



High Performance Cutting Tools



Forbes & Company Limited





# ALL PRODUCT CATALOGUE



Forbes & Company Limited

# HISTORY

**Forbes & Company Limited** is one of the oldest companies of world that is still in business. The company traces its origin to the year 1767 when John Forbes of Scotland started his business in India.

Over the years, the management of the company moved from the Forbes Family to the Campbells to the Tata Group and now finally to the well-known Shapoorji Pallonji Group; leaders in infrastructure, construction and real estate businesses, amongst many others. For more details about Shapoorji Pallonji & Co.Ltd. please visit: [www.shapoorji.in](http://www.shapoorji.in)

Forbes & Company Limited has three main businesses, namely Engineering, Shipping and Transaction Management Solutions. Many of these businesses have joint ventures with world leaders and are present throughout India and in many other countries across the globe.

Forbes & Company Limited have a tradition of excellence and total customer delight as its singular aim. Engineering Division of Forbes began its journey with the manufacturing of Spring Lock Washers and expanded its capabilities to manufacture a range of precision cutting tools under the brand name of Totem.





**High Performance Cutting Tools**



**Forbes & Company Limited**

## VISION

To be a Market Leader by empowering customers with Innovation Solutions in Precision Cutting Tools and Industrial Automation through world class practices.

## MISSION

- To inculcate innovation led organizational culture to be a front runner in the field of technology
- To add value to the customers' business while adhering to our core values of QDP: Quality, Price, Delivery & the 5C's: Convenience, Comfort, Care, Commitment and Customer Delight.
- To develop a strong in house Research & Development skillset to enhance the quality of solutions
- To establish the cost leadership through world class manufacturing and operational excellence
- To be accountable towards the interest of all stakeholders, environment & society at large through all our actions and decisions.

**RAVI PREM**

COO - Engg. Solution Group



Forbes & Company Limited

## QUALITY POLICY

We commit ourselves for customer delight by delivering innovative products and solutions through continual improvement of business processes by active participation of our employees

We remain committed towards environment and statutory compliances.

**RAVI PREM**

COO - Engg. Solution Group

# CONTENTS



HSS TAPS			
	PRODUCTS	DESCRIPTION	PAGE
	HSS SPIRAL POINT TAPS	HSS-E Machine Taps Through Hole Application	5
	HSS SPIRAL FLUTE TAPS	HSS-E Machine Taps Blind Hole Application	41
	HSS STRAIGHT FLUTE TAPS	HSS-E Machine Taps Through & Blind Hole Application	73
	HSS FORMING TAPS	HSS-E Machine Taps Cold Forming Application	95
	HSS HAND TAPS	HSS Hand Taps General Purpose	111
	TECHNICAL DETAILS		141

DIES			
	PRODUCTS	DESCRIPTION	PAGE
	ROUND SPLIT DIES	HSS & Carbon Steel Round Dies External Threading Application	166
	HEXAGONAL DIES	HSS & Carbon Steel Hexagonal Dies External Threading Application	187
	TECHNICAL DETAILS		197

END MILLS			
	PRODUCTS	DESCRIPTION	PAGE
	PROTON PLUS SERIES	Solid Carbide End Mill And Ball End Mills For Above 45 HRC	202
	HSM SERIES	Solid Carbide End Mill And Ball End Mills For 30 To 45 HRC For Die & Mould Industry	210
	TR SERIES	Solid Carbide End Mill And Ball End Mills For Stainless Steel, Titanium & High Temperature Alloys	214

# CONTENTS



END MILLS			
	PRODUCTS	DESCRIPTION	PAGE
	HP SERIES	Solid Carbide End Mills for Aluminium Application	217
	GP SERIES	Solid Carbide End Mills and Ball Nose End Mills for General Purpose Application	291
	TECHNICAL DETAILS		239

DRILLS			
	PRODUCTS	DESCRIPTION	PAGE
	SOLID CARBIDE DRILLS	3X, 5X & 7X Solid & With Coolant Feed Drills	263
	HIGH SPEED STEEL DRILLS	Parallel Shank & Taper Shank Drills	286
	TECHNICAL DETAILS		295

CARBIDE BURRS			
	PRODUCTS	DESCRIPTION	PAGE
	TUNGSTEN CARBIDE ROTARY BURRS	Deburring Application	311
	TECHNICAL DETAILS		341

CARBON STEEL TAPS			
	PRODUCTS	DESCRIPTION	PAGE
	CARBON STEEL HAND TAPS	General Purpose Application	345
	CASE SET	Set Of Tap, Die, Tap Wrench & Die Holder	369
	TECHNICAL DETAILS		372



# HSS-E/HSS



High Performance Cutting Tools



# HIGH SPEED STEEL TAPS



# HSS-E



High Performance Cutting Tools



## SPIRAL POINT MACHINE TAPS

## SPIRAL POINTED TAP - SA SERIES



SPIRAL POINT is also known as 'gun nose' or 'bull nose' or chipdriver. These taps are dimensionally the same as a hand tap, second lead, but have the cutting face ground back relative to the axis of the tap, for the lead portion.

This gives the flute a better cutting action, requiring less power, and pushes the cut material forward, allowing free flow of coolant along the flutes to the cutting edge.







The flutes are not ground as deeply as for hand taps, giving the tap greater strength. It can therefore be run at higher speeds. Spiral point taps are ideal for machine tapping of through holes, or blind holes where there is enough clearance beyond the threaded portion to accommodate the swarf.

Advantages :

- Thread Chamfer is of 4.5 threads & cutting load is distributed
- Shallow flute depth, hence stronger tap
- Chip clogging is eliminated as the tap pushes the chip forward and thus enhancing tool life.



## SPIRAL POINT TAPS

SERIES		THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
SA1		M	DIN371/ DIN376	General Steel	B/4-4.5P	Bright	9
SA3		M	DIN371/ DIN376	General Steel	B/4-4.5P	TiN	10
SA4		M	DIN371/ DIN376	General Steel	B/4-4.5P	TiAlN	11
SAF3		M	DIN371/ DIN376	Forged Steel	B/4-4.5P	TiN	12
SAF5		M	DIN371/ DIN376	Forged Steel	B/4-4.5P	TiCN	13
SA1		MF	DIN374	General Steel	B/4-4.5P	Bright	14
SA3		MF	DIN374	General Steel	B/4-4.5P	TiN	15
SA4		MF	DIN374	General Steel	B/4-4.5P	TiAlN	16
SA1		UNC	DIN371/ DIN376	General Steel	B/4-4.5P	Bright	17
SA3		UNC	DIN371/ DIN376	General Steel	B/4-4.5P	TiN	18
SA4		UNC	DIN371/ DIN376	General Steel	B/4-4.5P	TiAlN	19
SA1		UNF	DIN374	General Steel	B/4-4.5P	Bright	20
SA3		UNF	DIN374	General Steel	B/4-4.5P	TiN	21
SA4		UNF	DIN374	General Steel	B/4-4.5P	TiAlN	22

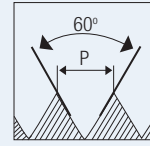
# SELECTION GUIDE



## SPIRAL POINT TAPS

SERIES		THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
SA1		M	ISO	General Steel	B/4-4.5P	Bright	23
SA3		M	ISO	General Steel	B/4-4.5P	TiN	24
SA4		M	ISO	General Steel	B/4-4.5P	TiAlN	25
SAF3		M	ISO	Forged Steel	B/4-4.5P	TiN	26
SAF5		M	ISO	Forged Steel	B/4-4.5P	TiCN	27
SAS4		M	ISO	Stainless Steel	B/4-4.5P	TiAlN	28
SAS5		M	ISO	Stainless Steel	B/4-4.5P	TiCN	29
SA1		MF	ISO	General Steel	B/4-4.5P	Bright	30
SA3		MF	ISO	General Steel	B/4-4.5P	TiN	31
SA4		MF	ISO	General Steel	B/4-4.5P	TiAlN	32
SAF3		MF	ISO	Forged Steel	B/4-4.5P	TiN	33
SAF5		MF	ISO	Forged Steel	B/4-4.5P	TiCN	34
SA1L		M/MF	ISO Long Shank	General Steel	B/4-4.5P	Bright	35
SA3L		M/MF	ISO Long Shank	General Steel	B/4-4.5P	TiN	36
SA1		UNC	ISO	General Steel	B/4-4.5P	Bright	37
SA3		UNC	ISO	General Steel	B/4-4.5P	TiN	38
SA1		UNF	ISO	General Steel	B/4-4.5P	Bright	39
SA3		UNF	ISO	General Steel	B/4-4.5P	TiN	40

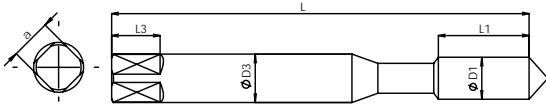
**M** Metric coarse threads



HOLE TYPE



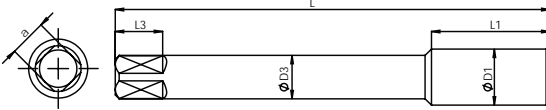
HSS-E
DIN 371/376
6HX
8/4-4.5P
BF



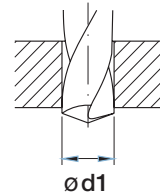
Reinforced Shank DIN371 (M3 - M10)



PO-P1



Reduced Shank DIN376 (M12 - M20)

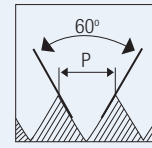


Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203112	56	11	3.5	2.7	6	2.5
M 3.5	0.6	FAB0203113	56	12	4	3	6	2.9
M 4	0.7	FAB0203114	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0203115	70	16	6	4.9	7	4.2
M 6	1	FAB0203116	80	19	6	4.9	7	5
M 8	1.25	FAB0203118	90	22	8	6.2	9	6.8
M 10	1.5	FAB0203119	100	24	10	8	11	8.5
M 12	1.75	FAB0203120	110	28	9	7	10	10.3
M 14	2	FAB0203121	110	30	11	9	12	12
M 16	2	FAB0203122	110	32	12	9	12	14
M 18	2.5	FAB0204201	125	34	14	11	14	15.5
M 20	2.5	FAB0204202	140	34	16	12	15	17.5

M

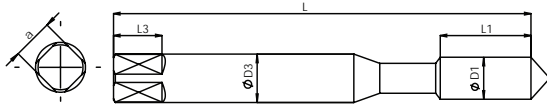
**Metric coarse threads**



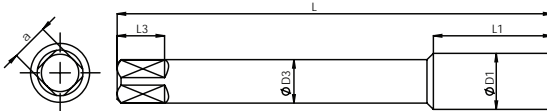
HOLE TYPE



HSS-E
DIN 371/376
6HX
B/4-4.5P
TiN



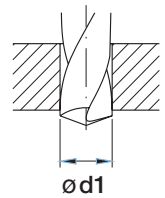
Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

P0-P2

K1-K2

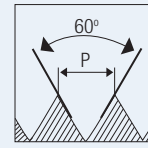


Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203123	56	11	3.5	2.7	6	2.5
M 3.5	0.6	FAB0203124	56	12	4	3	6	2.9
M 4	0.7	FAB0203125	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0203126	70	16	6	4.9	7	4.2
M 6	1	FAB0203127	80	19	6	4.9	7	5
M 8	1.25	FAB0203129	90	22	8	6.2	9	6.8
M 10	1.5	FAB0203130	100	24	10	8	11	8.5
M 12	1.75	FAB0203131	110	28	9	7	10	10.3
M 14	2	FAB0203132	110	30	11	9	12	12
M 16	2	FAB0203133	110	32	12	9	12	14
M 18	2.5	FAB0204203	125	34	14	11	14	15.5
M 20	2.5	FAB0204204	140	34	16	12	15	17.5



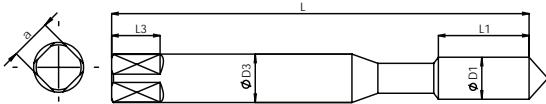
**M** Metric coarse threads



HOLE TYPE



HSS-E
DIN 371/376
6HX
B/4-4.5P
TiAIN

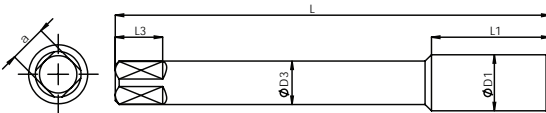


Reinforced Shank DIN371 (M 3 - M 10)

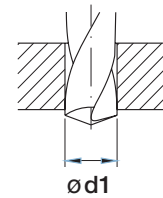


P0-P2

K1-K3



Reduced Shank DIN376 (M 12 - M 20)



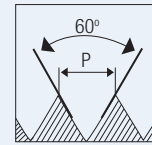
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0204205	56	11	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204206	56	12	4	3	6	2.9
M 4	0.7	FAB0204207	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0204208	70	16	6	4.9	7	4.2
M 6	1	FAB0204209	80	19	6	4.9	7	5
M 8	1.25	FAB0204210	90	22	8	6.2	9	6.8
M 10	1.5	FAB0204211	100	24	10	8	11	8.5
M 12	1.75	FAB0204212	110	28	9	7	10	10.3
M 14	2	FAB0204213	110	30	11	9	12	12
M 16	2	FAB0204214	110	32	12	9	12	14
M 18	2.5	FAB0204215	125	34	14	11	14	15.5
M 20	2.5	FAB0204216	140	34	16	12	15	17.5



M

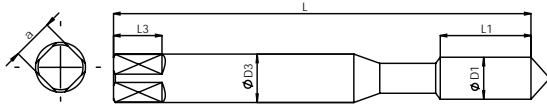
**Metric coarse threads**



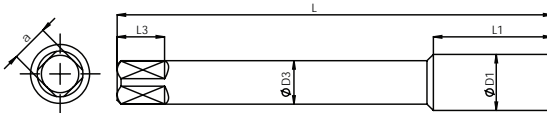
HOLE TYPE



HSS-E
DIN 371/376
6HX
B/4-4.5P
TiN

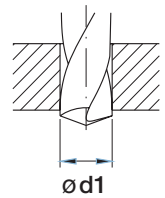


Reinforced Shank DIN371 (M 3 - M 10)



Reduced Shank DIN376 (M 12 - M 20)

P2-P3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0204217	56	11	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204218	56	12	4	3	6	2.9
M 4	0.7	FAB0204219	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0204220	70	16	6	4.9	7	4.2
M 6	1	FAB0204221	80	19	6	4.9	7	5
M 8	1.25	FAB0204222	90	22	8	6.2	9	6.8
M 10	1.5	FAB0204223	100	24	10	8	11	8.5
M 12	1.75	FAB0204224	110	28	9	7	10	10.3
M 14	2	FAB0204225	110	30	11	9	12	12
M 16	2	FAB0204226	110	32	12	9	12	14
M 18	2.5	FAB0204227	125	34	14	11	14	15.5
M 20	2.5	FAB0204228	140	34	16	12	15	17.5

HSS TAPS

DIES

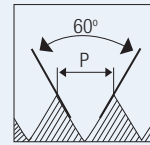
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

# M Metric coarse threads



HOLE TYPE



HSS-E

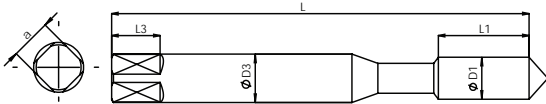
DIN 371/376

6HX

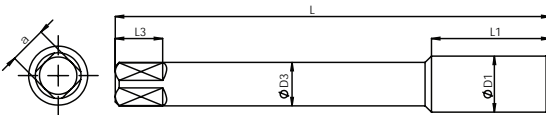
B/4-4.5P

TiCN

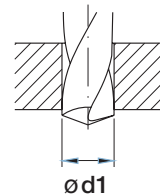
P2-P4



Reinforced Shank DIN371 (M 3 - M 10)



Reduced Shank DIN376 (M 12 - M 20)



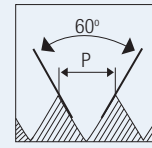
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0204229	56	11	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204230	56	12	4	3	6	2.9
M 4	0.7	FAB0204231	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0204232	70	16	6	4.9	7	4.2
M 6	1	FAB0204233	80	19	6	4.9	7	5
M 8	1.25	FAB0204234	90	22	8	6.2	9	6.8
M 10	1.5	FAB0204235	100	24	10	8	11	8.5
M 12	1.75	FAB0204236	110	28	9	7	10	10.3
M 14	2	FAB0204237	110	30	11	9	12	12
M 16	2	FAB0204238	110	32	12	9	12	14
M 18	2.5	FAB0204239	125	34	14	11	14	15.5
M 20	2.5	FAB0204240	140	34	16	12	15	17.5



**MF**

**Metric fine threads**



HOLE TYPE



HSS-E

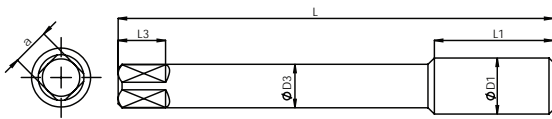
DIN 374

6HX

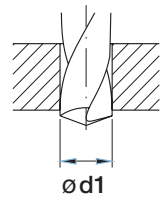
B/4-4.5P

BF

P0-P1



Male Centre (M6 - M10)  
Female Centre (M12 - M20)



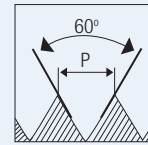
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204241	80	14	4.5	3.4	6	5.2
M 8	1	FAB0204242	90	18	6	4.9	7	7
M 10	1.25	FAB0204243	100	22	7	5.5	8	8.8
M 10	1	FAB0204244	90	18	7	5.5	8	9
M 12	1.5	FAB0204245	100	22	9	7	10	10.5
M 12	1.25	FAB0204246	100	22	9	7	10	10.8
M 14	1.5	FAB0204247	100	22	11	9	12	12.5
M 14	1.25	FAB0204248	100	22	11	9	12	12.8
M 16	1.5	FAB0204249	100	22	12	11	12	14.5
M 18	1.5	FAB0204250	110	25	14	12	14	16.5
M 20	1.5	FAB0204251	125	25	16	14.5	15	18.5



**MF**

**Metric fine threads**



HOLE TYPE



HSS-E

DIN 374

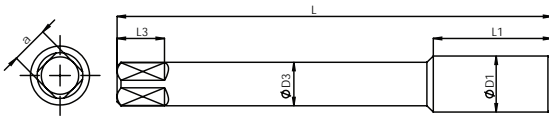
6HX



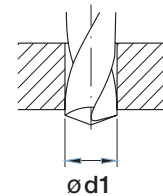
TiN

P0-P2

K1-K2



Male Centre (M6 - M10)  
Female Centre (M12 - M20)



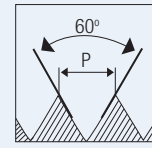
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204252	80	13	4.5	3.4	6	5.2
M 8	1	FAB0204253	90	17	6	4.9	7	7
M 10	1.25	FAB0204254	100	22	7	5.5	8	8.8
M 10	1	FAB0204255	90	18	7	5.5	8	9
M 12	1.5	FAB0204256	100	22	9	7	10	10.5
M 12	1.25	FAB0204257	100	22	9	7	10	10.8
M 14	1.5	FAB0204258	100	22	11	9	12	12.5
M 14	1.25	FAB0204259	100	22	11	9	12	12.8
M 16	1.5	FAB0204260	100	22	12	11	12	14.5
M 18	1.5	FAB0204261	110	25	14	12	14	16.5
M 20	1.5	FAB0204262	125	25	16	14.5	15	18.5



**MF**

**Metric fine threads**



HOLE TYPE



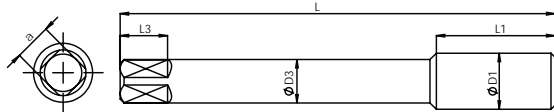
HSS-E

DIN 374

6HX

B/4-4.5P

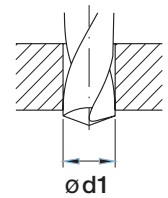
TiAIN



Male Centre (M6 - M10)  
Female Centre (M12 - M20)

P0-P2

K1-K3



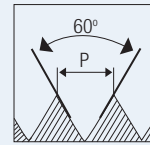
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 6	0.75	FAB0204263	80	14	4.5	3.4	6	5.2
M 8	1	FAB0204264	90	18	6	4.9	7	7
M 10	1.25	FAB0204265	100	22	7	5.5	8	8.8
M 10	1	FAB0204266	90	18	7	5.5	8	9
M 12	1.5	FAB0204267	100	22	9	7	10	10.5
M 12	1.25	FAB0204268	100	22	9	7	10	10.8
M 14	1.5	FAB0204269	100	22	11	9	12	12.5
M 14	1.25	FAB0204270	100	22	11	9	12	12.8
M 16	1.5	FAB0204271	100	22	12	11	12	14.5
M 18	1.5	FAB0204272	110	25	14	12	14	16.5
M 20	1.5	FAB0204273	125	25	16	14.5	15	18.5



**UNC**

**Unified coarse threads**



HOLE TYPE



HSS-E

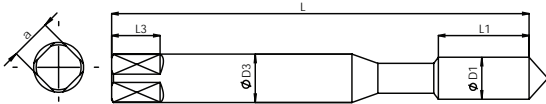
DIN 371/376

2B

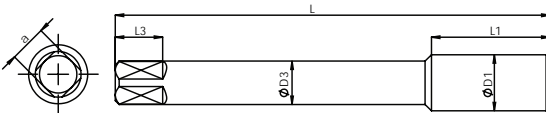
8/4-4.5P

BF

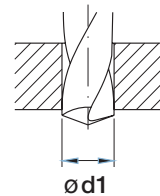
**P0-P1**



Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank DIN376 (7/16" - 1")



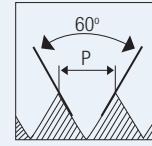
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0204274	80	19	7	5.5	8	5.2
5/16"	18	FAB0204275	90	22	8	6.2	9	6.6
3/8"	16	FAB0204276	100	24	10	8	11	8
7/16"	14	FAB0204277	100	24	8	6.2	9	9.4
1/2"	13	FAB0204278	110	28	9	7	10	10.8
5/8"	11	FAB0204279	110	32	12	9	12	13.5
3/4"	10	FAB0204280	125	34	14	11	14	16.5
7/8"	9	FAB0204281	140	34	18	14.5	17	19.5
1"	8	FAB0204282	160	38	18	14.5	17	22.25



UNC

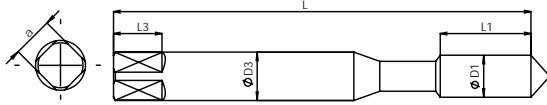
Unified coarse threads



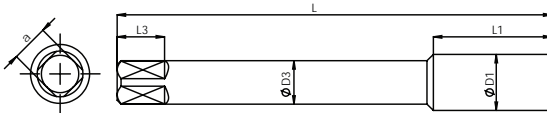
HOLE TYPE



HSS-E
DIN 371/376
2B
B/4-4.5P
TiN



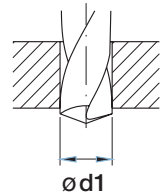
Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank DIN376 (7/16" - 1")

P0-P2

K1-K2



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0204283	80	19	7	5.5	8	5.2
5/16"	18	FAB0204284	90	22	8	6.2	9	6.6
3/8"	16	FAB0204285	100	24	10	8	11	8
7/16"	14	FAB0204286	100	24	8	6.2	9	9.4
1/2"	13	FAB0204287	110	28	9	7	10	10.8
5/8"	11	FAB0204288	110	32	12	9	12	13.5
3/4"	10	FAB0204289	125	34	14	11	14	16.5
7/8"	9	FAB0204290	140	34	18	14.5	17	19.5
1"	8	FAB0204291	160	38	18	14.5	17	22.25

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

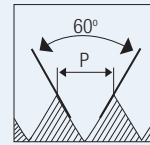
CS TAPS





**UNC**

**Unified coarse threads**



HOLE TYPE



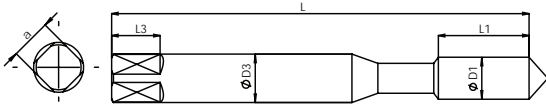
HSS-E

DIN 371/376

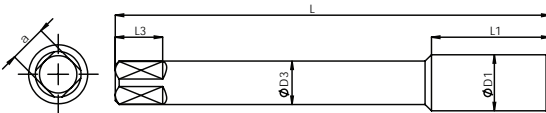
2B

8/4-4.5P

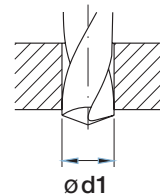
TiAIN



Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank DIN376 (7/16" - 1")



P0-P2

K1-K3

Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0204292	80	19	7	5.5	8	5.2
5/16"	18	FAB0204293	90	22	8	6.2	9	6.6
3/8"	16	FAB0204294	100	24	10	8	11	8
7/16"	14	FAB0204295	100	24	8	6.2	9	9.4
1/2"	13	FAB0204296	110	28	9	7	10	10.8
5/8"	11	FAB0204297	110	32	12	9	12	13.5
3/4"	10	FAB0204298	125	34	14	11	14	16.5
7/8"	9	FAB0204299	140	34	18	14.5	17	19.5
1"	8	FAB0204300	160	38	18	14.5	17	22.25



HSS TAPS

DIES

END MILLS

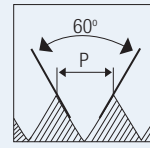
DRILLS

CARBIDE BURRS

CS TAPS

UNF

Unified fine threads



HOLE TYPE



HSS-E

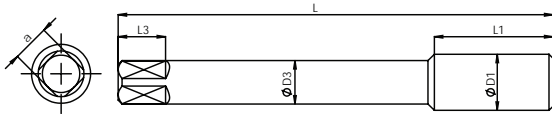
DIN 374

2B

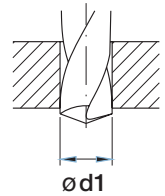
B/4-4.5P

BF

P0-P1



Male Centre (1/4" - 3/8")  
Female Centre (7/16" - 1")



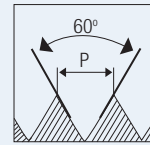
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0204301	80	19	5.5	4.3	7	5.5
5/16"	24	FAB0204302	90	20	6	4.9	8	6.9
3/8"	24	FAB0204303	100	20	7	5.5	8	8.5
7/16"	20	FAB0204304	100	22	8	6.2	9	9.9
1/2"	20	FAB0204305	100	22	9	7	10	11.5
5/8"	18	FAB0204306	100	22	12	9	12	14.5
3/4"	16	FAB0204307	110	25	14	11	14	17.5
7/8"	14	FAB0204308	125	25	18	14.5	17	20.5
1"	12	FAB0204309	140	28	18	14.5	17	23.25



UNF

Unified fine threads



HOLE TYPE



HSS-E

DIN 374

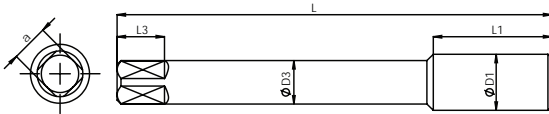
2B

8/4-4.5P

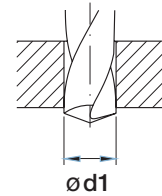
TiN

P0-P2

K1-K2



Male Centre (1/4" - 3/8")  
Female Centre (7/16" - 1")



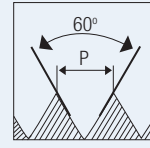
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0204310	80	19	5.5	4.3	7	5.5
5/16"	24	FAB0204311	90	20	6	4.9	8	6.9
3/8"	24	FAB0204312	100	20	7	5.5	8	8.5
7/16"	20	FAB0204313	100	22	8	6.2	9	9.9
1/2"	20	FAB0204314	100	22	9	7	10	11.5
5/8"	18	FAB0204315	100	22	12	9	12	14.5
3/4"	16	FAB0204316	110	25	14	11	14	17.5
7/8"	14	FAB0204317	125	25	18	14.5	17	20.5
1"	12	FAB0204318	140	28	18	14.5	17	23.25



UNF

Unified fine threads



HOLE TYPE



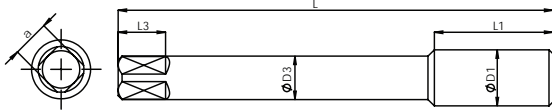
HSS-E

DIN 374

2B

B/4-4.5P

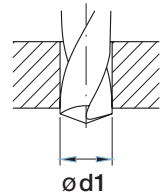
TiAIN



Male Centre (1/4" - 3/8")  
Female Centre (7/16" - 1")

P0-P2

K1-K3



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ø d1
1/4"	28	FAB0204319	80	19	5.5	4.3	7	5.5
5/16"	24	FAB0204320	90	20	6	4.9	8	6.9
3/8"	24	FAB0204321	100	20	7	5.5	8	8.5
7/16"	20	FAB0204322	100	22	8	6.2	9	9.9
1/2"	20	FAB0204323	100	22	9	7	10	11.5
5/8"	18	FAB0204324	100	22	12	9	12	14.5
3/4"	16	FAB0204325	110	25	14	11	14	17.5
7/8"	14	FAB0204326	125	25	18	14.5	17	20.5
1"	12	FAB0204327	140	28	18	14.5	17	23.25

HSS TAPS

DIES

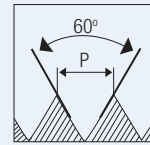
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

# M Metric coarse threads

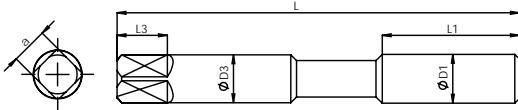


HOLE TYPE

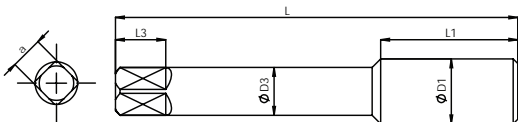


HSS-E
ISO 529
6HX
8/4-4.5P
BF

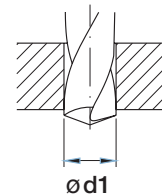
PO-P1



Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M20)



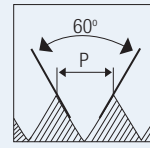
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200647	48	11	3.15	2.5	5	2.5
M 3.5	0.6	FAB0200653	50	13	3.55	2.8	5	2.9
M 4	0.7	FAB0200659	53	13	4	3.15	6	3.3
M 5	0.8	FAB0200671	58	16	5	4	7	4.2
M 6	1	FAB0200682	66	19	6.3	5	8	5
M 7	1	FAB0203033	66	19	7.1	5.6	8	6
M 8	1.25	FAB0200694	72	22	8	6.3	9	6.8
M 10	1.5	FAB0200718	80	24	10	8	11	8.5
M 12	1.75	FAB0200748	89	29	9	7.1	10	10.3
M 14	2	FAB0200778	95	30	11.2	9	12	12
M 16	2	FAB0200799	102	32	12.5	10	13	14
M 18	2.5	FAB0203037	112	37	14	11.2	14	15.5
M 20	2.5	FAB0203039	112	37	14	11.2	14	17.5



M

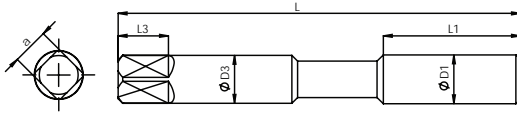
**Metric coarse threads**



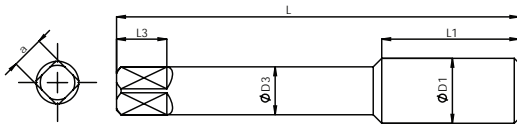
HOLE TYPE



HSS-E
ISO 529
6HX
B/4-4.5P
TiN



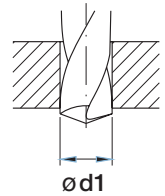
Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M20)

P0-P2

K1-K2



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200648	48	11	3.15	2.5	5	2.5
M 3.5	0.6	FAB0200654	50	13	3.55	2.8	5	2.9
M 4	0.7	FAB0200661	53	13	4	3.15	6	3.3
M 5	0.8	FAB0200673	58	16	5	4	7	4.2
M 6	1	FAB0200684	66	19	6.3	5	8	5
M 7	1	FAB0203040	66	19	7.1	5.6	8	6
M 8	1.25	FAB0200696	72	22	8	6.3	9	6.8
M 10	1.5	FAB0200720	80	24	10	8	11	8.5
M 12	1.75	FAB0200751	89	29	9	7.1	10	10.3
M 14	2	FAB0200780	95	30	11.2	9	12	12
M 16	2	FAB0200801	102	32	12.5	10	13	14
M 18	2.5	FAB0203043	112	37	14	11.2	14	15.5
M 20	2.5	FAB0200810	112	37	14	11.2	14	17.5

HSS TAPS

DIES

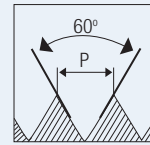
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

# M Metric coarse threads



HOLE TYPE



HSS-E

ISO 529

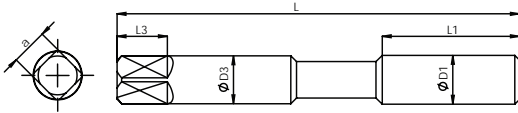
6HX

8/4-4.5P

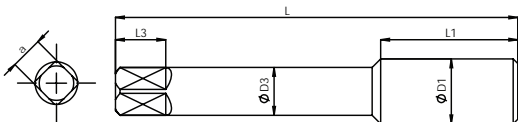
TiAIN

P0-P2

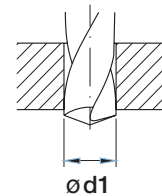
K1-K3



Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M20)



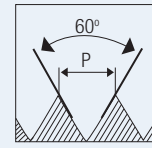
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203044	48	11	3.15	2.5	5	2.5
M 3.5	0.6	FAB0203045	50	13	3.55	2.8	5	2.9
M 4	0.7	FAB0200662	53	13	4	3.15	6	3.3
M 5	0.8	FAB0203046	58	16	5	4	7	4.2
M 6	1	FAB0200685	66	19	6.3	5	8	5
M 7	1	FAB0203047	66	19	7.1	5.6	8	6
M 8	1.25	FAB0200697	72	22	8	6.3	9	6.8
M 10	1.5	FAB0200721	80	24	10	8	11	8.5
M 12	1.75	FAB0203052	89	29	9	7.1	10	10.3
M 14	2	FAB0203054	95	30	11.2	9	12	12
M 16	2	FAB0203055	102	32	12.5	10	13	14
M 18	2.5	FAB0203057	112	37	14	11.2	14	15.5
M 20	2.5	FAB0203059	112	37	14	11.2	14	17.5



M

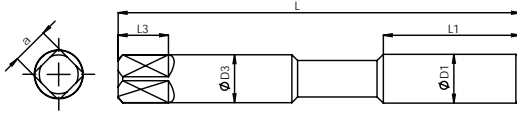
**Metric coarse threads**



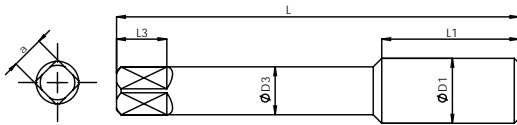
HOLE TYPE



HSS-E
ISO 529
6HX
B/4-4.5P
TiN

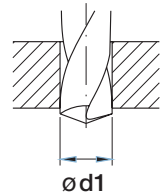


Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M16)

P2-P3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 3	0.5	FAB0203060	48	11	3.15	2.5	5	2.5
M 4	0.7	FAB0203061	53	13	4	3.15	6	3.3
M 5	0.8	FAB0203062	58	16	5	4	7	4.2
M 6	1	FAB0203063	66	19	6.3	5	8	5
M 8	1.25	FAB0203065	72	22	8	6.3	9	6.8
M 10	1.5	FAB0203068	80	24	10	8	11	8.5
M 12	1.75	FAB0203070	89	29	9	7.1	10	10.3
M 14	2	FAB0203072	95	30	11.2	9	12	12
M 16	2	FAB0203074	102	32	12.5	10	13	14

HSS TAPS

DIES

END MILLS

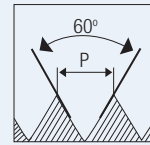
DRILLS

CARBIDE BURRS

CS TAPS



**M** Metric coarse threads



HOLE TYPE



HSS-E

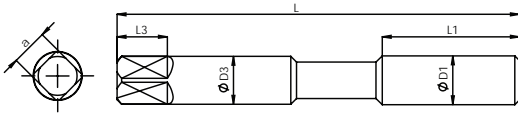
ISO 529

6HX

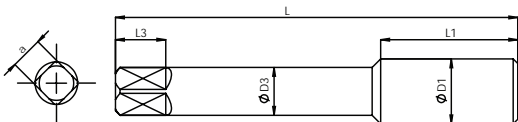
B/4-4.5P

TiCN

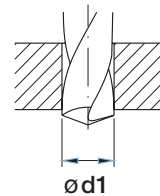
P2-P4



Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M16)



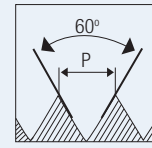
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203077	48	11	3.15	2.5	5	2.5
M 4	0.7	FAB0203078	53	13	4	3.15	6	3.3
M 5	0.8	FAB0203079	58	16	5	4	7	4.2
M 6	1	FAB0203080	66	19	6.3	5	8	5
M 8	1.25	FAB0203082	72	22	8	6.3	9	6.8
M 10	1.5	FAB0203085	80	24	10	8	11	8.5
M 12	1.75	FAB0203087	89	29	9	7.1	10	10.3
M 14	2	FAB0203089	95	30	11.2	9	12	12
M 16	2	FAB0203091	102	32	12.5	10	13	14



M

**Metric coarse threads**



HOLE TYPE



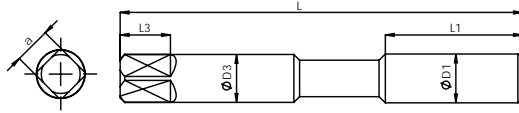
HSS-E

ISO 529

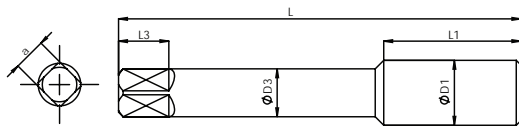
6HX

B/4-4.5P

TiAIN

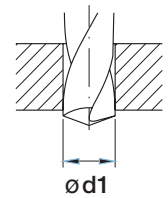


Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M16)

M1-M3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203094	48	11	3.15	2.5	5	2.5
M 4	0.7	FAB0203095	53	13	4	3.15	6	3.3
M 5	0.8	FAB0203096	58	16	5	4	7	4.2
M 6	1	FAB0203097	66	19	6.3	5	8	5
M 8	1.25	FAB0203098	72	22	8	6.3	9	6.8
M 10	1.5	FAB0203099	80	24	10	8	11	8.5
M 12	1.75	FAB0203100	89	29	9	7.1	10	10.3
M 14	2	FAB0203101	95	30	11.2	9	12	12
M 16	2	FAB0203102	102	32	12.5	10	13	14

HSS TAPS

DIES

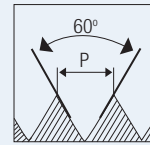
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

# M Metric coarse threads



HOLE TYPE



HSS-E

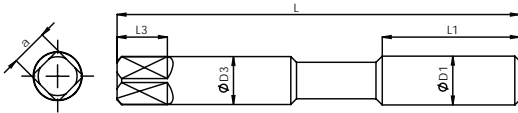
ISO 529

6HX

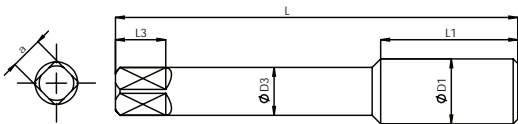
B/4-4.5P

TiCN

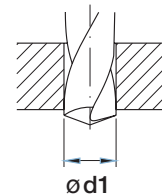
M1-M3



Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M16)



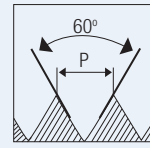
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203103	48	11	3.15	2.5	5	2.5
M 4	0.7	FAB0203104	53	13	4	3.15	6	3.3
M 5	0.8	FAB0203105	58	16	5	4	7	4.2
M 6	1	FAB0203106	66	19	6.3	5	8	5
M 8	1.25	FAB0203107	72	22	8	6.3	9	6.8
M 10	1.5	FAB0203108	80	24	10	8	11	8.5
M 12	1.75	FAB0203109	89	29	9	7.1	10	10.3
M 14	2	FAB0203110	95	30	11.2	9	12	12
M 16	2	FAB0203111	102	32	12.5	10	13	14



**MF**

**Metric fine threads**



HOLE TYPE



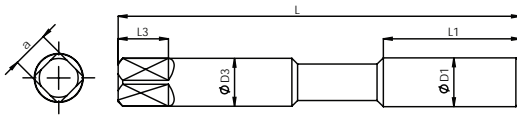
HSS-E

ISO 529

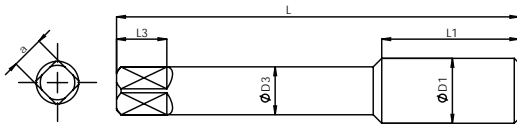
6HX

B/4-4.5P

BF

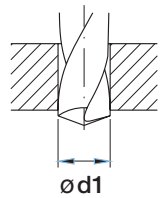


Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M20)

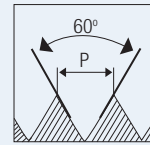
P0-P1



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203034	69	19	8	6.3	9	7
M 10	1	FAB0203035	76	20	10	8	11	9
M 10	1.25	FAB0200708	76	20	10	8	11	8.8
M 12	1.5	FAB0200738	89	29	9	7.1	10	10.5
M 14	1.5	FAB0200769	95	30	11.2	9	12	12.5
M 16	1.5	FAB0200787	102	32	12.5	10	13	14.5
M 18	1.5	FAB0203036	104	29	14	11.2	14	16.5
M 20	1.5	FAB0203038	104	29	14	11.2	14	18.5

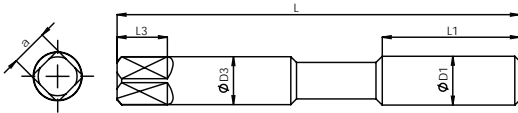
**MF** Metric fine threads



HOLE TYPE



HSS-E
ISO 529
6HX
B/4-4.5P
TiN

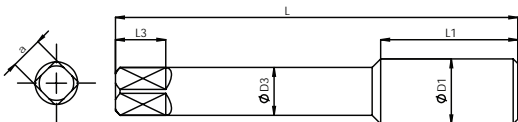


Reinforced Shank (M8 - M10)

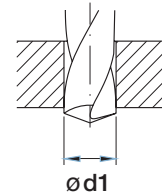


P1-P2

K1-K2



Reduced Shank (M12 - M20)



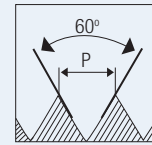
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203041	69	19	8	6.3	9	7
M 10	1	FAB0200702	76	20	10	8	11	9
M 10	1.25	FAB0200710	76	20	10	8	11	8.8
M 12	1.5	FAB0200740	89	29	9	7.1	10	10.5
M 14	1.5	FAB0200771	95	30	11.2	9	12	12.5
M 16	1.5	FAB0200789	102	32	12.5	10	13	14.5
M 18	1.5	FAB0203042	104	29	14	11.2	14	16.5
M 20	1.5	FAB0200807	104	29	14	11.2	14	18.5



MF

Metric fine threads



HOLE TYPE



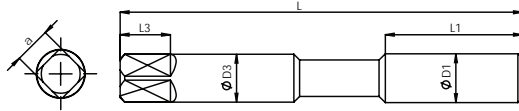
HSS-E

ISO 529

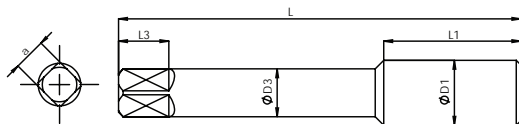
6HX

B/4-4.5P

TiAIN



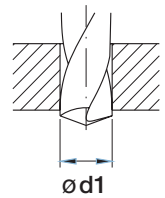
Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M20)

P0-P2

K1-K3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203048	69	19	8	6.3	9	7
M 10	1	FAB0203049	76	20	10	8	11	9
M 10	1.25	FAB0203050	76	20	10	8	11	8.8
M 12	1.5	FAB0203051	89	29	9	7.1	10	10.5
M 14	1.5	FAB0203053	95	30	11.2	9	12	12.5
M 16	1.5	FAB0200790	102	32	12.5	10	13	14.5
M 18	1.5	FAB0203056	104	29	14	11.2	14	16.5
M 20	1.5	FAB0203058	104	29	14	11.2	14	18.5

HSS TAPS

DIES

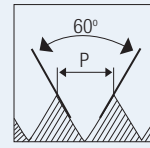
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

**MF** Metric fine threads

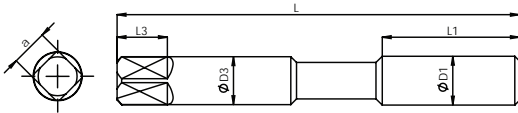


HOLE TYPE

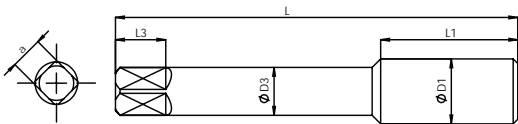


HSS-E
ISO 529
6HX
B/4-4.5P
TiN

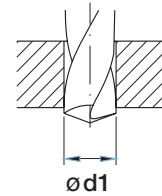
**P2-P3**



Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M20)



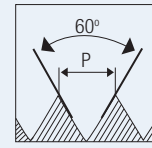
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203064	69	19	8	6.3	9	7
M 10	1	FAB0203066	76	20	10	8	11	9
M 10	1.25	FAB0203067	76	20	10	8	11	8.8
M 12	1.5	FAB0203069	89	29	9	7.1	10	10.5
M 14	1.5	FAB0203071	95	30	11.2	9	12	12.5
M 16	1.5	FAB0203073	102	32	12.5	10	13	14.5
M 18	1.5	FAB0203075	104	29	14	11.2	14	16.5
M 20	1.5	FAB0203076	104	29	14	11.2	14	18.5



**MF**

**Metric fine threads**



HOLE TYPE



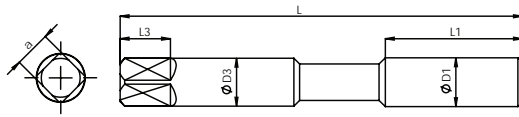
HSS-E

ISO 529

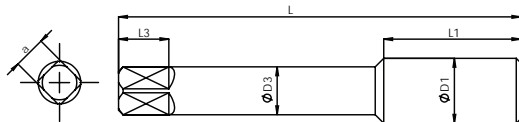
6HX

B/4-4.5P

TiCN

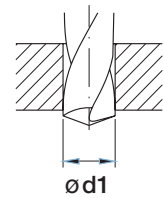


Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M20)

**P2-P4**



Unit : mm

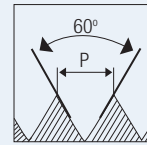
Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203081	69	19	8	6.3	9	7
M 10	1	FAB0203083	76	20	10	8	11	9
M 10	1.25	FAB0203084	76	20	10	8	11	8.8
M 12	1.5	FAB0203086	89	29	9	7.1	10	10.5
M 14	1.5	FAB0203088	95	30	11.2	9	12	12.5
M 16	1.5	FAB0203090	102	32	12.5	10	13	14.5
M 18	1.5	FAB0203092	104	29	14	11.2	14	16.5
M 20	1.5	FAB0203093	104	29	14	11.2	14	18.5





M/MF

**Metric coarse & fine threads - long shank**



HOLE TYPE



HSS-E

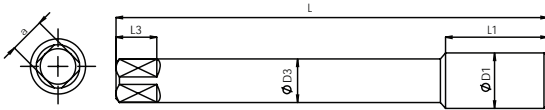
ISO 529

6HX

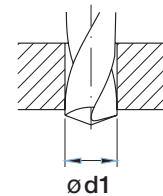
8/4-4.5P

BF

P0-P1



Male centre (M4 - M5)  
Female centre (M6 - M16)



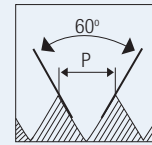
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 4	0.7	FAB0200818	73	13	3.15	2.5	5	3.3
M 5	0.8	FAB0200822	79	16	4	3.15	6	4.2
M 6	1	FAB0200832	89	19	4.5	3.55	6	5
M 8	1.25	FAB0200843	97	22	6.3	5	8	6.8
M 10	1.5	FAB0200854	108	24	8	6.3	9	8.5
M 12	1.5	FAB0200865	119	29	9	7.1	10	10.5
M 12	1.75	FAB0200876	119	29	9	7.1	10	10.3
M 14	1.5	FAB0200886	127	30	11.2	9	12	12.5
M 14	2	FAB0203264	127	30	11.2	9	12	12
M 16	1.5	FAB0203265	137	32	12.5	10	13	14.5
M 16	2	FAB0203266	137	32	12.5	10	13	14



M/MF

**Metric coarse & fine threads - long shank**



HOLE TYPE



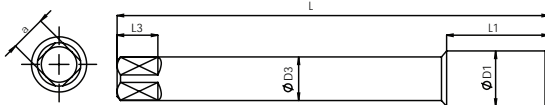
HSS-E

ISO 529

6HX

B/4-4.5P

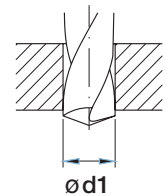
TiN



Male centre (M4 - M5)  
Female centre (M6 - M16)

P0-P2

K1-K2



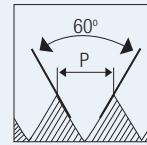
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 4	0.7	FAB0200820	73	13	3.15	2.50	5	3.3
M 5	0.8	FAB0200824	79	16	4	3.15	6	4.2
M 6	1	FAB0200834	89	19	4.5	3.55	6	5
M 8	1.25	FAB0200845	97	22	6.3	5.00	8	6.8
M 10	1.5	FAB0200856	108	24	8	6.30	9	8.5
M 12	1.5	FAB0200867	119	29	9	7.10	10	10.5
M 12	1.75	FAB0200878	119	29	9	7.10	10	10.3
M 14	1.5	FAB0200888	127	30	11.2	9.00	12	12.5
M 14	2	FAB0203267	127	30	11.2	9.00	12	12
M 16	1.5	FAB0203268	137	32	12.5	10.00	13	14.5
M 16	2	FAB0203269	137	32	12.5	10.00	13	14



UNC

Unified coarse threads



HOLE TYPE



HSS-E

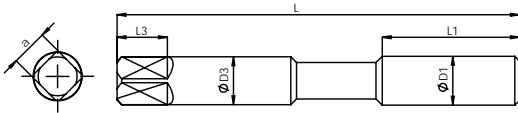
ISO 529

2B

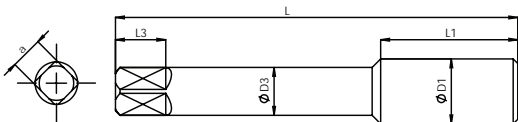


BF

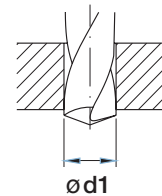
P0-P1



Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")



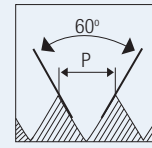
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0200573	66	19	6.3	5	8	3.2
5/16"	18	FAB0200582	72	22	8	6.3	9	6.6
3/8"	16	FAB0200593	80	24	10	8	11	8
7/16"	14	FAB0200603	85	25	8	6.3	9	9.4
1/2"	13	FAB0200614	89	29	9	7.1	10	10.8
5/8"	11	FAB0200627	102	32	12.5	10	13	13.5
3/4"	10	FAB0200638	112	37	14	11.2	14	16.5



UNC

Unified coarse threads



HOLE TYPE



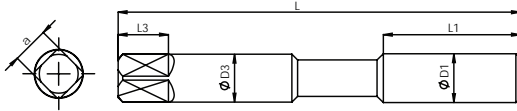
HSS-E

ISO  
529

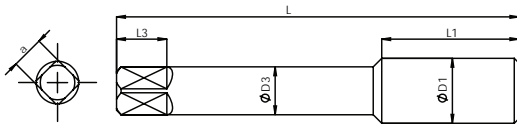
2B

B/4-4.5P

TiN



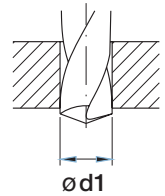
Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

P0-P2

K1-K2



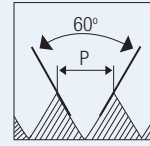
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0200575	66	19	6.3	5	8	3.2
5/16"	18	FAB0200584	72	22	8	6.3	9	6.6
3/8"	16	FAB0200595	80	24	10	8	11	8
7/16"	14	FAB0200605	85	25	8	6.3	9	9.4
1/2"	13	FAB0200616	89	29	9	7.1	10	10.8
5/8"	11	FAB0200629	102	32	12.5	10	13	13.5
3/4"	10	FAB0200640	112	37	14	11.2	14	16.5



UNF

Unified fine threads



HOLE TYPE



HSS-E

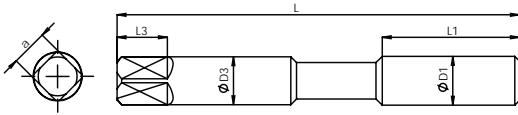
ISO 529

2B

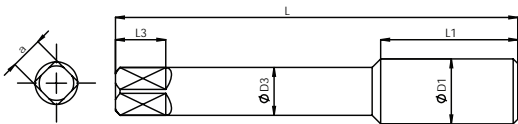
8/4-4.5P

BF

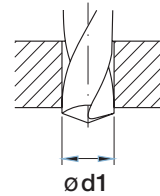
PO-P1



Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0200497	66	19	6.3	5	8	5.5
5/16"	24	FAB0200506	69	19	8	6.3	9	6.9
3/8"	24	FAB0200517	76	20	10	8	11	8.5
7/16"	20	FAB0200528	82	22	8	6.3	9	9.9
1/2"	20	FAB0200539	84	24	9	7.1	10	11.5
5/8"	18	FAB0200552	95	25	12.5	10	13	14.5
3/4"	16	FAB0200563	104	29	14	11.2	14	17.5

HSS TAPS

DIES

END MILLS

DRILLS

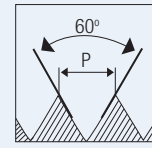
CARBIDE BURRS

CS TAPS



UNF

Unified fine threads



HOLE TYPE



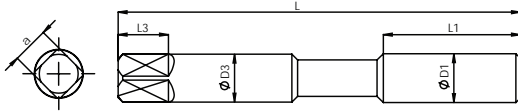
HSS-E

ISO  
529

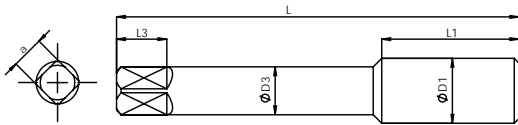
2B

B/4-4.5P

TiN



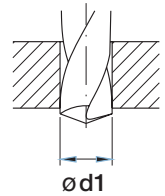
Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

P0-P2

K1-K2



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0200499	66	19	6.3	5	8	5.5
5/16"	24	FAB0200508	69	19	8	6.3	9	6.9
3/8"	24	FAB0200519	76	20	10	8	11	8.5
7/16"	20	FAB0200530	82	22	8	6.3	9	9.9
1/2"	20	FAB0200541	84	24	9	7.1	10	11.5
5/8"	18	FAB0200554	95	25	12.5	10	13	14.5
3/4"	16	FAB0200565	104	29	14	11.2	14	17.5

# HSS-E



High Performance Cutting Tools



## SPIRAL FLUTE MACHINE TAPS

## SPIRAL FLUTE TAPS - SB SERIES



SPIRAL FLUTE - These taps are used to produce a thread close to the bottom of a blind hole and therefore have a very short lead. The right hand spiral cut of the flutes acts to force the swarf away from the cutting teeth to the rear of the flutes and out of the hole. They are better on materials which form long continuous stringy swarf, rather than chips. They are also better to tap a thread in a hole where there is a break in the material, e.g. another hole, as the spiral fluting helps the tap to pick up on the other side. Spiral flute taps can have slow or fast helix angles.

Advantages :



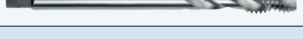
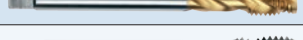
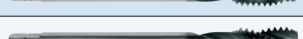

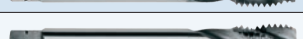




- Can be used in both blind holes & also in through holes
- Chips are pushed upwards due to spiral flute – Chip clogging avoided
- Full thread depth can be achieved and this design prevents tap breakage



# SELECTION GUIDE



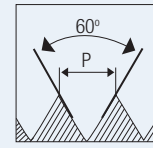
## SPIRAL FLUTE TAPS

SERIES		THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
SB1		M	DIN371/ DIN376	General Steel	C/2-3P	Bright	44
SB3		M	DIN371/ DIN376	General Steel	C/2-3P	TiN	45
SB4		M	DIN371/ DIN376	General Steel	C/2-3P	TiAlN	46
SBF5		M	DIN371/ DIN376	Forged Steel	C/2-3P	TiCN	47
SB1		MF	DIN374	General Steel	C/2-3P	Bright	48
SB3		MF	DIN374	General Steel	C/2-3P	TiN	49
SB4		MF	DIN374	General Steel	C/2-3P	TiAlN	50
SBF5		MF	DIN374	Forged Steel	C/2-3P	TiCN	51
SB1		UNC	DIN371/ DIN376	General Steel	C/2-3P	Bright	52
SB3		UNC	DIN371/ DIN376	General Steel	C/2-3P	TiN	53
SB1		UNF	DIN374	General Steel	C/2-3P	Bright	54
SB3		UNF	DIN374	General Steel	C/2-3P	TiN	55
SB1		M	ISO	General Steel	C/2-3P	Bright	56
SB3		M	ISO	General Steel	C/2-3P	TiN	57
SB4		M	ISO	General Steel	C/2-3P	TiAlN	58
SBF5		M	ISO	Forged Steel	C/2-3P	TiCN	59
SBS4		M	ISO	Stainless Steel	C/2-3P	TiAlN	60
SBS5		M	ISO	Stainless Steel	C/2-3P	TiCN	61
SB1		MF	ISO	General Steel	C/2-3P	Bright	62
SB3		MF	ISO	General Steel	C/2-3P	TiN	63
SB4		MF	ISO	General Steel	C/2-3P	TiAlN	64
SBF5		MF	ISO	Forged Steel	C/2-3P	TiCN	65
SB1L		M	ISO Long Shank	General Steel	C/2-3P	Bright	66
SB3L		M	ISO Long Shank	General Steel	C/2-3P	TiN	67
SB1		UNC	ISO	General Steel	C/2-3P	Bright	68
SB3		UNC	ISO	General Steel	C/2-3P	TiN	69
SB1		UNF	ISO	General Steel	C/2-3P	Bright	70
SB3		UNF	ISO	General Steel	C/2-3P	TiN	71



M

**Metric coarse threads**



HOLE TYPE



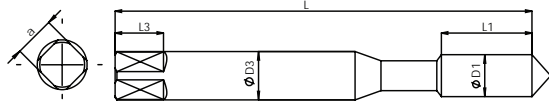
HSS-E

DIN 371/376

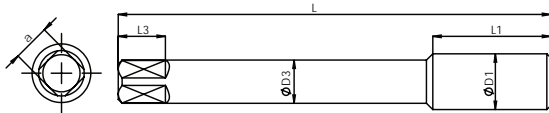
6HX



BF

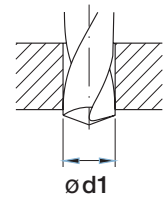


Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

P0-P1



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203197	56	6	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204328	56	7	4	3	6	2.9
M 4	0.7	FAB0203198	63	8	4.5	3.4	6	3.3
M 5	0.8	FAB0203199	70	8	6	4.9	8	4.2
M 6	1	FAB0203200	80	10	6	4.9	8	5
M 7	1	FAB0203201	80	10	7	5.5	8	6
M 8	1.25	FAB0203202	90	13	8	6.2	9	6.8
M 10	1.5	FAB0203203	100	15	10	8	11	8.5
M 12	1.75	FAB0203204	110	18	9	7	10	10.2
M 14	2	FAB0203205	110	20	11	9	12	12
M 16	2	FAB0203206	110	20	12	9	12	14
M 18	2.5	FAB0204329	125	25	14	11	14	15.5
M 20	2.5	FAB0204330	140	25	16	12	15	17.5

HSS TAPS

DIES

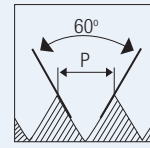
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

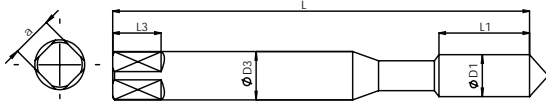
**M** Metric coarse threads



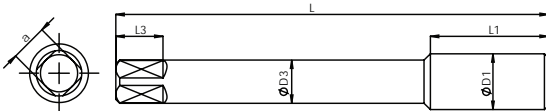
HOLE TYPE



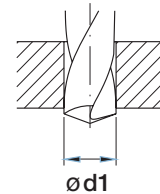
HSS-E
DIN 371/376
6HX
C/2-3P
35°
TiN



Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)



P0-P2  
K1-K2

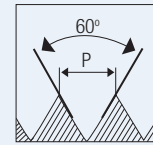
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203207	56	6	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204331	56	7	4	3	6	2.9
M 4	0.7	FAB0203208	63	8	4.5	3.4	6	3.3
M 5	0.8	FAB0203209	70	8	6	4.9	8	4.2
M 6	1	FAB0203210	80	10	6	4.9	8	5
M 7	1	FAB0203211	80	10	7	5.5	8	6
M 8	1.25	FAB0203212	90	13	8	6.2	9	6.8
M 10	1.5	FAB0203213	100	15	10	8	11	8.5
M 12	1.75	FAB0203684	110	18	9	7	10	10.2
M 14	2	FAB0203215	110	20	11	9	12	12
M 16	2	FAB0203216	110	20	12	9	12	14
M 18	2.5	FAB0204332	125	25	14	11	14	15.5
M 20	2.5	FAB0204333	140	25	16	12	15	17.5



M

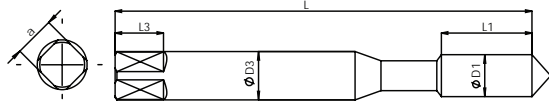
**Metric coarse threads**



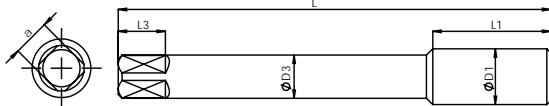
HOLE TYPE



HSS-E
DIN 371/376
6HX
C/2-3P
35°
TiAIN



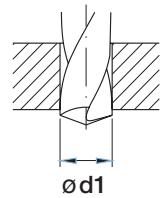
Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

P0-P2

K1-K3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 3	0.5	FAB0204334	56	6	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204335	56	7	4	3	6	2.9
M 4	0.7	FAB0200968	63	8	4.5	3.4	6	3.3
M 5	0.8	FAB0203685	70	8	6	4.9	8	4.2
M 6	1	FAB0203686	80	10	6	4.9	8	5
M 7	1	FAB0204336	80	10	7	5.5	8	6
M 8	1.25	FAB0203687	90	13	8	6.2	9	6.8
M 10	1.5	FAB0203688	100	15	10	8	11	8.5
M 12	1.75	FAB0203689	110	18	9	7	10	10.2
M 14	2	FAB0204337	110	20	11	9	12	12
M 16	2	FAB0204338	110	20	12	9	12	14
M 18	2.5	FAB0204339	125	25	14	11	14	15.5
M 20	2.5	FAB0204340	140	25	16	12	15	17.5

HSS TAPS

DIES

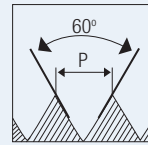
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

**M** Metric coarse threads

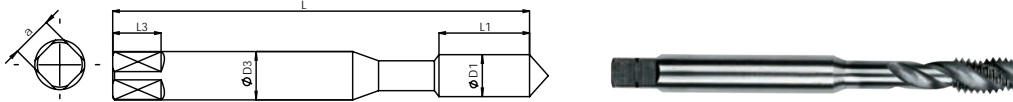


HOLE TYPE

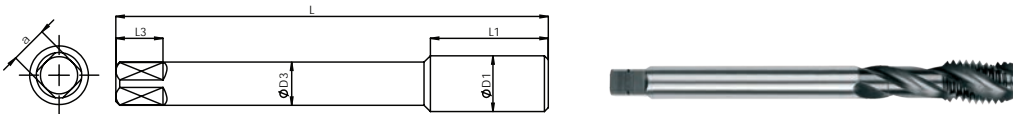


HSS-E
DIN 371/376
6HX
C/2-3P
TiCN

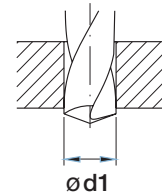
P2-P3



Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)



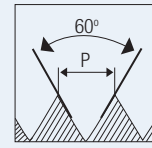
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0204341	56	6	3.5	2.7	6	2.5
M 3.5	0.6	FAB0204342	56	7	4	3	6	2.9
M 4	0.7	FAB0204343	63	8	4.5	3.4	6	3.3
M 5	0.8	FAB0204344	70	8	6	4.9	8	4.2
M 6	1	FAB0204345	80	10	6	4.9	8	5
M 7	1	FAB0204346	80	10	7	5.5	8	6
M 8	1.25	FAB0204347	90	13	8	6.2	9	6.8
M 10	1.5	FAB0204348	100	15	10	8	11	8.5
M 12	1.75	FAB0204349	110	18	9	7	10	10.2
M 14	2	FAB0204350	110	20	11	9	12	12
M 16	2	FAB0204351	110	20	12	9	12	14
M 18	2.5	FAB0204352	125	25	14	11	14	15.5
M 20	2.5	FAB0204353	140	25	16	12	15	17.5



MF

**Metric fine threads**



HOLE TYPE



HSS-E

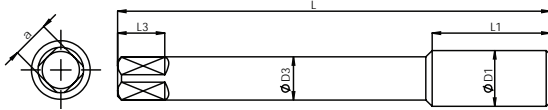
DIN 374

6HX

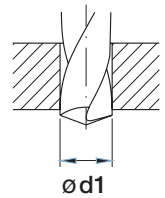


BF

P1-P1



Male centre (M6 - M10)  
Female centre (M12 - M20)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204354	80	8	4.5	3.4	6	5.2
M 8	1	FAB0204355	90	11	6	4.9	8	7
M 10	1.25	FAB0204356	100	13	7	5.5	8	8.8
M 10	1	FAB0204357	90	13	7	5.5	8	9
M 12	1.5	FAB0204358	100	15	9	7	10	10.5
M 12	1.25	FAB0204359	100	15	9	7	10	10.8
M 14	1.5	FAB0204360	100	15	11	9	12	12.5
M 14	1	FAB0204361	100	15	11	9	12	13
M 16	1.5	FAB0204362	100	15	12	9	12	14.5
M 18	1.5	FAB0204363	110	15	14	11	14	16.5
M 20	1.5	FAB0204364	125	15	16	12	15	18.5

HSS TAPS

DIES

END MILLS

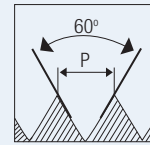
DRILLS

CARBIDE BURRS

CS TAPS



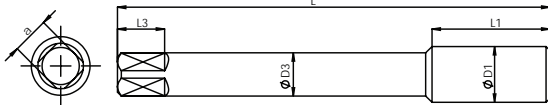
**MF** **Metric fine threads**



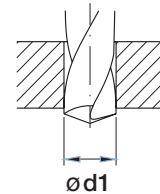
HOLE TYPE



HSS-E
DIN 374
6HX
C/2-3P
35°
TiN



Male centre (M6 - M10)  
Female centre (M12 - M20)



P1-P2

K1-K2

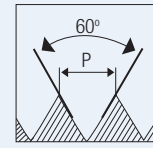
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204365	80	8	4.5	3.4	6	5.2
M 8	1	FAB0203297	90	11	6	4.9	8	7
M 10	1.25	FAB0204366	100	13	7	5.5	8	8.8
M 10	1	FAB0204367	90	13	7	5.5	8	9
M 12	1.5	FAB0204368	100	15	9	7	10	10.5
M 12	1.25	FAB0204369	100	15	9	7	10	10.8
M 14	1.5	FAB0204370	100	15	11	9	12	12.5
M 14	1	FAB0204371	100	15	11	9	12	13
M 16	1.5	FAB0204372	100	15	12	9	12	14.5
M 18	1.5	FAB0204373	110	15	14	11	14	16.5
M 20	1.5	FAB0204374	125	15	16	12	15	18.5



MF

Metric fine threads



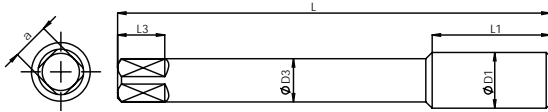
HOLE TYPE



HSS-E

DIN 374

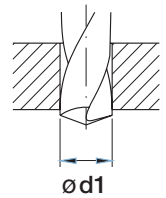
6HX



Male centre (M6 - M10)  
Female centre (M12 - M20)

P0-P2

K1-K3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 6	0.75	FAB0204375	80	8	4.5	3.4	6	5.2
M 8	1	FAB0204376	90	11	6	4.9	8	7
M 10	1.25	FAB0204377	100	13	7	5.5	8	8.8
M 10	1	FAB0204378	90	13	7	5.5	8	9
M 12	1.5	FAB0204379	100	15	9	7	10	10.5
M 12	1.25	FAB0204380	100	15	9	7	10	10.8
M 14	1.5	FAB0204381	100	15	11	9	12	12.5
M 14	1	FAB0204382	100	15	11	9	12	13
M 16	1.5	FAB0204383	100	15	12	9	12	14.5
M 18	1.5	FAB0204384	110	15	14	11	14	16.5
M 20	1.5	FAB0204385	125	15	16	12	15	18.5

HSS TAPS

DIES

END MILLS

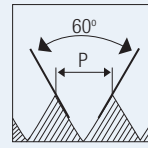
DRILLS

CARBIDE BURRS

CS TAPS



**MF** Metric fine threads

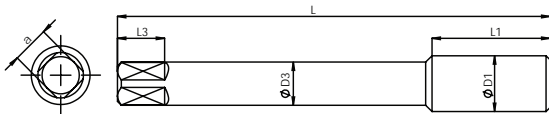


HOLE TYPE

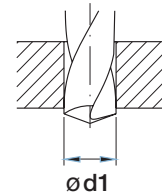


HSS-E
DIN 374
6HX
C/2-3P
TiCN

P2-P3



Male centre (M6 - M10)  
Female centre (M12 - M20)



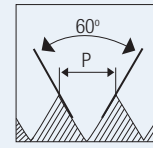
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204386	80	8	4.5	3.4	6	5.2
M 8	1	FAB0204387	90	11	6	4.9	8	7
M 10	1.25	FAB0204388	100	13	7	5.5	8	8.8
M 10	1	FAB0204389	90	13	7	5.5	8	9
M 12	1.5	FAB0204390	100	15	9	7	10	10.5
M 12	1.25	FAB0204391	100	15	9	7	10	10.8
M 14	1.5	FAB0204392	100	15	11	9	12	12.5
M 14	1	FAB0204393	100	15	11	9	12	13
M 16	1.5	FAB0204394	100	15	12	9	12	14.5
M 18	1.5	FAB0204395	110	15	14	11	14	16.5
M 20	1.5	FAB0204396	125	15	16	12	15	18.5



UNC

Unified coarse threads



HOLE TYPE



HSS-E

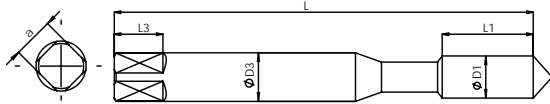
DIN 371/376

2B

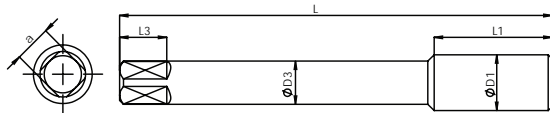


35°

BF

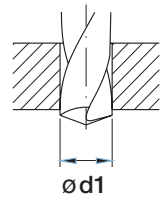


Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank (7/16" - 1")

P0-P1

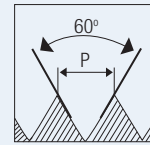


Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ø d1
1/4"	20	FAB0204397	80	13	7	5.5	8	5.2
5/16"	18	FAB0204398	90	14	8	6.2	9	6.6
3/8"	16	FAB0204399	100	16	9	7	10	8
7/16"	14	FAB0204400	100	19	8	6.2	9	9.4
1/2"	13	FAB0204401	110	20	9	7	10	10.80
5/8"	11	FAB0204402	110	24.20	12	9	12	13.5
3/4"	10	FAB0204403	125	25	14	11	14	16.5
7/8"	9	FAB0204404	140	25	18	14.5	17	19.5
1"	8	FAB0204405	160	30	18	14.5	17	22.25



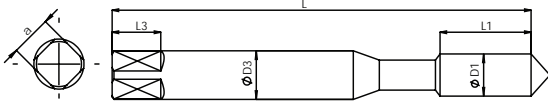
# UNC Unified coarse threads



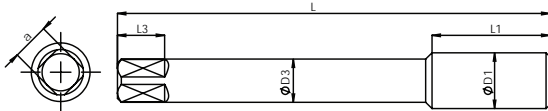
HOLE TYPE



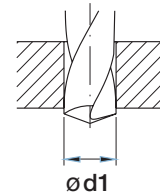
HSS-E
DIN 371/376
2B
C/2-3P
35°
TiN



Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank DIN376 (7/16" - 1")



P0-P2

K1-K2

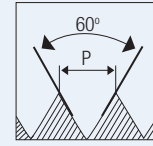
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0204406	80	13	7	5.5	8	5.2
5/16"	18	FAB0204407	90	14	8	6.2	9	6.6
3/8"	16	FAB0204408	100	16	9	7	10	8
7/16"	14	FAB0204409	100	19	8	6.2	9	9.4
1/2"	13	FAB0204410	110	20	9	7	10	10.80
5/8"	11	FAB0204411	110	24.20	12	9	12	13.5
3/4"	10	FAB0204412	125	25	14	11	14	16.5
7/8"	9	FAB0204413	140	25	18	14.5	17	19.5
1"	8	FAB0204414	160	30	18	14.5	17	22.25



UNF

Unified fine threads



HOLE TYPE



HSS-E

DIN 374

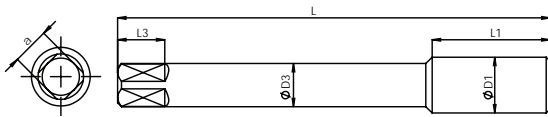
6HX



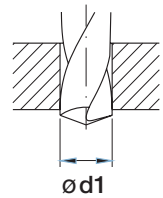
35°

BF

P0-P1



Male centre (1/4" - 3/8")  
Female centre (7/16" - 1")



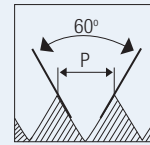
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0204415	80	10	7	5.5	8	5.5
5/16"	24	FAB0204416	90	10	8	6.2	9	6.9
3/8"	24	FAB0204417	100	10	9	7	10	8.5
7/16"	20	FAB0204418	100	13	8	6.2	9	9.9
1/2"	20	FAB0204419	100	13	9	7	10	11.5
5/8"	18	FAB0204420	100	16	12	9	12	14.5
3/4"	16	FAB0204421	110	16	14	11	14	17.5
7/8"	14	FAB0204422	125	18	18	14.5	17	20.5
1"	12	FAB0204423	140	22	18	14.5	17	23.25



UNF

Unified fine threads



HOLE TYPE



HSS-E
DIN 374
2B
C/2-3P
35°
TiN

HSS TAPS

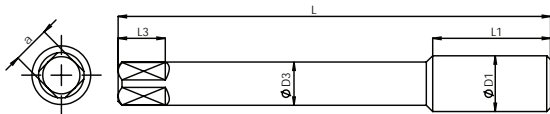
DIES

END MILLS

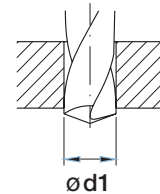
DRILLS

CARBIDE BURRS

CS TAPS



Male centre (1/4" - 3/8")  
Female centre (7/16" - 1")



P0-P2

K1-K2

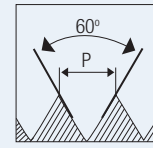
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0204424	80	10	7	5.5	8	5.5
5/16"	24	FAB0204425	90	10	8	6.2	9	6.9
3/8"	24	FAB0204426	100	10	9	7	10	8.5
7/16"	20	FAB0204427	100	13	8	6.2	9	9.9
1/2"	20	FAB0204428	100	13	9	7	10	11.5
5/8"	18	FAB0204429	100	16	12	9	12	14.5
3/4"	16	FAB0204430	110	16	14	11	14	17.5
7/8"	14	FAB0204431	125	18	18	14.5	17	20.5
1"	12	FAB0204432	140	22	18	14.5	17	23.25



M

**Metric coarse threads**



HOLE TYPE



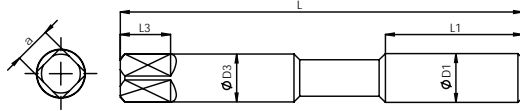
HSS-E

ISO 529

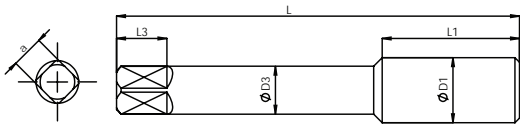
6HX



BF

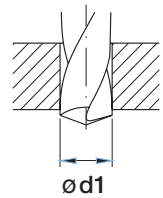


Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)

P0-P1



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 3	0.5	FAB0200649	48	5	3.15	2.5	5	2.5
M 3.5	0.6	FAB0203134	50	6	3.55	2.8	5	2.9
M 4	0.7	FAB0200663	53	7	4	3.15	6	3.3
M 5	0.8	FAB0200674	58	8	5	4	7	4.2
M 6	1	FAB0200686	66	10	6.3	5	8	5
M 7	1	FAB0203135	66	10	7.1	5.6	8	6
M 8	1.25	FAB0200698	72	13	8	6.3	9	6.8
M 10	1.5	FAB0200722	80	15	10	8	11	8.5
M 12	1.75	FAB0200752	89	18	9	7.1	10	10.2
M 14	2	FAB0200781	95	20	11.2	9	12	12
M 16	2	FAB0200802	102	20	12.5	10	13	14
M 18	2.5	FAB0203139	112	25	14	11.2	14	15.5
M 20	2.5	FAB0203141	112	25	14	11.2	14	17.5

HSS TAPS

DIES

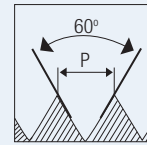
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

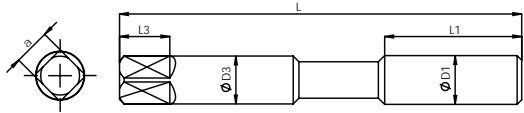
**M** Metric coarse threads



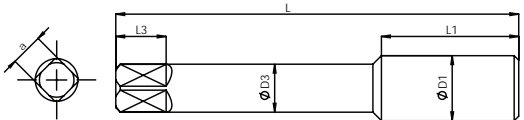
HOLE TYPE



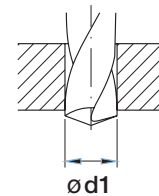
HSS-E
ISO 529
6HX
C/2-3P
35°
TiN



Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)



P0-P2

K1-K2

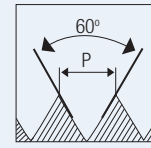
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200650	48	5	3.15	2.5	5	2.5
M 3.5	0.6	FAB0203142	50	6	3.55	2.8	5	2.9
M 4	0.7	FAB0200665	53	7	4	3.15	6	3.3
M 5	0.8	FAB0200676	58	8	5	4	7	4.2
M 6	1	FAB0200688	66	10	6.3	5	8	5
M 7	1	FAB0203143	66	10	7.1	5.6	8	6
M 8	1.25	FAB0200700	72	13	8	6.3	9	6.8
M 10	1.5	FAB0200724	80	15	10	8	11	8.5
M 12	1.75	FAB0200754	89	18	9	7.1	10	10.2
M 14	2	FAB0200782	95	20	11.2	9	12	12
M 16	2	FAB0200804	102	20	12.5	10	13	14
M 18	2.5	FAB0202155	112	25	14	11.2	14	15.5
M 20	2.5	FAB0200812	112	25	14	11.2	14	17.5



M

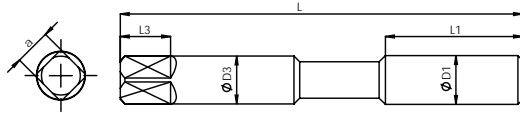
**Metric coarse threads**



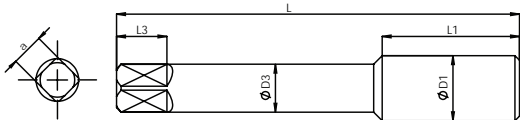
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
35°
TiAIN



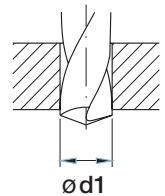
Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)

P0-P2

K1-K3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 3	0.5	FAB0203145	48	5	3.15	2.5	5	2.5
M 3.5	0.6	FAB0203146	50	6	3.55	2.8	5	2.9
M 4	0.7	FAB0200666	53	7	4	3.15	6	3.3
M 5	0.8	FAB0200677	58	8	5	4	7	4.2
M 6	1	FAB0200689	66	10	6.3	5	8	5
M 7	1	FAB0203147	66	10	7.1	5.6	8	6
M 8	1.25	FAB0200701	72	13	8	6.3	9	6.8
M 10	1.5	FAB0200725	80	15	10	8	11	8.5
M 12	1.75	FAB0200755	89	18	9	7.1	10	10.2
M 14	2	FAB0203152	95	20	11.2	9	12	12
M 16	2	FAB0203153	102	20	12.5	10	13	14
M 18	2.5	FAB0203155	112	25	14	11.2	14	15.5
M 20	2.5	FAB0203157	112	25	14	11.2	14	17.5

HSS TAPS

DIES

END MILLS

DRILLS

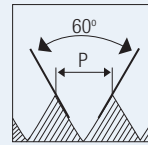
CARBIDE BURRS

CS TAPS



M

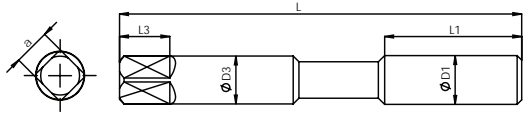
Metric coarse threads



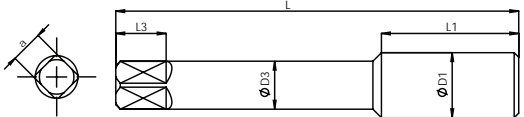
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
TiCN

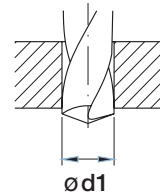


Reinforced Shank (M3 - M10)  
Male centre upto M 5



Reduced Shank (M12 - M20)

P3-P4



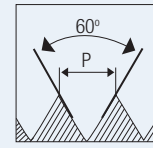
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 3	0.5	FAB0203158	48	5	3.15	2.5	5	2.5
M 4	0.7	FAB0203159	53	7	4	3.15	6	3.3
M 5	0.8	FAB0203160	58	8	5	4	7	4.2
M 6	1	FAB0203161	66	10	6.3	5	8	5
M 8	1.25	FAB0203163	72	13	8	6.3	9	6.8
M 10	1.5	FAB0203166	80	15	10	8	11	8.5
M 12	1.75	FAB0203169	89	18	9	7.1	10	10.2
M 14	2	FAB0203171	95	20	11.2	9	12	12
M 16	2	FAB0203173	102	20	12.5	10	13	14
M 20	2.5	FAB0203176	112	25	14	11.2	14	17.5



M

**Metric coarse threads**



HOLE TYPE



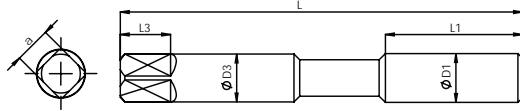
HSS-E

ISO 529

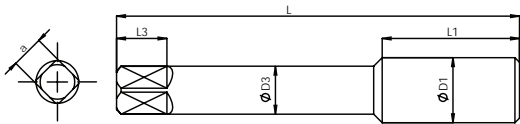
6HX

C/2-3P

TiAIN

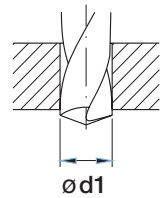


Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)

M1-M3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 3	0.5	FAB0203177	48	5	3.15	2.5	5	2.5
M 4	0.7	FAB0203178	53	7	4	3.15	6	3.3
M 5	0.8	FAB0203179	58	8	5	4	7	4.2
M 6	1	FAB0203180	66	10	6.3	5	8	5
M 8	1.25	FAB0203181	72	13	8	6.3	9	6.8
M 10	1.5	FAB0203182	80	15	10	8	11	8.5
M 12	1.75	FAB0203183	89	18	9	7.1	10	10.2
M 14	2	FAB0203184	95	20	11.2	9	12	12
M 16	2	FAB0203185	102	20	12.5	10	13	14
M 20	2.5	FAB0203186	112	25	14	11.2	14	17.5

HSS TAPS

DIES

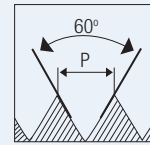
END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

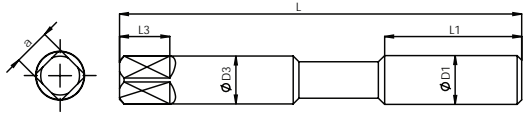
**M** Metric coarse threads



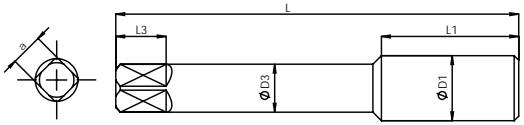
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
TiCN

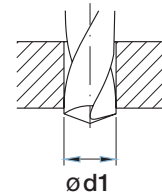


Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)

M1-M3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203187	48	5	3.15	2.5	5	2.5
M 4	0.7	FAB0203188	53	7	4	3.15	6	3.3
M 5	0.8	FAB0203189	58	8	5	4	7	4.2
M 6	1	FAB0203190	66	10	6.3	5	8	5
M 8	1.25	FAB0203191	72	13	8	6.3	9	6.8
M 10	1.5	FAB0203192	80	15	10	8	11	8.5
M 12	1.75	FAB0203193	89	18	9	7.1	10	10.2
M 14	2	FAB0203194	95	20	11.2	9	12	12
M 16	2	FAB0203195	102	20	12.5	10	13	14
M 20	2.5	FAB0203196	112	25	14	11.2	14	17.5



HSS TAPS

DIES

END MILLS

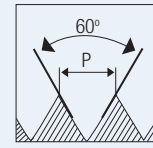
DRILLS

CARBIDE BURRS

CS TAPS

MF

Metric fine threads



HOLE TYPE



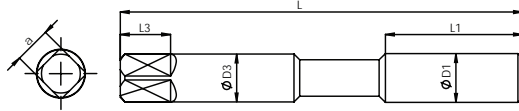
HSS-E

ISO 529

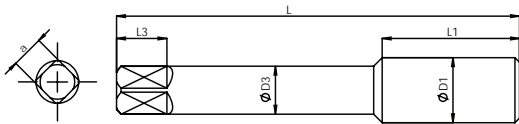
6HX



BF

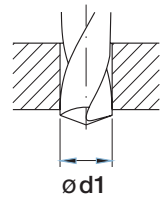


Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M20)

P0-P1



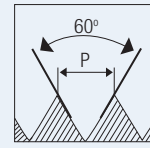
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203136	72	13	8	6.3	9	7
M 10	1	FAB0203137	80	15	10	8	11	9
M 10	1.25	FAB0200711	80	15	10	8	11	8.8
M 12	1.5	FAB0200741	89	18	9	7.1	10	10.5
M 14	1.5	FAB0200772	95	20	11.2	9	12	12.5
M 16	1.5	FAB0200791	102	20	12.5	10	13	14.5
M 18	1.5	FAB0203138	112	25	14	11.2	14	16.5
M 20	1.5	FAB0203140	112	25	14	11.2	14	18.5



**MF**

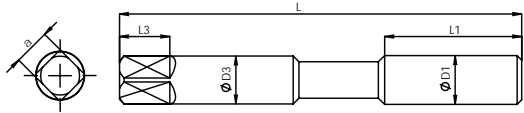
**Metric fine threads**



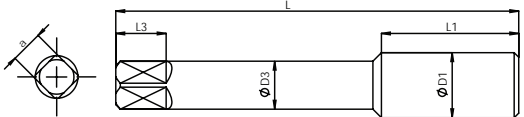
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
35°
TiN



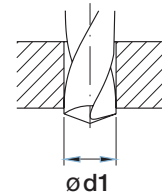
Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M20)

P0-P2

K1-K2



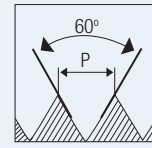
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0202157	72	13	8	6.3	9	7
M 10	1	FAB0200703	80	15	10	8	11	9
M 10	1.25	FAB0200713	80	15	10	8	11	8.8
M 12	1.5	FAB0200743	89	18	9	7.1	10	10.5
M 14	1.5	FAB0200774	95	20	11.2	9	12	12.5
M 16	1.5	FAB0200793	102	20	12.5	10	13	14.5
M 18	1.5	FAB0203144	112	25	14	11.2	14	16.5
M 20	1.5	FAB0200808	112	25	14	11.2	14	18.5



MF

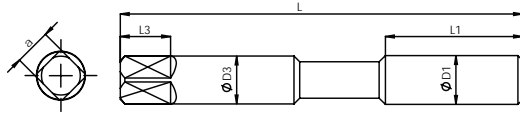
Metric fine threads



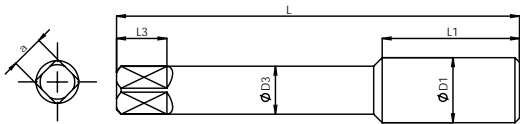
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
35°
TiAIN



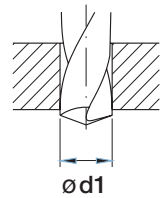
Reinforced Shank (M3 - M10)



Reduced Shank (M12 - M20)

P0-P2

K1-K3



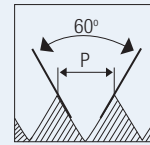
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ø d1
M 8	1	FAB0203148	72	13	8	6.3	9	7
M 10	1	FAB0203149	80	15	10	8	11	9
M 10	1.25	FAB0203150	80	15	10	8	11	8.8
M 12	1.5	FAB0200744	89	18	9	7.1	10	10.5
M 14	1.5	FAB0203151	95	20	11.2	9	12	12.5
M 16	1.5	FAB0200794	102	20	12.5	10	13	14.5
M 18	1.5	FAB0203154	112	25	14	11.2	14	16.5
M 20	1.5	FAB0203156	112	25	14	11.2	14	18.5



**MF**

**Metric fine threads**



HOLE TYPE



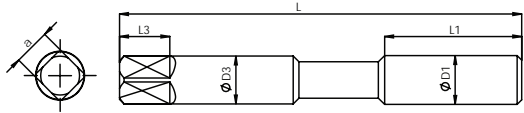
HSS-E

ISO 529

6HX

C/2-3P

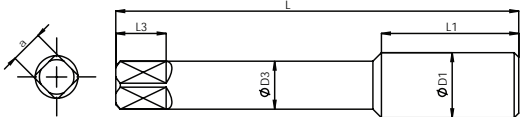
TiCN



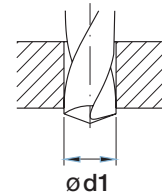
Reinforced Shank (M8 - M10)



P2-P3



Reduced Shank (M12 - M20)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203162	72	13	8	6.3	9	7
M 10	1	FAB0203164	80	15	10	8	11	9
M 10	1.25	FAB0203165	80	15	10	8	11	8.8
M 12	1.5	FAB0203167	89	18	9	7.1	10	10.5
M 14	1.5	FAB0203169	95	20	11.2	9	12	12.5
M 16	1.5	FAB0203171	102	20	12.5	10	13	14.5
M 18	1.5	FAB0203173	112	25	14	11.2	14	16.5
M 20	1.5	FAB0203175	112	25	14	11.2	14	18.5

HSS TAPS

DIES

END MILLS

DRILLS

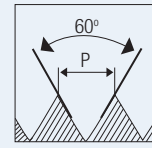
CARBIDE BURRS

CS TAPS



M/MF

**Metric coarse & fine threads - long shank**



HOLE TYPE



HSS-E

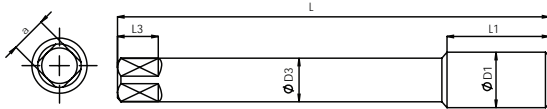
ISO 529

6HX

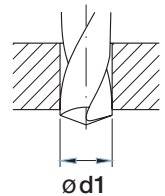


BF

P0-P1



Male Centre (M4 - M5)  
Female Centre (M6 - M16)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 4	0.7	FAB0203270	73	7	3.15	2.5	5	3.3
M 5	0.8	FAB0200825	79	8	4	3.15	6	4.2
M 6	1	FAB0200836	89	10	6.34	3.55	6	5
M 8	1.25	FAB0200846	97	13	6.34	5	8	6.8
M 10	1.5	FAB0200857	108	15	8	6.3	9	8.5
M 12	1.5	FAB0200868	119	15	9	7.1	10	10.5
M 12	1.75	FAB0200879	119	18	9	7.1	10	10.3
M 14	1.5	FAB0200889	127	15	11.2	9	12	12.5
M 14	2	FAB0203271	127	20	11.2	9	12	12
M 16	1.5	FAB0203272	137	15	12.5	10	13	14.5
M 16	2	FAB0203273	137	20	12.5	10	13	14

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

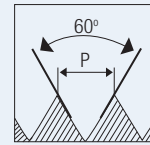
CS TAPS





M/MF

**Metric coarse & fine threads - long shank**



HOLE TYPE



HSS-E

ISO 529

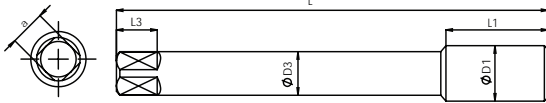
6HX

C/2-3P

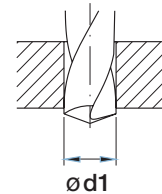
35°

TiN

P0-P2



Male Centre (M4 - M5)  
Female Centre (M6 - M16)



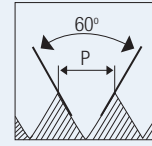
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 4	0.7	FAB0203274	73	7	3.15	2.5	5	3.3
M 5	0.8	FAB0200827	79	8	4	3.15	6	4.2
M 6	1	FAB0200838	89	10	6.34	3.55	6	5
M 8	1.25	FAB0200848	97	13	6.34	5	8	6.8
M 10	1.5	FAB0200859	108	15	8	6.3	9	8.5
M 12	1.5	FAB0200870	119	15	9	7.1	10	10.5
M 12	1.75	FAB0200881	119	18	9	7.1	10	10.3
M 14	1.5	FAB0200891	127	15	11.2	9	12	12.5
M 14	2	FAB0203275	127	20	11.2	9	12	12
M 16	1.5	FAB0203276	137	15	12.5	10	13	14.5
M 16	2	FAB0203277	137	20	12.5	10	13	14



UNC

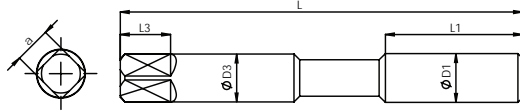
Unified coarse threads



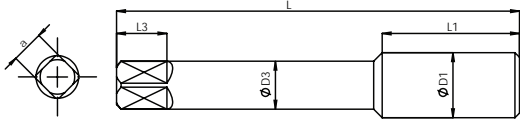
HOLE TYPE



HSS-E
ISO 529
2B
C/2-3P
35°
BF

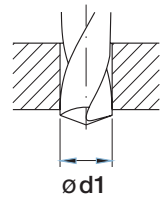


Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

P0-P1



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ø d1
1/4"	20	FAB0200576	66	10	6.3	5	8	5.2
5/16"	18	FAB0200585	72	15	8	6.3	9	6.6
3/8"	16	FAB0200596	80	15	10	8	11	8
7/16"	14	FAB0200606	85	19	8	6.3	9	9.4
1/2"	13	FAB0200617	89	19	9	7.1	10	10.8
5/8"	11	FAB0200631	102	20	12.5	10	13	13.5
3/4"	10	FAB0200641	112	25	14	11.2	14	16.5

HSS TAPS

DIES

END MILLS

DRILLS

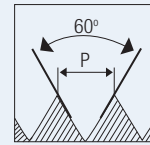
CARBIDE BURRS

CS TAPS



UNC

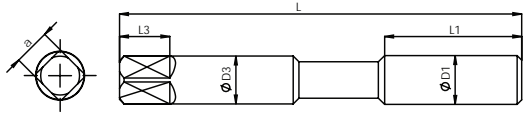
Unified coarse threads



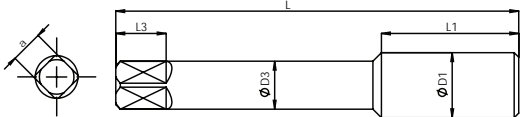
HOLE TYPE



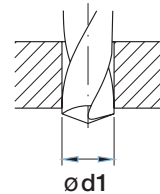
HSS-E
ISO 529
2B
C/2-3P
35°
TiN



Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")



P0-P2

K1-K2

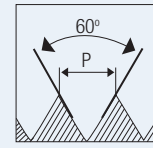
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0200578	66	10	6.3	5	8	5.2
5/16"	18	FAB0200587	72	15	8	6.3	9	6.6
3/8"	16	FAB0200598	80	15	10	8	11	8
7/16"	14	FAB0200608	85	19	8	6.3	9	9.4
1/2"	13	FAB0200619	89	19	9	7.1	10	10.8
5/8"	11	FAB0200633	102	20	12.5	10	13	13.5
3/4"	10	FAB0200643	112	25	14	11.2	14	16.5



UNF

Unified fine threads



HOLE TYPE



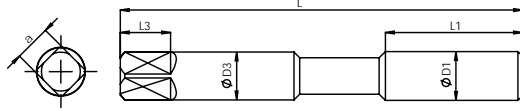
HSS-E

ISO 529

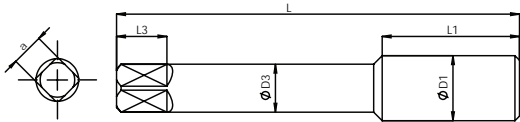
2B



BF

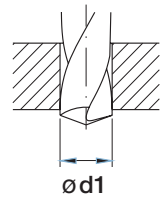


Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

P0-P1



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0200500	66	10	6.3	5	8	5.5
5/16"	24	FAB0200510	69	15	8	6.3	9	6.9
3/8"	24	FAB0200520	76	15	10	8	11	8.5
7/16"	20	FAB0200531	82	19	8	6.3	9	9.9
1/2"	20	FAB0200542	84	19	9	7.1	10	11.5
5/8"	18	FAB0200555	95	20	12.5	10	13	14.5
3/4"	16	FAB0200566	104	20	14	11.2	14	17.5

HSS TAPS

DIES

END MILLS

DRILLS

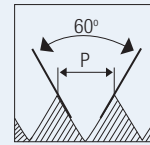
CARBIDE BURRS

CS TAPS



UNF

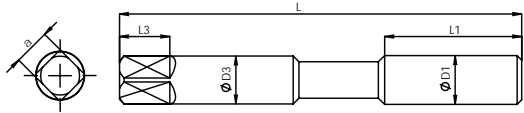
Unified fine threads



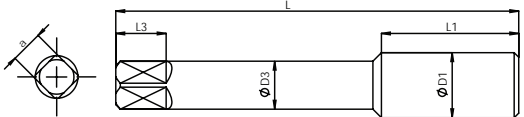
HOLE TYPE



HSS-E
ISO 529
2B
C/2-3P
35°
TiN



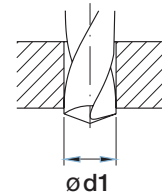
Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

P0-P2

K1-K2



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0200501	66	10	6.3	5	8	5.5
5/16"	24	FAB0200512	69	15	8	6.3	9	6.9
3/8"	24	FAB0200522	76	15	10	8	11	8.5
7/16"	20	FAB0200533	82	19	8	6.3	9	9.9
1/2"	20	FAB0200544	84	19	9	7.1	10	11.5
5/8"	18	FAB0200557	95	20	12.5	10	13	14.5
3/4"	16	FAB0200568	104	20	14	11.2	14	17.5



# HSS-E



High Performance Cutting Tools



## STRAIGHT FLUTE MACHINE TAPS

## STRAIGHT FLUTE TAPS - SC SERIES



Straight flute taps dimensionally same as hand taps & with a lead chamfer of 1.1/2 threads. The flute & rake angle are designed as per application. These Taps are recommended for tapping on grey cast iron, S G iron & steel. The chips produced are short or powder type with the help of special design provided in the tap

Advantages :

- Thread Chamfer is 1.5 thread & threading can be done upto bottom
- Chips are broken into short / powder chips



# SELECTION GUIDE



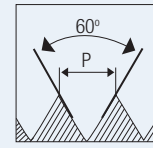
## STRAIGHT FLUTE TAPS

SERIES		THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
SC3		M	DIN371/DIN376	Cast Iron	E/1.5-2P	TiN	76
SC4		M	DIN371/DIN376	Cast Iron	E/1.5-2P	TiAIN	77
SC3		MF	DIN374	Cast Iron	E/1.5-2P	TiN	78
SC4		MF	DIN374	Cast Iron	E/1.5-2P	TiAIN	79
SC3		UNC	DIN371/DIN376	Cast Iron	E/1.5-2P	TiN	80
SC4		UNC	DIN371/DIN376	Cast Iron	E/1.5-2P	TiAIN	81
SC3		UNF	DIN374	Cast Iron	E/1.5-2P	TiN	82
SC4		UNF	DIN374	Cast Iron	E/1.5-2P	TiAIN	83
SC3		M	ISO	Cast Iron	E/1.5-2P	TiN	84
SC4		M	ISO	Cast Iron	E/1.5-2P	TiAIN	85
SC3		MF	ISO	Cast Iron	E/1.5-2P	TiN	86
SC4		MF	ISO	Cast Iron	E/1.5-2P	TiAIN	87
SC3L		M/MF Long Shank	ISO	Cast Iron	E/1.5-2P	TiN	88
SC4L		M/MF Long Shank	ISO	Cast Iron	E/1.5-2P	TiAIN	89
SC3		UNC	ISO	Cast Iron	E/1.5-2P	TiN	90
SC4		UNC	ISO	Cast Iron	E/1.5-2P	TiAIN	91
SC3		UNF	ISO	Cast Iron	E/1.5-2P	TiN	92
SC4		UNF	ISO	Cast Iron	E/1.5-2P	TiAIN	93



M

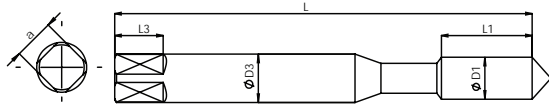
**Metric coarse threads**



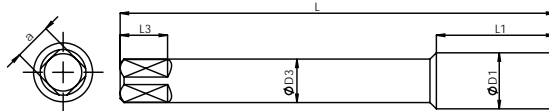
HOLE TYPE



HSS-E
DIN 371/376
6HX
E/1.5-2P
TiN



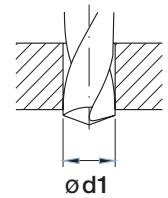
Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

K1-K2

N1-N3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0204433	56	11	3.5	2.7	6	2.5
M 4	0.7	FAB0204434	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0203676	70	16	6	4.9	8	4.2
M 6	1	FAB0203677	80	19	6	4.9	8	5
M 8	1.25	FAB0203678	90	22	8	6.2	9	6.8
M 9	1.25	FAB0204435	90	22	9	7	10	7.8
M 10	1.5	FAB0200969	100	24	10	8	11	8.5
M 11	1.5	FAB0204436	100	24	8	6.2	9	9.5
M 12	1.75	FAB0200975	110	28	9	7	10	10.2
M 14	2	FAB0204437	110	30	11	9	12	12
M 16	2	FAB0204438	110	32	12	9	12	14
M 18	2.5	FAB0204439	125	34	14	11	14	15.5
M 20	2.5	FAB0204440	140	34	16	12	15	17.5

HSS TAPS

DIES

END MILLS

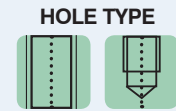
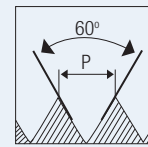
DRILLS

CARBIDE BURRS

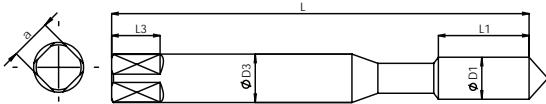
CS TAPS



**M** Metric coarse threads



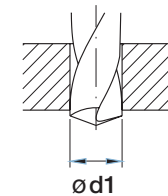
**K1-K3**



Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M3	0.5	FAB0204441	56	11	3.5	2.7	6	2.5
M 4	0.7	FAB0204442	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0204443	70	16	6	4.9	8	4.2
M 6	1	FAB0203679	80	19	6	4.9	8	5
M 8	1.25	FAB0203680	90	22	8	6.2	9	6.8
M 9	1.25	FAB0204444	90	22	9	7	10	7.8
M 10	1.5	FAB0203682	100	24	10	8	11	8.5
M 11	1.5	FAB0204445	100	24	8	6.2	9	9.5
M 12	1.75	FAB0203683	110	28	9	7	10	10.2
M 14	2	FAB0204446	110	30	11	9	12	12
M 16	2	FAB0204447	110	32	12	9	12	14
M 18	2.5	FAB0204448	125	34	14	11	14	15.5
M 20	2.5	FAB0204449	140	34	16	12	15	17.5

HSS TAPS

DIES

END MILLS

DRILLS

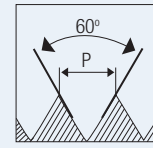
CARBIDE BURRS

CS TAPS



MF

Metric fine threads



HOLE TYPE



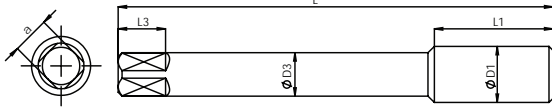
HSS-E

DIN 374

6HX

E/1.5-2P

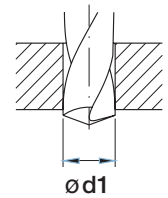
TiN



Male centre (M6 - M10)  
Female centre (M12 - M20)

K1-K2

N1-N3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204450	80	19	4.5	3.4	6	5.2
M 8	1	FAB0204451	90	22	6	4.9	8	7
M 10	1.25	FAB0203681	100	24	7	5.5	8	8.8
M 10	1	FAB0204452	90	20	7	5.5	8	9
M 12	1.5	FAB0204453	100	22	9	7	10	10.5
M 12	1.25	FAB0204454	100	22	9	7	10	10.8
M 14	1.5	FAB0204455	100	22	11	9	12	12.5
M 16	1.5	FAB0204456	100	22	12	9	12	14.5
M 18	1.5	FAB0204457	110	25	14	11	14	16.5
M 20	1.5	FAB0204458	125	25	16	12	15	18.5

HSS TAPS

DIES

END MILLS

DRILLS

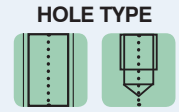
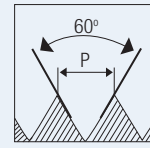
CARBIDE BURRS

CS TAPS



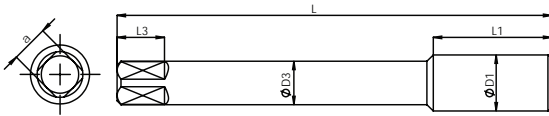
**MF**

**Metric fine threads**

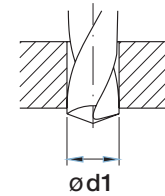


HSS-E
DIN 374
6HX
E/1.5-2P
TiAlN

**K1-K3**



Male centre (M6 - M10)  
Female centre (M12 - M20)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M 6	0.75	FAB0204459	80	19	4.5	3.4	6	5.2
M 8	1	FAB0204460	90	22	6	4.9	8	7
M 10	1.25	FAB0204461	100	24	7	5.5	8	8.8
M 10	1	FAB0204462	90	20	7	5.5	8	9
M 12	1.5	FAB0204463	100	22	9	7	10	10.5
M 12	1.25	FAB0204464	100	22	9	7	10	10.8
M 14	1.5	FAB0204465	100	22	11	9	12	12.5
M 16	1.5	FAB0204466	100	22	12	9	12	14.5
M 18	1.5	FAB0204467	110	25	14	11	14	16.5
M 20	1.5	FAB0204468	125	25	16	12	15	18.5

HSS TAPS

DIES

END MILLS

DRILLS

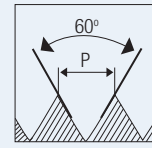
CARBIDE BURRS

CS TAPS



UNC

Unified coarse threads



HOLE TYPE



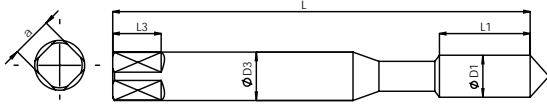
HSS-E

DIN 371/376

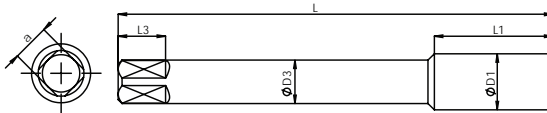
2B

E/1.5-2P

TiN



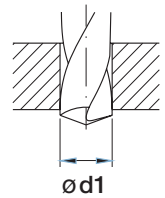
Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank DIN376 (7/16" - 1")

K1-K2

N2-N3



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ø d1
1/4"	20	FAB0204469	80	19	7	5.5	8	5.2
5/16"	18	FAB0204470	90	22	8	6.2	9	6.6
3/8"	16	FAB0204471	100	24	10	8	11	8
7/16"	14	FAB0204472	110	24	8	6.2	9	9.4
1/2"	13	FAB0204473	110	28	9	7	10	10.8
5/8"	11	FAB0204474	110	32	12	9	12	13.5
3/4"	10	FAB0204475	125	34	14	11	14	16.5
7/8"	9	FAB0204476	140	34	18	14.5	17	19.5
1"	8	FAB0204477	160	38	18	14.5	17	22.25

HSS TAPS

DIES

END MILLS

DRILLS

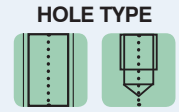
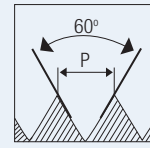
CARBIDE BURRS

CS TAPS

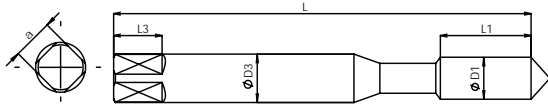


UNC

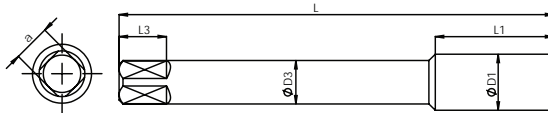
Unified coarse threads



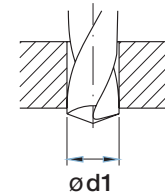
HSS-E
DIN 371/376
2B
E/1.5-2P
TiAlN



Reinforced Shank DIN371 (1/4" - 3/8")



Reduced Shank DIN376 (7/16" - 1")



K1-K3

Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0204478	80	19	7	5.5	8	5.2
5/16"	18	FAB0204479	90	22	8	6.2	9	6.6
3/8"	16	FAB0204480	100	24	10	8	11	8
7/16"	14	FAB0204481	110	24	8	6.2	9	9.4
1/2"	13	FAB0204482	110	28	9	7	10	10.8
5/8"	11	FAB0204483	110	32	12	9	12	13.5
3/4"	10	FAB0204484	125	34	14	11	14	16.5
7/8"	9	FAB0204485	140	34	18	14.5	17	19.5
1"	8	FAB0204486	160	38	18	14.5	17.5	22.25

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

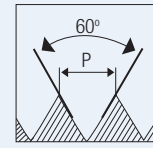


Straight Flute Machine Tap

SC3 Series

UNF

Unified fine threads



HOLE TYPE



HSS-E

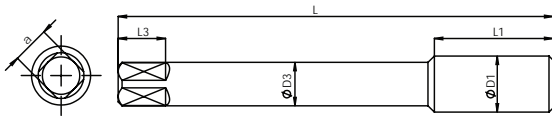
DIN 374

2B

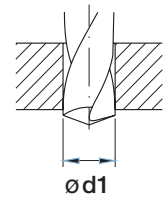
E/1.5-2P

TiN

K1-K2



Male centre (1/4" - 3/8")  
Female centre (7/16" - 1")



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0204487	80	19	5.5	4.3	7	5.5
5/16"	24	FAB0204488	90	22	6	4.9	8	6.9
3/8"	24	FAB0204489	100	20	7	5.5	8	8.5
7/16"	20	FAB0204490	100	22	8	6	9	9.9
1/2"	20	FAB0204491	100	22	9	7	10	11.5
5/8"	18	FAB0204492	100	22	12	9	12	14.5
3/4"	16	FAB0204493	110	25	14	11	14	17.5
7/8"	14	FAB0204494	125	25	18	14.5	17	20.5
1"	12	FAB0204495	140	28	18	14.5	17	23.25

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

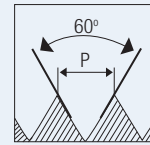
CS TAPS



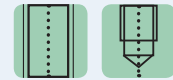


UNF

Unified fine threads



HOLE TYPE



HSS-E

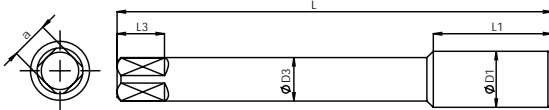
DIN 374

2B

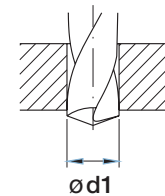
E/1.5-2P

TiAlN

K1-K3



Male centre (1/4" - 3/8")  
Female centre (7/16" - 1")



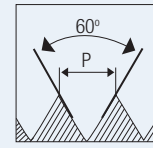
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0204496	80	19	5.5	4.3	7	5.5
5/16"	24	FAB0204497	90	22	6	4.9	8	6.9
3/8"	24	FAB0204498	100	20	7	5.5	8	8.5
7/16"	20	FAB0204499	100	22	8	6	9	9.9
1/2"	20	FAB0204500	100	22	9	7	10	11.5
5/8"	18	FAB0204501	100	22	12	9	12	14.5
3/4"	16	FAB0204502	110	25	14	11	14	17.5
7/8"	14	FAB0204503	125	25	18	14.5	17	20.5
1"	12	FAB0204504	140	28	18	14.5	17	23.25



M

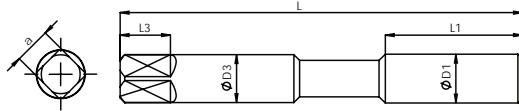
**Metric coarse threads**



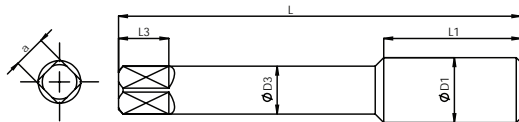
HOLE TYPE



HSS-E
ISO 529
6HX
E/1.5-2P
TiN



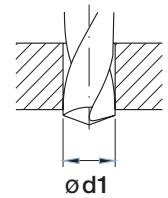
Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)

K1-K2

N2-N3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200645	48	11	3.15	2.5	5	2.5
M 3.5	0.6	FAB0200652	50	13	3.55	2.8	5	2.9
M 4	0.7	FAB0200657	53	13	4	3.15	6	3.3
M 5	0.8	FAB0200669	58	16	5	4	7	4.2
M 6	1	FAB0200680	66	19	6.3	5	8	5
M 8	1.25	FAB0200692	72	22	8	6.3	9	6.8
M 10	1.5	FAB0200716	80	24	10	8	11	8.5
M 12	1.75	FAB0200747	89	29	9	7.1	10	10.2
M 14	2	FAB0200776	95	30	11.2	9	12	12
M 16	2	FAB0200797	102	32	12.5	10	13	14
M 20	2.5	FAB0203219	112	37	14	11.2	14	17.5

HSS TAPS

DIES

END MILLS

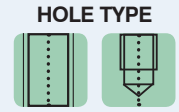
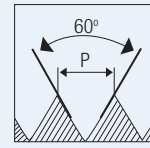
DRILLS

CARBIDE BURRS

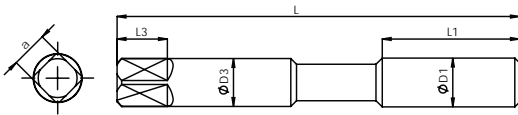
CS TAPS



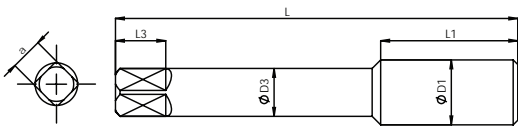
# M Metric coarse threads



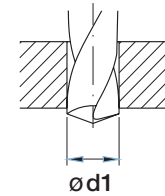
HSS-E
ISO 529
6HX
E/1.5-2P
TiAlN



Reinforced Shank (M3 - M10)  
Male centre upto M5



Reduced Shank (M12 - M20)



**K1-K3**

Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200646	48	11	3.15	2.5	5	2.5
M 3.5	0.6	FAB0203220	50	13	3.55	2.8	5	2.9
M 4	0.7	FAB0200658	53	13	4	3.15	6	3.3
M 5	0.8	FAB0200670	58	16	5	4	7	4.2
M 6	1	FAB0200681	66	19	6.3	5	8	5
M 8	1.25	FAB0200693	72	22	8	6.3	9	6.8
M 10	1.5	FAB0200717	80	24	10	8	11	8.5
M 12	1.75	FAB0200871	89	29	9	7.1	10	10.2
M 14	2	FAB0200777	95	30	11.2	9	12	12
M 16	2	FAB0200798	102	32	12.5	10	13	14
M 20	2.5	FAB0200809	112	37	14	11.2	14	17.5

HSS TAPS

DIES

END MILLS

DRILLS

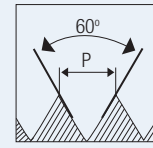
CARBIDE BURRS

CS TAPS



MF

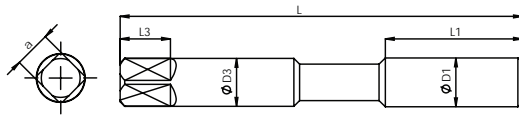
Metric fine threads



HOLE TYPE



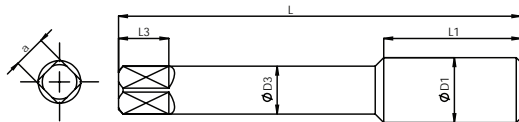
HSS-E
ISO 529
6HX
E/1.5-2P
TiN



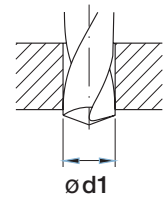
Reinforced Shank (M10)

K1-K2

N2-N3



Reduced Shank (M12 - M20)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ø d1
M 10	1.25	FAB0200706	76	20	10	8	11	8.8
M 12	1.25	FAB0200727	84	24	9	7.1	10	10.8
M12	1.5	FAB0200736	89	29	9	7.1	10	10.5
M 14	1.5	FAB0200767	95	30	11.2	9	12	12.5
M 16	1.5	FAB0200785	102	32	12.5	10	13	14.5
M 18	1.5	FAB0203217	104	29	14	11.2	14	16.5
M 20	1.5	FAB0203218	104	29	14	11.2	14	18.5

HSS TAPS

DIES

END MILLS

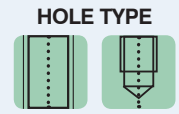
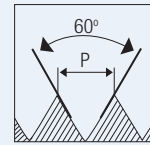
DRILLS

CARBIDE BURRS

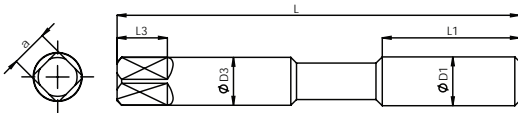
CS TAPS



**MF** Metric fine threads

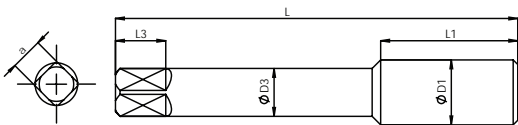


HSS-E
ISO 529
6HX
E/1.5-2P
TiAIN

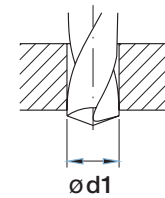


Reinforced Shank (M10)

**K1-K3**  
**N2-N3**



Reduced Shank (M12 - M20)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M 10	1.25	FAB0200707	76	20	10	8	11	8.8
M 12	1.25	FAB0200728	84	20	10	8	11	10.8
M 12	1.5	FAB0200737	89	29	9	7.1	10	10.5
M 14	1.5	FAB0200768	95	30	11.2	9	12	12.5
M 16	1.5	FAB0200786	102	32	12.5	10	13	14.5
M 18	1.5	FAB0200805	104	29	14	11.2	14	16.5
M 20	1.5	FAB0200806	104	29	14	11.2	14	18.5

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

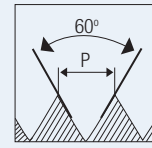


Straight Flute Machine Tap

SC3L Series

M/MF

**Metric coarse & fine threads - long shank**



HOLE TYPE



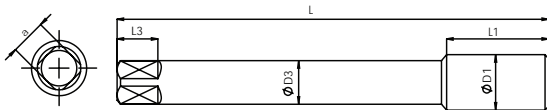
HSS-E

ISO 529

6HX

E/1.5-2P

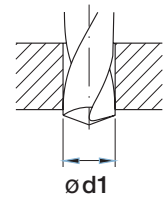
TiN



Male centre (M4 - M5)  
Female centre (M6 - M16)

K1-K2

N2-N3



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ø d1
M 4	0.7	FAB0200817	73	13	3.15	2.50	5	3.3
M 5	0.8	FAB0200821	79	16	4.00	3.15	6	4.2
M 6	1	FAB0200830	89	19	4.50	3.55	6	5
M 8	1.25	FAB0200841	97	22	6.30	5.00	8	6.8
M 10	1.5	FAB0200852	108	24	8.00	6.30	9	8.5
M 12	1.5	FAB0200863	119	29	9.00	7.10	10	10.5
M 12	1.75	FAB0200874	119	29	9.00	7.10	10	10.3
M 14	1.5	FAB0200884	127	30	11.20	9.00	12	12.5
M 14	2	FAB0203278	127	30	11.20	9.00	12	12
M 16	1.5	FAB0203279	137	32	12.50	10.00	13	14.5
M 16	2	FAB0200892	137	32	12.50	10.00	13	14

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

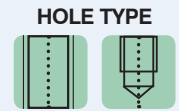
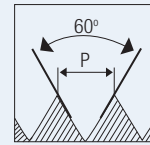


Straight Flute Machine Tap

SC4L Series

M/MF

**Metric coarse & fine threads - long shank**



HSS-E

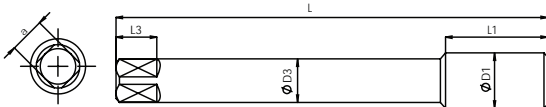
ISO 529

6HX

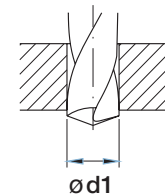


TiAlN

**K1-K3**



Male centre (M4 - M5)  
Female centre (M6 - M16)



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M 4	0.7	FAB0203280	73	13	3.15	2.50	5	3.3
M 5	0.8	FAB0203281	79	16	4.00	3.15	6	4.2
M 6	1	FAB0200831	89	19	4.50	3.55	6	5
M 8	1.25	FAB0200842	97	22	6.30	5.00	8	6.8
M 10	1.5	FAB0200853	108	24	8.00	6.30	9	8.5
M 12	1.5	FAB0200864	119	29	9.00	7.10	10	10.5
M 12	1.75	FAB0200875	119	29	9.00	7.10	10	10.3
M 14	1.5	FAB0200885	127	30	11.20	9.00	12	12.5
M 14	2	FAB0203282	127	30	11.20	9.00	12	12
M 16	1.5	FAB0203283	137	32	12.50	10.00	13	14.5
M 16	2	FAB0203284	137	32	12.50	10.00	13	14

HSS TAPS

DIES

END MILLS

DRILLS

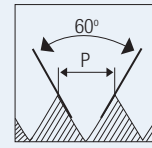
CARBIDE BURRS

CS TAPS



UNC

Unified coarse threads



HOLE TYPE



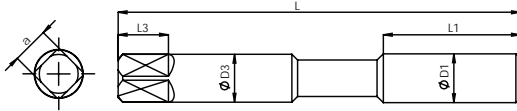
HSS-E

ISO  
529

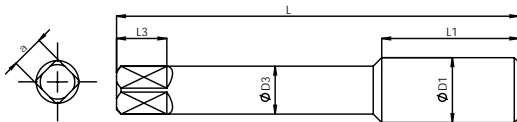
2B

E/1.5-2P

TiN



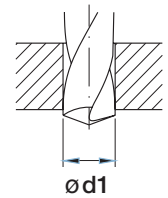
Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

K1-K2

N2-N3



Unit : mm

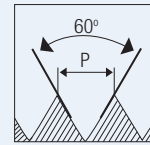
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0200571	66	19	6.3	5	8	5.2
5/16"	18	FAB0200581	72	22	8	6.3	9	6.6
3/8"	16	FAB0200591	80	24	10	8	11	8
7/16"	14	FAB0200601	85	25	8	6.3	9	9.4
1/2"	13	FAB0200612	89	29	9	7.1	10	10.8
5/8"	11	FAB0200625	102	32	12.5	10	13	13.5
3/4"	10	FAB0200636	112	37	14	11.2	14	16.5



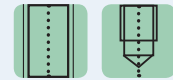


UNC

Unified coarse threads



HOLE TYPE



HSS-E

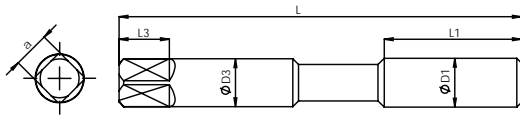
ISO 529

2B

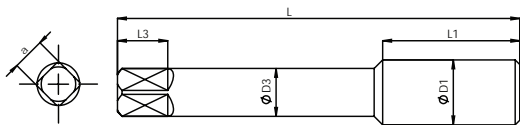
E/1.5-2P

TiAIN

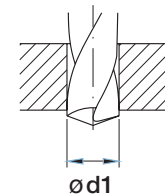
K1-K3



Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")



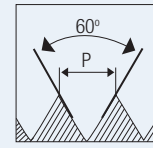
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAB0200572	66	19	6.3	5	8	5.2
5/16"	18	FAB0203289	72	22	8	6.3	9	6.6
3/8"	16	FAB0200592	80	24	10	8	11	8
7/16"	14	FAB0200602	85	25	8	6.3	9	9.4
1/2"	13	FAB0200613	89	29	9	7.1	10	10.8
5/8"	11	FAB0200626	102	32	12.5	10	13	13.5
3/4"	10	FAB0200637	112	37	14	11.2	14	16.5



UNF

Unified fine threads



HOLE TYPE



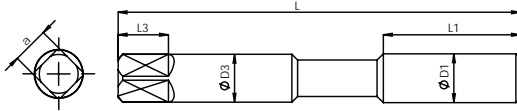
HSS-E

ISO  
529

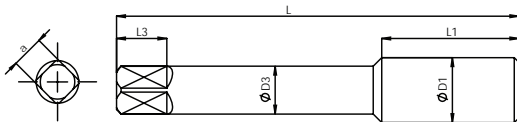
2B

E/1.5-2P

TiN



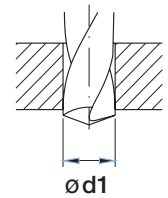
Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")

K1-K2

N2-N3



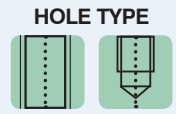
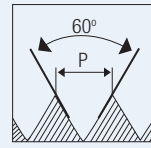
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0200495	66	19	6.3	5	8	5.5
5/16"	24	FAB0200504	69	19	8	6.3	9	6.9
3/8"	24	FAB0200515	76	20	10	8	11	8.5
7/16"	20	FAB0200526	82	22	8	6.3	9	9.9
1/2"	20	FAB0200537	84	24	9	7.1	10	11.5
5/8"	18	FAB0200550	95	25	12.5	10	13	14.5
3/4"	16	FAB0200561	104	29	14	11.2	14	17.5

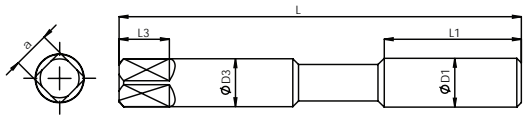


**UNF**

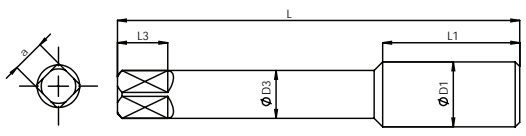
**Unified fine threads**



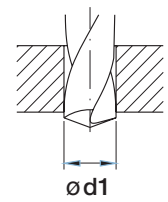
HSS-E
ISO 529
2B
E/1.5-2P
TiAIN



Reinforced Shank (1/4" - 3/8")



Reduced Shank (7/16" - 3/4")



**K1-K3**

Unit : mm								
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAB0200496	66	19	6.3	5	8	5.5
5/16"	24	FAB0200505	69	19	8	6.3	9	6.9
3/8"	24	FAB0200516	76	20	10	8	11	8.5
7/16"	20	FAB0200527	82	22	8	6.3	9	9.9
1/2"	20	FAB0200538	84	24	9	7.1	10	11.5
5/8"	18	FAB0200551	95	25	12.5	10	13	14.5
3/4"	16	FAB0200562	104	29	14	11.2	14	17.5

- HSS TAPS
- DIES
- END MILLS
- DRILLS
- CARBIDE BURRS
- CS TAPS



# HSS-E



High Performance Cutting Tools



## FORMING MACHINE TAPS

## FORMING TAPS - SD SERIES



Forming Otherwise known as 'Roll', 'Fluteless' or Polygon taps. Used for the chipless production of threads in ductile materials such as copper, aluminium, soft brass or steel. Threads produced by fluteless taps are formed by plastic deformation, they are not cut. These taps do not have flute or cutting edges but have special roll forming lobes with circular land. They are operated at high speeds and are better at maintaining gauge qualification. Because they produce no chips they are very suitable for blind hole application as well as through hole application.

Forming taps require different tapping drill sizes when compared to drill sizes used for cut taps.








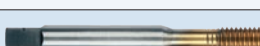


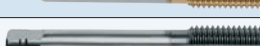

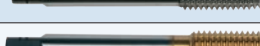
Advantages :

- Can run at higher parameters ex. cutting speed
- Better durability compared to cutting taps
- Sturdy exactness for dimensions & profile
- Better stability for formed threads
- Minimum chance of fracture
- No swarf, thus no concern of its disposable

# SELECTION GUIDE



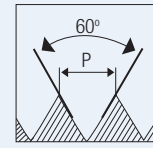
## FORMING TAPS

SERIES		THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
SD1		M	DIN371/DIN376	Aluminium	C/2-3P	Bright	98
SD3		M	DIN371/DIN376	Aluminium	C/2-3P	TiN	99
SD4		M	DIN371/DIN376	Aluminium	C/2-3P	TiAlN	100
SD1		MF	DIN374	Aluminium	C/2-3P	Bright	101
SD3		MF	DIN374	Aluminium	C/2-3P	TiN	102
SD4		MF	DIN374	Aluminium	C/2-3P	TiAlN	103
SD1*		M	DIN371	Aluminium	C/2-3P	Bright	104
SD3*		M	DIN371	Aluminium	C/2-3P	TiN	105
SD1		M	ISO	Aluminium	C/2-3P	Bright	106
SD3		M	ISO	Aluminium	C/2-3P	TiN	107
SDF5		M	ISO	Forged Steel	C/2-3P	TiCN	108
SD1		MF	ISO	Aluminium	C/2-3P	Bright	109
SD3		MF	ISO	Aluminium	C/2-3P	TiN	110

\* without oil groove

M

**Metric coarse threads**



HOLE TYPE



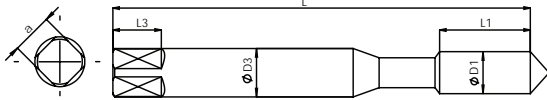
HSS-E

DIN 371/376

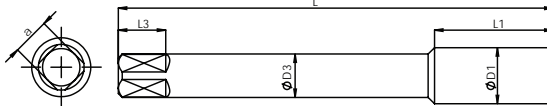
6HX

C/2-3P

BF

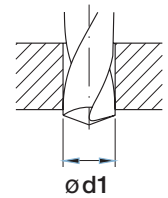


Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

N1-N4

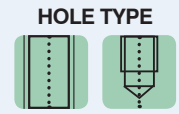
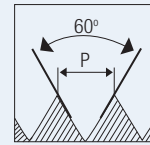


Unit : mm

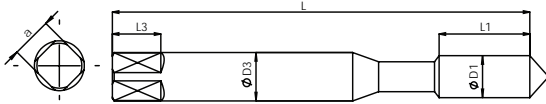
Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200954	56	11	3.5	2.7	6	2.8
M 3.5	0.6	FAB0204505	56	12	4	3	6	3.3
M 4	0.7	FAB0200955	63	13	4.5	3.4	6	3.7
M 5	0.8	FAB0200956	70	16	6	4.9	8	4.7
M 6	1	FAB0200957	80	19	6	4.9	8	5.5
M 7	1	FAB0204506	80	19	7	5.5	8	6.5
M 8	1.25	FAB0200958	90	22	8	6.2	9	7.4
M 10	1.5	FAB0200959	100	24	10	8	11	9.3
M 12	1.75	FAB0200960	110	28	9	7	10	11.2
M 14	2	FAB0203285	110	30	11	9	12	13.1
M 16	2	FAB0203286	110	32	12	9	12	15.1



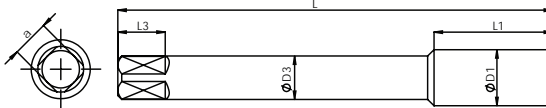
**M** Metric coarse threads



HSS-E
DIN 371/376
6HX
C/2-3P
TiN

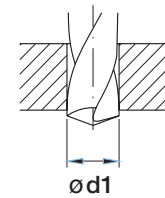


Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

N1-N4



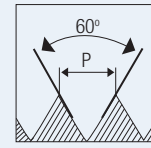
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0200961	56	11	3.5	2.7	6	2.8
M 3.5	0.6	FAB0204507	56	12	4	3	6	3.3
M 4	0.7	FAB0200962	63	13	4.5	3.4	6	3.7
M 5	0.8	FAB0200963	70	16	6	4.9	8	4.7
M 6	1	FAB0200964	80	19	6	4.9	8	5.5
M 7	1	FAB0204508	80	19	7	5.5	8	6.5
M 8	1.25	FAB0200965	90	22	8	6.2	9	7.4
M 10	1.5	FAB0200966	100	24	10	8	11	9.3
M 12	1.75	FAB0200967	110	28	9	7	10	11.2
M 14	2	FAB0203287	110	30	11	9	12	13.1
M 16	2	FAB0203288	110	32	12	9	12	15.1



M

## Metric coarse threads



HOLE TYPE



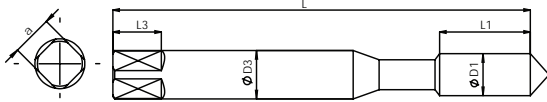
HSS-E

DIN  
371/376

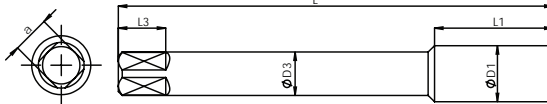
6HX

C/2-3P

TiAIN



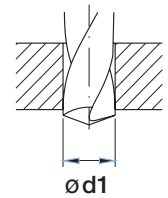
Reinforced Shank DIN371 (M3 - M10)



Reduced Shank DIN376 (M12 - M20)

P0-P2

N1-N4

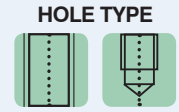
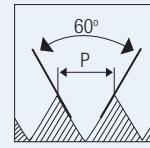


Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0204509	56	11	3.5	2.7	6	2.8
M 3.5	0.6	FAB0204510	56	12	4	3	6	3.3
M 4	0.7	FAB0204511	63	13	4.5	3.4	6	3.7
M 5	0.8	FAB0204512	70	16	6	4.9	8	4.7
M 6	1	FAB0204513	80	19	6	4.9	8	5.5
M 7	1	FAB0204514	80	19	7	5.5	8	6.5
M 8	1.25	FAB0204515	90	22	8	6.2	9	7.4
M 10	1.5	FAB0204516	100	24	10	8	11	9.3
M 12	1.75	FAB0204517	110	28	9	7	10	11.2
M 14	2	FAB0204518	110	30	11	9	12	13.1
M 16	2	FAB0204519	110	32	12	9	12	15.1

**MF**

**Metric fine threads**



HSS-E

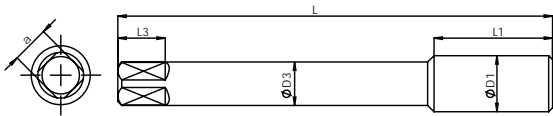
DIN 374

6HX

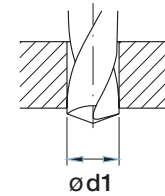
C/2-3P

BF

N1-N4



Male Centre (M8 - M10)  
Female Centre (M12 - M20)



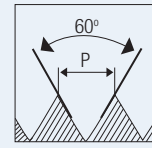
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0204520	90	17	6	4.9	8	7.6
M 10	1.25	FAB0204521	100	22	7	5.5	8	9.4
M 12	1.5	FAB0204522	100	22	9	7	10	11.3
M 12	1.25	FAB0204523	100	22	9	7	10	11.4
M 14	1.5	FAB0204524	100	22	11	9	12	13.3
M 16	1.5	FAB0204525	100	22	12	9	12	15.3
M 18	1.5	FAB0204526	110	25	14	11	14	17.3
M 20	1.5	FAB0204527	125	25	16	12	15	19.3



MF

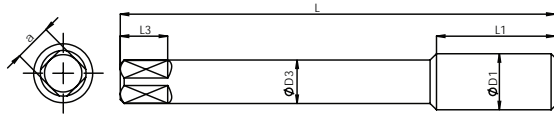
Metric fine threads



HOLE TYPE



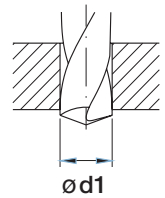
HSS-E
DIN 374
6HX
C/2-3P
TiN



Male Centre (M8 - M10)  
Female Centre (M12 - M20)

P0-P2

N1-N4



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0204528	90	17	6	4.9	8	7.6
M 10	1.25	FAB0204529	100	22	7	5.5	8	9.4
M 12	1.5	FAB0204530	100	22	9	7	10	11.3
M 12	1.25	FAB0204531	100	22	9	7	10	11.4
M 14	1.5	FAB0204532	100	22	11	9	12	13.3
M 16	1.5	FAB0204533	100	22	12	9	12	15.3
M 18	1.5	FAB0204534	110	25	14	11	14	17.3
M 20	1.5	FAB0204535	125	25	16	12	15	19.3

HSS TAPS

DIES

END MILLS

DRILLS

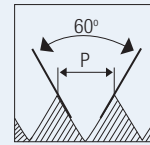
CARBIDE BURRS

CS TAPS

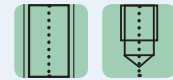


**MF**

**Metric fine threads**



HOLE TYPE



HSS-E

DIN 374

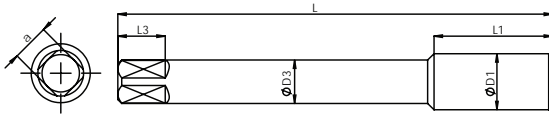
6HX

C/2-3P

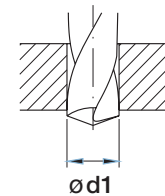
TiAIN

P0-P2

N1-N4



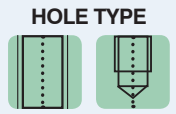
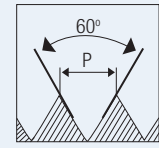
Male Centre (M8 - M10)  
Female Centre (M12 - M20)



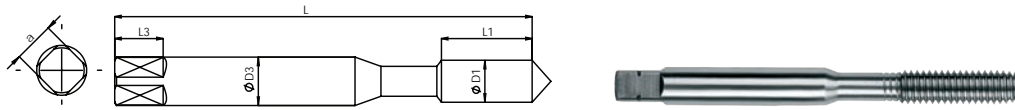
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0204536	90	17	6	4.9	7	7.6
M 10	1.25	FAB0204537	100	22	7	5.5	8	9.4
M 12	1.5	FAB0204538	100	22	9	7	10	11.3
M 12	1.25	FAB0204539	100	22	9	7	10	11.4
M 14	1.5	FAB0204540	100	22	11	9	12	13.3
M 16	1.5	FAB0204541	100	22	12	9	12	15.3
M 18	1.5	FAB0204542	110	25	14	11	14	17.3
M 20	1.5	FAB0204543	125	25	16	12	15	19.3

**M** Metric coarse threads - without oil groove

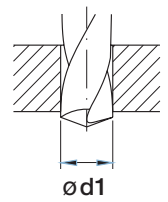


HSS-E
DIN 371
6HX
C/2-3P
BF



Reinforced Shank DIN371

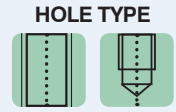
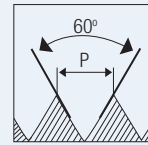
N1-N3



Unit : mm

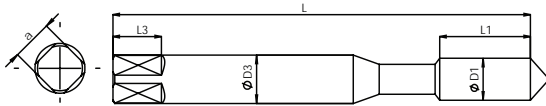
Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203614	56	11	3.5	2.7	6	2.8
M 4	0.7	FAB0203615	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0203616	70	16	6	4.9	8	3.7
M 6	1	FAB0203617	80	19	6	4.9	8	4.6
M 8	1.25	FAB0203618	90	22	8	6.2	9	5.5

**M** Metric coarse threads - without oil groove

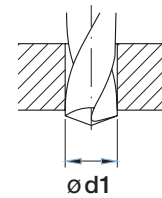


HSS-E
DIN 371
6HX
C/2-3P
TiN

N1-N3



Reinforced Shank DIN371



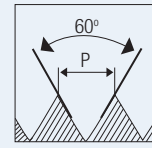
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203619	56	11	3.5	2.7	6	2.8
M 4	0.7	FAB0203620	63	13	4.5	3.4	6	3.3
M 5	0.8	FAB0203621	70	16	6	4.9	8	3.7
M 6	1	FAB0203622	80	19	6	4.9	8	4.6
M 8	1.25	FAB0203623	90	22	8	6.2	9	5.5



M

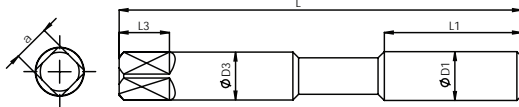
**Metric coarse threads**



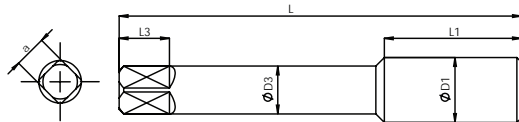
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
BF

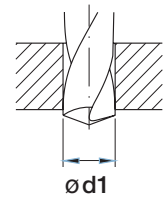


Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M16)

N1-N4



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0201417	48	11	3.15	2.5	5	2.8
M 3.5	0.6	FAB0203221	50	13	3.55	2.8	5	3.3
M 4	0.7	FAB0201421	53	13	4	3.15	6	3.7
M 5	0.8	FAB0201420	58	16	5	4	7	4.6
M 6	1	FAB0201422	66	19	6.3	5	8	5.5
M 7	1	FAB0203222	66	19	7.1	5.6	8	6.5
M 8	1.25	FAB0201425	72	22	8	6.3	9	7.4
M 10	1.5	FAB0201426	80	24	10	8	9	9.3
M 12	1.75	FAB0201428	89	29	9	7.1	10	11.2
M 14	2	FAB0203228	95	30	11.2	9	12	13.1
M 16	2	FAB0203230	102	32	12.5	10	13	15.1

HSS TAPS

DIES

END MILLS

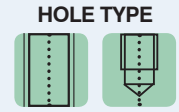
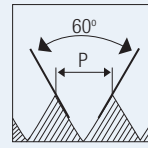
DRILLS

CARBIDE BURRS

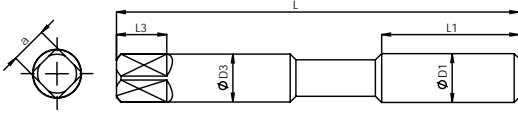
CS TAPS



# M Metric coarse threads

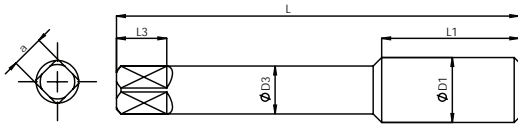


HSS-E
ISO 529
6HX
C/2-3P
TiN

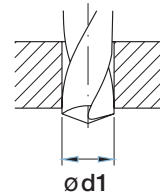


Reinforced Shank (M3 - M10)  
Male Centre upto M5

P0-P2  
N1-N4



Reduced Shank (M12 - M16)



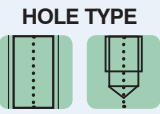
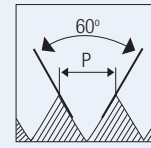
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0202740	48	11	3.15	2.5	5	2.8
M 3.5	0.6	FAB0203231	50	13	3.55	2.8	5	3.3
M 4	0.7	FAB0202747	53	13	4	3.15	6	3.7
M 5	0.8	FAB0202748	58	16	5	4	7	4.6
M 6	1	FAB0202749	66	19	6.3	5	8	5.5
M 7	1	FAB0203232	66	19	7.1	5.6	8	6.5
M 8	1.25	FAB0202750	72	22	8	6.3	9	7.4
M 10	1.5	FAB0202751	80	24	10	8	9	9.3
M 12	1.75	FAB0202752	89	29	9	7.1	10	11.2
M 14	2	FAB0203238	95	30	11.2	9	12	13.1
M 16	2	FAB0203240	102	32	12.5	10	13	15.1



M

**Metric coarse threads**



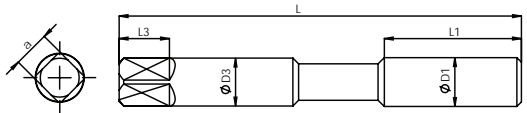
HSS-E

ISO 529

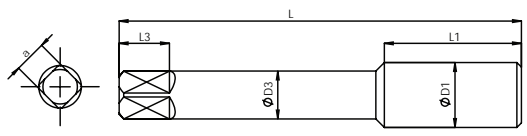
6HX

C/2-3P

TiCN



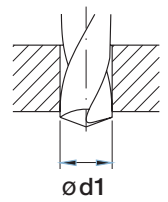
Reinforced Shank (M3 - M10)  
Male Centre upto M5



Reduced Shank (M12 - M16)

P0-P2

N1-N4



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAB0203241	48	11	3.15	2.5	5	2.8
M 4	0.7	FAB0203242	53	13	4	3.15	6	3.7
M 5	0.8	FAB0203243	58	16	5	4	7	4.6
M 6	1	FAB0203244	66	19	6.3	5	8	5.5
M 8	1.25	FAB0203246	72	22	8	6.3	9	7.4
M 10	1.5	FAB0203249	80	24	10	8	9	9.3
M 12	1.75	FAB0203251	89	29	9	7.1	10	11.2

HSS TAPS

DIES

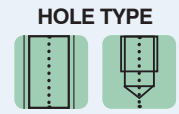
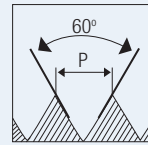
END MILLS

DRILLS

CARBIDE BURRS

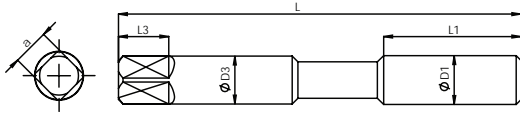
CS TAPS

**MF** Metric fine threads

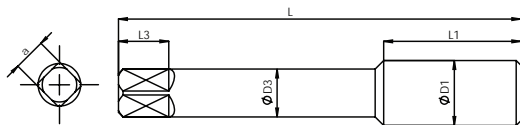


HSS-E
ISO 529
6HX
C/2-3P
BF

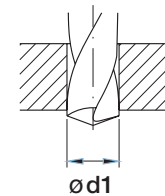
P1



Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M16)



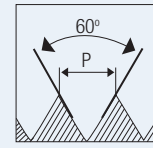
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203223	69	19	8	6.3	9	7.5
M 10	1	FAB0203224	76	20	10	8	11	9.5
M 10	1.25	FAB0203225	76	20	10	8	11	9.4
M 12	1.5	FAB0203226	89	29	9	7.1	10	10.5
M 14	1.5	FAB0203227	95	30	11.2	9	12	12.5
M 16	1.5	FAB0203229	102	32	12.5	10	13	14.5



MF

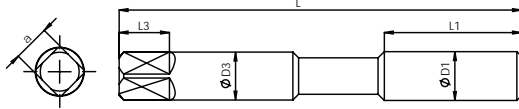
Metric fine threads



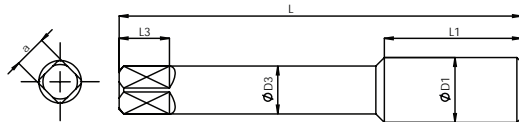
HOLE TYPE



HSS-E
ISO 529
6HX
C/2-3P
TiN



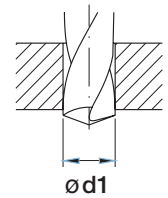
Reinforced Shank (M8 - M10)



Reduced Shank (M12 - M16)

P1-P1

N1-N4



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 8	1	FAB0203233	69	19	8	6.3	9	7.5
M 10	1	FAB0203234	76	20	10	8	11	9.5
M 10	1.25	FAB0203235	76	20	10	8	11	9.4
M 12	1.5	FAB0203236	89	29	9	7.1	10	10.5
M 14	1.5	FAB0203237	95	30	11.2	9	12	12.5
M 16	1.5	FAB0203239	102	32	12.5	10	13	14.5

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

# HSS



High Performance Cutting Tools



# HAND TAPS

## HSS HAND TAPS



These are straight flute general purpose taps which can be used for both machine or hand tapping. They are generally the most economical tool for use on production runs, but are best on materials that produce chips, or where the swarf breaks readily. Where deep holes are to be tapped, in materials which produce stringy swarf, other types of taps may be needed, especially for coarse threads.

Hand taps can be supplied in sets of three; bottom, second and taper leads, or individually.

**BOTTOM TAPS** have a chamfer (lead) of 1–2 threads, the angle of the lead being around 18 degrees per side. They are used to produce threads close to the bottom of blind holes.

**SECOND TAPS** have a lead of 3-5 threads at 8 degrees per side. They are the most popular and can be used for through holes, or blind holes where the thread does not need to go right to the bottom.

**TAPER TAPS** have a lead of 7-10 threads at 5 degrees per side. The taper lead distributes the cutting force over a large area, and the taper shape helps the thread to start. They can therefore be used to start a thread prior to use of second or bottom leads, or for through holes.

# SELECTION GUIDE



## HSS HAND TAPS

	THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
	M	ISO	6H	T/S/B	Bright	114
	MF	ISO	6H	T/B	Bright	116
	M	ISO Long Shank	6H	T	Bright	119
	M	ISO Long Shank	6H	S	Bright	120
	M/MF	ISO Long Shank	6H	B	Bright	121
	M/MF	ISO Long Shank	6H	B/4-4.5P	Bright	123
	M	ISO	6H	Serial Form	Bright	124
	BSW	ISO	6H	T/S/B	Bright	125
	BSF	ISO	6H	T/S/B	Bright	127
	BA	ISO	6H	T/S/B	Bright	128
	BSB	ISO	6H	T/S/B	Bright	129
	BS Con	ISO	6H	T/B	Bright	130
	ME	ISO	6H	T/S/B	Bright	131
	BSP	ISO 2284	6H	T/B	Bright	132
	BSPT	ISO 2284	6H	T/B	Bright	133
	UNC	ISO	2B	T/S/B	Bright	134
	UNF	ISO	2B	T/S/B	Bright	136
	NPT	ANSI	6H	T/B	Bright	138
	NPS	ANSI	6H	T/B	Bright	139



HSS Hand Taps

HSS TAPS

DIES

END MILLS

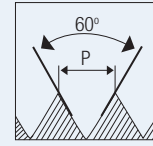
DRILLS

CARBIDE BURRS

CS TAPS

M

## Metric coarse threads



HOLE TYPE



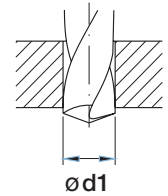
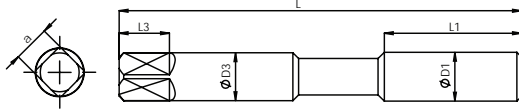
HSS

ISO 529

6H

T/S/B

BF



Reinforced Shank (M3 - M10)  
Male Centre upto M5

Unit : mm

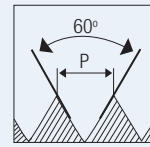
Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 1.6	0.35	FAA0201729	41	8	2.5	2	4	1.25
M 2	0.4	FAA0201745	41	8	2.5	2	4	1.6
M 2.2	0.45	FAA0201761	44.5	9.5	2.8	2.24	5	1.75
M 2.3	0.4	FAA0201766	44.5	9.5	2.8	2.24	5	1.9
M 2.5	0.45	FAA0201771	44.5	9.5	2.8	2.24	5	2.05
M 2.6	0.45	FAA0201782	44.5	9.5	2.8	2.24	5	2.15
M 3	0.5	FAA0201787	48	11	3.15	2.5	5	2.5
M 3.5	0.6	FAA0201828	50	13	3.55	2.8	5	2.9
M 4	0.7	FAA0201847	53	13	4	3.15	6	3.3
M 4.5	0.75	FAA0201889	53	13	4.5	3.55	6	3.75
M 5	0.8	FAA0201897	58	16	5	4	7	4.2
M 6	1	FAA0201939	66	19	6.3	5	8	5
M 7	1	FAA0201985	66	19	7.1	5.6	8	6
M 8	1.25	FAA0202003	72	22	8	6.3	9	6.75
M 9	1.25	FAA0202051	72	22	9	7.1	10	7.75
M 10	1.5	FAA0202072	80	24	10	8	11	8.5
M 11	1.5	FAA0202123	85	25	8	6.3	9	9.5





M

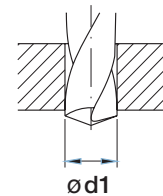
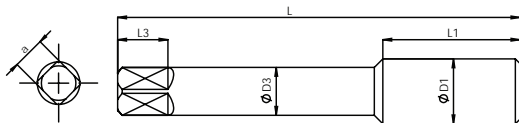
Metric coarse threads



HOLE TYPE



HSS
ISO 529
6H
T/S/B
BF



Reduced Shank (M12 - M56)

Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 12	1.75	FAA0202141	89	29	9	7.1	10	10.25
M 14	2	FAA0202177	95	30	11.2	9	12	12
M 16	2	FAA0202204	102	32	12.5	10	13	14
M 18	2.5	FAA0202247	112	37	14	11.2	14	15.5
M 20	2.5	FAA0202265	112	37	14	11.2	14	17.5
M 22	2.5	FAA0202302	118	38	16	12.5	16	19.5
M 24	3	FAA0202325	130	45	18	14	18	21
M 27	3	FAA0202360	135	45	20	16	20	24
M 30	3.5	FAA0202381	138	48	20	16	20	26.5
M 33	3.5	FAA0202405	151	51	22.4	18	22	29.5
M 36	4	FAA0202418	162	57	25	20	24	32
M 39	4	FAA0202440	170	60	28	22.4	26	35
M 42	4.5	FAA0202449	170	60	28	22.4	26	37.5
M 45	4.5	FAA0202459	187	67	31.5	25	28	40.5
M 48	5	FAA0202468	187	67	31.5	25	28	43
M 52	5	FAA0202477	200	70	35.5	28	31	47
M 56	5.5	FAA0202481	200	70	35.5	28	31	50.5



HSS Hand Taps

HSS TAPS

DIES

END MILLS

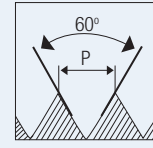
DRILLS

CARBIDE BURRS

CS TAPS

MF

Metric fine threads



HOLE TYPE



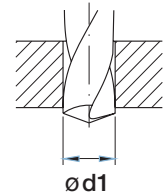
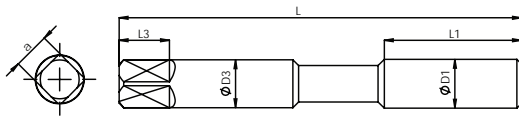
HSS

ISO 529

6H

T/B

BF



Reinforced Shank (M3 - M10)  
Male Centre upto M5

Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.35	FAA0202535	48	11	3.15	2.5	5	2.12
M 3	0.6	FAA0202541	48	11	3.15	2.5	5	2.12
M 4	0.5	FAA0202564	53	13	4	3.15	6	2.8
M 4	0.75	FAA0202575	53	13	4	3.15	6	2.8
M 5	0.5	FAA0202588	58	16	5	4	7	3.55
M 5.5	0.9	FAA0202614	62	17	5.6	4.5	7	4
M 6	0.5	FAA0202626	66	19	6.3	5	8	4.5
M 6	0.75	FAA0202633	66	19	6.3	5	8	4.5
M 7	0.75	FAA0202665	66	19	7.1	5.6	8	5.3
M 8	1	FAA0202697	69	19	8	6.3	9	6
M 9	1	FAA0202731	69	19	9	7.1	10	7.1
M 10	1	FAA0202758	76	20	10	8	11	7.5
M 10	1.25	FAA0202786	76	20	10	8	11	7.5
M 11	1.25	FAA0202829	82	22	8	6.3	9	9.75
M 12	1	FAA0202845	80	24	9	7.1	10	11
M 12	1.25	FAA0202869	84	24	9	7.1	10	10.8
M 12	1.5	FAA0202893	89	29	9	7.1	10	10.5
M 14	1	FAA0202945	87	22	11.2	9	12	13
M 14	1.25	FAA0202966	90	25	11.2	9	12	12.8
M 14	1.5	FAA0202988	95	30	11.2	9	12	13.5
M 16	1	FAA0203041	92	22	12.5	10	13	15



HSS Hand Taps

HSS TAPS

DIES

END MILLS

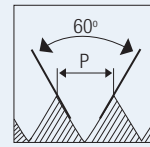
DRILLS

CARBIDE BURRS

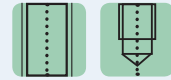
CS TAPS

**MF**

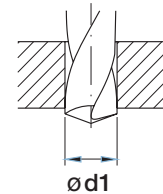
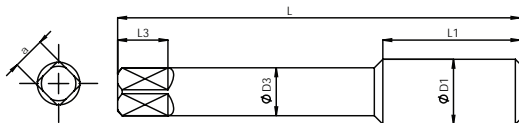
## Metric fine threads



HOLE TYPE



HSS
ISO 529
6H
T/B
BF



Reduced Shank (M12 - M56)

Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 16	1.5	FAA0203063	102	32	12.5	10	13	14.5
M 18	1	FAA0203097	97	22	14	11.2	14	17
M 18	1.5	FAA0203106	104	29	14	11.2	14	16.5
M 18	2	FAA0203129	112	37	14	11.2	14	16
M 20	1	FAA0203146	102	27	14	11.2	14	19
M 20	1.5	FAA0203155	104	29	14	11.2	14	18.5
M 20	2	FAA0203180	112	37	14	11.2	14	18
M 22	1	FAA0203195	109	29	16	12.5	16	21
M 22	1.5	FAA0203201	113	33	16	12.5	16	20.5
M 22	2	FAA0203218	118	38	16	12.5	16	20
M 24	1	FAA0203227	114	29	18	14	18	23
M 24	1.5	FAA0203233	120	35	18	14	18	22.5
M 24	2	FAA0203253	120	35	18	14	18	22
M 25	1	FAA0203266	114	29	18	14	18	24
M 25	1.5	FAA0203273	120	35	18	14	18	23.5
M 27	1.5	FAA0203306	127	37	20	16	20	25.5
M 27	2	FAA0203315	127	37	20	16	20	25
M 28	1.5	FAA0203328	127	37	20	16	20	26.5
M 30	1.5	FAA0203343	127	37	20	16	20	28.5
M 30	2	FAA0203358	127	37	20	16	20	28



HSS Hand Taps

HSS TAPS

DIES

END MILLS

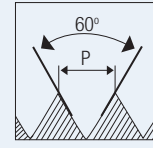
DRILLS

CARBIDE BURRS

CS TAPS

MF

Metric fine threads



HOLE TYPE



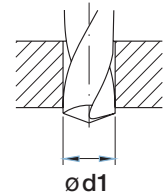
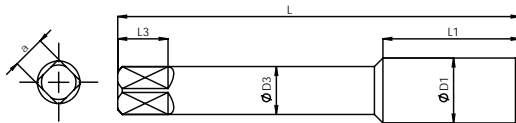
HSS

ISO 529

6H

T/B

BF



Reduced Shank (M12 - M56)

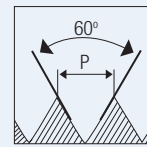
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 30	3	FAA0203370	138	48	20	16	20	27
M 32	1.5	FAA0203384	137	37	22.4	18	22	30.5
M 33	1.5	FAA0203397	137	37	22.4	18	22	31.5
M 33	2	FAA0203402	137	37	22.4	18	22	31
M 33	3	FAA0203408	151	51	22.4	18	22	30
M 36	1.5	FAA0203434	144	39	25	20	24	34.5
M 36	2	FAA0203441	144	39	25	20	24	34
M 36	3	FAA0203449	162	57	25	20	24	33
M 39	1.5	FAA0203463	149	39	28	22.4	26	37.5
M 39	2	FAA0203466	149	39	28	22.4	26	37
M 39	3	FAA0203469	170	60	28	22.4	26	36
M 40	1.5	FAA0203476	149	39	28	22.4	26	38.5
M 42	1.5	FAA0203489	149	39	28	22.4	26	40.5
M 42	3	FAA0203499	170	60	28	22.4	26	39
M 45	1.5	FAA0203520	165	45	31.5	25	28	43.5
M 45	3	FAA0203528	187	67	31.5	25	28	42
M 48	1.5	FAA0203532	165	45	31.5	25	28	46.5
M 48	2	FAA0203538	165	45	31.5	25	28	46
M 48	3	FAA0203545	187	67	31.5	25	28	45



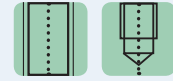
M

**Metric coarse threads - long shank**

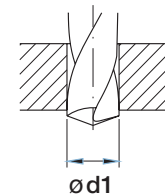
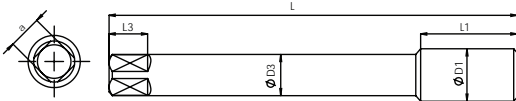


(Taper-Type A)

HOLE TYPE



HSS
ISO 2283
6H
T
BF



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	TPI		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAA0203714	66	11	2.24	1.8	4	2.5
M 4	0.7	FAA0203721	73	13	3.15	2.5	5	3.3
M 5	0.8	FAA0203738	79	16	4	3.15	6	4.2
M 6	1	FAA0203747	89	19	4.5	3.55	6	5
M 8	1.25	FAA0203770	97	22	6.3	5	8	6.75
M 10	1.5	FAA0203794	108	24	8	6.3	9	8.5
M 12	1.75	FAA0203816	119	29	9	7.1	10	10.25
M 14	2	FAA0207063	127	30	11.2	9	12	12.5
M 16	2	FAA0203852	137	32	12.5	10	13	14
M 18	2.5	FAA0203867	149	37	14	11.2	14	15.5
M 20	2.5	FAA0203884	149	37	14	11.2	14	17.5



HSS Hand Taps

HSS TAPS

DIES

END MILLS

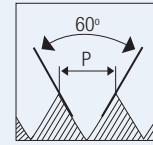
DRILLS

CARBIDE BURRS

CS TAPS

M

## Metric coarse threads - long shank



(Second-Type D)

HOLE TYPE



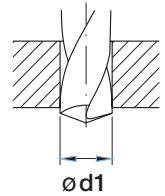
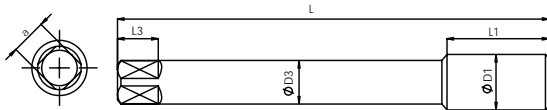
HSS

ISO 2283

6H

S

BF



Unit : mm

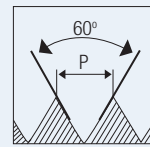
Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAA0203715	66	11	2.24	1.8	4	2.5
M 4	0.7	FAA0203722	73	13	3.15	2.5	5	3.3
M 5	0.8	FAA0203739	79	16	4	3.15	6	4.2
M 6	1	FAA0203748	89	19	4.5	3.55	6	5
M 8	1.25	FAA0203771	97	22	6.3	5	8	6.75
M 10	1.5	FAA0203795	108	24	8	6.3	9	8.5
M 12	1.75	FAA0203817	119	29	9	7.1	10	10.25
M 14	2	FAA0207305	127	30	11.2	9	12	12
M 16	2	FAA0203853	137	32	12.5	10	13	14
M 18	2.5	FAA0207306	149	37	14	11.2	14	15.5
M 20	2.5	FAA0203885	149	37	14	11.2	14	17.5



HSS Hand Taps

M/MF

## Metric coarse & fine threads - long shank



(Bottom-Type C)

HOLE TYPE



HSS TAPS

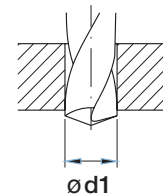
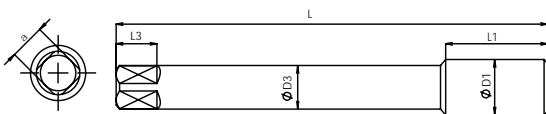
DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAA0203716	66	11	2.24	1.8	4	2.5
M 3.5	0.6	FAA0203719	68	13	2.5	2	4	2.9
M 4	0.7	FAA0203723	73	13	3.15	2.5	5	3.3
M 5	0.8	FAA0203740	79	16	4	3.15	6	4.2
M 6	1	FAA0203749	89	19	4.5	3.55	6	5
M 7	1	FAA0203759	89	19	5.6	4.5	7	6
M 8	1	FAA0203767	97	19	6.3	5	8	7
M 8	1.25	FAA0203772	97	22	6.3	5	8	6.75
M 9	1.25	FAA0203781	97	22	7.1	5.6	8	7.75
M 10	1	FAA0203786	108	20	8	6.3	9	9
M 10	1.25	FAA0203792	108	20	8	6.3	9	8.75
M 10	1.5	FAA0203796	108	24	8	6.3	9	8.5
M 12	1.25	FAA0203808	119	24	9	7.1	10	10.75
M 12	1.5	FAA0203813	119	29	9	7.1	10	10.5



HSS Hand Taps

HSS TAPS

DIES

END MILLS

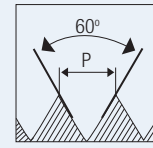
DRILLS

CARBIDE BURRS

CS TAPS

M/MF

## Metric coarse & fine threads - long shank



(Bottom-Type C)

HOLE TYPE



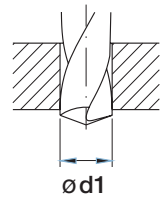
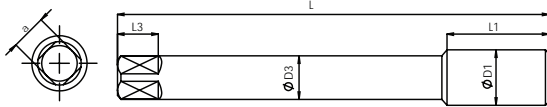
HSS

ISO  
2283

6H

B

BF



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 12	1.75	FAA0203818	119	29	9	7.1	10	10.25
M 14	1.25	FAA0203828	127	25	11.2	9	12	12.75
M 14	1.5	FAA0203832	127	30	11.2	9	12	12.5
M 14	2	FAA0203841	127	30	11.2	9	12	12
M 16	1.5	FAA0203849	137	32	12.5	10	13	14.5
M 16	2	FAA0203854	137	32	12.5	10	13	14
M 18	1.5	FAA0203864	149	29	14	11.2	14	16.5
M 18	2.5	FAA0203868	149	37	14	11.2	14	15.5
M 20	1.5	FAA0203875	149	29	14	11.2	14	18.5
M 20	2.5	FAA0203886	149	37	14	11.2	14	17.5
M 22	2.5	FAA0203902	158	38	16	12.5	16	19.5
M 24	3	FAA0203918	172	45	18	14	18	21
M 27	3	FAA0203940	180	45	20	16	20	24
M 30	3.5	FAA0203955	183	48	20	16	20	26.5

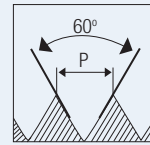




HSS Hand Taps

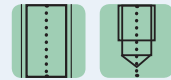
M/MF

## Metric coarse & fine threads - long shank



(SPPT-Type B)

HOLE TYPE



HSS

ISO 2283

6H

BF

HSS TAPS

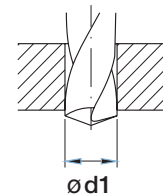
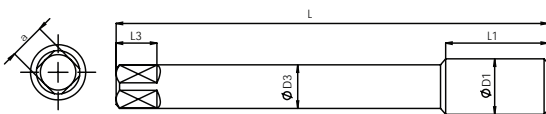
DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAA0203717	66	11	2.24	1.8	4	2.5
M 3.5	0.6	FAA0203720	68	13	2.5	2	4	2.9
M 4	0.7	FAA0203726	73	13	3.15	2.5	5	3.3
M 5	0.8	FAA0203743	79	16	4	3.15	6	4.2
M 6	1	FAA0203753	89	19	4.5	3.55	6	5
M 8	1.25	FAA0203775	97	22	6.3	5	8	6.75
M 10	1.25	FAA0203793	108	20	8	6.3	9	8.75
M 10	1.5	FAA0203798	108	24	8	6.3	9	8.5
M 12	1.5	FAA0203815	119	29	9	7.1	10	10.5
M 12	1.75	FAA0203821	119	29	9	7.1	10	10.25
M 14	1.5	FAA0203835	127	30	11.2	9	12	12.5
M 14	2	FAA0203842	127	30	11.2	9	12	12
M 16	1.5	FAA0203851	137	32	12.5	10	13	14.5
M 16	2	FAA0203857	137	32	12.5	10	13	14
M 18	1.5	FAA0203865	142	29	14	11.2	14	16.5
M 18	2.5	FAA0203869	149	37	14	11.2	14	15.5
M 20	1.5	FAA0203878	142	29	14	11.2	14	18.5
M 20	2.5	FAA0203888	149	37	14	11.2	14	17.5
M 22	2.5	FAA0203903	158	38	16	12.5	16	19.5
M 24	3	FAA0203920	172	45	18	14	18	21



HSS Hand Taps

HSS TAPS

DIES

END MILLS

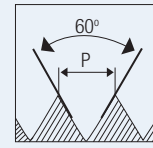
DRILLS

CARBIDE BURRS

CS TAPS

M

**Metric coarse threads - serial form**



HOLE TYPE



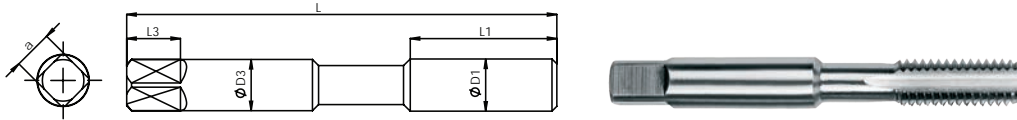
HSS

ISO 529

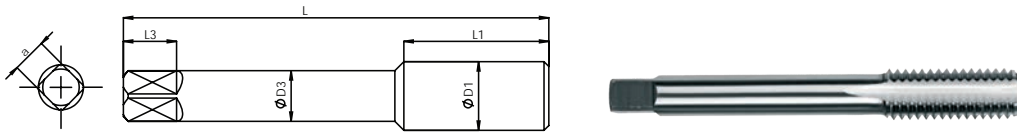
6H

T/S/B

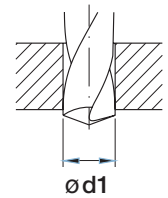
BF



Reinforced Shank (M3 - M10)



Reduced Shank (M12 - M30)



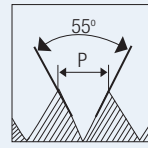
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 3	0.5	FAA0201820	48	11	3.15	2.5	5	2.5
M 4	0.7	FAA0201880	53	13	4	3.15	6	3.3
M 5	0.8	FAA0201931	58	16	5	4	7	4.2
M 6	1	FAA0201976	66	19	6.3	5	8	5
M 8	1.25	FAA0202036	72	22	8	6.3	9	6.75
M 10	1.5	FAA0202107	80	24	10	8	11	8.5
M 12	1.75	FAA0202170	89	29	9	7.1	10	10.25
M 14	2	FAA0202197	95	30	11.2	9	12	12
M 16	2	FAA0202232	102	32	12.5	10	13	14
M 18	2.5	FAA0202262	112	37	14	11.2	14	15.5
M 20	2.5	FAA0202292	112	37	14	11.2	14	17.5
M 22	2.5	FAA0202321	118	38	16	12.5	16	19.5
M 24	3	FAA0202348	130	45	18	14	18	21
M 27	3	FAA0202375	135	45	20	16	20	24
M 30	3.5	FAA0202400	138	48	20	16	20	26.5



**BSW**

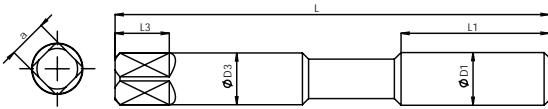
**Whitworth coarse threads**



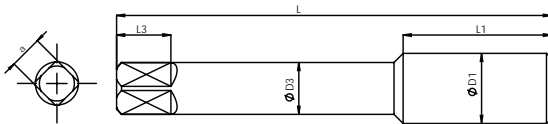
HOLE TYPE



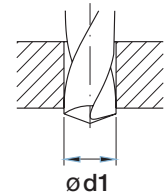
HSS
ISO 529
6H
T/S/B
BF



Reinforced Shank (1/8" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

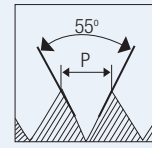
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	40	FAA0200009	48	11	3.15	2.5	5	2.55
5/32"	32	FAA0200020	53	13	4	3.15	6	3.2
3/16"	24	FAA0200034	58	16	5	4	7	3.7
1/4"	20	FAA0200061	66	19	6.3	5	8	5.1
5/16"	18	FAA0200094	72	22	8	6.3	9	6.5
3/8"	16	FAA0200115	80	24	10	8	11	7.9
7/16"	14	FAA0200139	85	25	8	6.3	9	9.3
1/2"	12	FAA0200159	89	29	9	7.1	10	10.5
9/16"	12	FAA0200177	95	30	11.2	9	12	12.1
5/8"	11	FAA0200189	102	32	12.5	10	13	13.5
11/16"	11	FAA0200230	112	37	14	11.2	14	15.1



HSS Hand Taps

BSW

Whitworth coarse threads



HOLE TYPE



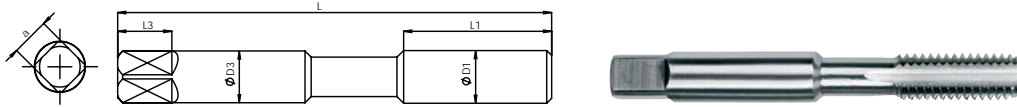
HSS

ISO  
529

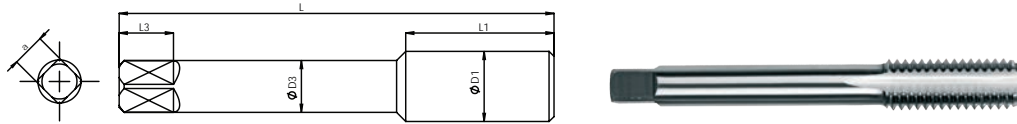
6H

T/S/B

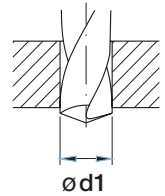
BF



Reinforced Shank (1/8" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

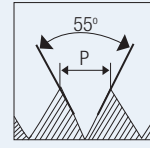
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
3/4"	10	FAA0200211	112	37	14	11.2	14	16.25
7/8"	9	FAA0200235	118	38	16	12.5	16	19.25
1"	8	FAA0200254	130	45	18	14	18	22
1.1/8"	7	FAA0200274	138	48	20	16	20	24.75
1.1/4"	7	FAA0200281	151	51	22.4	18	22	28
1.3/8"	6	FAA0200290	162	57	25	20	24	30.1
1.1/2"	6	FAA0200294	170	60	28	22.4	26	33.5
1.5/8"	5	FAA0200302	170	60	28	22.4	26	35.7
1.3/4"	5	FAA0200304	187	67	31.5	25	28	39
1.7/8"	4.5	FAA0200308	187	67	31.5	25	28	41.3
2"	4.5	FAA0200312	200	70	35.5	28	31	44.5



HSS Hand Taps

**BSF**

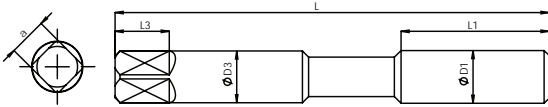
**Whitworth fine threads**



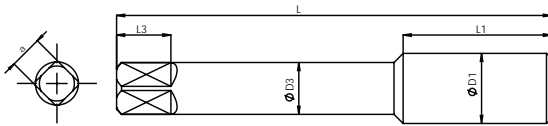
HOLE TYPE



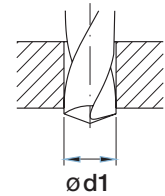
HSS
ISO 529
6H
T/S/B
BF



Reinforced Shank (3/16" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
3/16"	32	FAA0200346	58	16	5	4	7	4
1/4"	26	FAA0200360	66	19	6.3	5	8	5.3
5/16"	22	FAA0200381	72	22	8	6.3	9	6.8
3/8"	20	FAA0200394	80	24	10	8	11	8.3
7/16"	18	FAA0200407	85	25	8	6.3	9	9.7
1/2"	16	FAA0200419	89	29	9	7.1	10	11.1
9/16"	16	FAA0200431	95	30	11.2	9	12	12.7
5/8"	14	FAA0200437	102	32	12.5	10	13	14
11/16"	14	FAA0200450	112	37	14	11.2	14	15.5
3/4"	12	FAA0200454	112	37	14	11.2	14	16.75
7/8"	11	FAA0200462	118	38	16	12.5	16	19.75
1"	10	FAA0200470	130	45	18	14	18	22.75
1.1/8"	9	FAA0200478	138	48	20	16	20	25.5
1.1/4"	9	FAA0200482	151	51	22.4	18	22	28.5
1.3/8"	8	FAA0200486	162	57	25	20	24	31.5
1.1/2"	8	FAA0200490	170	60	28	22.4	26	34.5
1.5/8"	8	FAA0200494	170	60	28	22.4	26	37.7
1.3/4"	7	FAA0200495	187	67	31.5	25	28	41
2"	7	FAA0200497	200	70	35.5	28	31	47

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



HSS Hand Taps

HSS TAPS

DIES

END MILLS

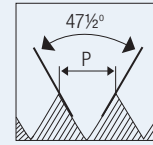
DRILLS

CARBIDE BURRS

CS TAPS

BA

British association threads



HOLE TYPE



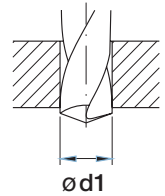
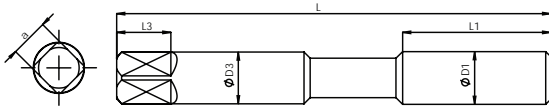
HSS

ISO 529

6H

T/S/B

BF



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
# 12	90.9	FAA0200646	40	7	2.5	2	4	1.05
# 11	81.9	FAA0200642	41	8	2.5	2	4	1.2
# 10	72.6	FAA0200632	41	8	2.5	2	4	1.4
# 9	65.1	FAA0200623	41	8	2.5	2	4	1.55
# 8	59.1	FAA0200613	44.5	9.5	2.8	2.24	5	1.8
# 7	52.9	FAA0200601	44.5	9.5	2.8	2.24	5	2.05
# 6	47.9	FAA0200588	44.5	9.5	2.8	2.24	5	2.3
# 5	43	FAA0200576	48	11	3.15	2.5	5	2.65
# 4	38.5	FAA0200562	50	13	3.55	2.8	5	3
# 3	34.8	FAA0200552	53	13	4.5	3.55	6	3.4
# 2	31.4	FAA0200539	58	16	5	4	7	4
# 1	28.2	FAA0200527	62	17	5.6	4.5	7	4.5
# 0	25.4	FAA0200515	66	19	6.3	5	8	5.1



HSS Hand Taps

HSS TAPS

DIES

END MILLS

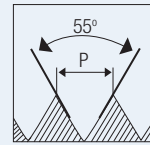
DRILLS

CARBIDE BURRS

CS TAPS

**BSB**

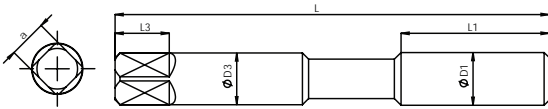
**British standard brass threads**



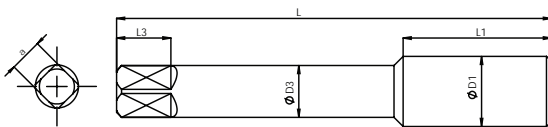
HOLE TYPE



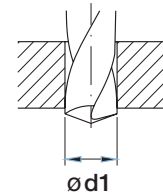
HSS
ISO 529
6H
T/S/B
BF



Reinforced Shank (1/8" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	26	FAA0200651	66	19	6.3	5	8	5.3
5/16"	26	FAA0200656	69	19	8	6.3	9	5.8
3/8"	26	FAA0200661	76	20	10	8	11	8.4
7/16"	26	FAA0200666	82	22	8	6.3	9	10
1/2"	26	FAA0200671	84	24	9	7.1	10	11.5
9/16"	26	FAA0200676	90	25	11.2	9	12	13.1
5/8"	26	FAA0200681	95	25	12.5	10	13	14.7
3/4"	26	FAA0200686	104	29	14	11.2	14	17.8
7/8"	26	FAA0200690	113	33	16	12.5	16	21
1"	26	FAA0207315	120	35	18	14	18	24.2



HSS Hand Taps

HSS TAPS

DIES

END MILLS

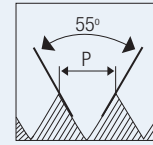
DRILLS

CARBIDE BURRS

CS TAPS

BS Con

British standard conduit threads



HOLE TYPE



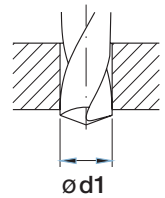
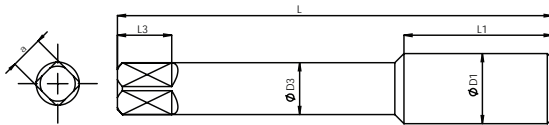
HSS

ISO 529

6H

T/B

BF



Unit : mm

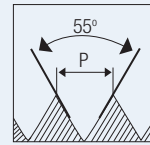
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ø d1
1/2"	18	FAA0200696	84	24	9	7.1	10	11.5
5/8"	18	FAA0200699	95	25	12.5	10	13	14.2
3/4"	16	FAA0200701	104	29	14	11.2	14	17.5
1"	16	FAA0200706	120	35	18	14	18	23.8





ME

Model engineers threads



HOLE TYPE



HSS
ISO 529
6H
T/S/B
BF

HSS TAPS

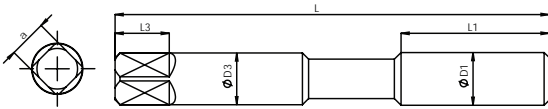
DIES

END MILLS

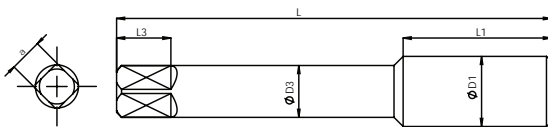
DRILLS

CARBIDE BURRS

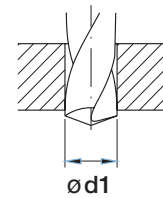
CS TAPS



Reinforced Shank (1/8" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	40	FAA0207317	48	11	3.15	2.5	5	2.55
5/32"	40	FAA0200718	53	13	4	3.15	6	3.3
3/16"	40	FAA0200723	58	16	5	4	7	4
7/32"	40	FAA0200727	62	17	5.6	4.5	7	4.8
1/4"	40	FAA0200732	66	13	6.3	5	8	5.5
9/32"	32	FAA0200737	66	19	7.1	5.6	8	6.1
5/16"	32	FAA0200742	66	16	8	6.3	9	7
3/8"	32	FAA0200746	73	16	10	8	11	8.6
7/16"	32	FAA0207320	80	20	8	6.3	9	10.3
1/2"	32	FAA0207324	80	20	9	10	7.1	11.9



HSS Hand Taps

HSS TAPS

DIES

END MILLS

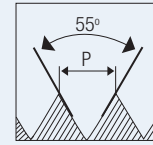
DRILLS

CARBIDE BURRS

CS TAPS

**BSP**

**British standard pipe threads**



HOLE TYPE



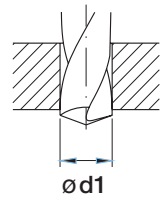
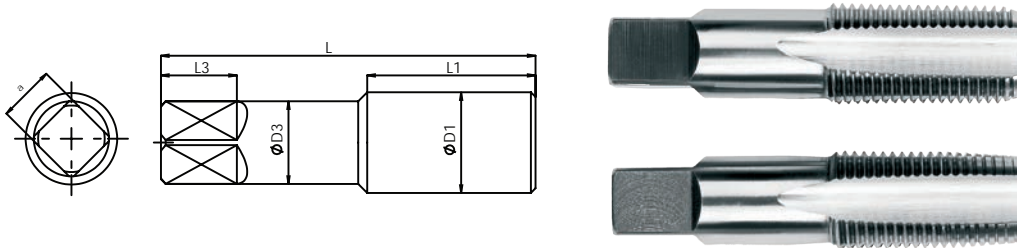
HSS

ISO 2284

6H

T/B

BF



Unit : mm

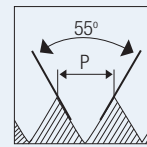
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	28	FAA0204602	59	15	8	6.3	9	8.8
1/4"	19	FAA0204623	67	19	10	8	11	11.8
3/8"	19	FAA0204644	75	21	12.5	10	13	15.25
1/2"	14	FAA0204662	87	26	16	12.5	16	19
5/8"	14	FAA0204678	91	26	18	14	18	21
3/4"	14	FAA0204686	96	28	20	16	20	24.5
7/8"	14	FAA0204700	102	29	22.4	18	22	28.25
1"	11	FAA0204706	109	33	25	20	24	30.75
1.1/4"	11	FAA0204721	119	36	31.5	25	28	39.5
1.1/2"	11	FAA0204732	125	37	35.5	28	31	45
1.3/4"	11	FAA0204742	132	39	35.5	28	31	51
2"	11	FAA0204745	140	41	40	31.5	34	57



HSS Hand Taps

**BSPT**

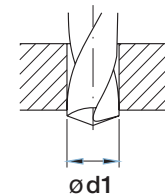
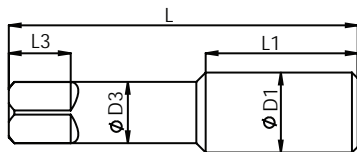
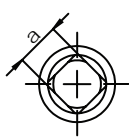
**British standard taper pipe threads**



HOLE TYPE



HSS
ISO 2284
6H
T/B
BF



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	28	FAA0204833	59	15	8	6.3	9	8.8
1/4"	19	FAA0204846	67	19	10	8	11	11.8
3/8"	19	FAA0204855	75	21	12.5	10	13	15.25
1/2"	14	FAA0204863	87	26	16	12.5	16	19
3/4"	14	FAA0204871	96	28	20	16	20	24.5
1"	11	FAA0204880	109	33	25	20	24	30.75
1.1/4"	11	FAA0204889	119	36	31.5	25	28	39.5
1.1/2"	11	FAA0204892	125	37	35.5	28	31	45
2"	11	FAA0204895	140	41	40	31.5	34	57

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



HSS Hand Taps

HSS TAPS

DIES

END MILLS

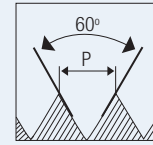
DRILLS

CARBIDE BURRS

CS TAPS

UNC

Unified coarse threads



HOLE TYPE



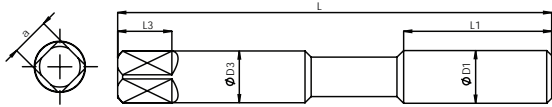
HSS

ISO 529

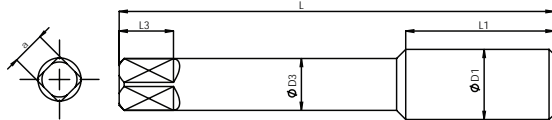
2B

T/S/B

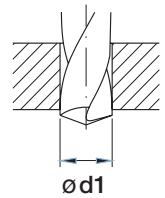
BF



Reinforced Shank (1/8" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

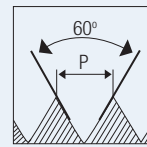
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	20	FAA0200875	66	19	6.3	5	8	5.1
5/16"	18	FAA0200907	72	22	8	6.3	9	6.6
3/8"	16	FAA0200940	80	24	10	8	11	8
7/16"	14	FAA0200980	85	25	8	6.3	9	9.4
1/2"	13	FAA0201007	89	29	9	7.1	10	10.8
9/16"	12	FAA0201042	95	30	11.2	9	12	12.2
5/8"	11	FAA0201058	102	32	12.5	10	13	13.5
3/4"	10	FAA0201092	112	37	14	11.2	14	16.5
7/8"	9	FAA0201125	118	38	16	12.5	16	19.5
1"	8	FAA0201151	130	45	18	14	18	22.25
1.1/8"	7	FAA0201181	138	48	20	16	20	25
1.1/4"	7	FAA0201192	151	51	22.4	18	22	28
1.3/8"	6	FAA0201200	162	57	25	20	24	30.75
1.1/2"	6	FAA0201208	170	60	28	22.4	26	34
1.3/4"	5	FAA0201219	187	67	31.5	25	28	39.5
2"	4.5	FAA0201224	200	70	35.5	28	31	45



HSS Hand Taps

UNC

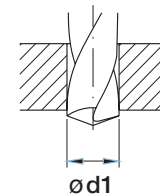
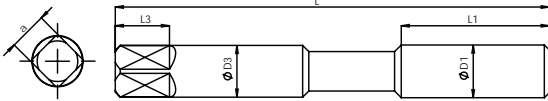
Unified coarse threads



HOLE TYPE



HSS
ISO 529
2B
T/S/B
BF



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
# 1	64	FAA0200810	41	8	2.5	2	4	1.55
# 2	56	FAA0200814	44.5	9.5	2.8	2.24	5	1.85
# 3	48	FAA0200819	44.5	9.5	2.8	2.24	5	2.1
# 4	40	FAA0200824	48	11	3.15	2.5	5	2.35
# 5	40	FAA0200833	48	11	3.15	2.5	5	2.65
# 6	32	FAA0200838	50	13	3.55	2.8	5	2.85
# 8	32	FAA0200845	53	13	4.5	3.55	6	3.5
# 10	24	FAA0200855	58	16	5	4	7	3.9
# 12	24	FAA0200866	62	17	5.6	4.5	7	4.5

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



HSS Hand Taps

HSS TAPS

DIES

END MILLS

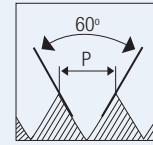
DRILLS

CARBIDE BURRS

CS TAPS

UNF

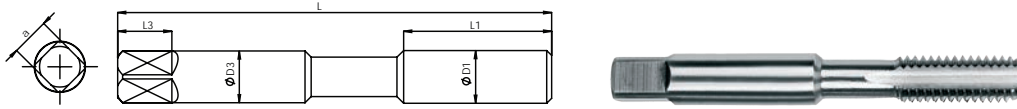
Unified fine threads



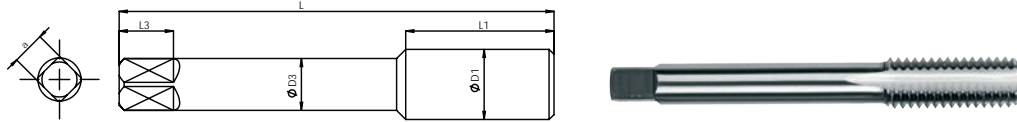
HOLE TYPE



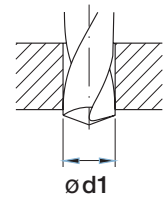
HSS
ISO 529
2B
T/S/B
BF



Reinforced Shank (1/8" - 3/8")



Reduced Shank (7/16" - 2")



Unit : mm

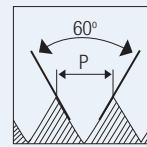
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	28	FAA0201315	66	19	6.3	5	8	5.5
5/16"	24	FAA0201349	69	19	8	6.3	9	6.9
3/8"	24	FAA0201390	76	20	10	8	11	8.5
7/16"	20	FAA0201430	82	22	8	6.3	9	9.9
1/2"	20	FAA0201455	84	24	9	7.1	10	11.5
9/16"	18	FAA0201488	90	25	11.2	9	12	12.9
5/8"	18	FAA0201503	95	25	12.5	10	13	14.5
3/4"	16	FAA0201528	104	29	14	11.2	14	17.5
7/8"	14	FAA0201555	113	33	16	12.5	16	20.4
1"	12	FAA0201586	120	35	18	14	18	23.25
1.1/8"	12	FAA0201610	127	37	20	16	20	26.5
1.1/4"	12	FAA0201622	137	37	22.4	18	22	29.5
1.3/8"	12	FAA0201629	144	37	25	20	24	32.75
1.1/2"	12	FAA0201637	149	39	28	22.4	26	36



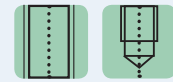
HSS Hand Taps

UNF

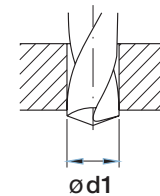
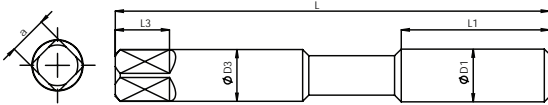
Unified fine threads



HOLE TYPE



HSS
ISO 529
2B
T/S/B
BF



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
# 0	80	FAA0201236	41	8	2.5	2	4	1.25
# 1	72	FAA0201240	41	8	2.5	2	4	1.55
# 2	64	FAA0201243	44.5	9.5	2.8	2.24	5	1.9
# 3	56	FAA0201248	44.5	9.5	2.8	2.24	5	2.15
# 4	48	FAA0201253	48	11	3.15	2.5	5	2.4
# 5	44	FAA0201258	48	11	3.15	2.5	5	2.7
# 6	40	FAA0201263	50	13	3.55	2.8	5	2.95
# 8	36	FAA0201268	53	13	4.5	3.55	6	3.5
# 10	32	FAA0201275	58	16	5	4	7	4.1
# 12	28	FAA0201302	62	17	5.6	4.5	7	4.7

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



HSS Hand Taps

HSS TAPS

DIES

END MILLS

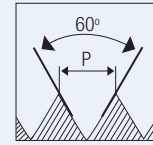
DRILLS

CARBIDE BURRS

CS TAPS

NPT

## National taper pipe threads



HOLE TYPE



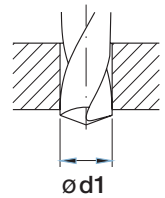
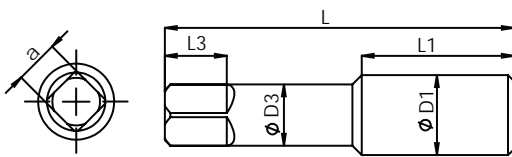
HSS

ANSI  
94.9

6H

T/B

BF



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/16"	27	FAA0204896	2.1/8	11/16	0.3125	0.234	3/8	6.3
1/8"	27	FAA0204899	2.1/8	3/4	0.4375	0.328	3/8	8.7
1/4"	18	FAA0204909	2.7/16	1.1/16	0.5625	0.421	7/16	11.1
3/8"	18	FAA0204919	2.9/16	1.1/16	0.7	0.531	1/2	14.5
1/2"	14	FAA0204928	3.1/8	1.3/8	0.6875	0.515	5/8	18
3/4"	14	FAA0204942	3.1/4	1.3/8	0.9063	0.679	11/16	23.25
1"	11.5	FAA0204950	3.3/4	1.3/4	1.125	0.843	13/16	29
1.1/4"	11.5	FAA0204957	4	1.3/4	1.3125	0.984	15/16	38
1.1/2"	11.5	FAA0204962	4.1/4	1.3/4	1.5	1.125	1	44
2"	11.5	FAA0204967	4.1/2	1.3/4	1.875	1.406	1.1/8	56
2.1/2"	8	FAA0204970	5.1/2	2.9/16	2.25	1.687	1.1/4	-
3"	8	FAA0207340	6	2.5/8	2.625	1.968	1.3/8	-

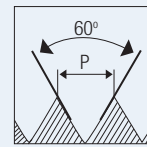




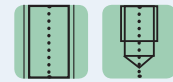
HSS Hand Taps

**NPS**

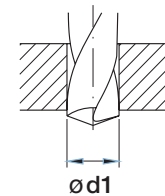
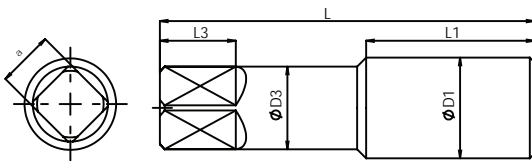
**National pipe straight threads**



HOLE TYPE



HSS
ANSI 94.9
6H
T/B
BF



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD			L	L1	ØD3	a	L3	Ød1
1/16"	27	FAA0207341	2.1/8	11/16	0.3125	0.234	3/8	6.3
1/8"	27	FAA0205002	2.1/8	3/4	0.4375	0.328	3/8	8.7
1/4"	18	FAA0207342	2.7/16	1.1/16	0.5625	0.421	7/16	11.1
3/8"	18	FAA0207343	2.9/16	1.1/16	0.7	0.531	1/2	14.5
1/2"	14	FAA0207344	3.1/8	1.3/8	0.6875	0.515	5/8	18
3/4"	14	FAA0207345	3.1/4	1.3/8	0.9063	0.679	11/16	23.25
1"	11.5	FAA0207346	3.3/4	1.3/4	1.125	0.843	13/16	29
1.1/4"	11.5	FAA0207349	4	1.3/4	1.3125	0.984	15/16	38
1.1/2"	11.5	FAA0207351	4.1/4	1.3/4	1.5	1.125	1	44
2"	11.5	FAA0207354	4.1/2	1.3/4	1.875	1.406	1.1/8	56

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



# HSS TAPS



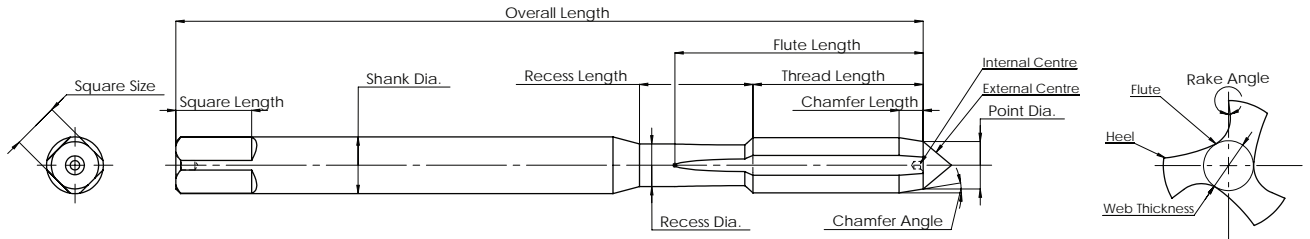
High Performance Cutting Tools



## TECHNICAL DETAILS

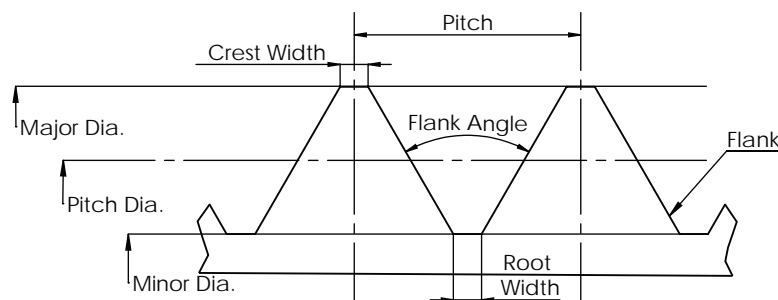
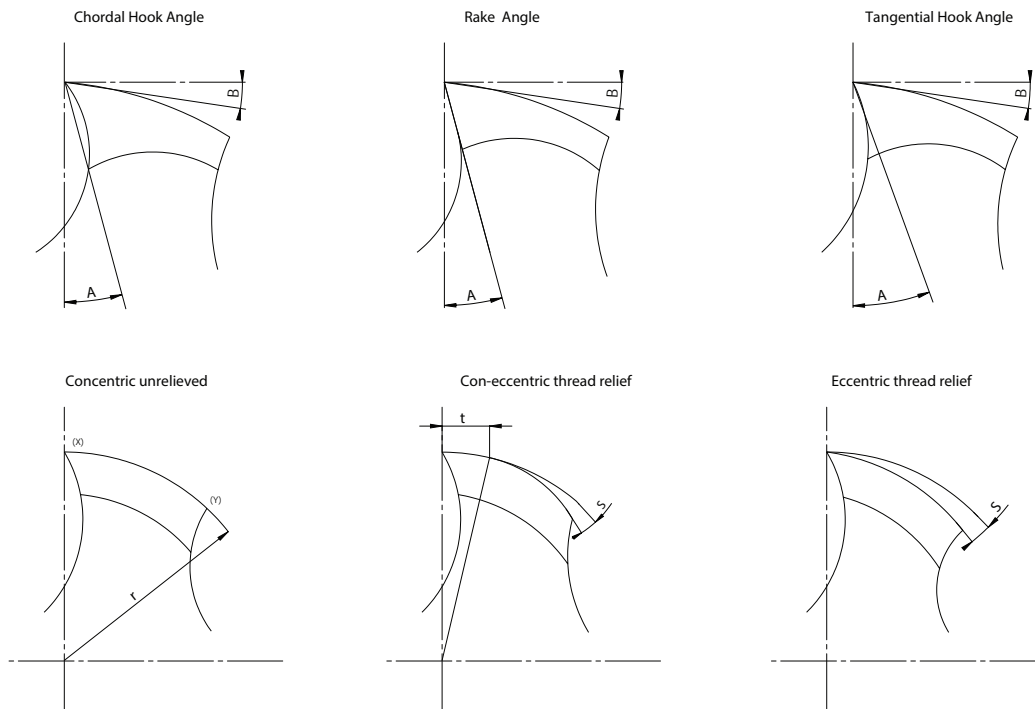


## TAP NOMENCLATURE



- **THREAD LENGTH:** It is a total length of threaded portion.
- **OVERALL LENGTH:** The axial distance between the two extreme ends of a tap is called as the overall length of the tap.
- **SQUARE:** The square end of the tap shank, for holding it in the tap wrench.
- **SHANK :** It is the cylindrical part if tap which is use for hold or drive.
- **CUTTING EDGE :** The edge formed by the intersection of the flute face and the form of the thread, imposed on the land
- **FLUTE :** It is the groove in the body in tap which provide cutting edge. Permits removal of chips and allows coolant or lubricant to reach the cutting edge.
- **LAND :** It is the surface between cutting edge and non cutting edge
- **WEB :** The central portion of tap which joins the land and extending along the fluted portion of tap
- **WEB TAPER :** It is the increase in the web thickness from the entering end of the Tap towards the shank end of the flutes.
- **HEEL :** It is the edge formed by the intersection of the relieved surface behind the cutting edge and the flute
- **CHAMFER :** The taper on the threads at the front end of the tap made by grinding and relieving the crest of the first few teeth
- **RAKE ANGLE :** The angular relationship of the straight cutting face of the tooth with respect to a radial line through the crest of the tooth of cutting edge. There are three type of rake angle. The details given below. Positive rake means that the crest of the cutting face is angularly ahead. Negative rake means that the crest of the cutting face is angularly behind. Zero radial rake means the cutting face is directly on a radial line
- **CREST :** It is the prominent part of thread i.e. Top surface joining the two sides of thread
- **ROOT :** It is bottom of groove between sides of two adjacent thread
- **FLANK :** The flank angle are angle between individual flank and perpendicular to axis of thread, It is equal to as half angle of thread
- **INCLUDED ANGLE :** It is the angle between two flank of thread

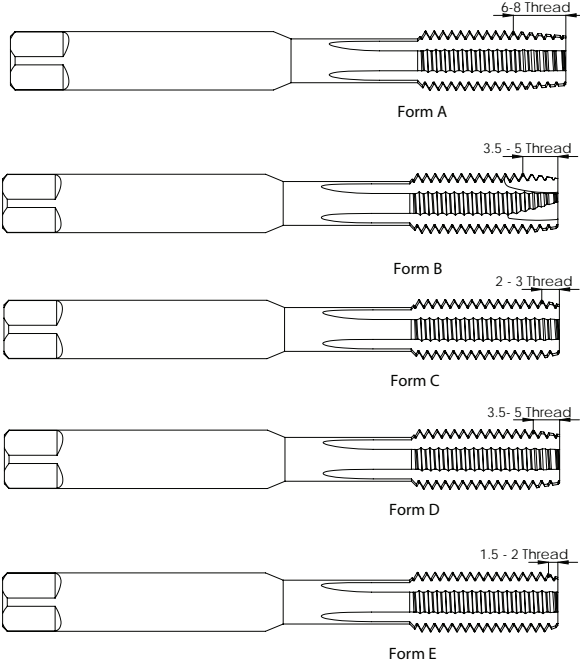
## TAP NOMENCLATURE



### Thread Profile

- **DEPTH OF THREAD :** It is the distance between the crest and root of single thread
- **MINOR DIAMETER :** It is the diameter between the two root of opposite thread.
- **THREAD RELIEF :** The clearance produced on the land by gradually reducing the diameter of the entire thread form between the cutting edge and the non cutting edge
- **EFFECTIVE DIAMETER (PCD) :** The pitch circle diameter of thread as generated by straight line parallel to axis of tap. This straight line is called as Pitch line. Along the pitch line the width of threads and width of spaces are equal on a perfect thread. This is the important parameter in screw thread and it decides the quality of fit between the two threaded assembly.
- **MAJOR DIAMETER :** It is the diameter over the crest of thread. Basic major diameter, it is the nominal diameter

## CHAMFER FORMS



### Form A

6 - 8 threads for short through hole

### Form B

3.5 - 5 threads with spiral point for all through holes and deep tapping holes

### Form C

2 - 3 threads for blind holes; generally for aluminium and grey cast iron.

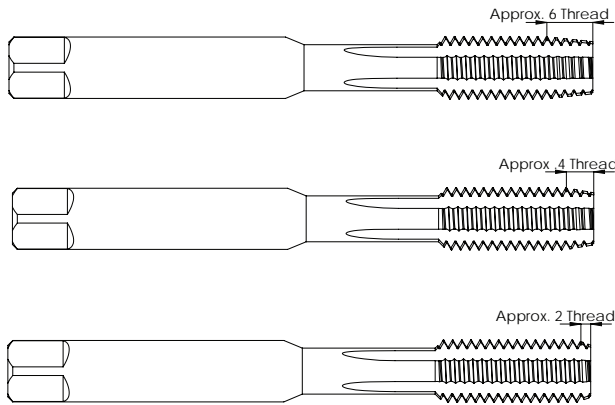
### Form D

3.5 - 5 threads for short through hole

### Form E

1.5 - 2 threads for blind holes with small run-out depth

### Chamfer length for set of 3 taps



### Taper Tap

6 threads approx.

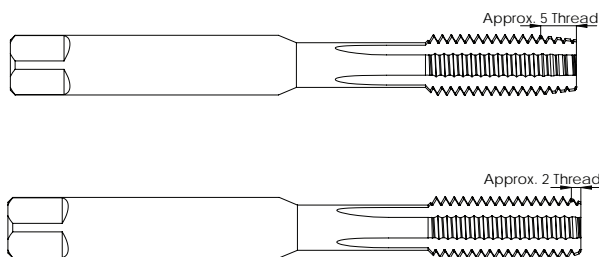
### Second Tap

4 threads approx.

### Bottom Tap

2 threads approx.

### Chamfer length for set of 2 taps (Pairs)



### Taper Tap

5 threads approx.

### Bottom Tap

2 threads approx.

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## MATERIAL DETAILS

High speed steel is used for construction of taps which plays a major role on the productivity of the tapping process. The High speed steel properties are often in contrast with one another: high hardness and hot hardness, high wear resistance, excellent cutting properties (cutting edge stability), and high toughness. Hence, the choice of high quality steel is vital in order to guarantee optimal tap performance.

Grade	Hardness	C%	W%	Mo%	Cr%	V%	Co%	ISO Standard
M2	810-850	0.9	6.4	5.0	4.2	1.8	-	HSS
M35	830-870	0.9	6.4	5.0	4.2	1.8	4.8	HSSE
M42	870-960	1.1	1.5	9.4	3.9	1.2	8.0	HSSE
Asp 30	870-910	1.3	6.4	5.0	4.2	3.1	8.5	ASP 30

Influence of the alloying elements on High speed steel are given below :

- Carbon** : Influences the hardness of the matrix and permits the formation of carbides
- Tungsten** : Increases hot hardness and wear resistance
- Molybdenum** : Improves hardenability and toughness
- Vanadium** : Increases wear resistance
- Cobalt** : Acts positively on hot hardness

Also heat treatment plays a major role in addition to composition and quality. The heat treatment must guarantee a good compromise between hardness, toughness, and other characteristics required by the tap. HSS heat treatment consists in heating the steel to high temperatures (austenitising) followed by a rapid cooling or quenching. The martensitic structure thus obtained has high hardness but is not sufficiently stable and tough to be used in taps. In order to stabilise the structure and increase toughness, a series of tempering cycles are made which also increase the hardness due to the formation of "secondary" carbides.



**MATERIAL DETAILS**

Material Group	Material Description	Content	Tensile Strength RM (MPa)*	Hardness (HB)	Hardness (HRC)
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	—
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	—
P2	Medium- and High-Carbon Steels	C >0,25%	<530	<220	<25
P3	Alloy Steels and Tool Steels	C >0,25%	600-850	<330	<35
P4	Alloy Steels and Tool Steels	C >0,25%	850-1400	340-450	35-48
P5	Ferritic, Martensitic, and PH Stainless Steels	—	600-900	<330	<35
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	—	900-1350	350-450	35-48
M1	Austenitic Stainless Steel	—	<600	130-200	-
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	—	600-800	150-230	<25
M3	Duplex Stainless Steel	—	<800	135-275	<30
K1	Grey Cast Iron	—	125-500	120-290	<32
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	—	<600	130-260	<28
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	—	>600	180-350	<43
N1	Wrought Aluminium	—	—	—	—
N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	—	—	—
N3	High-Silicon Aluminium Alloys and Magnesium Alloys	Si > 12,2%	—	—	—
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70-100	—	—	—	—
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass	—	—	—	—
N6	Carbon, Graphite Composites, CFRP	—	—	—	—
N7	Metal Matrix Composites (MMC)	—	—	—	—
S1	Iron-Based, Heat-Resistant Alloys	—	500-1200	160-260	25-48
S2	Cobalt-Based, Heat-Resistant Alloys	—	1000-1500	250-450	25-48
S3	Nickel-Based, Heat-Resistant Alloys	—	600-1700	160-450	<48
S4	Titanium and Titanium Alloys	—	900-1600	300-400	33-48
H1	Hardened Materials	—	—	—	44-48
H2	Hardened Materials	—	—	—	48-55
H3	Hardened Materials	—	—	—	56-60
H4	Hardened Materials	—	—	—	>60

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.





**MATERIAL DETAILS**

Material Group	ANSI	DIN
P0	A36, 1008, 1010, 1018 through 1029; 1108, 1117	
P1	10L18, 1200 Series, 1213, 12L14	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572	ST52, S355JR, C35, GS60, Cf53
P3	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	15-5 PH, 13-8 PH, 17-4 PH, 400 and 500 Series	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	15-5 PH, 13-8 PH, 17-4 PH, 400 and 500 Series	X102CrMo17, G-X120Cr29
M1	200 Series, 301, 302, 304, 304L, 309	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	323, 329, F55, 2205, S329000	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	GG15, GG25, GG30, GG40, GTW40
K2	60-40-18, 65-45-12, 80-55-06, SAE J434:D4018, D4512, D5506, ASTM A47: Grade 32510, 35018, SAE J158: Grade M3210, M4504, M5003, M5503, M7002, ASTM A842: Grade 250, 300, 350, 400, 450	GGG40, GTS35
K3	ASTM A536:100-70-03, 120-90-02, SAE J434: D7003, SAE J158:Grade M8501AST A897: 125-80-10, 150-100-7, 175-125-4, 200-150-1, 230-185	GGG60, GTW55, GTS65
N1	2025, 5050, 7050, 1000, 2017	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, AlMgSiPb
N2	2024, 6061, 7075	GAISiCu4, GDAISi10Mg
N3	—	G-ALSi12, G-AISi17Cu4, G-AISi21CuNiMg
N4	C81500	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	—	LEXAN®, HOSTALEN™, Polystyrol, Makralon®
N6	Graphite, CFK, CFRP	CFK, GFK
N7	C63000	—
S1	INCOLOY® 800 Series, A608, A567, Discaloy™, INVAR®, N-155, 16-25-6, 19-9 DL; Cast: ASTM A-297, A-351, A-567, A-608	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Haynes® 25 (L605), Haynes 188, J-1570, Stellite®, AiResist 213; Cast: AiResist 13, Haynes 21, MAR-M302, MAR-M509, NASA Co-W-Re, WI-52	Haynes® 188, Stellite® 6,21,31
S3	Astroloy™, Hastelloy® B/C/ C-276 /X, INCONEL® 600 and 700 Series, IN102,INCOLOY 900 Series, Rene 41, Waspalloy®, Monel®, K-500, MAR-M20, NIMONIC®, UDIMET®	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Pure: Ti 98.8, Ti 98.9,Ti 99.9; Alloyed: Ti 5Al-2.5Sn, Ti6Al-4V, Ti6Al-2Sn-4Zr-2Mo,Ti-3Al-8V-6Cr-4Mo-4Zr, Ti-10V-2Fe-3Al, Ti-13V-11Cr-3Al	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Tool Steel H10, H11, H13, D2, D3, 4340, P20	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, HARDOX® 400
H2	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—
H3	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—
H4	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## FORMULAS

### TAP DRILL SIZE

- A. Tap Drill Size (Inch Size Cut Taps)  
 Drill  $\emptyset$  = Basic O.D. OF Thread – ((0.0130 X % of Full Thread)/Pitch (T.P.I.))
- B. Tap Drill Size (Inch Size Roll Form Taps)  
 Drill  $\emptyset$  = BASIC O.D. OF Thread– ((0.0068 X % of Full Thread)/Pitch (T.P.I.))
- C. Tap Drill Size (Metric Size Cut Taps)  
 Drill  $\emptyset$  = Basic O.D. OF Thread – ((Pitch in mm X % of Full Thread)/76.98)
- D. Tap Drill Size (Metric Size Roll Form Taps)  
 DRILL  $\emptyset$  = BASIC O.D. OF THD – ((Pitch in mm X % of Full Thread)/147.06).

### OR

Drill Diameter = Nominal diameter - Pitch

### INCH – METRIC CONVERSIONS

- A. INCHES TO MILLIMETERS  $MM = INCH \times 25.4$
- B. MILLIMETERS TO INCHES  $INCH = MM/25.4$  - OR -  $INCH = MM \times 0.03937$

### THREADING FORMULAS

$$\text{Cutting Speed (Vc)} = \frac{N \times 3.14 \times D}{1000} \text{ (m/min)}$$

$$\text{RRM (N)} = \frac{Vc \times 1000}{3.14 \times D} \text{ (RPM)}$$

$$\text{Torque (Md)} = \frac{P^2 \times D \times Kc}{8000} \text{ (Nm)}$$

$$\text{Power (P)} = \frac{Md \times 2 \times 3.14 \times N}{60} \text{ (KW)}$$

Vc - Cutting Speed (m/min)

P - Pitch (mm)

Kc - Specific cutting force (N/mm<sup>2</sup>)

P - Power (KW)

Md - Torque (Nm)

D - Nominal Dia (mm)

N - RPM



## HARDNESS AND TENSILE STRENGTH

Vickers Hardness No. HV	Rockwell C. Scale Hardness No. HRC	Brinell Hardness No. HB	Tensile strength N/mm <sup>2</sup>
940	68		
900	67		
864	66		
829	65		
800	64		
773	63		
745	62		
720	61		
698	60		
675	59		
655	58	2200	
650	618	2180	
640	608	2145	
639	57	607	2140
630	599	2105	
620	589	2070	
615	56	584	2050
610	580	2030	
600	570	1995	
596	55	567	1980
590	561	1955	
580	551	1920	
578	54	549	1910
570	542	1880	
560	53	532	1845
550	523	1810	
544	52	517	1790
540	513	1775	
530	504	1740	
527	51	501	1730
520	494	1700	
514	50	488	1680
510	485	1665	
500	475	1630	
497	49	472	1620
490	466	1595	
484	48	460	1570
480	456	1555	
473	47	449	1530
470	447	1520	
460	437	1485	
458	46	435	1480
450	428	1455	
446	45	424	1440
440	418	1420	

Vickers Hardness No. HV	Rockwell C. Scale Hardness No. HRC	Brinell Hardness No. HB	Tensile strength N/mm <sup>2</sup>
434	44	413	1400
423	43	402	1360
413	42	393	1330
403	41	383	1300
392	40	372	1260
382	39	363	1230
373	38	354	1200
364	37	346	1170
355	36	337	1140
350	333	1125	
345	35	328	1110
340	323	1095	
336	34	319	1080
330	314	1060	
327	33	311	1050
320	304	1030	
317	32	301	1020
310	31	295	995
302	30	287	970
300	285	965	
295	280	950	
293	29	278	940
290	276	930	
287	28	273	920
285	271	915	
280	27	266	900
275	261	880	
272	26	258	870
270	257	865	
268	25	255	860
265	252	850	
260	24	247	835
255	23	242	820
250	22	238	800
245	233	785	
243	21	231	780
240	228	770	
235	223	755	
230	219	740	
225	214	720	
220	209	705	
215	204	690	
210	199	675	
205	195	660	
200	190	640	

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



**TABLE CUTTING SPEEDS**

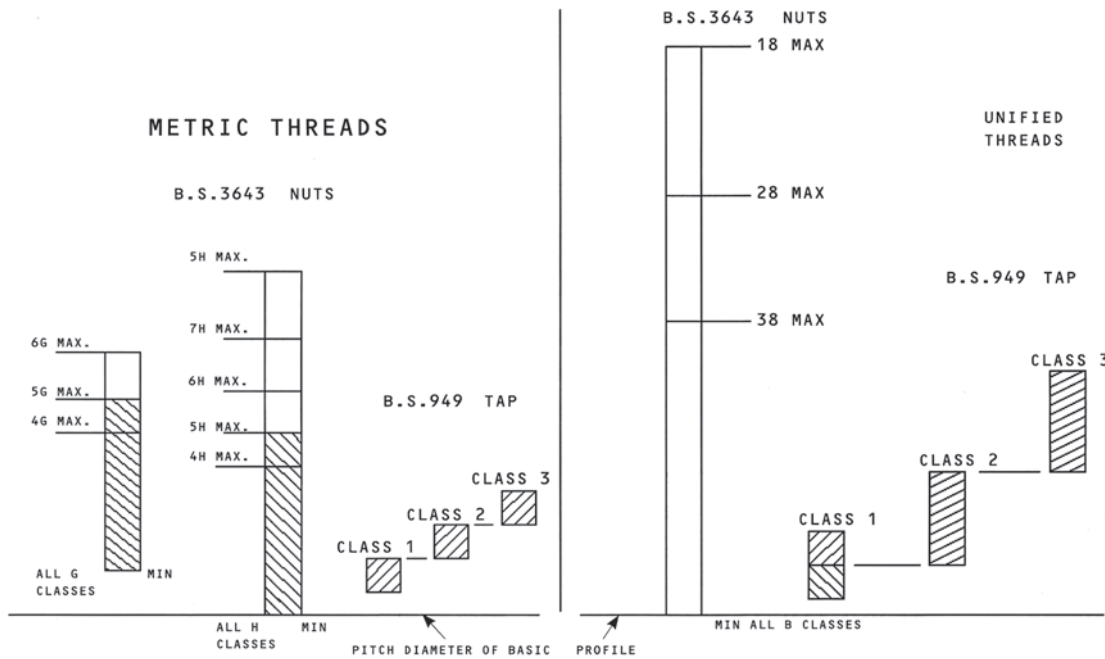
M/min	5	8	10	15	20	25	30	40	50	60	70	80	90	100	110	150
Tool dia mm /inch	Revolutions Per Minute (RPM)															
1	1592	2546	3138	4775	6366	7958	9549	12732	15916	19099	22282	25465	28648	31831	35014	47747
1.5	1061	1698	2122	3183	4244	5305	6366	8488	10610	12732	14854	16977	19099	21221	23343	31831
2	796	1273	1592	2387	3183	3979	4775	6366	7958	9549	11141	12732	14324	15916	17507	23873
2.5	637	1019	1273	1910	2546	3183	3820	5093	6366	7639	8913	10186	11459	12732	14006	19099
3	531	849	1061	1592	2122	2653	3183	4244	5305	6366	7427	8488	9549	10610	11671	15916
1/8"	500	801	1001	1501	2002	2502	3003	4004	5005	6006	7007	8008	9009	10010	11011	15015
3.5	455	728	909	1364	1819	2274	2728	3638	4547	5457	6366	7176	8185	9095	10004	13642
4	398	637	796	1194	1592	1989	2387	3183	3979	4775	5570	6366	7162	7958	8754	11937
4.5	354	566	707	1061	1415	1768	2122	2829	3537	4244	4951	5659	6366	7074	7781	10610
3/16"	334	535	669	1003	1337	1672	2006	2675	3344	4012	4681	5350	6018	6687	7356	10031
5	318	509	637	955	1273	1592	1910	2546	3183	3820	4456	5093	5730	6366	7003	9549
6	265	424	531	796	1061	1326	1592	2122	2653	3183	3714	4244	4775	5305	5836	7958
1/4"	251	401	501	752	1003	1253	1504	2005	2506	3008	3509	4010	4511	5013	5514	7519
7	227	364	455	682	909	1137	1364	1819	2274	2728	3183	3638	4093	4547	5002	6821
5/16"	200	321	401	601	802	1002	1203	1604	2004	2405	2806	3207	3608	4009	4410	6013
8	199	318	398	597	796	995	1194	1592	1989	2387	2785	3183	3581	3979	4377	5968
9	177	283	354	531	707	884	1061	1415	1768	2122	2476	2829	3183	3537	3890	5305
3/8"	167	267	334	501	668	835	1002	1336	1670	2004	2338	2672	3006	3340	3674	5010
10	159	255	318	477	637	796	955	1273	1592	1910	2228	2546	2865	3183	3501	4775
7/16"	143	229	287	430	573	716	860	1146	1433	1719	2006	2292	2579	2865	3152	4298
12	133	212	265	398	531	663	796	1061	1326	1592	1857	2122	2387	2653	2918	3979
1/2"	125	201	251	376	501	627	752	1003	1253	1504	1754	2005	2256	2506	2757	3760
14	114	182	227	341	455	568	682	909	1137	1364	1592	1819	2046	2274	2501	3410
9/16"	111	178	223	334	446	557	668	891	1114	1337	1559	1782	2005	2228	2450	3341
15	106	170	212	318	424	531	637	849	1061	1273	1485	1698	1910	2122	2334	3183

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

## RECOMMENDED TAP TOLERANCES

Tap Tolerance BS 949	Class 1	Class 2	Class 3
Metric BS 3643	Classes 4H, 5H	Classes 6H, 4G, 5G	Classes 7H, 8H, 9G
Unified BS 1580	Class 3B	Class 2B	Class 1B
Whitworth BS 84	Close Class	Medium Class	Normal Class
B.A. BS 93	-	Normal Class	-

## DISPOSITION OF TAP TOLERANCES IN RELATION TO NUT TOLERANCES FOR METRIC AND UNIFIED THREADS

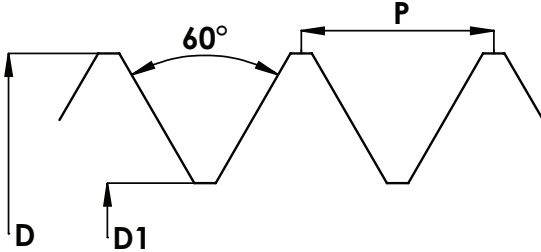


## THREAD TOLERANCES FOR TAP TO ANSI 9-49

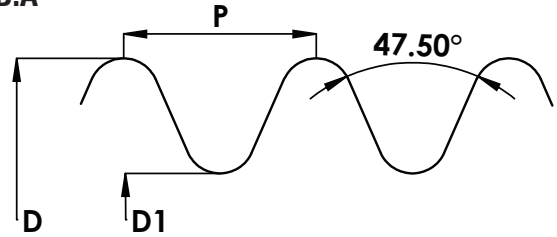
up to 1" Diameter	GH 2	Basic pitch diameter, plus 0.0005", plus 0.0010"
up to 1" Diameter	GH 3	Basic pitch diameter, plus 0.0010", plus 0.0015"
up to 1" Diameter	GH 4	Basic pitch diameter, plus 0.0015", plus 0.0020"
Over 1" Dia. to 1 1/2" Dia.	GH 4	Basic pitch diameter, plus 0.0010", plus 0.0020"
Over 1 1/2" Dia.	GH 7	Basic pitch diameter, plus 0.0015", plus 0.0035"

**THREAD FORMS**

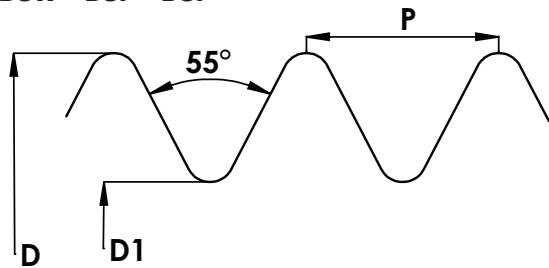
**Metric ISO - UNC - UNF**



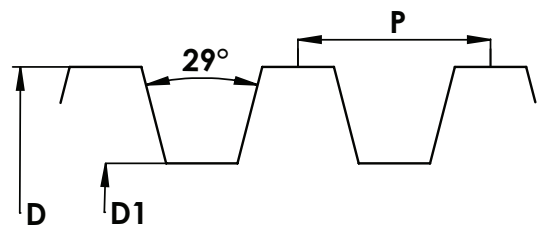
**B.A**



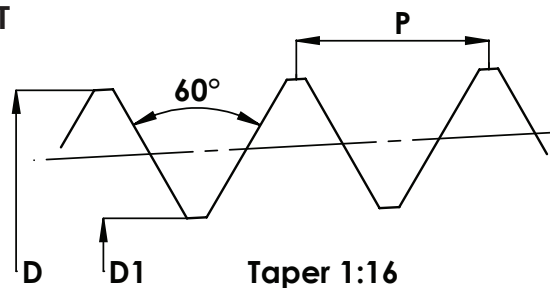
**BSW - BSF - BSP**



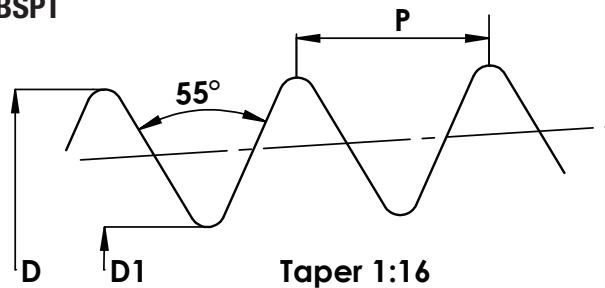
**ACME**



**NPT**



**BSPT**

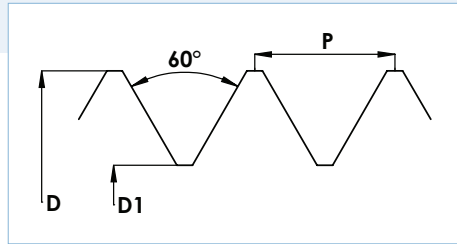


- ACME : Acme Thread
- BA : British Association Standard Thread
- BSF : British Standard Fine Thread Series
- BSP : British Standard Pipe
- BSPT : British Standard Taper Pipe Thread
- BSW : British Standard Whitworth Coarse Thread Series
- M : Metric Screw Thread Series
- NGT : National Gas Taper Thread (See "SGT")
- NPS : for Tap marking only (See NPSC, NPSM)
- NPSF : Dryseal American National Standard Fuel Internal Straight Pipe Thread
- NPSI : Dryseal American National Standard Intermediate Internal Straight Pipe Thread

- NPT : American National Standard Taper Pipe Thread
- NPTF : Dryseal American National Standard Taper Pipe Thread
- PG : Panzer Gewinder
- STI : Special Thread for Helical Coil Wire Screw Thread Inserts
- UN : Unified Constant Pitch Thread Series
- UNC : Unified Coarse Thread Series
- UNEF : Unified Extra Fine Thread Series
- UNF : Unified Fine Thread Series
- UNS : Unified Thread-Special
- WW : British Standard Whitworth Special Thread

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

**RECOMMENDED TAP DRILL SIZES**

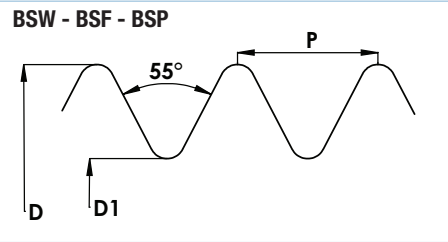


Metric Coarse		
Nominal Diameter	Pitch	Drill Size
ØD		
2	0.4	1.6
2.2	0.45	1.75
2.3	0.4	1.9
2.5	0.45	2.05
2.6	0.45	2.1
3	0.5	2.5
3.5	0.6	2.9
4	0.7	3.3
4.5	0.75	3.7
5	0.8	4.2
6	1	5
7	1	6
8	1.25	6.8
9	1.25	7.8
10	1.5	8.5
11	1.5	9.5
12	1.75	10.2
14	2	12
16	2	14
18	2.5	15.5
20	2.5	17.5
22	2.5	19.5
24	3	21
27	3	24
30	3.5	26.5
33	3.5	29.5
36	4	32
39	4	35
42	4.5	37.5
45	4.5	40.5
48	5	43
52	5	47
56	5.5	50.5
60	5.5	54.5
64	6	58
68	6	62

Metric Fine		
Nominal Diameter	Pitch	Drill Size
ØD		
2.5	0.35	2.15
3	0.35	2.65
3.5	0.35	3.15
4	0.5	3.5
4.5	0.5	4
5	0.5	4.5
6	0.75	5.2
7	0.75	6.2
8	0.75	7.2
8	1	7
9	1	8
10	0.75	9.2
10	1	9
10	1.25	8.8
11	1	10
12	1	11
12	1.25	10.8
12	1.5	10.5
14	1	13
14	1.25	12.8
14	1.5	12.5
15	1	14
15	1.5	13.5
16	1	15
16	1.5	14.5
17	1	16
17	1.5	15.5
18	1.5	16.5
18	2	16
20	1	19
20	1.5	18.5
20	2	18
22	1	21
22	1.5	20.5
22	2	20
24	1	23
24	1.5	22.5
24	2	22
24	1	24
25	1.5	23.5

Metric Fine		
Nominal Diameter	Pitch	Drill Size
ØD		
26	1.5	24.5
27	1	26
27	1.5	25.5
27	2	25
28	1.5	26.5
28	2	26
30	1	29
30	1.5	28.5
30	2	28
32	1.5	30.5
32	2	30
33	1.5	31.5
33	2	31
33	3	30
35	1.5	33.5
36	1.5	34.5
36	2	34
36	3	33
38	1.5	36.5
39	1.5	37.5
39	2	37
39	3	36
40	1.5	38.5
40	2	38
40	3	37
42	1.5	40.5
42	2	40
42	3	39
45	1.5	43.5
45	2	43
45	3	42
48	1.5	46.5
48	2	46
48	3	45
50	1.5	48.5
50	2	48
50	3	47
52	1.5	50.5
52	2	50
52	3	49

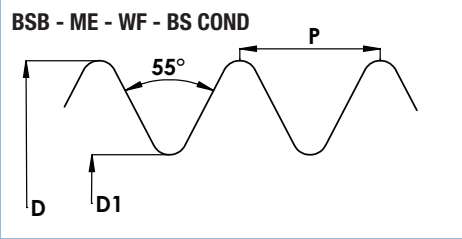
Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

**RECOMMENDED TAP DRILL SIZES**


BSW			BSF			BSP		
Nominal Diameter	TPI	Drill Size in mm	Nominal Diameter	TPI	Drill Size in mm	Nominal Diameter	TPI	Drill Size in mm
ØD			ØD			ØD		
1/16"	60	1.2	3/16"	32	4	1/8"	28	8.80
3/32"	48	1.9	7/32"	28	4.6	1/4"	19	11.80
1/8"	40	2.6	1/4"	26	5.30	3/8"	19	15.25
5/32"	32	3.2	9/32"	26	6.00	1/2"	14	19.00
3/16"	24	3.7	5/16"	22	6.80	5/8"	14	21.00
7/32"	24	4.5	3/8"	20	8.30	3/4"	14	24.50
1/4"	20	5.1	7/16"	18	9.70	7/8"	14	28.25
9/32"	20	5.8	1/2"	16	11.10	1"	11	30.75
5/16"	18	6.5	9/16"	16	12.70	1.1/4"	11	39.50
3/8"	16	7.9	5/8"	14	14.00	1.1/2"	11	45.00
7/16"	14	9.3	11/16"	14	15.50	1.3/4"	11	51.00
1/2"	12	10.5	3/4"	12	16.75	2"	11	57.00
9/16"	12	12.1	7/8"	11	19.75			
5/8"	11	13.5	15/16"	11	21.50			
11/16"	11	15.1	1"	10	22.75			
3/4"	10	16.3	1.1/8"	9	25.50			
7/8"	9	19.3	1.1/4"	9	28.50			
15/16"	9	20.6	1.3/8"	8	31.50			
1"	8	22.0	1.1/2"	8	34.50			
1.1/8"	7	24.8	1.5/8"	8	37.70			
1.1/4"	7	28.0	1.3/4"	7	41.00			
1.3/8"	6	30.5	1.7/8"	7	43.70			
1.1/2"	6	33.5	2"	7	47.00			
1.5/8"	5	36.0						
1.3/4"	5	39.0						
1.7/8"	4 ½	41.3						
2"	4 ½	44.5						



## RECOMMENDED TAP DRILL SIZES



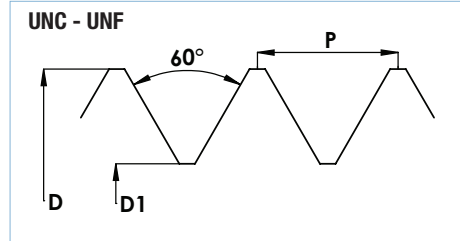
BSB		
Nominal Diameter ØD	TPI	Drill Size in mm
1/4"	26	5.3/4
9/32"	26	6.10
5/16"	26	6.90
3/8"	26	8.40
7/16"	26	10.00
1/2"	26	11.50
9/16"	26	13.1/13
5/8"	26	14.70
11/16"	26	16.50
3/4"	26	17.80
7/8"	26	21.00
1"	26	24.20
1.1/8"	26	27.50
1.1/4"	26	30.50
1.3/8"	26	33.70
1.1/2"	26	36.90
2	26	49.60

ME		
Nominal Diameter ØD	TPI	Drill Size in mm
1/8"	40	2.55
5/32"	40	3.30
3/16"	40	4.00
7/32"	40	4.80
1/4"	40	5.50
9/32"	32	6.10
5/16"	32	7.00
3/8"	32	8.60
7/16"	26	10.00
1/2"	26	11.50

BS COND.		
Nominal Diameter ØD	TPI	Drill Size in mm
1/2"	18	11.50
5/8"	18	14.20
3/4"	16	17.50
7/8"	16	20.60
1"	16	23.80
1.1/4"	16	30.10
1.1/2"	14	36.10
2	14	48.80

WHITWORTH FORM SPECIAL		
Nominal Diameter ØD	TPI	Drill Size in mm
1/4"	24/28/32	5.3, 5.4, 5.5
5/16"	24/40	6.75, 7.3
3/8"	24,40	8.4, 8.9
7/16"	20/24/40	9.8/10, 10.5
1/2"	20/24/40	11.5, 11.9, 12
9/16"	20	13.1
5/8"	20	14.5
11/16"	20	16.2
3/4"	14/20	17.1, 17.8
7/8"	14/16/20	20.0, 20.6, 21.0
1"	12/20	23.0, 24.0

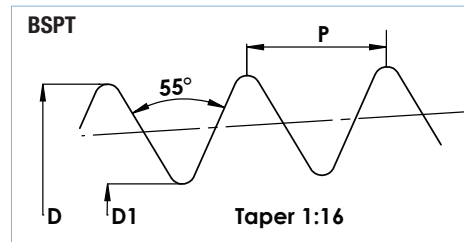
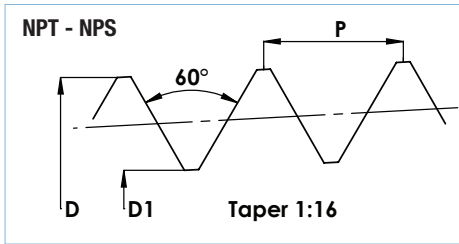
## RECOMMENDED TAP DRILL SIZES



UNC		
Nominal Diameter	Pitch	Drill Size
Ø D		
#1	64	1.5
#2	56	1.8
#3	48	2.1
#4	40	2.3
#5	40	2.6
#6	32	2.85
#8	32	3.5
#10	24	3.9
#12	24	4.5
1/4"	20	5.2
5/16"	18	6.6
3/8"	16	8
7/16"	14	9.4
1/2"	13	10.75
9/16"	12	12.25
5/8"	11	13.5
3/4"	10	16.5
7/8"	9	19.5
1"	8	22.25
1.1/8"	7	25
1.1/4"	7	28.25
1.3/8"	6	30.75
1.1/2"	6	34
1.3/4"	5	39.5
2"	4.5	45.25

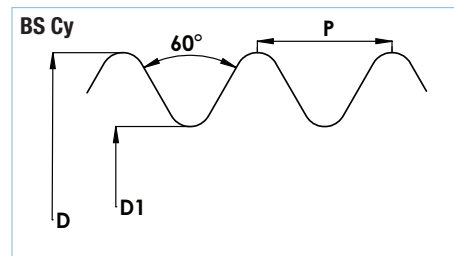
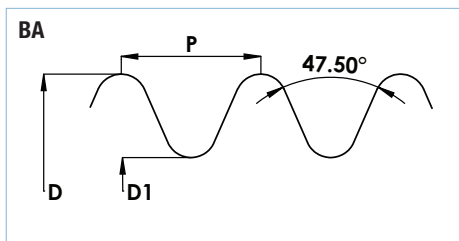
UNF		
Nominal Diameter	Pitch	Drill Size
Ø D		
#1	80	1.3
#2	72	1.6
#3	64	1.9
#4	56	2.1
#5	48	2.4
#6	44	2.7
#8	40	3
#10	36	3.5
#12	32	4.1
1/4"	28	4.7
5/16"	28	5.5
3/8"	24	6.9
7/16"	24	8.5
1/2"	20	9.9
9/16"	20	11.5
5/8"	18	12.9
3/4"	18	14.5
7/8"	16	17.5
1"	14	20.5
1.1/8"	12	23.25
1.1/4"	12	26.5
1.3/8"	12	29.5
1.1/2"	12	32.7
2"	12	36

## RECOMMENDED TAP DRILL SIZES



NPT & NPS			
Nominal Diameter ØD	TPI	Drill Size in mm	
		Tapping With Reamer	Tapping Without Reamer
1/16"	27	6.00	6.30
1/8"	27	8.40	8.70
1/4"	18	10.70	11.10
3/8"	18	14.25	14.50
1/2"	14	17.50	18.00
3/4"	14	22.75	23.25
1"	11.5	28.50	29.00
1.1/4"	11.5	37.50	38.00
1.1/2"	11.5	43.50	44.00
2" BA	11.5	55.00	56.00

BSPT		
Nominal Diameter ØD	TPI	Drill Size in mm
1/4"	19	11.80
3/8"	19	15.25
1/2"	14	19.00
5/8"	14	21.00
3/4"	14	24.50
7/8"	14	28.25
1"	11	30.75
1.1/4"	11	39.50
1.1/2"	11	45.00
1.3/4"	11	51.00
2	11	57.00



BA			
Size	Diameter	TPI	Drill Size in mm
0	0.2362	25.4	5.10
1	0.2087	28.2	4.50
2	0.1850	31.4	4.00
3	0.1614	34.8	3.40
4	0.1417	38.5	3.00
5	0.1260	43	2.65
6	0.1102	47.9	2.30
7	0.0984	52.9	2.05
8	0.0866	59.1	1.80
9	0.0748	65.1	1.55
10	0.0669	72.6	1.40
11	0.0591	81.9	1.20
12	0.0512	90.9	1.05

BS Cy		
Size	TPI	Drill Size in mm
1/8"	40	2.65
5/32"	32	3.30
3/16"	32	4.10
7/32"	26	4.80
1/4"	26	5.60
5/16"	26	7.20
3/8"	26	8.70
7/16"	26	10.30
1/2"	26	11.90
9/16"	26	13.50
5/8"	26	15.00
3/4"	26	18.20
1"	24	24.50

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## SURFACE TREATMENT

While selecting the correct type of tap for a job, the material to be tapped should also be considered. This may determine the surface coating that should be applied to the tap in order to extend its life. Most taps are supplied with no surface treatment. They are referred to as 'Bright Finish'. These taps are mainly for use on non-ferrous materials, or steels that do not cold weld. Bright finish taps are therefore suitable for all hand operations, where speeds are too low for cold welding to occur, and for most machine operations.

### **STEAM OXIDE:**

A black oxidized surface ( $Fe_3O_4$ ) produced on the surface of a finished tap by means of a steam furnace. This oxidized surface is porous and helps retain cutting fluid in the working portion of the tap. The materials on which steam oxide has shown improvement in performance are stainless steels, steel forgings, tool and die steels, hot and cold rolled steels, and high nickel alloys.

### **TITANIUM NITRIDE (TiN):**

A thin deposit (approx. 0.0001") applied to the surface of a finished tap utilizing PVD coating technology. TiN coating increases the surface hardness and wear resistance. Use of TiN coating on standard tools will help increase tool life in harder materials (up to 32 HRC), such as stainless steels, steel forgings, tool and die steels and hot and cold rolled steels. TiN coating also works very well with water-base cutting fluids.

### **TITANIUM CARBON NITRIDE (TiCN):**

Similar to TiN, TiCN is applied utilizing PVD coating technology. This coating combines high hardness (approx. 2800 vickers) with the anti-seizure properties of Nitride. A lower coefficient of friction helps reduce welding by 75% over TiN coated tools. These features make TiCN especially beneficial in non-ferrous material and hardened steels.

### **TITANIUM ALUMINUM NITRIDE (TiAlN):**

TiAlN is applied using PVD coating technology. The addition of aluminum reduces friction and increases the coating oxidation temperature. As a result, TiAlN has increased resistance to heat and oxidation wear. This makes TiAlN better suited for High Speed/High Heat applications. TiAlN coating is incorporated into many of our tools.



## CUTTING SPEEDS BASED ON MACHINING CONDITION

Tapping speeds are determined by many factors. The main ones are:-

- a) Thread pitch
- b) Material being tapped
- c) Hole depth
- d) Hole type, through or blind
- e) Depth of thread
- f) Lubricant quality and flow rate

Tapping speeds should be decreased if :-

- a) Lubricant is poor, or flow is restricted
- b) Bottom lead or Spiral flute taps are used
- c) Thread depth (%) increases.
- d) Thread pitch is coarse
- e) Cutting taper threads (50% normal speed)
- f) Cutting Acme or Trapezoidal threads (40% normal speed)

Tapping speeds can be increased if:-

- a) Thread depth decreases
- b) Thread pitch is fine
- c) Coolant flow and quality is good
- d) Spiral point or Fluteless (Roll) taps are used



## TROUBLESHOOTING

Many factors can affect the quality of a tapped thread.  
Some more common problems are listed along with probable causes.

### POOR THREAD FINISH

Misalignment of tap and work piece  
Incorrect feed rate  
Chips/swarf not being cleared properly  
Tapping device or machine faulty  
Insufficient or incorrect lubricant  
Incorrectly ground or blunt tap  
Wrong tap selection

### OVERSIZE/BELL MOUTHED

Misalignment  
Incorrect feed rate  
Incorrect tapping drill  
Tapping device or machine faulty  
Insufficient or incorrect lubricant  
Incorrectly ground or eccentric tap  
Wrong tap selection

### EXCESSIVE TAP WEAR

Wrong tap selection  
Blunt or incorrectly sharpened tap  
Insufficient or incorrect lubricant  
Tapping speed too high  
Hole work hardened  
Taps Technical Information

### COLD WELDING

Wrong material composition  
Blunt or incorrectly sharpened tap  
Insufficient or incorrect lubricant  
Tapping speed too high  
Material too soft

### TAP BREAKING

Incorrectly sharpened/blunt tap  
Tap hits bottom of hole  
Machine or tapping device faulty  
Wrong tap selection  
Incorrect or insufficient lubricant  
Tapping speed too high  
Hole work hardened  
Inefficient chip or swarf removal  
Incorrect tapping drill size

### TAP TEETH CHIPPING

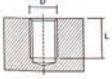
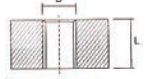
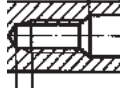
Incorrectly sharpened/blunt tap  
Tap hits bottom of hole  
Machine or tapping device faulty

In order to minimize problems the following rules should be followed:-

- 1) Use a pitch controlled tapping attachment
- 2) Choose the correct lubricant
- 3) Use the correct type of tap for the job
- 4) Use the correct tapping drill size
- 5) Choose the correct speeds and feeds
- 6) Keep taps sharp. Re grind with a proper machine
- 7) Ensure accurate alignment
- 8) Check hardness of material, especially when changing batches
- 9) Ensure thread gauging is recently certified – they do wear !



**CUSTOM TOOL REQUEST FORM - HSS TAPS**

<b>Customer:</b>			
Customer Name		Date	
Address:			
Contact Person:			
Contact No.	Tel. _____	Mobile: _____	
Email : _____			
<b>Tap Details:</b>		<b>Work material Details:</b>	
Tap Size :		Component Name:	
Tolerance/Gauge Details:		Material Type:	
Standard:		Hardness:	
Tap Dimensional Details (For Special)		Tensile Strength	
<b>Pre Tapping Hole</b>			
<b>Type Of Hole</b>			
<input type="checkbox"/> Drilled	<input type="checkbox"/> Reamed	<input type="checkbox"/> Punched	<input type="checkbox"/> Cast
<input type="checkbox"/> Blind Hole	<input type="checkbox"/> Through Hole	<input type="checkbox"/> Steped Hole	
			
Drill /Hole Dia	Hole Depth:	Thread Depth:	
<b>Machine Details</b>			
<b>Machine make/ Type :</b>			
<b>Operation:</b>	<input type="checkbox"/> Vertical	<input type="checkbox"/> Horizontal	<input type="checkbox"/> Angular
	<input type="checkbox"/> Hand Tapping	<input type="checkbox"/> Machine Tapping	
<b>Type Of Tap Holder:</b>	<input type="checkbox"/> Rigid Type	<input type="checkbox"/> Floating Type	<input type="checkbox"/> Collect Chuck
<b>Cutting Speed</b>	_____ RPM	_____ M/Min	M/c Power: _____ hp
<b>Lubrication</b>	<input type="checkbox"/> Oil	<input type="checkbox"/> Water Soluble	<input type="checkbox"/> Brush
	<input type="checkbox"/> Air/Dry	<input type="checkbox"/> Other	
<b>Type Of Chips:</b>	<input type="checkbox"/> Continuous	<input type="checkbox"/> Semi Continous	<input type="checkbox"/> Short
	<input type="checkbox"/> Powder		
<b>Coatings:</b>	<input type="checkbox"/> Tin	<input type="checkbox"/> TiAlN	<input type="checkbox"/> TiCn
	<input type="checkbox"/> Other		
<b>Current Supplier's Detail</b>			
Tool Make:		Consumption/mth.: _____	
Tool Size: _____		Tool Price: _____	
Tool Life : _____		Cost Per Component: _____	
<b>Additional Information if any:</b>			
<b>Sales Engineer</b>		<b>Branch Manager</b>	
DSO:			

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## TRIAL TOOL RESULTS FORM

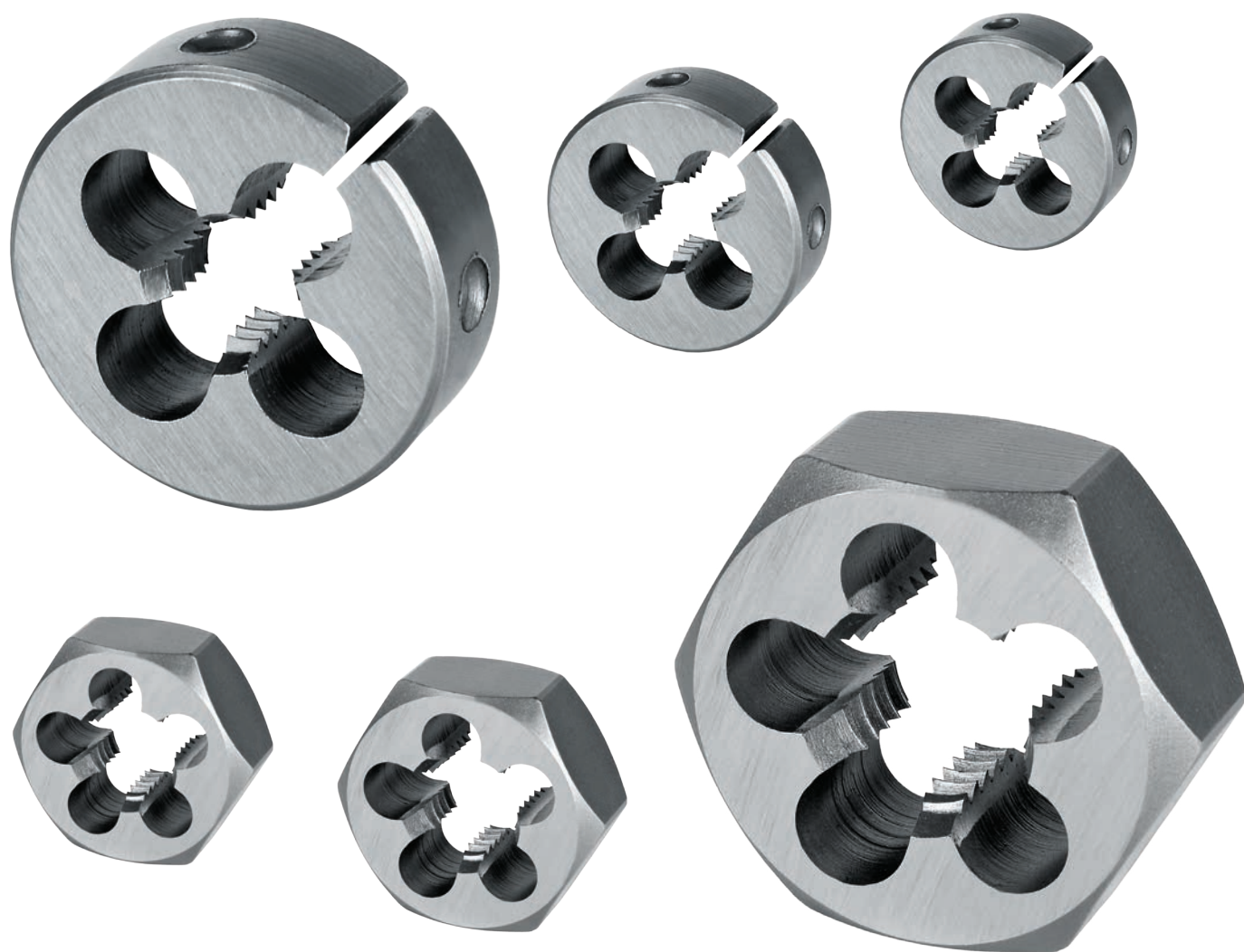
Customer Name		Ref No.	
Address		Date	
		Sales/Apl. Engg.:	
Contact Person's Name & Dept.:		Contact No.:	
<b>Tool Description:</b>			
Component Details:		Operation Details:	
Component Name:		Type :	
Material:		Hole/Drill Depth:	
Hardness:		Hole Type:	
Tensile Strength:		Gauge Details:	
<b>Recommended Parameters:</b>			
Size:		Coolant:	
Speed:		These parameters are for only as a guide can vary according to working conditions	
Feed:			
<b>Machine/Tapping Details:</b>			
<b>Present Status</b>		<b>Trial Status</b>	
M/c. Type		Tool-1	Tool-2
Spindle rpm:			
Speed:			
Feed:			
Coolant:			
Tap Make:			
No Of Flutes:			
Type /Tool No:			
Life Obtained			
Kind of Failure		Thread Chip off / Thread worn out / No Go answering / Go Tight / Tap Breakage / Reverse Cutting / Chip Clogging / Built up edge	
Tool Consumption /Quarter:			
Cost / Component:			
Cycle time of operation:			
<b>Trial Result Summary:</b>			
<b>Additional Information if any:</b>			
Sales Engineer		Branch Manager	
DSO:			



# HSS & CARBON STEEL



High Performance Cutting Tools












## ROUND & HEXAGONAL DIES

## ROUND SPLIT DIES

	MATERIAL		THREAD FORM	STANDARD	TOLERANCE	PAGE
	CS	HSS	M	BS1127	6G	166
	CS	HSS	MF	BS1127	6G	168
	CS	HSS	BSW	BS1127	6G	172
	CS	HSS	BSF	BS1127	6G	174
	CS	HSS	BA	BS1127	6G	176
	CS	HSS	BSB	BS1127	6G	177
	CS	HSS	ME	BS1127	6G	178
	CS	HSS	WF	BS1127	6G	179
	CS	HSS	BSP	BS1127	6G	180
	CS	HSS	BSPT	BS1127	6G	181
	CS	HSS	UNC	BS1127	6G	182
	CS	HSS	UNF	BS1127	6G	184
	CS	HSS	NPT	BS1127	6G	186



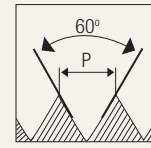
## HEXAGONAL DIES

	THREAD FORM	BLANK STANDARD	APPLICATION	CHAMFER	COATING	PAGE
	CS	HSS	M	BS1127	6G	187
	CS	HSS	MF	BS1127	6G	188
	CS	HSS	BSW	BS1127	6G	190
	CS	HSS	BSF	BS1127	6G	191
	CS	HSS	BSP	BS1127	6G	192
	CS	HSS	BSPT	BS1127	6G	193
	CS	HSS	UNC	BS1127	6G	194
	CS	HSS	UNF	BS1127	6G	195
	CS	HSS	NPT	BS1127	6G	196

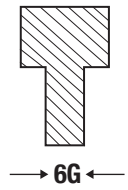
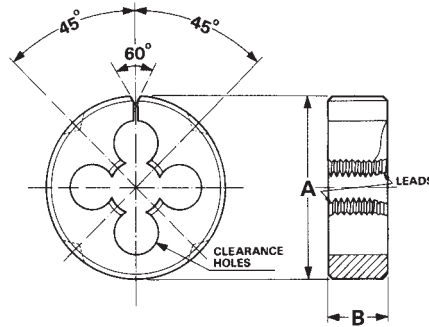


M

Metric coarse threads



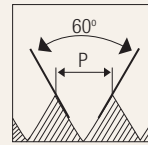
HSS
CS
BS 1127
6G



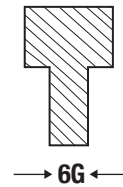
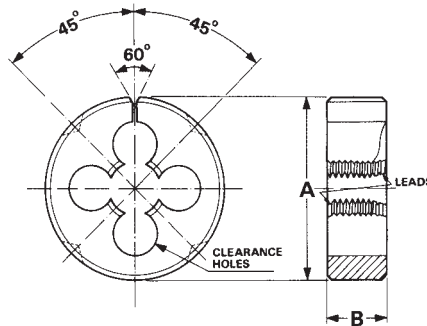
Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	Clearance Holes	Threading Diameter
ØD	p	A	EDP No.	EDP No.	B		
M 2	0.4	13/16"	FBC0201098	FBB0201147	1/4"	3	1.96
M 3	0.5	13/16"	FBC0201150	FBB0201196	1/4"	3	2.95
M 4	0.7	13/16"	FBC0201196	FBB0201248	1/4"	3	3.95
M 5	0.8	13/16"	FBC0201253	FBB0201310	1/4"	3	4.95
M 6	1	13/16"	FBC0201334	FBB0201371	1/4"	4	5.93
M 7	1	13/16"	FBC0201385	FBB0201407	1/4"	4	6.93
M 6	1	1"	FBC0201346	FBB0201380	3/8"	4	5.93
M 7	1	1"	FBC0201391	FBB0201416	3/8"	4	6.93
M 8	1.25	1"	FBC0201432	FBB0201456	3/8"	4	7.92
M 9	1.25	1"	FBC0201470	FBB0201496	3/8"	4	8.93
M 10	1.5	1"	FBC0201538	FBB0201560	3/8"	4	9.91
M 12	1.75	1.1/2"	FBC0201663	FBB0201697	1/2"	4	11.90
M 14	2	1.1/2"	FBC0201734	FBB0201762	1/2"	5	13.89
M 16	2	1.1/2"	FBC0201803	FBB0201826	1/2"	5	15.89
M 18	2.5	1.1/2"	FBC0201838	FBB0201880	1/2"	6	17.88
M 20	2.5	1.1/2"	FBC0201904	FBB0201926	1/2"	6	19.88

# M Metric coarse threads



HSS
CS
BS 1127
6G



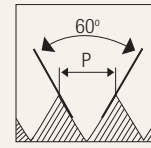
Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	Clearance Holes	Threading Diameter
ØD	p	A	EDP No.	EDP No.	B		
M 20	2.5	2"	FBC0201910	FBB0201931	5/8"	5	19.88
M 22	2.5	2"	FBC0201934	FBB0201949	5/8"	5	21.88
M 24	3	2"	FBC0201958	FBB0201968	5/8"	5	23.88
M 27	3	2.1/4"	FBM2300071	FBM2300344	11/16"	6	
M 30	3.5	2.1/4"	FBM2300084	FBM2300364	11/16"	6	
M 33	3.5	2.1/4"	FBM2300094	FBM2300377	11/16"	6	
M 36	4	2.1/2"	FBM2300106	FBM2300391	7/8"	6	
M 36	4	3"	FBM2300107	FBM2300392	7/8"	6	
M 39	4	3"	FBM2300113	FBM2300402	7/8"	6	
M 42	4.5	3"	FBM2300120	FBM2300408	7/8"	6	
M 48	5	4"	FBM2300130	FBM2300413	1"	6	

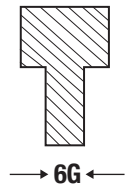
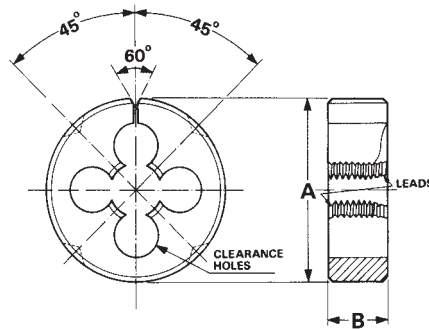


**MF**

**Metric fine threads**



HSS
CS
BS 1127
6G



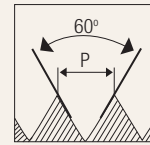
Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD	p	A	EDP No.	EDP No.	B		
M 1.6	0.35	13/16"	FBC0201092	FBB0201143	1/4"	3	1.56
M 2.2	0.45	13/16"	FBC0201109	FBB0201160	1/4"	3	2.15
M 2.3	0.4	13/16"	FBC0201115	FBB0201169	1/4"	3	2.25
M 2.5	0.45	13/16"	FBC0201121	FBB0201173	1/4"	3	2.45
M 2.6	0.45	13/16"	FBC0201132	FBB0201182	1/4"	3	2.55
M 3	0.6	13/16"	FBC0201161	FBB0201209	1/4"	3	2.96
M 3.5	0.6	13/16"	FBC0201167	FBB0201218	1/4"	3	3.46
M 4	0.5	13/16"	FBC0201184	FBB0201231	1/4"	3	3.95
M 4	0.75	13/16"	FBC0201212	FBB0201261	1/4"	3	3.95
M 4.5	0.5	13/16"	FBC0201218	FBB0201270	1/4"	3	4.45
M 4.5	0.75	13/16"	FBC0201224	FBB0201275	1/4"	3	4.45
M 5	0.5	13/16"	FBC0201235	FBB0201284	1/4"	3	4.95
M 5	0.75	13/16"	FBC0201241	FBB0201297	1/4"	3	4.95
M 5	0.9	13/16"	FBC0201274	FBB0201323	1/4"	3	4.95
M 5.5	0.5	13/16"	FBC0201280	FBB0201331	1/4"	4	5.45
M 5.5	0.9	13/16"	FBC0201292	FBB0201335	1/4"	4	5.45
M 6	0.5	13/16"	FBC0201298	FBB0201343	1/4"	4	5.95
M 6	0.75	13/16"	FBC0201310	FBB0201353	1/4"	4	5.95
M 7	0.75	13/16"	FBC0201373	FBB0201393	1/4"	4	6.95

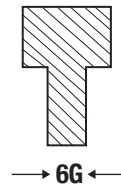
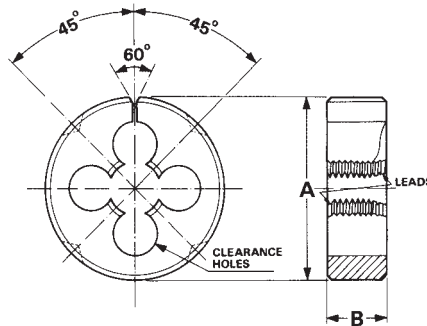


**MF**

**Metric fine threads**



**HSS** **CS** **BS 1127** **6G**



Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD	p	A	EDP No.	EDP No.	B		
M 6	0.5	1"	FBC0201304	FBB0201348	3/8"	4	5.95
M 6	0.75	1"	FBC0201316	FBB0201358	3/8"	4	5.95
M 7	0.75	1"	FBC0201379	FBB0201398	3/8"	4	6.95
M 8	0.75	1"	FBC0201408	FBB0201429	3/8"	4	7.97
M 8	1	1"	FBC0201420	FBB0201434	3/8"	4	7.93
M 9	0.75	1"	FBC0201453	FBB0201482	3/8"	4	8.95
M 9	1	1"	FBC0201464	FBB0201487	3/8"	4	8.93
M 10	0.5	1"	FBC0201481	FBB0202548	3/8"	4	9.93
M 10	0.75	1"	FBC0201487	FBB0201509	3/8"	4	9.95
M 10	1	1"	FBC0201499	FBB0201518	3/8"	4	9.93
M 10	1.25	1"	FBC0201516	FBB0201535	3/8"	4	9.93
M 11	1	1.1/2"	FBC0201554	FBB0201597	1/2"	5	10.93
M 11	1.5	1.1/2"	FBC0201576	FBB0201613	1/2"	4	10.91
M 12	1	1.1/2"	FBC0201604	FBB0201634	1/2"	5	11.93
M 12	1.25	1.1/2"	FBC0201620	FBB0201647	1/2"	5	11.92
M 12	1.5	1.1/2"	FBC0201636	FBB0201668	1/2"	4	11.91
M 14	1	1.1/2"	FBC0201685	FBB0201726	1/2"	5	13.93
M 14	1.25	1.1/2"	FBC0201696	FBB0201731	1/2"	5	13.92



Round Split Dies

HSS TAPS

DIES

END MILLS

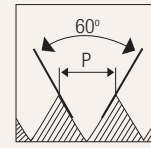
DRILLS

CARBIDE BURRS

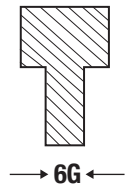
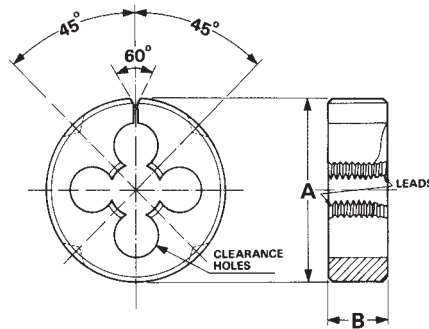
CS TAPS

**MF**

**Metric fine threads**



HSS
CS
BS 1127
6G



Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD	p	A	EDP No.	EDP No.	B		
M 14	1.5	1.1/2"	FBC0201707	FBB0201744	1/2"	5	13.91
M 15	1.5	1.1/2"	FBC0201757	FBB0201786	1/2"	5	14.91
M 16	1	1.1/2"	FBC0201763	FBB0201795	1/2"	5	15.93
M 16	1.5	1.1/2"	FBC0201781	FBB0201813	1/2"	5	15.91
M 18	1.5	1.1/2"	FBC0201820	FBB0201861	1/2"	6	17.91
M 20	1.5	1.1/2"	FBC0201874	FBB0201902	1/2"	6	19.91
M 20	1.5	2"	FBC0201880	FBB0201907	5/8"	5	19.91
M 22	1.5	2"	FBC0201922	FBB0201940	5/8"	6	21.91
M 24	1	2"	FBC0201940	FBB0201953	5/8"	6	23.93
M 24	1.5	2"	FBC0201946	FBB0201958	5/8"	6	23.90
M 25	1.5	2"	FBC0201970	FBB0201977	5/8"	6	24.91
M 26	1.5	2"	FBC0201988	FBB0201986	5/8"	6	25.90
M 27	1.5	2"	FBC0202000	FBB0202641	5/8"	6+6	26.9
M 28	1.5	2"	FBC0202012	FBB0202711	5/8"	6+6	27.9
M 30	1.5	2"	FBC0202024	FBB0201991	5/8"	6+6	29.9
M 32	1.5	2.1/4"	FBM2300087	FBM2300368	11/16"	6+6	
M 33	1.5	2.1/4"	FBM2300091	FBM2300595	11/16"	6+6	

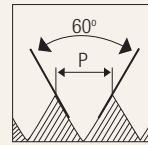




Round Split Dies

MF

## Metric fine threads

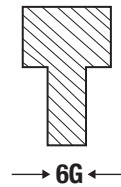
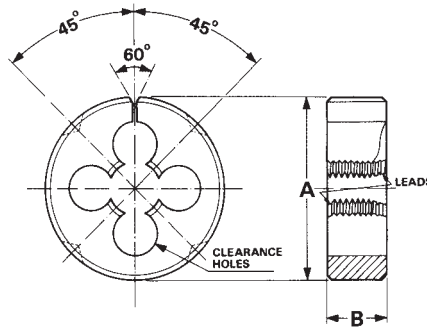


HSS

CS

BS  
1127

6G



Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD	p	A	EDP No.	EDP No.	B		
M 34	1.5	2.1/2"	FBM2300097	FBM2300381	7/8"	6	
M 35	1.5	2.1/2"	FBM2300100	FBM2300383	7/8"	6	
M 36	1.5	2.1/2"	FBM2300102	FBM2300385	7/8"	6	
M 40	1.5	2.1/2"	FBM2300114	FBM2300404	7/8"	6	
M 34	1.5	3"	FBM2300098	FBM2300382	7/8"	6	
M 35	1.5	3"	FBM2300101	FBM2300384	7/8"	6	
M 36	1.5	3"	FBM2300103	FBM2300386	7/8"	6	
M 38	1.5	3"	FBM2300109	FBM2300396	7/8"	6	
M 45	1.5	3"	FBM2300123	-	7/8"	6	
M 45	1.5	4"	FBM2300124	FBM2300410	1"	6	
M 46	1.5	4"	FBM2300126	FBM2300411	1"	6	
M 48	1.5	4"	FBM2300127	FBM2300412	1"	8	
M 50	1.5	4"	FBM2300131	FBM2300414	1"	6	
M 52	1.5	4"	FBM2300132	FBM2300415	1"	6	
M 55	1.5	4"	FBM2300133	FBM2300416	1"	6	
M 60	1.5	4"	FBM2300134	FBM2300418	1"	6	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Round Split Dies

HSS TAPS

DIES

END MILLS

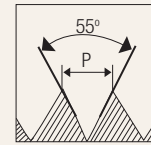
DRILLS

CARBIDE BURRS

CS TAPS

**BSW**

**Whitworth coarse threads**

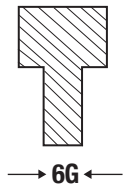
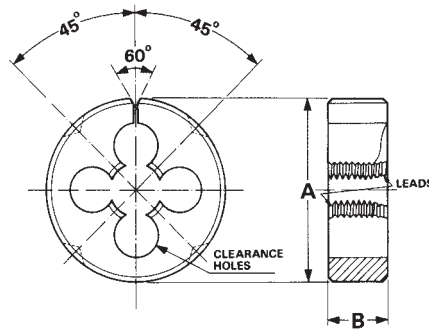


HSS

CS

BS  
1127

6G



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter A	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
			EDP No.	EDP No.			
1/16"	60	13/16"	FBC0200001	FBB0200001	1/4"	3	1.56
3/32"	48	13/16"	FBC0200007	FBB0200005	1/4"	3	2.35
1/8"	40	13/16"	FBC0200013	FBB0200017	1/4"	3	3.14
5/32"	32	13/16"	FBC0200019	FBB0200034	1/4"	3	3.93
3/16"	24	13/16"	FBC0200036	FBB0200051	1/4"	3	4.72
7/32"	24	13/16"	FBC0200047	FBB0200064	1/4"	4	5.51
1/4"	20	13/16"	FBC0200059	FBB0200081	1/4"	4	6.31
1/4"	20	1"	FBC0200071	FBB0200090	3/8"	3	6.31
9/32"	20	1"	FBC0200089	FBB0200111	3/8"	4	7.10
5/16"	18	1"	FBC0200101	FBB0200119	3/8"	4	7.88
3/8"	16	1"	FBC0200128	FBB0200144	3/8"	4	9.47
7/16"	14	1.1/2"	FBC0200159	FBB0200173	1/2"	4	11.05
1/2"	12	1.1/2"	FBC0200181	FBB0200197	1/2"	4	12.63
9/16"	12	1.1/2"	FBC0200198	FBB0200210	1/2"	5	14.21
5/8"	11	1.1/2"	FBC0200210	FBB0200223	1/2"	5	15.80
11/16"	11	1.1/2"	FBC0200221	FBB0200232	1/2"	6	17.39
3/4"	10	1.1/2"	FBC0200233	FBB0200244	1/2"	6	18.97



Round Split Dies

HSS TAPS

DIES

END MILLS

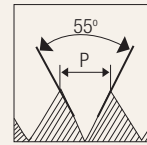
DRILLS

CARBIDE BURRS

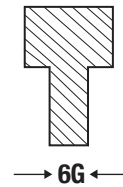
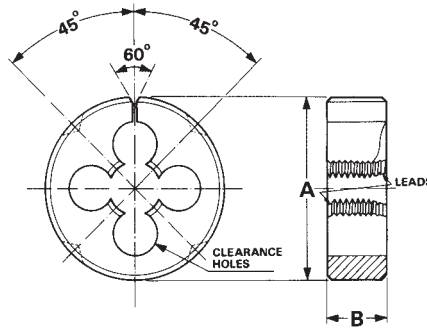
CS TAPS

**BSW**

**Whitworth coarse threads**



**HSS** **CS** **BS 1127** **6G**



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
7/8"	9	2"	FBC0200245	FBB0200253	5/8"	5	22.14
1"	8	2"	FBC0200251	FBB0200257	5/8"	6	25.30
1.1/8"	7	2.1/4"	FBM2300001	FBM2300297	11/16"	6	
1.1/4"	7	2.1/4"	FBM2300004	FBM2300299	11/16"	6	
1.1/4"	7	2.1/2"	FBM2300005	FBM2300300	7/8"	6	
1.3/8"	6	2.1/2"	FBM2300010	FBM2300301	7/8"	6	
1.1/2"	6	2.1/2"	FBM2300012	FBM2300302	7/8"	6	
1.1/2"	6	3"	FBM2300013	FBM2300303	7/8"	6	
1.3/4"	5	4"	FBM2300014	FBM2300304	1"	6	
2"	4.5	4"	FBM2300015	FBM2300305	1"	6	



Round Split Dies

HSS TAPS

DIES

END MILLS

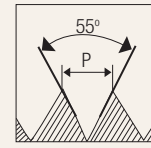
DRILLS

CARBIDE BURRS

CS TAPS

**BSF**

**Whitworth fine threads**

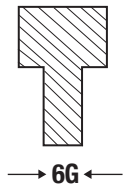
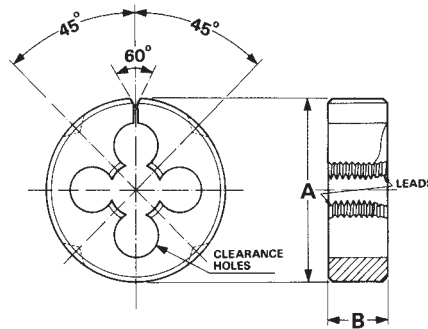


HSS

CS

BS  
1127

6G



Unit : mm

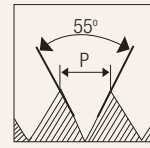
Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
3/16"	32	13/16"	FBC0200257	FBB0200261	1/4"	3	4.73
7/32"	28	13/16"	FBC0200263	FBB0200270	1/4"	4	5.51
1/4"	26	13/16"	FBC0200269	FBB0200279	1/4"	4	6.31
1/4"	26	1"	FBC0200275	FBB0200283	3/8"	4	6.31
9/32"	26	1"	FBC0200281	FBB0200299	3/8"	4	7.1
5/16"	22	1"	FBC0200287	FBB0200303	3/8"	4	7.89
3/8"	20	1"	FBC0200293	FBB0200320	3/8"	4	9.47
7/16"	18	1.1/2"	FBC0200314	FBB0200341	1/2"	4	11.05
1/2"	16	1.1/2"	FBC0200330	FBB0200349	1/2"	4	12.63
9/16"	16	1.1/2"	FBC0200336	FBB0200358	1/2"	5	14.22
5/8"	14	1.1/2"	FBC0200342	FBB0200366	1/2"	5	15.80
3/4"	12	1.1/2"	FBC0200353	FBB0200383	1/2"	5	18.97
7/8"	11	2"	FBC0200359	FBB0200391	5/8"	5	22.14
1"	10	2"	FBC0200365	FBB0200395	5/8"	6	25.30
1.1/8"	9	2.1/4"	FBM2300016	FBM2300306	11/16"	6	



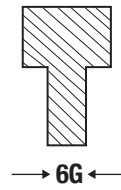
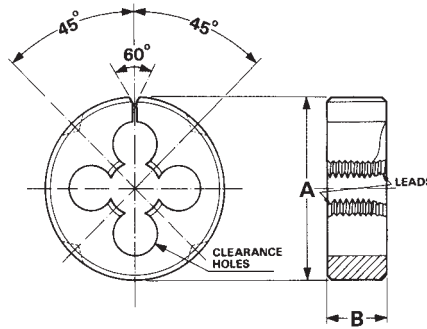
Round Split Dies

**BSF**

**Whitworth fine threads**



**HSS** **CS** **BS 1127** **6G**



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
1.1/4"	9	2.1/4"	FBM2300020	FBM2300308	11/16"	6	
1.3/8"	8	2.1/2"	FBM2300025	FBM2300310	7/8"	6	
1.1/2"	8	2.1/2"	FBM2300027	FBM2300311	7/8"	6	
1.1/2"	8	3"	FBM2300028	FBM2300312	7/8"	6	
1.3/4"	7	4"	FBM2300029	FBM2300313	1"	6	
2"	7	4"	FBM2300030	-	1"	6	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Round Split Dies

HSS TAPS

DIES

END MILLS

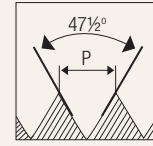
DRILLS

CARBIDE BURRS

CS TAPS

BA

British association threads

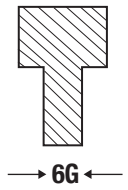
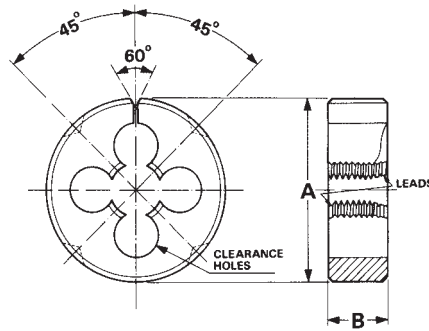


HSS

CS

BS 1127

6G



Unit : mm

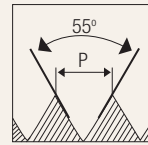
Nominal Diameter ØD	TPI	Outer Diameter A	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
			EDP No.	EDP No.			
# 12	90.9	13/16"	FBC0202220	FBB0202153	1/4"	3	1.27
# 11	81.9	13/16"	FBC0202226	FBB0202158	1/4"	3	1.47
# 10	72.6	13/16"	FBC0202232	FBB0202163	1/4"	3	1.67
# 9	65.1	13/16"	FBC0202238	FBB0202168	1/4"	3	1.87
# 8	59.1	13/16"	FBC0202244	FBB0202173	1/4"	3	2.16
# 7	52.9	13/16"	FBC0202250	FBB0202178	1/4"	3	2.46
# 6	47.9	13/16"	FBC0202256	FBB0202183	1/4"	3	2.76
# 5	43	13/16"	FBC0202262	FBB0202188	1/4"	3	3.15
# 4	38.5	13/16"	FBC0202268	FBB0202193	1/4"	3	3.55
# 3	34.8	13/16"	FBC0202274	FBB0202198	1/4"	3	4.04
# 2	31.4	13/16"	FBC0202280	FBB0202203	1/4"	3	4.64
# 1	28.2	13/16"	FBC0202286	FBB0202208	1/4"	4	5.23
# 0	25.4	13/16"	FBC0202292	FBB0202213	1/4"	4	5.92



Round Split Dies

**BSB**

**British brass threads**

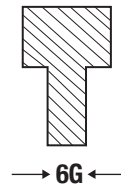
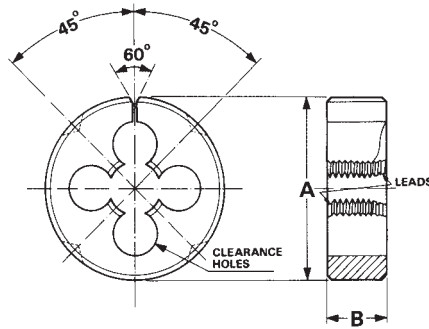


HSS

CS

BS  
1127

6G



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
1/4"	26	13/16"	FBC0200371	FBB0200399	1/4"	4	6.31
1/4"	26	1"	FBC0200377	FBB0200403	3/8"	4	6.31
5/16"	26	1"	FBC0200383	FBB0200416	3/8"	4	7.89
3/8"	26	1"	FBC0200389	FBB0200425	3/8"	4	9.48
7/16"	26	1.1/2"	FBC0200395	FBB0200442	1/2"	5	11.06
1/2"	26	1.1/2"	FBC0200401	FBB0200455	1/2"	5	12.64
9/16"	26	1.1/2"	FBC0200407	FBB0200468	1/2"	5	14.23
5/8"	26	1.1/2"	FBC0200413	FBB0200476	1/2"	5	15.81
3/4"	26	1.1/2"	FBC0200419	FBB0200485	1/2"	6	18.98

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Round Split Dies

HSS TAPS

DIES

END MILLS

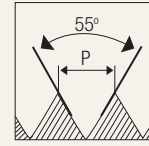
DRILLS

CARBIDE BURRS

CS TAPS

ME

Model engineer threads

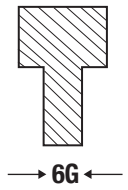
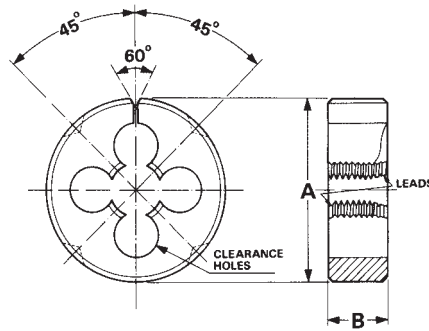


HSS

CS

BS 1127

6G



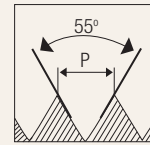
Unit : mm

Nominal Diameter	TPI	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD		A	EDP No.	EDP No.	B		
1/8"	40	13/16"	FBC0200906	FBB0200888	1/4"	3	3.14
5/32"	32	13/16"	FBC0200912	FBB0200892	1/4"	3	3.93
3/16"	40	13/16"	FBC0200918	FBB0200897	1/4"	3	4.72
7/32"	40	13/16"	FBC0200924	FBB0200902	1/4"	4	5.51
1/4"	40	13/16"	FBC0200930	FBB0200911	1/4"	4	6.31
1/4"	40	1"	FBC0202482	FBB0200916	3/8"	4	6.31
9/32"	32	1"	FBC0200936	FBB0200928	3/8"	4	7.10
5/16"	32	1"	FBC0200948	FBB0200946	3/8"	4	7.90
3/8"	32	1"	FBC0200954	FBB0200953	3/8"	4	9.48

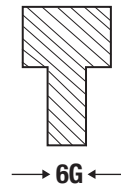
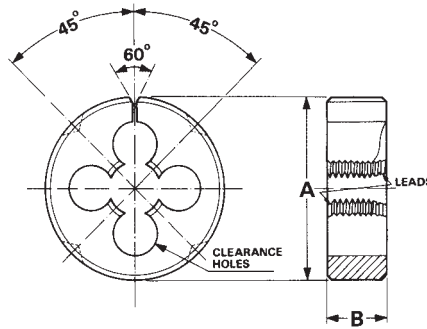


WF

Whitworth fine special threads



HSS CS BS 1127 6G



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
11/64"	40	13/16"	FBC0201032	FBB0201035	1/4"	3	4.33
3/16"	28	13/16"	FBC0201050	FBB0201045	1/4"	3	4.73
13/64"	24	13/16"	FBC0201038	FBB0201054	1/4"	3	5.13
15/64"	28	13/16"	FBC0201044	FBB0201068	1/4"	4	5.92
1/4"	32	1"	–	FBB0201083	3/8"	4	6.31
9/32"	40	1"	–	FBB0201087	3/8"	4	7.11
5/16"	40	1"	–	FBB0201091	3/8"	4	7.9
3/8"	40	1"	–	FBB0201095	3/8"	4	9.48
7/16"	40	1.1/2"	–	FBB0201107	1/2"	5	11.07
1/2"	40	1.1/2"	–	FBB0201131	1/2"	5	12.64



Round Split Dies

HSS TAPS

DIES

END MILLS

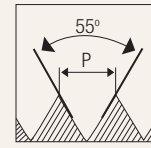
DRILLS

CARBIDE BURRS

CS TAPS

BSP

British standard pipe threads

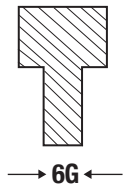
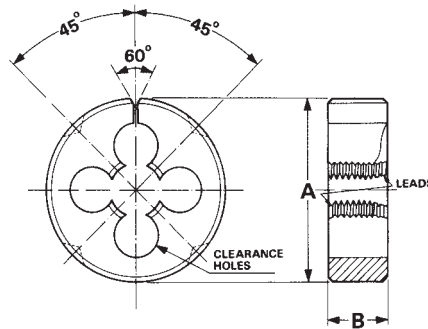


HSS

CS

BS  
1127

6G



Unit : mm

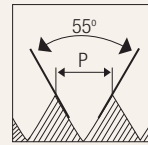
Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
1/8"	28	1"	FBC0202117	FBB0202071	3/8"	4	9.68
1/4"	19	1.1/2"	FBC0202138	FBB0202088	1/2"	5	13.11
3/8"	19	1.1/2"	FBC0202149	FBB0202097	1/2"	5	16.6
1/2"	14	1.1/2"	FBC0202160	FBB0202106	1/2"	6	20.89
1/2"	14	2"	FBC0202166	FBB0202111	5/8"	5	20.89
5/8"	14	2"	FBC0202172	FBB0202116	5/8"	6	22.84
3/4"	14	2"	FBC0202178	FBB0202120	5/8"	6	26.36
7/8"	14	2"	FBC0202184	FBB0202125	5/8"	6+6	30.11
1"	11	2"	FBC0202190	FBB0202129	5/8"	6+6	33.16
1.1/8"	11	2.1/2"	FBM2300139	FBM2300426	7/8"	6	
1.1/4"	11	2.1/2"	FBM2300140	FBM2300427	7/8"	6	
1.1/4"	11	3"	FBM2300141	FBM2300428	7/8"	6	
1.3/8"	11	4"	FBM2300142	FBM2300430	1"		
1.1/2"	11	4"	FBM2300144	FBM2300431	1"	6	
1.3/4"	11	4"	FBM2300145	FBM2300432	1"		
2"	11	4"	FBM2300146	FBM2300433	1"	6	



Round Split Dies

# BSPT

## British standard taper pipe threads

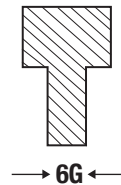
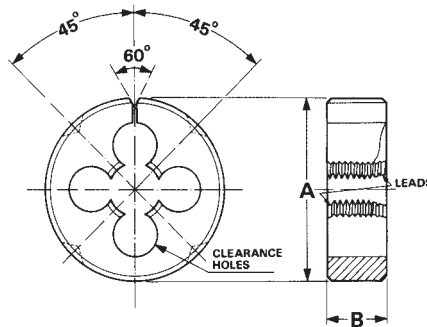


HSS

CS

BS  
1127

6G



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.			
1/8"	28	1"	FBM2300147	FBM2300434	10	4	
1/8"	28	1.1/2"	FBM2300148	FBM2300435	10	4	
1/4"	19	1.1/2"	FBM2300149	FBM2300437	14	4	
3/8"	19	1.1/2"	FBM2300150	FBM2300439	14	5	
3/8"	19	2"	FBM2300151	FBM2300440	14	5	
1/2"	14	2"	FBM2300152	FBM2300441	19	5	
3/4"	14	2"	FBM2300153	FBM2300442	20	6	
3/4"	14	2.1/2"	FBM2300154	FBM2300443	22	6	
1"	11	2.1/2"	FBM2300156	FBM2300444	25	6	
1"	11	3"	FBM2300157	FBM2300445	25	6	
1.1/4"	11	3"	FBM2300159	FBM2300446	25	6	
1.1/2"	11	4"	FBM2300160	FBM2300447	25	6	
2"	11	4"	FBM2300161	FBM2300448	27	6	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Round Split Dies

HSS TAPS

DIES

END MILLS

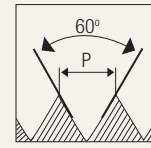
DRILLS

CARBIDE BURRS

CS TAPS

UNC

Unified coarse threads

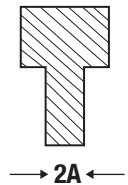
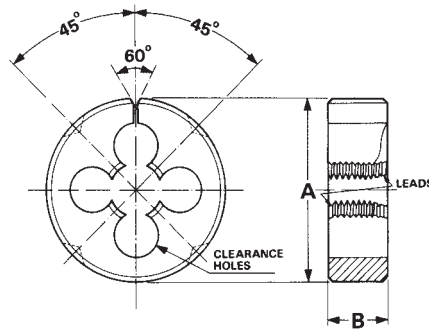


HSS

CS

BS  
1127

2A



Unit : mm

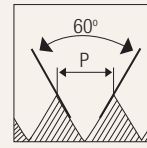
Nominal Diameter ØD	TPI	Outer Diameter A	HSS	Carbon Steel	Thickness B	No. Clearance Hole	Threading Diameter
			EDP No.	EDP No.			
# 4	40	13/16"	FBC0200682	FBB0200706	1/4"	3	2.83
# 5	40	13/16"	FBC0200688	FBB0200714	1/4"	3	3.15
# 6	32	13/16"	FBC0200704	FBB0200722	1/4"	3	3.48
# 8	32	13/16"	FBC0200715	FBB0200730	1/4"	3	4.14
# 10	24	13/16"	FBC0200726	FBB0200738	1/4"	3	4.79
# 12	24	13/16"	FBC0200742	FBB0200750	1/4"	4	5.45
1/4"	20	13/16"	FBC0200747	FBB0200758	1/4"	4	6.31
1/4"	20	1"	FBC0200753	FBB0200766	3/8"	4	6.31
5/16"	18	1"	FBC0200769	FBB0200782	3/8"	4	7.89
3/8"	16	1"	FBC0200791	FBB0200799	3/8"	4	9.47
7/16"	14	1.1/2"	FBC0200817	FBB0200824	1/2"	4	11.05
1/2"	13	1.1/2"	FBC0200843	FBB0200840	1/2"	4	12.62
9/16"	12	1.1/2"	FBC0200859	FBB0200852	1/2"	5	14.21
5/8"	11	1.1/2"	FBC0200865	FBB0200860	1/2"	5	15.79
3/4"	10	1.1/2"	FBC0200882	FBB0200872	1/2"	6	18.96



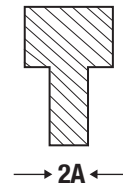
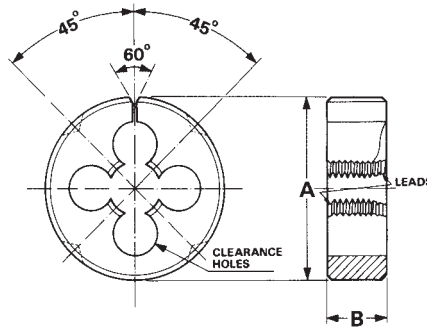
Round Split Dies

**UNC**

**Unified coarse threads**



HSS
CS
BS 1127
2A



Unit : mm

Nominal Diameter ØD	TPI	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
		A	EDP No.	EDP No.	B		
7/8"	9	2"	FBC0200894	FBB0200880	5/8"	5	22.14
1"	8	2"	FBC0200900	FBB0200884	5/8"	6	25.3
1.1/8"	7	2.1/4"	FBM2300048	FBM2300322	11/16"	6	
1.1/4"	7	2.1/4"	FBM2300050	FBM2300325	11/16"	6	
1.3/8"	6	2.1/2"	FBM2300054	FBM2300327	7/8"	6	
1.1/2"	6	2.1/2"	FBM2300056	FBM2300329	7/8"	6	
1.1/2"	6	3"	FBM2300057	FBM3000530	7/8"	6	
1.3/4"	5	4"	FBM2300058	FBM2300330	1"	8	
2"	4.5	4"	FBM2300059	FBM2300331	1"	6	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Round Split Dies

HSS TAPS

DIES

END MILLS

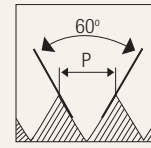
DRILLS

CARBIDE BURRS

CS TAPS

UNF

Unified fine threads

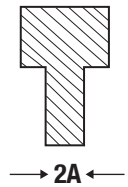
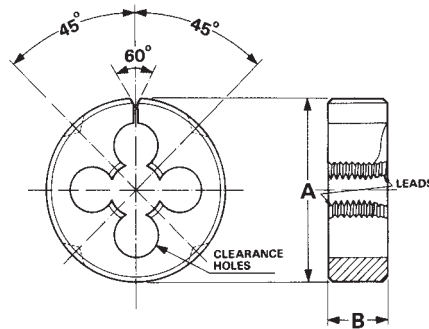


HSS

CS

BS 1127

2A



Unit : mm

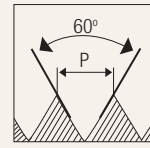
Nominal Diameter	TPI	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD		A	EDP No.	EDP No.	B		
# 3	56	13/16"	FBC0200437	FBB0200498	1/4"	3	
# 4	48	13/16"	FBC0200443	FBB0200502	1/4"	3	2.83
# 5	44	13/16"	FBC0200449	FBB0200506	1/4"	3	3.16
# 6	40	13/16"	FBC0200465	FBB0200514	1/4"	3	3.48
# 8	36	13/16"	FBC0200476	FBB0200522	1/4"	3	4.14
# 10	32	13/16"	FBC0200487	FBB0200530	1/4"	3	4.8
# 12	28	13/16"	FBC0200498	FBB0200542	1/4"	4	5.46
1/4"	28	13/16"	FBC0200515	FBB0200550	1/4"	4	6.32
1/4"	28	1"	FBC0200527	FBB0200558	3/8"	4	6.32
5/16"	24	1"	FBC0200538	FBB0200578	3/8"	4	7.9
3/8"	24	1"	FBC0200560	FBB0200599	3/8"	4	9.48
7/16"	20	1.1/2"	FBC0200586	FBB0200627	1/2"	4	11.06
1/2"	20	1.1/2"	FBC0200607	FBB0200647	1/2"	5	12.65
9/16"	18	1.1/2"	FBC0200618	FBB0200660	1/2"	5	14.23
5/8"	18	1.1/2"	FBC0200629	FBB0200669	1/2"	5	15.82
3/4"	16	1.1/2"	FBC0200646	FBB0200682	1/2"	6	18.99



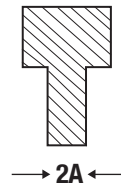
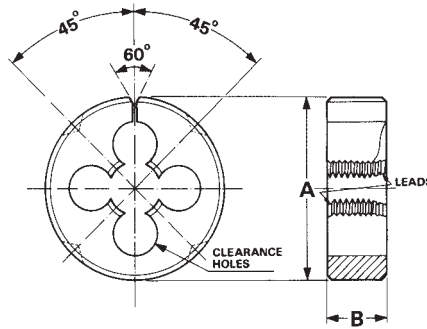
Round Split Dies

UNF

Unified fine threads



HSS CS BS 1127 2A



Unit : mm

Nominal Diameter	Pitch	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD	TPI	A	EDP No.	EDP No.	B		
7/8"	14	2"	FBC0200658	FBB0200690	5/8"	5	22.13
1"	12	2"	FBC0200664	FBB0200694	5/8"	6	25.31
1.1/8"	12	2.1/4"	FBM2300034	FBM2300314	11/16"	6	
1.1/4"	12	2.1/4"	FBM2300037	FBM2300317	11/16"	6	
1.3/8"	12	2.1/2"	FBM2300041	-	7/8"	6	
1.1/2"	12	2.1/2"	FBM2300043	FBM2300319	7/8"	6	
1.1/2"	12	3"	FBM2300044	FBM2300320	7/8"	6	
1.3/4"	14	4"	FBM2300046	FBM2300647	1"	6	
2"	-	4"	FBM2300047	FBM2300321	1"	6	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Round Split Dies

HSS TAPS

DIES

END MILLS

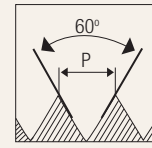
DRILLS

CARBIDE BURRS

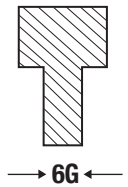
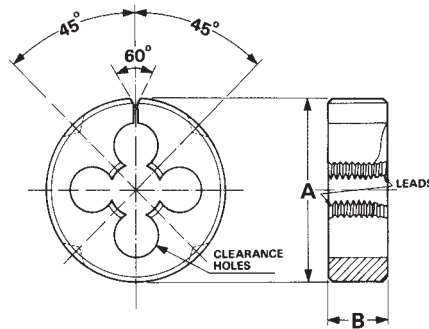
CS TAPS

NPT

National taper pipe threads



HSS
CS
BS 1127
6G

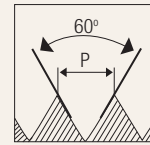


Unit : mm

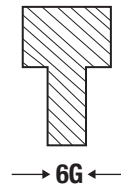
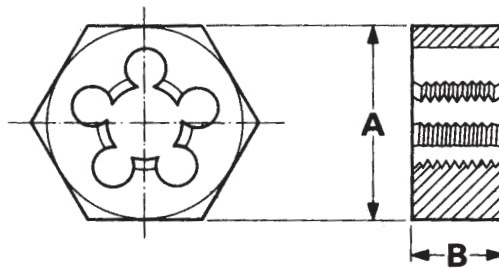
Nominal Diameter	TPI	Outer Diameter	HSS	Carbon Steel	Thickness	No. Clearance Hole	Threading Diameter
ØD		A	EDP No.	EDP No.	B		
1/8"	27	1"	FBM2300162	FBM2300449	10	4	
1/8"	27	1.1/2"	FBM2300163	FBM2300450	10	4	
1/4"	18	1.1/2"	FBM2300164	FBM2300453	15	4	
3/8"	18	1.1/2"	FBM2300165	FBM2300456	15	5	
3/8"	18	2"	FBM2300166	FBM2300457	14	5	
1/2"	14	2"	FBM2300167	FBM2300459	19	5	
3/4"	14	2"	FBM2300168	FBM2300461	20	6	
3/4"	14	2.1/2"	FBM2300169	FBM2300462	22	6	
1"	11.1/2	2.1/2"	FBM2300171	FBM2300464	25	6	
1"	11.1/2	3"	FBM2300172	FBM2300465	25	6	
1.1/4"	11.1/2	3"	FBM2300173	FBM2300467	25	6	
1.1/2"	11.1/2	4"	FBM2300174	FBM2300468	25	6	
2"	11.1/2	4"	FBM2300175	FBM2300469	27	6	



# M Metric coarse threads



**HSS** **CS** **BS 1127** **6G**



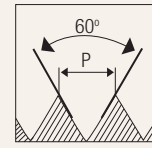
Unit : mm

Nominal Diameter	Pitch	Across Flat	HSS	Carbon Steel	Thickness
ØD	p	A	EDP No.	EDP No.	
M 2	0.4	0.710"	FBE2300078	FBD2300122	6.35
M 2.5	0.45	0.710"	FBE2300079	FBD2300123	6.35
M 3	0.5	0.710"	FBE2300080	FBD2300124	6.35
M 4	0.7	0.710"	FBE2300081	FBD2300127	6.35
M 5	0.8	0.710"	FBE2300082	FBD2300130	6.35
M 6	1	0.710"	FBE2300084	FBD2300135	6.35
M 7	1	0.710"	FBE2300085	FBD2300136	6.35
M 8	1.25	0.820"	FBE2300087	FBD2300139	7.94
M 9	1.25	0.920"	FBE2300088	FBD2300140	9.53
M 10	1.5	0.920"	FBE2300091	FBD2300144	9.53
M 12	1.75	1.100"	FBE2300096	FBD2300150	12.70
M 14	2	1.300"	FBE2300098	FBD2300154	15.88
M 16	2	1.300"	FBE2300100	FBD2300160	15.88
M 18	2.5	1.480"	FBE2300102	FBD2300163	17.46
M 20	2.5	1.480"	FBE2300104	FBD2300166	17.46
M 22	2.5	1.670"	FBE2300106	FBD2300169	20.63
M 24	3	2.050"	FBE2300108	FBD2300172	23.81
M 27	3	2.220"	FBE2300110	FBD2300176	26.99
M 30	3.5	2.220"	FBE2300112	FBD2300182	26.99
M 36	4	2.760"	FBE2300113	FBD2300191	31.75
M 39	4	2.760"	FBE2300115	FBD2300194	31.75
M 42	4.5	3.150"	FBE2300366	FBD2300198	31.75 44.45
M 45	4.5	3.150"	-	FBD2300201	31.75 44.45
M 48	5	3.150"	-	FBD2300203	31.75 44.45

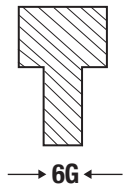
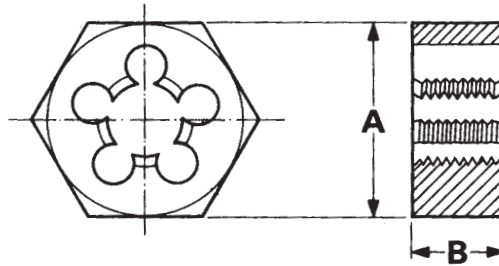


MF

**Metric fine threads**



HSS
CS
BS 1127
6G

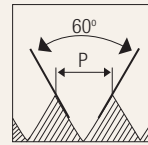


Unit : mm

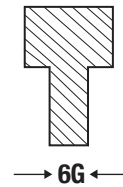
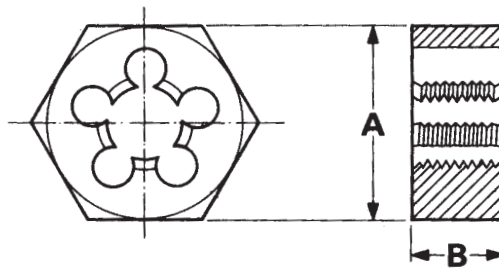
Nominal Diameter	Pitch	Across Flat	HSS	Carbon Steel	Thickness
ØD	p	A	EDP No.	EDP No.	
M 3	0.6	0.710"	-	FBD2300125	6.35
M 3.5	0.7	0.710"	-	FBD2300126	6.35
M 4	0.75	0.710"	-	FBD2300128	6.35
M 5	0.5	0.710"	-	FBD2300129	6.35
M 6	0.75	0.710"	FBE2300083	FBD2300134	6.35
M 7	1	0.710"	FBE2300085	FBD2300136	6.35
M 8	1	0.820"	FBE2300086	FBD2300138	7.94
M 9	1.25	0.920"	FBE2300088	FBD2300140	9.53
M 10	1	0.920"	FBE2300089	FBD2300142	9.53
M 10	1.25	0.920"	FBE2300090	FBD2300143	9.53
M 11	1.5	1.010"	FBE2300092	FBD2300146	11.11
M 12	1	1.100"	FBE2300093	FBD2300147	12.70
M 12	1.25	1.100"	FBE2300094	FBD2300148	12.70
M 12	1.5	1.100"	FBE2300095	FBD2300149	12.70

**MF**

**Metric fine threads**



HSS
CS
BS 1127
6G



Unit : mm

Nominal Diameter	Pitch	Across Flat	HSS	Carbon Steel	Thickness
ØD	p	A	EDP No.	EDP No.	
M 14	1.25	1.300"	-	FBD2300152	15.88
M 14	1.5	1.300"	FBE2300097	FBD2300153	15.88
M 16	1.5	1.300"	FBE2300099	FBD2300158	15.88
M 18	1.5	1.480"	FBE2300101	FBD2300162	17.46
M 20	1.5	1.480"	FBE2300103	FBD2300164	17.46
M 22	1.5	1.670"	FBE2300105	FBD2300167	20.63
M 24	1.5	2.050"	FBE2300107	FBD2300170	23.81
M 25	1.5	2.220"	-	FBD2300173	26.99
M 27	1.5	2.220"	FBE2300109	FBD2300174	26.99
M 27	2	2.220"	-	FBD2300175	26.99
M 30	1.5	2.220"	FBE2300111	FBD2300179	26.99
M 30	2	2.220"	-	FBD2300180	26.99
M 30	3	2.220"	-	FBD2300181	26.99
M 32	1.5	2.220"	-	FBD2300183	26.99
M 33	3.5	2.580"	-	FBD2300187	28.58



Hexagonal Dies

HSS TAPS

DIES

END MILLS

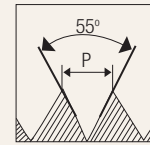
DRILLS

CARBIDE BURRS

CS TAPS

**BSW**

**Whitworth coarse threads**

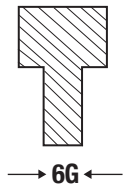
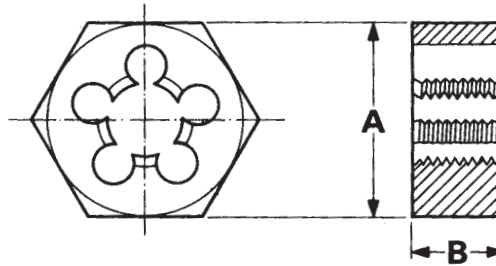


HSS

CS

BS  
1127

6G



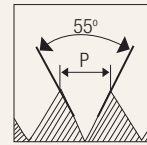
Unit : mm

Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
1/8"	40	0.710"	FBE2300001	FBD2300001	6.35
5/32"	32	0.710"	FBE2300002	FBD2300002	6.35
3/16"	24	0.710"	FBE2300003	FBD2300003	6.35
7/32"	24	0.710"	-	FBD2300004	6.35
1/4"	20	0.710"	FBE2300004	FBD2300005	6.35
9/32"	20	0.820"	-	FBD2300006	7.94
5/16"	18	0.820"	FBE2300005	FBD2300007	7.94
3/8"	16	0.920"	FBE2300006	FBD2300008	9.53
7/16"	14	1.010"	FBE2300007	FBD2300009	11.11
1/2"	12	1.100"	FBE2300008	FBD2300010	12.70
9/16"	12	1.300"	FBE2300009	FBD2300011	15.88
5/8"	11	1.300"	FBE2300010	FBD2300012	15.88
3/4"	10	1.480"	FBE2300011	FBD2300013	17.46
7/8"	9	1.670"	FBE2300012	FBD2300014	20.63
1"	8	2.050"	FBE2300013	FBD2300015	23.81
1.1/8"	7	2.220"	FBE2300014	FBD2300016	26.99
1.1/4"	7	2.220"	FBE2300015	FBD2300017	26.99
1.3/8"	6	2.580"	FBE2300016	FBD2300018	28.58
1.1/2"	6	2.760"	FBE2300017	FBD2300019	31.75
1.3/4"	6	3.150"	FBE2300018	FBD2300021	31.75 44.45
2"	4.1/2	3.550"	FBE2300019	FBD2300022	31.75 44.45

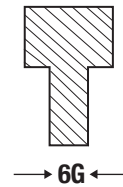
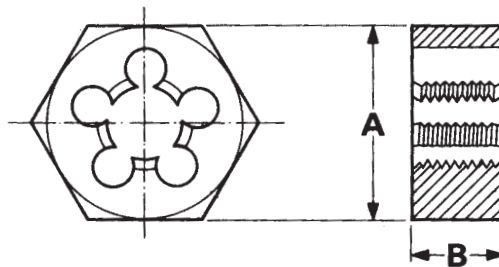


**BSF**

**Whitworth fine threads**



HSS
CS
BS 1127
6G



Unit : mm

Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
1/8"		0.710"	FBE2300020	FBD2300024	6.35
5/32"		0.710"	FBE2300021	FBD2300025	6.35
3/16"	32	0.710"	FBE2300022	FBD2300026	6.35
7/32"	28	0.710"	-	FBD2300027	6.35
1/4"	26	0.710"	FBE2300023	FBD2300028	6.35
5/16"	22	0.820"	FBE2300024	FBD2300029	7.94
3/8"	20	0.920"	FBE2300025	FBD2300030	9.53
7/16"	18	1.010"	FBE2300026	FBD2300031	11.11
1/2"	16	1.100"	FBE2300027	FBD2300032	12.70
9/16"	16	1.300"	FBE2300346	FBD2300033	15.88
5/8"	14	1.300"	FBE2300028	FBD2300034	15.88
3/4"	12	1.480"	FBE2300029	FBD2300035	17.46
7/8"	11	1.670"	FBE2300030	FBD2300036	20.63
1"	10	2.050"	FBE2300031	FBD2300037	23.81

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Hexagonal Dies

HSS TAPS

DIES

END MILLS

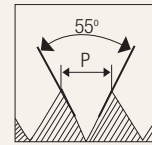
DRILLS

CARBIDE BURRS

CS TAPS

BSP

British standard pipe threads

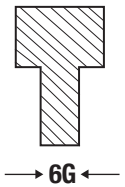
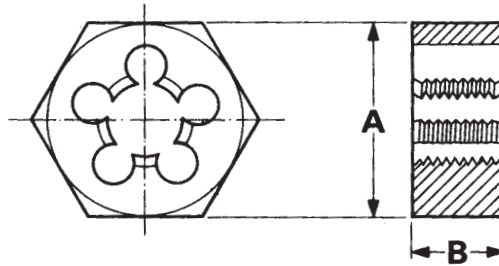


HSS

CS

BS  
1127

6G



Unit : mm

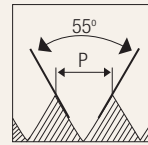
Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
1/8"	28	0.920"	FBE2300067	FBD2300094	9.53
1/4"	19	1.100"	FBE2300068	FBD2300095	12.70
3/8"	19	1.300"	FBE2300069	FBD2300096	15.88
1/2"	14	1.670"	FBE2300070	FBD2300097	20.63
5/8"	14	1.670"	FBE2300071	FBD2300098	20.63
3/4"	14	2.050"	FBE2300072	FBD2300099	23.81
7/8"	14	2.220"	-	FBD2300100	26.99
1"	11	2.580"	FBE2300073	FBD2300101	28.58
1.1/4"	11	2.760"	FBE2300078	FBD2300102	31.75
1.1/2"	11	3.150"	FBE2300075	FBD2300104	31.75 44.45
2"	11	3.890"	FBE2300077	FBD2300106	31.75 44.45



Hexagonal Dies

**BSPT**

**British standard taper pipe threads**

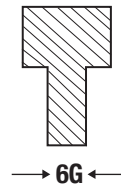
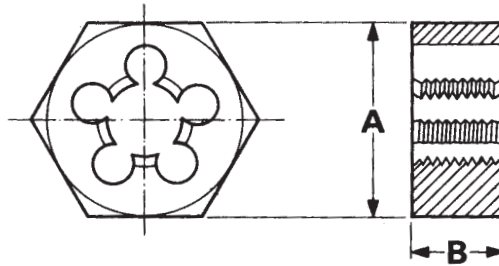
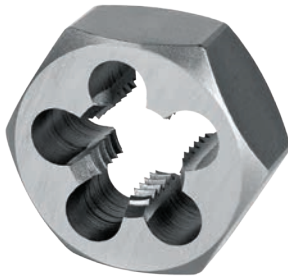


HSS

CS

BS  
1127

6G



Unit : mm

Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
1/8"	28	0.920"	FBE2300367	FBD2300107	10
1/4"	19	1.100"	FBE2300368	FBD2300108	14
3/8"	19	1.300"	FBE2300369	FBD2300109	14
1/2"	14	1.670"	–	FBD2300110	19
3/4"	14	2.050"	–	FBD2300111	20
1"	11	2.580"	–	FBD2300112	25

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Hexagonal Dies

HSS TAPS

DIES

END MILLS

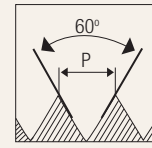
DRILLS

CARBIDE BURRS

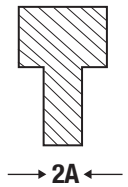
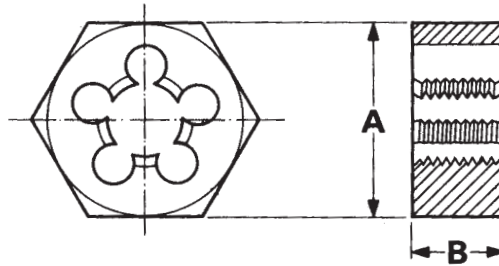
CS TAPS

UNC

Unified coarse threads



HSS
CS
BS 1127
2A



Unit : mm

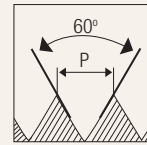
Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
# 5	40	0.710"	-	FBD2300042	6.35
# 6	32	0.710"	-	FBD2300043	6.35
# 8	32	0.710"	-	FBD2300044	6.35
# 10	24	0.710"	-	FBD2300045	6.35
# 12	24	0.710"	-	FBD2300046	6.35
1/4"	20	0.710"	FBE2300033	FBD2300048	6.35
5/16"	18	0.820"	FBE2300034	FBD2300049	7.94
3/8"	16	0.920"	FBE2300035	FBD2300050	9.53
7/16"	14	1.010"	FBE2300036	FBD2300051	11.11
1/2"	13	1.100"	FBE2300037	FBD2300052	12.70
9/16"	12	1.300"	FBE2300038	FBD2300053	15.88
5/8"	11	1.300"	FBE2300039	FBD2300054	15.88
3/4"	10	1.480"	FBE2300040	FBD2300055	17.46
7/8"	9	1.670"	FBE2300041	FBD2300056	20.63
1"	8	2.050"	FBE2300042	FBD2300057	23.81
1.1/8"	7	2.220"	FBE2300043	FBD2300058	26.99
1.1/4"	7	2.220"	FBE2300044	FBD2300059	26.99
1.3/8"	6	2.580"	FBE2300045	FBD2300060	28.58
1.1/2"	6	2.760"	FBE2300046	FBD2300061	31.75



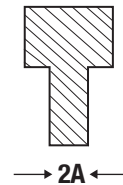
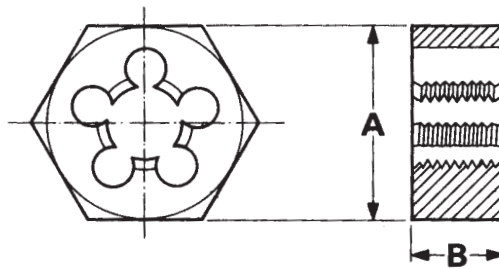


UNF

Unified fine threads



HSS CS BS 1127 2A



Unit : mm

Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
# 5	44	0.710"	-	FBD2300066	6.35
# 6	40	0.710"	-	FBD2300067	6.35
# 8	36	0.710"	-	FBD2300068	6.35
# 10	32	0.710"	FBE2300049	FBD2300069	6.35
# 12	28	0.710"	-	FBD2300070	6.35
1/4"	28	0.710"	FBE2300051	FBD2300072	6.35
5/16"	24	0.820"	FBE2300052	FBD2300073	7.94
3/8"	24	0.920"	FBE2300053	FBD2300074	9.53
7/16"	20	1.010"	FBE2300054	FBD2300075	11.11
1/2"	20	1.100"	FBE2300055	FBD2300076	12.70
9/16"	18	1.300"	FBE2300056	FBD2300077	15.88
5/8"	18	1.300"	FBE2300057	FBD2300078	15.88
3/4"	16	1.480"	FBE2300058	FBD2300079	17.46
7/8"	14	1.670"	FBE2300059	FBD2300080	20.63
1"	12	2.050"	FBE2300060	FBD2300081	23.81
1.1/8"	12	2.220"	FBE2300061	FBD2300082	26.99
1.1/4"	12	2.220"	FBE2300062	FBD2300083	26.99
1.3/8"	12	2.580"	FBE2300063	FBD2300084	28.58
1.1/2"	12	2.760"	FBE2300064	FBD2300085	31.75



Hexagonal Dies

HSS TAPS

DIES

END MILLS

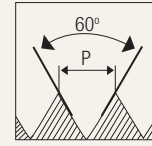
DRILLS

CARBIDE BURRS

CS TAPS

NPT

National taper pipe threads

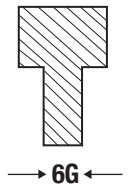
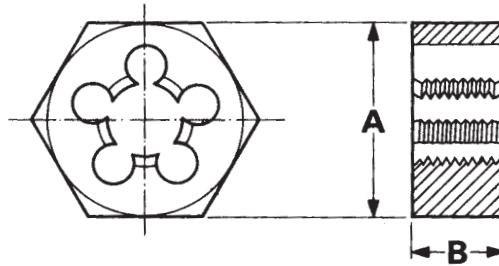
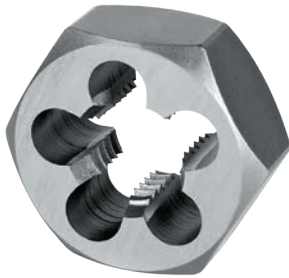


HSS

CS

BS  
1127

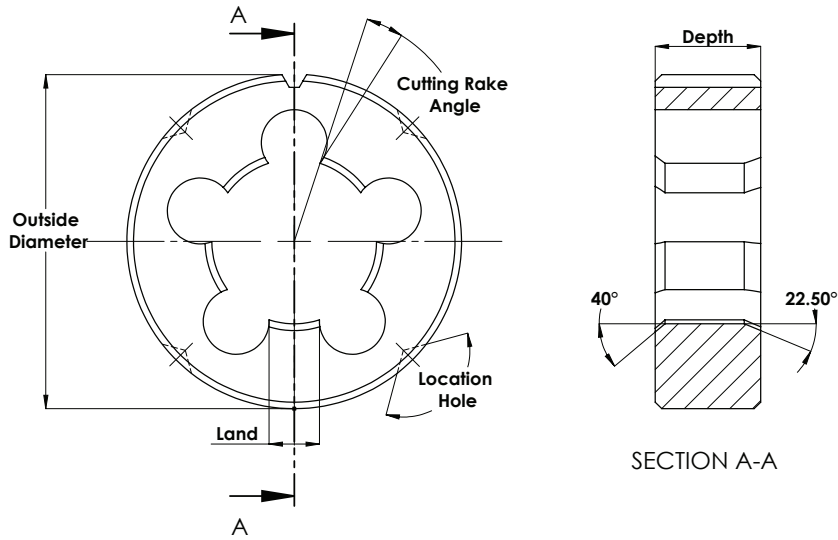
6G



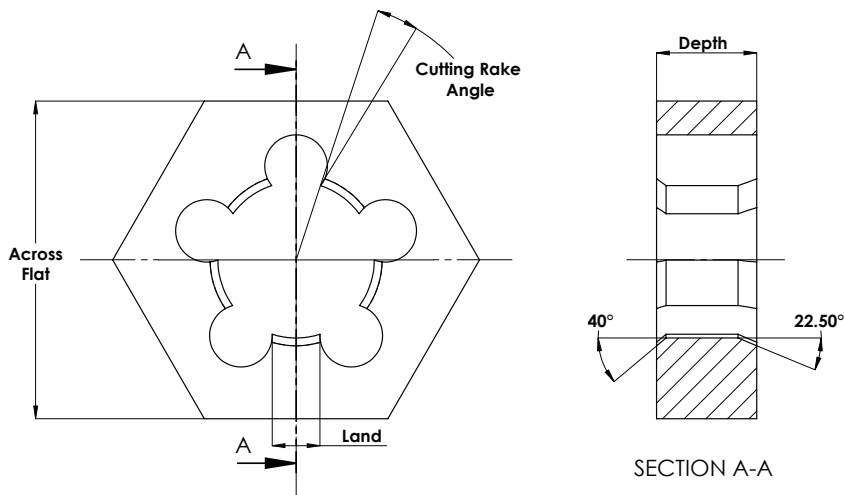
Unit : mm

Nominal Diameter ØD	TPI	Across Flat	HSS	Carbon Steel	Thickness
		A	EDP No.	EDP No.	
1/8"	27	0.920"	FBE2300370	FBD2300114	10
1/4"	18	1.100"	FBE2300371	FBD2300115	15
3/8"	18	1.300"	FBE2300372	FBD2300116	15
1/2"	14	1.670"	FBE2300373	FBD2300117	19
3/4"	14	2.050"	FBE2300374	FBD2300118	20
1"	11.1/2	2.580"	FBE2300375	FBD2300119	25
1.1/2"	11.1/2	3.150"	FBE2300376	FBD2300121	
2"	11.1/2	3.890"	FBE2300379	-	

**ROUND DIES NOMENCLATURE**



**HEXAGONAL DIES NOMENCLATURE**



HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



## DOS AND DONT'S- THREADING WITH DIES

- **CHAMFER:** make a chamfer at the end of the bar at an angle of 45 degrees to remove sudden loading of the leading edges. This has to be done before starting the die or die nut. Also it has to be made certain that the die or die nut is presented to the bolt squarely.
- **TOLERANCE:** Major diameter of the bolt usually has large tolerances. Use this to your advantage by reducing the diameter of the bar. Thus, the cutting force will be reduced to a minimum. If tolerance class is not specified, consider tolerance applicable for medium range i.e. 6H and 6G.
- **SWarf:** To direct the swarf away from cutting area, it is always preferable to use the gun nose type of die.
- **LUBRICANT:** the cutting area should always be supplied with a steady flow of the correct lubricant. 5. Split dies: To avoid rubbing, the adjustable split die should not open out. Move the adjustable screws equally by say, 0.15 mm to close the split die. If it is done unequally, there may be pressure on one side which may lead to breakage.
- **CLEANING:** As a norm, die nuts are used for cleaning out existing threads. Usually the process is done by hand. Avoid using die nuts for thread cutting unless it is an exception.
- **RAKE ANGLE:** Large rake angle for long chip formation whereas a small rake angle for short chip formation. It applicable and or workpiece material isn't specified, assume it as intermediate tensile strength.

# CARBIDE



High Performance Cutting Tools









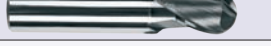






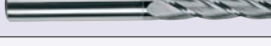
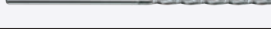




# END MILLS

# SELECTION GUIDE



## END MILLS

SERIES		FLUTE	LENGTH	CORNER STYLE	PAGES
Proton Plus		4	Regular	Square End	202
Proton Plus		4	Long	Square End	204
Proton Plus		4	Long Reach	Square End	206
Proton Plus		2	Regular	Ball Nose	207
Proton Plus		2	Long	Ball Nose	208
Proton Plus		2	Long Reach	Ball Nose	209
HSM		4	Regular	Square End	210
HSM		2	Regular	Square End	211
HSM		4	Regular	Ball Nose	212
HSM		2	Regular	Ball Nose	213
F177 TR		4	Regular	Square End	214
F179 TR		4	Regular	Ball Nose	215
F178 TR		5	Regular	Square End	216
F135 HP		2	Regular	Square End	217
F136 HP		2	Regular	Square End	218
F111 GP		4	Regular	Square End	219
F163 GP		4	Stub	Square End	221
F122 GP		4	Long	Square End	222
F187 GP		4	Extra Long	Square End	223



## END MILLS

SERIES		FLUTE	LENGTH	CORNER STYLE	PAGES
F181 GP		4	Long Reach	Square End	224
F114 GP		4	Regular	Chip Breaker	225
F132 GP		4	Long	Chip Breaker	226
F116 GP		3	Regular	Square End	227
F164 GP		2	Stub	Square End	228
F121 GP		2	Regular	Square End	229
F123 GP		2	Long	Square End	230
F183 GP		2	Long reach	Square End	231
F165 GP		4	Stub	Ball Nose	232
F140 GP		4	Regular	Ball Nose	233
F184 GP		4	Long Reach	Ball Nose	234
F150 GP		2	Regular	Ball Nose	235
F166 GP		2	Stub	Ball Nose	236
F186 GP		2	Long Reach	Ball Nose	237
F192 GP		4	Regular	Chip Breaker	238

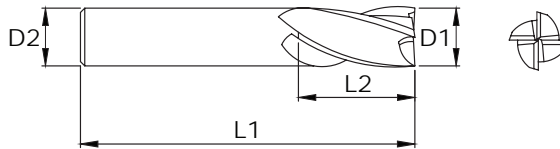


Solid Carbide End Mills

Proton Plus Series

4 Flute

**Centre cutting Proton Plus end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	Corner Radius
ØD1		L2	L1	ØD2	Cr
3	FBK0503424	12	38	3	-
3	FBK0503425	12	38	3	0.5
3	FBK0503426	12	38	3	1.0
4	FBK0503427	14	51	4	-
4	FBK0503428	14	51	4	0.5
4	FBK0503429	14	51	4	1.0
5	FBK0503430	15	60	5	-
5	FBK0503431	15	60	5	0.5
5	FBK0503432	15	60	5	1.0
6	FBK0503433	15	60	6	-
6	FBK0503434	15	60	6	0.5
6	FBK0503435	15	60	6	1.0
8	FBK0503436	19	60	8	-
8	FBK0503437	19	60	8	0.5
8	FBK0503438	19	60	8	1.0
10	FBK0503439	22	75	10	-

\*Custom Solution possible Refer page 261





Solid Carbide End Mills

Proton Plus Series

HSS TAPS

DIES

END MILLS

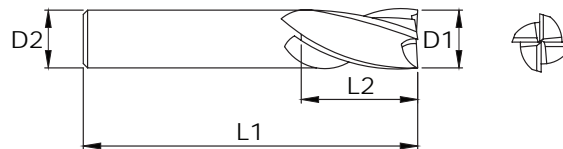
DRILLS

CARBIDE BURRS

CS TAPS

4 Flute

## Centre cutting Proton Plus end mill



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter ØD1	EDP No	Flute Length	Overall Length	Shank Diameter	Corner Radius
		L2	L1	ØD2	Cr
10	FBK0503440	22	75	10	0.5
10	FBK0503441	22	75	10	1.0
12	FBK0503442	22	76	12	-
12	FBK0503443	22	76	12	0.5
12	FBK0503444	22	76	12	1.0
16	FBK0503445	32	100	16	-
16	FBK0503446	32	100	16	0.5
16	FBK0503447	32	100	16	1.0

\*Custom Solution possible Refer page 261

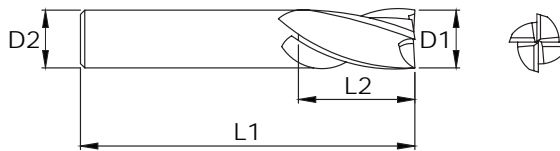


Solid Carbide End Mills

Proton Plus Series

4 Flute

**Centre cutting Proton Plus end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	Corner Radius
ØD1		L2	L1	ØD2	Cr
3	FBK0503448	12	60	3	-
3	FBK0503449	12	60	3	0.5
3	FBK0503450	12	60	3	1.0
4	FBK0503451	14	76	4	-
4	FBK0503452	14	76	4	0.5
4	FBK0503453	14	76	4	1.0
5	FBK0503454	15	76	5	-
5	FBK0503455	15	76	5	0.5
5	FBK0503456	15	76	5	1.0
6	FBK0503457	20	80	6	-
6	FBK0503458	20	80	6	0.5
6	FBK0503459	20	80	6	1.0
8	FBK0503460	25	80	8	-
8	FBK0503461	25	80	8	0.5

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

Proton Plus Series

HSS TAPS

DIES

END MILLS

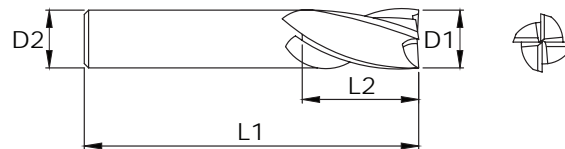
DRILLS

CARBIDE BURRS

CS TAPS

4 Flute

**Centre cutting Proton Plus end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	Corner Radius
ØD1		L2	L1	ØD2	Cr
8	FBK0503462	25	80	8	1.0
10	FBK0503463	25	100	10	-
10	FBK0503464	25	100	10	0.5
10	FBK0503465	25	100	10	1.0
12	FBK0503466	30	102	12	-
12	FBK0503467	30	102	12	0.5
12	FBK0503468	30	102	12	1.0
16	FBK0503469	40	150	16	-
16	FBK0503470	40	150	16	0.5
16	FBK0503471	40	150	16	1.0

\*Custom Solution possible Refer page 261

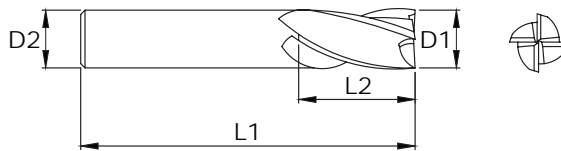


Solid Carbide End Mills

Proton Plus Series

4 Flute

**Centre cutting Proton Plus end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	Corner Radius
ØD1		L2	L1	ØD2	Cr
6	FBK0503472	25	100	6	-
6	FBK0503473	25	100	6	0.50
6	FBK0503474	25	100	6	1.00
8	FBK0503475	25	100	8	-
8	FBK0503476	25	100	8	0.50
8	FBK0503477	25	100	8	1.00
10	FBK0503478	30	150	10	-
10	FBK0503479	30	150	10	0.50
10	FBK0503480	30	150	10	1.00
12	FBK0503481	30	150	12	-
12	FBK0503482	30	150	12	0.50
12	FBK0503483	30	150	12	1.00

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

Proton Plus Series

HSS TAPS

DIES

END MILLS

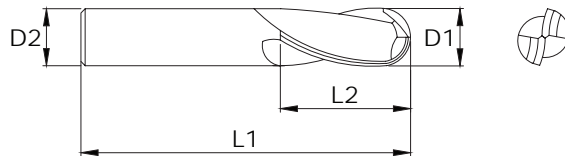
DRILLS

CARBIDE BURRS

CS TAPS

2 Flute

## Centre cutting Proton Plus ball nose end mill



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter Ø D1	EDP No	Flute Length	Overall Length	Shank Diameter
		L2	L1	Ø D2
1	FBK0501561	2	60	4
1.5	FBK0501562	3	60	4
2	FBK0501563	4	60	4
2.5	FBK0501564	4	60	4
3	FBK0501565	5	60	6
4	FBK0501566	6	60	6
5	FBK0501571	4	80	6
6	FBK0501553	10	60	6
8	FBK0501554	16	60	8
10	FBK0501555	19	75	10
12	FBK0501556	22	80	12

\*Custom Solution possible Refer page 261

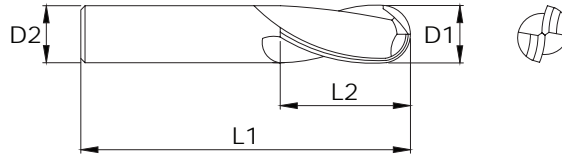


Solid Carbide End Mills

Proton Plus Series

2 Flute

**Centre cutting Proton Plus ball nose end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
1	FBK0501567	2	80	4
2	FBK0501568	3	80	4
3	FBK0501569	4	80	6
4	FBK0501570	4	80	6
6	FBK0501557	10	80	6
6	FBK0503367	12	102	6
8	FBK0503390	16	80	8
8	FBK0501558	16	100	8
10	FBK0501559	19	100	10
12	FBK0501560	22	100	12

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

Proton Plus Series

HSS TAPS

DIES

END MILLS

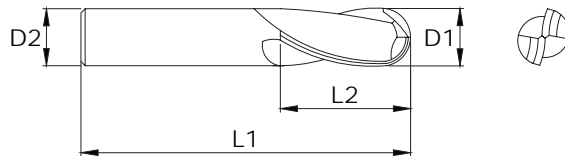
DRILLS

CARBIDE BURRS

CS TAPS

2 Flute

## Centre cutting Proton Plus ball nose end mill



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
6	FBK0503367	12	102	6
8	FBK0501558	16	100	8
10	FBK0503912	32	152	10
12	FBK0503913	32	152	12

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

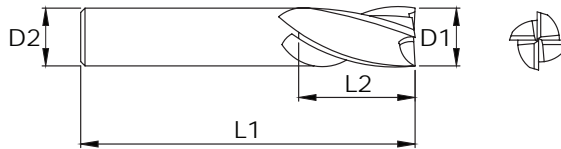
HSM Series

4 Flute

**Centre cutting HSM end mill**



**P2-P4**



Unit : mm

Diameter ØD1	EDP No	Flute Length L2	Overall Length L1	Shank Diameter
				ØD2
3	FBK0501200	12	38	3
4	FBK0501974	14	51	4
5	FBK0501326	20	51	5
6	FBK0501366	20	64	6
8	FBK0501975	20	64	8
10	FBK0500846	25	70	10
12	FBK0500942	25	76	12
14	FBK0501017	30	89	14
16	FBK0501048	30	89	16
20	FBK0501125	38	102	20

\*Custom Solution possible Refer page 261





Solid Carbide End Mills

HSM Series

HSS TAPS

DIES

END MILLS

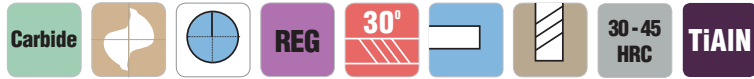
DRILLS

CARBIDE BURRS

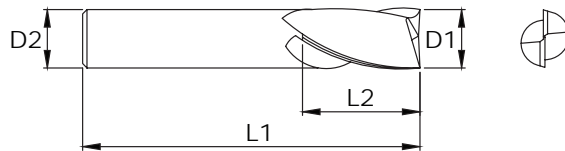
CS TAPS

2 Flute

## Centre cutting HSM end mill



P2-P4



Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0501196	12	38	3
4	FBK0501986	14	51	4
5	FBK0501318	20	51	5
6	FBK0501987	20	64	6
8	FBK0501441	20	64	8
10	FBK0500834	25	70	10
14	FBK0501015	30	89	14
16	FBK0501046	30	89	16
20	FBK0501122	38	102	20

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

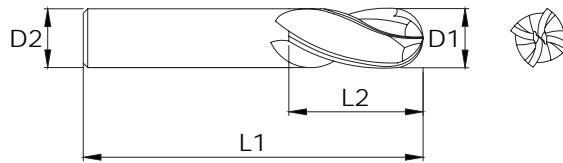
HSM Series

4 Flute

**Centre cutting HSM ball nose end mill**



P2-P4



Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0501198	12	38	3
4	FBK0501980	14	51	4
5	FBK0501322	20	51	5
6	FBK0501361	20	64	6
8	FBK0501448	20	64	8
10	FBK0500838	25	70	10
12	FBK0500937	25	76	12
16	FBK0501047	30	89	16
20	FBK0501981	38	102	20

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

HSM Series

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

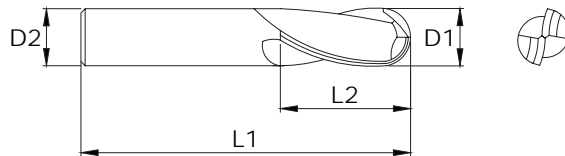
CS TAPS

2 Flute

**Centre cutting HSM ball nose end mill**



P2-P4



Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0501195	12	38	3
4	FBK0501241	14	51	4
5	FBK0501320	20	51	5
6	FBK0501992	20	64	6
8	FBK0501437	20	64	8
10	FBK0501993	25	70	10
12	FBK0501994	25	76	12
16	FBK0501045	30	89	16
20	FBK0501995	38	102	20

\*Custom Solution possible Refer page 261

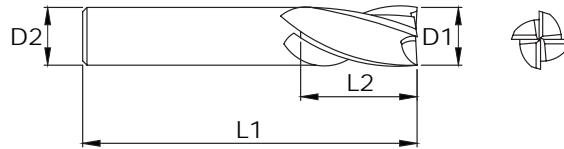


Solid Carbide End Mills

F177 TR Series

4 Flute

Centre cutting high performance end mill



P0-P6

K1-K3

S1-S4

H1-H4

				Unit : mm
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
6	FBK0503484	20	64	6
8	FBK0503485	20	64	8
10	FBK0503422	25	70	10
12	FBK0503487	25	76	12
16	FBK0503489	30	89	16
20	FBK0503490	35	102	20

\*Custom Solution possible Refer page 261

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Solid Carbide End Mills

F179 TR Series

HSS TAPS

DIES

END MILLS

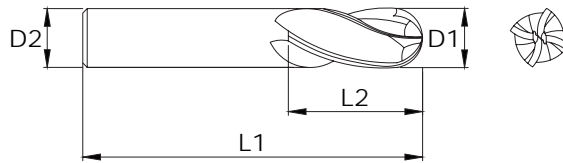
DRILLS

CARBIDE BURRS

CS TAPS

4 Flute

Centre cutting high performance ball nose end mill



P0-P6

K1-K3

S1-S4

H1-H4

				Unit : mm	
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	
Ø D1		L2	L1	Ø D2	
6	FBK0503889	16	64	6	
8	FBK0503890	20	64	8	
10	FBK0503891	20	70	10	
12	FBK0503892	25	76	12	
16	FBK0503893	30	89	16	

\*Custom Solution possible Refer page 261

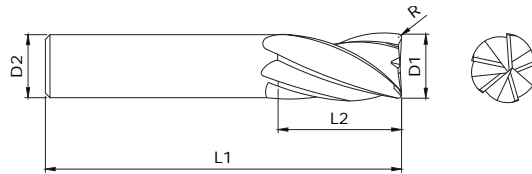


Solid Carbide End Mills

F178 TR Series

5 Flute

Centre cutting high performance end mill



P0-P6

K1-K3

S1-S4

H1-H4

				Unit : mm
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
6	FBK0503491	20	64	6
8	FBK0503492	20	64	8
10	FBK0503493	25	70	10
12	FBK0503494	25	76	12
14	FBK0503495	30	89	14
16	FBK0503496	30	89	16
20	FBK0503497	35	102	20

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

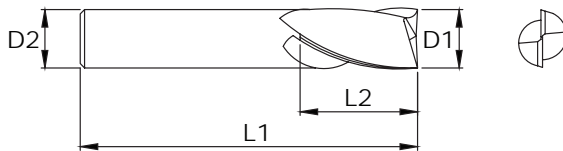
F135 HP Series

2 Flute

**Centre cutting  
high performance end mill**



N1-N4



				Unit : mm
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
4	FBK0501238	14	51	4
5	FBK0501315	20	51	5
6	FBK0501355	20	64	6
8	FBK0503383	20	64	8
10	FBK0500829	20	70	10
12	FBK0503384	20	76	12
14	FBK0503522	30	89	14
16	FBK0501605	30	89	16
20	FBK0501613	30	102	20

\*Custom Solution possible Refer page 261

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Solid Carbide End Mills

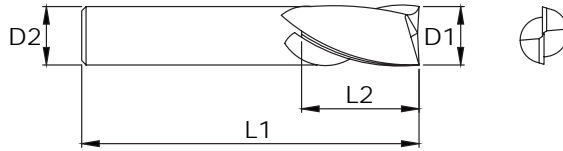
F136 HP Series

2 Flute

Centre cutting high performance end mill



N1-N4



Unit : mm

Diameter	FG Code	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
4	FBK0501239	14	51	4
5	FBK0501316	20	51	5
6	FBK0501356	20	64	6
8	FBK0501618	20	64	8
10	FBK0500830	25	70	10
12	FBK0500930	26	76	12
16	FBK0501606	30	89	16

\*Custom Solution possible Refer page 261

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

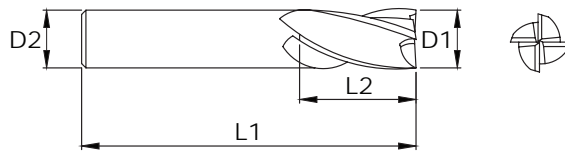
CS TAPS





4 Flute

**Centre cutting regular length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
1	FBK0500003	3	38	3
1.5	FBK0500006	6	38	3
2	FBK0500009	9	38	3
2.5	FBK0500012	12	38	3
3	FBK0500015	12	38	3
3.5	FBK0500017	12	51	4
4	FBK0500020	14	51	4
4.5	FBK0500023	20	51	5
5	FBK0500026	20	51	5
5.5	FBK0500029	20	64	6
6	FBK0500032	20	64	6
7	FBK0500037	20	64	8
8	FBK0500040	20	64	8
9	FBK0500043	20	64	9
10	FBK0500046	25	70	10
11	FBK0500048	25	70	11

\*Custom Solution possible Refer page 261

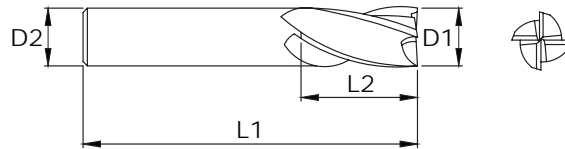


Solid Carbide End Mills

F111 GP Series

4 Flute

**Centre cutting regular length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

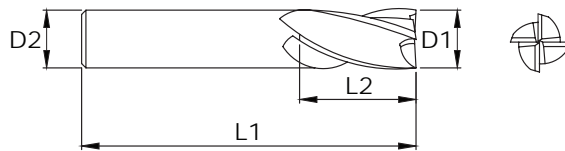
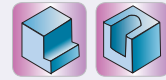
				Unit : mm	
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	
Ø D1		L2	L1	Ø D2	
12	FBK0500051	25	76	12	
14	FBK0500056	30	89	14	
16	FBK0500062	30	89	16	
18	FBK0500065	35	102	18	
20	FBK0500068	38	102	20	
22	FBK0500070	38	102	20	
25	FBK0500072	38	102	25	

\*Custom Solution possible Refer page 261



4 Flute

**Centre cutting stub length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
1	FBK0502014	2	38	3
1.5	FBK0500533	3	38	3
2	FBK0500535	4	38	3
2.5	FBK0500537	5	38	3
3	FBK0500539	6	38	3
4	FBK0500541	8	51	4
5	FBK0500543	11	51	5
6	FBK0500545	13	51	6
8	FBK0500547	13	51	8
10	FBK0500549	14	51	10
12	FBK0500551	16	64	12
14	FBK0500553	18	70	14
16	FBK0500555	20	76	16
20	FBK0500557	25	76	20

\*Custom Solution possible Refer page 261

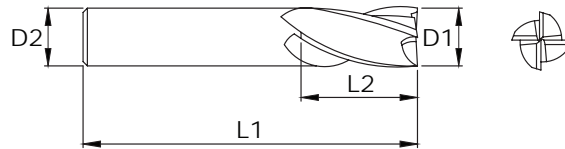


Solid Carbide End Mills

F122 GP Series

4 Flute

**Centre cutting long length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0500336	25	64	3
4	FBK0500339	25	64	4
5	FBK0500342	25	64	5
6	FBK0500345	30	76	6
7	FBK0500347	30	83	8
8	FBK0500350	35	83	8
9	FBK0500352	35	89	10
10	FBK0500355	40	89	10
12	FBK0500360	50	102	12
16	FBK0500365	65	117	16
20	FBK0500368	80	133	20
25	FBK0500370	80	152	25

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

F187 GP Series

HSS TAPS

DIES

END MILLS

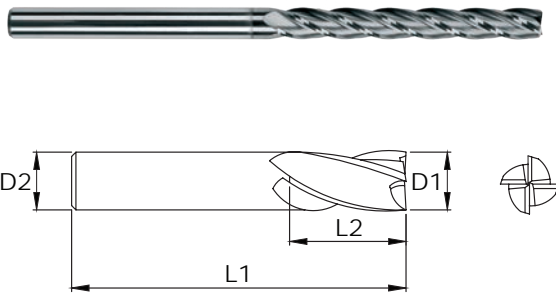
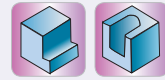
DRILLS

CARBIDE BURRS

CS TAPS

4 Flute

**Centre cutting extra long end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0502681	40	100	3
4	FBK0502682	40	100	4
5	FBK0502683	40	100	5
6	FBK0502684	50	100	6
8	FBK0502685	50	100	8
10	FBK0502686	50	100	10
12	FBK0502687	75	152	12
16	FBK0502688	75	152	16
20	FBK0502689	75	152	20

\*Custom Solution possible Refer page 261

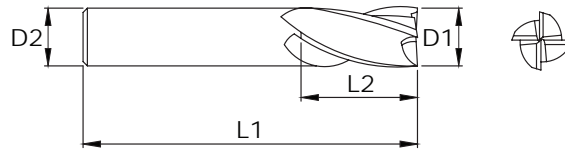


Solid Carbide End Mills

F181 GP Series

4 Flute

**Centre cutting long reach end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0500455	6	60	3
4	FBK0500457	9	76	4
5	FBK0500459	15	76	5
6	FBK0500461	15	76	6
8	FBK0500463	20	101	8
10	FBK0500465	25	101	10
12	FBK0500467	25	152	12
16	FBK0500469	30	152	16
18	FBK0500471	40	152	18
20	FBK0500473	50	152	20

\*Custom Solution possible Refer page 261

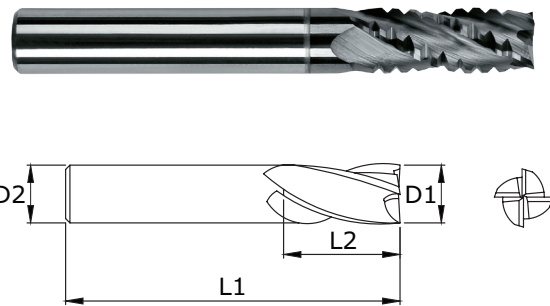


Solid Carbide End Mills

F114 CB GP Series

4 Flute

Centre cutting regular length chip breaker end mill



- P0-P6
- K1-K3
- S1-S4
- H1-H4

Without Coating

				Unit : mm	
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	
Ø D1		L2	L1	Ø D2	
4	FBK0500636	14	51	4	
5	FBK0500637	20	51	5	
6	FBK0500639	20	64	6	
8	FBK0500642	20	64	8	
9	FBK0500644	20	64	9	
10	FBK0500646	25	70	10	
12	FBK0500648	25	76	12	
14	FBK0500650	30	89	14	
16	FBK0500652	30	89	16	
18	FBK0500654	35	102	18	
20	FBK0500655	38	102	20	

With TiAlN Coating

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	
Ø D1		L2	L1	Ø D2	
4	FBK0504095	14	51	4	
5	FBK0500638	20	51	5	
6	FBK0500640	20	64	6	
8	FBK0500643	20	64	8	
9	FBK0500645	20	64	9	
10	FBK0500647	25	70	10	
12	FBK0500649	25	76	12	
14	FBK0500651	30	89	14	
16	FBK0500653	30	89	16	
18	FBK0504096	35	102	18	
20	FBK0503975	38	102	20	

\*Custom Solution possible Refer page 261



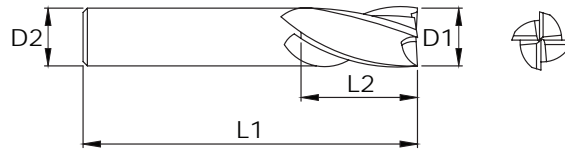


Solid Carbide End Mills

F132CB GP Series

4 Flute

**Centre cutting long length chip breaker end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Without Coating

				Unit : mm
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
6	FBK0500656	30	76	6
8	FBK0500658	35	83	8
10	FBK0500660	40	89	10
12	FBK0500662	50	102	12
16	FBK0500664	65	117	16

With TiAlN Coating

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
6	FBK0500657	30	76	6
8	FBK0500659	35	83	8
10	FBK0500661	40	89	10
12	FBK0500663	50	102	12

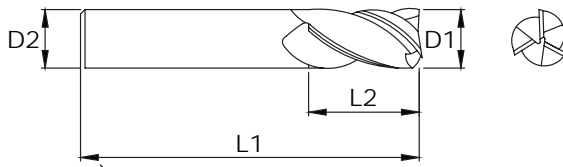
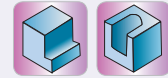
\*Custom Solution possible Refer page 261





3 Flute

**Centre cutting regular length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
1	FBK0500140	3	38	3
1.5	FBK0500143	6	38	3
2	FBK0500146	9	38	3
2.5	FBK0500149	12	38	3
3	FBK0500152	12	38	3
4	FBK0500157	14	51	4
5	FBK0500162	20	51	5
6	FBK0500165	20	63	6
8	FBK0500171	20	63	8
10	FBK0500176	25	70	10
12	FBK0500181	25	76	12
16	FBK0500189	30	89	16
20	FBK0500195	38	102	20
25	FBK0500198	40	102	25

\*Custom Solution possible Refer page 261

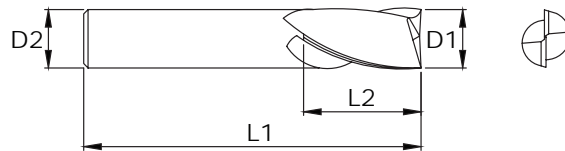


Solid Carbide End Mills

F164 GP Series

2 Flute

**Centre cutting stub length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

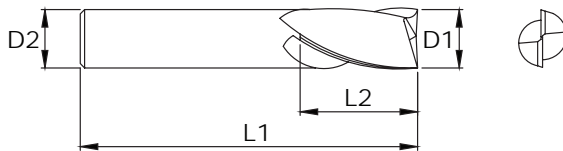
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0500565	6	38	3
4	FBK0500567	8	51	4
5	FBK0500569	11	51	5
6	FBK0500571	13	51	6
8	FBK0500573	13	51	8
10	FBK0500575	14	51	10
12	FBK0500577	16	63	12
16	FBK0500581	20	76	16
20	FBK0500583	25	76	20

\*Custom Solution possible Refer page 261



2 Flute

**Centre cutting regular length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
1	FBK0500075	3	38	3
1.5	FBK0500078	6	38	3
2	FBK0500081	9	38	3
2.5	FBK0500084	12	38	3
3	FBK0500087	12	38	3
4	FBK0500092	14	51	4
5	FBK0500097	20	51	5
6	FBK0500102	20	63	6
8	FBK0500109	20	63	8
10	FBK0500114	25	70	10
12	FBK0500119	25	76	12
16	FBK0500127	30	89	16
20	FBK0500133	38	102	20
25	FBK0500137	40	102	25

\*Custom Solution possible Refer page 261

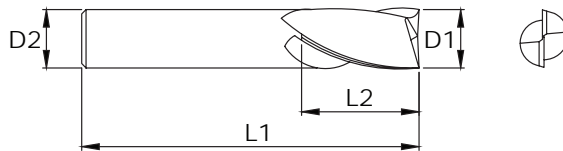


Solid Carbide End Mills

F123 GP Series

2 Flute

**Centre cutting long length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0500372	25	63	3
4	FBK0500375	25	63	4
5	FBK0500378	25	63	5
6	FBK0500380	30	76	6
7	FBK0500382	30	83	8
8	FBK0500385	35	83	8
9	FBK0500387	35	89	10
10	FBK0500390	40	89	10
12	FBK0500393	50	102	12
16	FBK0500396	65	117	16
20	FBK0500398	80	152	20

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

F183 GP Series

HSS TAPS

DIES

END MILLS

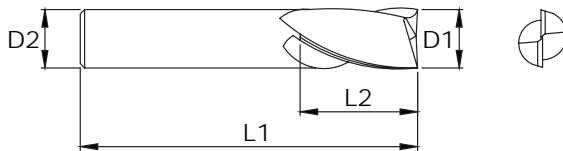
DRILLS

CARBIDE BURRS

CS TAPS

2 Flute

**Centre cutting long reach end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0500475	6	60	3
4	FBK0500477	9	76	4
5	FBK0500479	15	76	5
6	FBK0500481	15	76	6
8	FBK0500483	20	101	8
10	FBK0500485	25	101	10
12	FBK0500487	25	152	12
16	FBK0500489	30	152	16
20	FBK0500491	50	152	20

\*Custom Solution possible Refer page 261

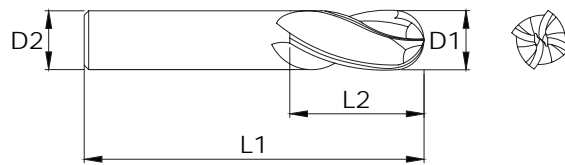


Solid Carbide End Mills

F165 GP Series

4 Flute

**Centre cutting ball nose stub length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBK0500591	6	38	3
4	FBK0500593	8	51	4
5	FBK0500595	11	51	5
6	FBK0500597	13	51	6
8	FBK0500599	13	51	8
10	FBK0500601	14	51	10
12	FBK0500603	16	63	12
16	FBK0500607	20	76	16
20	FBK0500609	25	76	20

\*Custom Solution possible Refer page 261



Solid Carbide End Mills

F140 GP Series

HSS TAPS

DIES

END MILLS

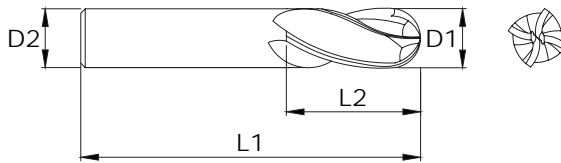
DRILLS

CARBIDE BURRS

CS TAPS

4 Flute

**Centre cutting ball nose regular length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
1	FBK0500201	3	38	3
1.5	FBK0500204	6	38	3
2	FBK0500207	9	38	3
2.5	FBK0500210	12	38	3
3	FBK0500213	12	38	3
4	FBK0500219	14	51	4
5	FBK0500225	20	51	5
6	FBK0500231	20	63	6
8	FBK0500240	20	63	8
10	FBK0500245	25	70	10
12	FBK0500250	25	76	12
16	FBK0500260	30	89	16
20	FBK0500266	38	102	20
25	FBK0500270	40	102	25

\*Custom Solution possible Refer page 261

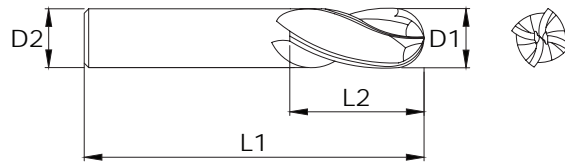


Solid Carbide End Mills

F184 GP Series

4 Flute

**Centre cutting ball nose  
long reach end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
3	FBK0500493	6	60	3
4	FBK0500495	9	76	4
5	FBK0500497	15	76	5
6	FBK0500499	15	76	6
8	FBK0500501	20	101	8
10	FBK0500503	25	101	10
12	FBK0500505	25	152	12
16	FBK0500507	30	152	16
18	FBK0500509	40	152	16
20	FBK0500511	50	152	20

\*Custom Solution possible Refer page 261



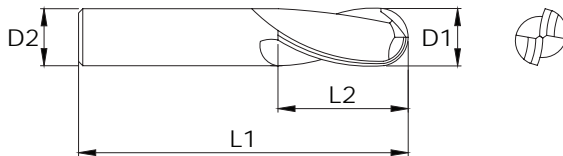


Solid Carbide End Mills

F150 GP Series

2 Flute

**Centre cutting ball nose  
regular length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

				Unit : mm	
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	
Ø D1		L2	L1	Ø D2	
1	FBK0500273	3	38	3	
1.5	FBK0500276	6	38	3	
2	FBK0500279	9	38	3	
2.5	FBK0500282	12	38	3	
3	FBK0500285	12	38	3	
4	FBK0500290	14	51	4	
5	FBK0500295	20	51	5	
6	FBK0500300	20	63	6	
8	FBK0500307	20	63	8	
10	FBK0500312	25	70	10	
12	FBK0500317	25	76	12	
16	FBK0500323	30	89	16	
20	FBK0500329	38	102	20	
25	FBK0500333	40	102	25	

\*Custom Solution possible Refer page 261

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

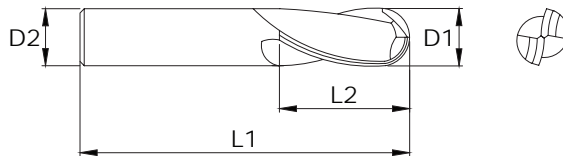


Solid Carbide End Mills

F166 GP Series

2 Flute

**Centre cutting ball nose stub length end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

				Unit : mm
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
3	FBK0500617	6	38	3
4	FBK0500619	8	51	4
5	FBK0500621	11	51	5
6	FBK0500623	13	51	6
8	FBK0500625	13	51	8
10	FBK0500627	14	51	10
12	FBK0500629	16	63	12
16	FBK0500633	20	76	16
20	FBK0500635	25	76	20

\*Custom Solution possible Refer page 261

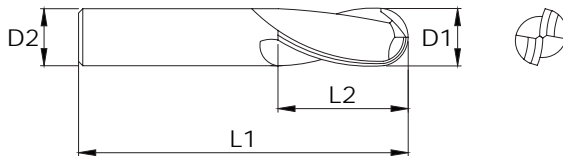


Solid Carbide End Mills

F186 GP Series

2 Flute

**Centre cutting ball nose  
long reach end mill**



P0-P6

K1-K3

S1-S4

H1-H4

N1-N6

				Unit : mm	
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	
ØD1		L2	L1	ØD2	
3	FBK0500513	6	60	3	
4	FBK0500515	9	76	4	
5	FBK0500517	15	76	5	
6	FBK0500519	15	101	6	
8	FBK0500521	20	101	8	
10	FBK0500523	25	152	10	
12	FBK0500525	25	152	12	
16	FBK0500527	30	152	16	
18	FBK0500529	40	152	18	
20	FBK0500531	50	152	20	

\*Custom Solution possible Refer page 261

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

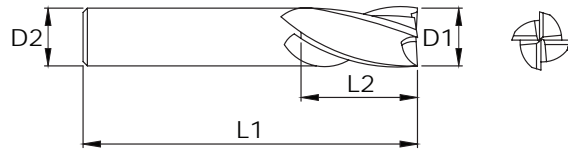
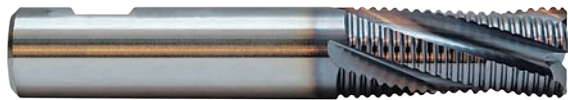


Solid Carbide End Mills

F192 Series

4 Flute

**Sinusoidal regular length  
chip breaker end mill**



P0-P6

K1-K3

S1-S4

H1-H4

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
8	FBK0504087	8	51	8
8	FBK0504029	16	64	8
10	FBK0504088	10	51	10
10	FBK0504089	20	70	10
12	FBK0504090	12	64	12
12	FBK0504091	25	76	12
16	FBK0504092	16	76	16
16	FBK0503359	35	89	16
20	FBK0504093	20	76	20
20	FBK0504094	38	102	20

# 8 mm available in 3 flute

\*Custom Solution possible Refer page 261

# END MILLS

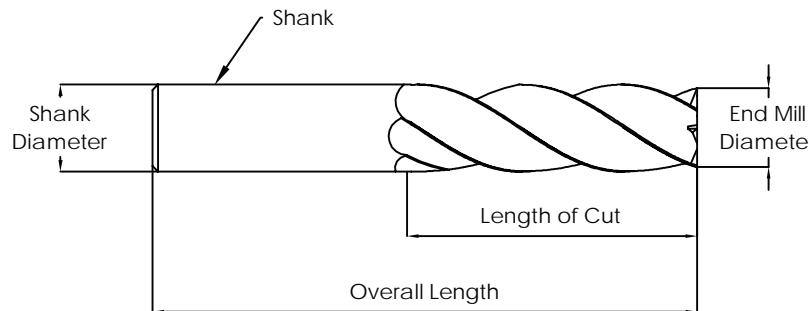


High Performance Cutting Tools



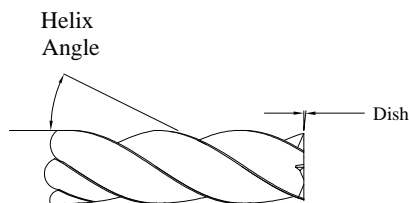
## TECHNICAL DETAILS

## END MILL NOMENCLATURE



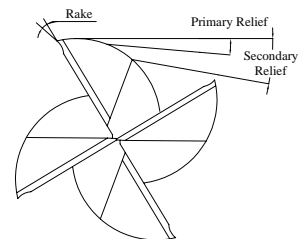
**Length of Cut (Flute Length)** – Always select the shortest Flute Length possible for your application. By selecting the shortest Flute Length, you can increase rigidity and allow for higher feed rates.

**End Mill Diameter** – Always select the largest diameter possible for your milling operation. Increasing your diameter by just 10%, can increase your rigidity by 25%.

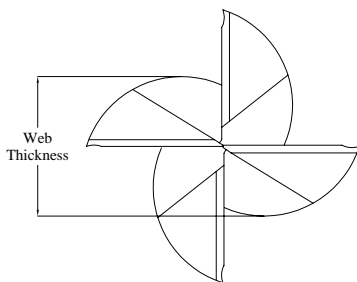


**Helix Angle** – Varies from 0 to 60 degrees. Higher helix angles can increase the number of teeth in a cut, and help in redirecting cutting forces. This is beneficial in harder to machine materials in particular. Changes in helix angle can also greatly affect the flute form of an end mill, and affect chip evacuation.

**Rake Angle** – The measurement of the curvature of the cutting edge in the face of the flute. A high rake angle will cut more aggressively and make the cutting action smoother, while a lower rake angle will increase the strength of the cutting edge.



**Primary & Secondary Relief** – The clearance directly behind the cutting edge. High primary relief angles will allow for more aggressive milling, while lower relief angles will increase the strength of the cutting edge. The primary relief will also affect the wear on a cutting edge. Lower primary relief angles can tend to develop larger wear lands.



**Web Thickness** – The cross section of the fluting of the end mill. Larger webs allow for more rigidity, while smaller webs allow for better chip evacuation. This feature is highly dependent on the material being machined.



## HOW TO REDUCE VIBRATION & CHATTER IN END MILLING

When chatter occurs, it can be self-sustaining until the problem is corrected. Chatter causes poor finish on the part, and will damage and significantly reduce the life of end mills. Carbide end mills are particularly susceptible to damage.

Typical methods to reduce chatter include reducing cutting forces by:

1. Reducing the number of flutes in cut.
2. Decreasing the chipload per tooth by reducing the feed or increasing the speed or RPM.
3. Reducing the axial or radial depth of cut.

Though these steps will reduce the chatter, slowing down the cutting process is not always the best course of action, and reducing the chipload can be detrimental to the cutter.

It is better to first improve rigidity and stability:

1. Use a larger end mill with a larger core diameter.
2. Use end mills with reduced clearance or a small circular margin.
3. Use the shortest overhang from spindle nose to tip of tool.
4. Use stub length end mills where possible.
5. Use balanced tool holders.
6. Rework fixture to hold the workpiece more securely.
7. Reprogram the cutter path to shift cutting forces into stiffer portions of the workpiece.
8. Look for ways to improve spindle speeds then adjust feed accordingly.

Chatter is common when machining corners. As the end mill enters the corner, the percentage of engagement increases the number of teeth in the cut. This drastically increases the cutting forces, causing chatter.

To reduce chatter when machining corners, consider using circular interpolation to produce a bigger corner radius than indicated by the part print. Then remove the remaining stock with a smaller end mill using circular interpretation.

### Reducing Chatter in End Milling

Chatter in the form of vibration and noise is a frequent challenge when end milling. It can cause scalloping and uneven finishes.

To reduce chatter, try the following:

1. Ensure that the starting places for speeds and feeds are correct for the workpiece material and the cut.
2. Decrease the feed, or chipload per tooth/tool.
3. Make the workpiece as secure and rigid as possible.

4. Reduce excess overhang between the workpiece and spindle.
5. Select an end mill with less flutes.
6. Check the tool run-out.
7. Review the tool geometry to ensure the cutting face, relief, fluting and helix angle are appropriate for the workpiece material.
8. If conventional, try climb milling.

### End Mill Accuracy and Deflection

Because end mills are supported only at the shank end, they are subject to deflection, which can reduce the accuracy of the milled part. Several factors affect the amount of deflection that will occur.

1. Overall Length and Length of Cut: As the length of the mill increases, difficulty in maintaining dimensional accuracy also increases. Rigidity decreases in proportion to length of cut to the 3rd power. Thus, a 4th length of cut is 1/8 as rigid as a 2" length of cut. A regular length end mill cutting 7075 aluminum can deflect <.002", while an extra long end mill can deflect >.006".
2. End Mill Diameter: Rigidity increases in proportion to diameter to the 4th power. A 1" – diameter end mill is 16 times more rigid than a 1/2" end mill. A 1" – diameter end mill over a 5/8" length of cut in 1040 steel will cut to size, while a 3/8" – diameter end mill may deflect to >.003".
3. End Mill Material Composition: Solid carbide is about three times more rigid and resistant to deflection than high-speed steel end mills, but not as tough.
4. Radial Depth of Cut and Axial Length of Cut: Heavy radical cuts as well as long axial lengths of cuts will deflect the end mill much more. A light-finishing pass is generally required to produce accurate parallel cuts.

### Tips:

- Always use the shortest tool possible.
- Shorter tools can reduce chatter.
- Increase coolant.
- Try left-hand spiral end mills.
- Try using higher helix end mills.
- Increase overall system rigidity.
- Reduce overhang.
- Conventional milling can resist deflection better than climb milling.
- Dull tools deflect more than sharp tools.



## CUTTING SPEED & FEED RATE CHART

### Series Proton Plus

Parameters for Endmill 2 flute and 4 flute Proton plus						
Tool Diameter	For 45 to 55 HRC		For 56 to 68 HRC		DOC in mm	
	Vc = 120 m/min.		Vc = 150 m/min			
	RPM	Feed	RPM	Feed		
mm		mm/min		mm/min	Axial	Radial
1.5	25455	1714	31819	1650	0.06	0.15
2	23864	1650	28637	1747	0.08	0.2
3	15910	1739	19091	1669	0.12	0.3
4	11932	1820	14319	1674	0.16	0.4
5	9546	1577	11455	1689	0.2	0.5
6	7955	1735	9546	1683	0.24	0.6
8	5966	1622	7160	1575	0.32	0.8
10	4773	1562	5728	1516	0.4	1
12	3978	1735	4773	1683	0.48	1.2

### Series Proton Plus Ball Nose

Parameters for Ball nose endmill 2 flute and 4 flute Proton plus						
Tool Diameter	For 45 to 55 HRC		For 56 to 68 HRC		DOC in mm	
	Vc = 150 m/min.		Vc = 180 m/min			
	RPM	Feed	RPM	Feed		
mm		mm/min		mm/min	Axial	Radial
1.5	31819	1714	38182	1650	0.06	0.15
2	23864	1650	28637	1747	0.08	0.2
3	15910	1739	19091	1669	0.12	0.3
4	11932	1820	14319	1674	0.16	0.4
5	9546	1577	11455	1689	0.2	0.5
6	7955	1735	9546	1683	0.24	0.6
8	5966	1622	7160	1575	0.32	0.8
10	4773	1562	5728	1516	0.4	1
12	3978	1735	4773	1683	0.48	1.2

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions.

Considering requirements of customer parameters may be decreased or increased.

If less than minimum Axial or Radial DOC values are used, increased feed rates are possible.

If greater than maximum Axial or Radial DOC values are used, decreased feed rates may be needed.

WARNING: Cutting tools may shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment in the vicinity of use.





## CUTTING SPEED & FEED RATE CHART

### Series HSM

Parameters for Endmill 2 flute and 4 flute HSM						
Tool Diameter	For 35 to 45 HRC		For 35 to 45 HRC		Max DOC in mm	
	Min Vc 60 m/min		Max Vc 75 m/min			
	RPM	Feed m/min	RPM	Feed m/min	Axial	Radial
mm						
3	6369	102	7961	207	0.3	1.5
4	4777	95	5971	238	0.4	2
5	3821	99	4777	363	0.5	2.5
6	3184	82	3980	302	0.6	3
8	2388	119	2985	304	0.8	4
10	1910	95	2388	243	1	5
12	1592	79	1990	302	1.2	6
16	1194	121	1492	226	1.6	8
20	955	122	1194	212	2	10

### Series HSM Ball Nose

Parameters for Ball nose endmill 2 flute and 4 flute HSM						
Tool Diameter	For 35 to 45 HRC		For 35 to 45 HRC		Max DOC in mm	
	Min Vc 60 m/min		Max Vc 75 m/min			
	RPM	Feed m/min	RPM	Feed m/min	Axial	Radial
mm						
3	6369	102	7961	207	0.3	1.5
4	4777	95	5971	238	0.4	2
5	3821	99	4777	363	0.5	2.5
6	3184	82	3980	302	0.6	3
8	2388	119	2985	304	0.8	4
10	1910	95	2388	243	1	5
12	1592	79	1990	302	1.2	6
16	1194	121	1492	226	1.6	8
20	955	122	1194	212	2	10

All posted speed and feed parameters are suggested starting values that may be increased given optimal setup conditions.

If less than minimum Axial or Radial DOC values are used, increased feed rates are possible.

If greater than maximum Axial or Radial DOC values are used, decreased feed rates may be needed.

WARNING: Cutting tools may shatter under improper use. Government regulations require use of safety glasses and other appropriate safety equipment in the vicinity of use.



## CUTTING SPEED CHART

### Series F114/F132 INCH

Workpiece Material Group		Example	SFM
Steels	P	Steel - Mild (.2 - .3 Carbon) 1018	340 - 500
		Steel - Mild (.4 - .5 Carbon) 4140	250 - 300
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	125 - 250
Cast Iron	K	Iron Cast (Soft)	450 - 600
		Iron - Cast (Medium Hard)	300 - 400
		Iron (Hard Chilled)	250 - 300
		Iron (Malleable)	225 - 300
Stainless Steels	M	Stainless Free Machining	200 - 300
		Austenitic Stainless 304/316	180 - 225
		Ferritic	200 - 275
		Martensitic	150 - 200
Special Alloys	S	PH Stainless 17-4 PH	125 - 200
		Titanium 6AL-4V	175 - 375
		Cobalt-Based Alloys Stellite	80 - 125
		Nickel-Based Alloys Inconel 625/718	80 - 125
Hardened Steels	H	Iron-Based Alloys Incoloy 800-802	80 - 125
		Hardened Steels 35-45 Rc	200 - 250
		Hardened Steels 45-55 Rc	150 - 200

#RPM = SMM x 318.057/Tool Dia.

#IPM = RPM/number of teeth x (inch/tooth)

## FEED RATE CHART

### Series F114/F132 INCH

Workpiece Material Group	Example	Tool Diameter (inch)									
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
		Inch/Tooth									
Steels	P	Steel - Mild (.2-.3 Carbon) 1018	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Steel - Mild (.4-.5 Carbon) 4140	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
Cast Iron	K	Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
		Iron Cast (Soft)	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Iron - Cast (Medium Hard) Iron (Hard Chilled) Iron (Malleable)	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
Stainless Steel	M	Stainless Steel Free Machining	.0005 - .0008	.0010 - .0012	.0012 - .0015	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Ferritic	.0005 - .0008	.0010 - .0012	.0012 - .0015	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Austenitic Stainless 304/316	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
		Martensitic PH Stainless 17-4 PH	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
Special Alloys	S	Titanium 6AL-4V	.0003 - .0004	.0004 - .0006	.0006 - .0008	.0008 - .0012	.0008 - .0012	.0012 - .0016	.0016 - .0018	.0018 - .0020	.0020 - .0030
		Stellite Inconel 625/718 Incoloy 800-802	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
Hardened Steels	H	Hardened Steels 35-45 Rc	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
		Hardened Steels 45-55 Rc	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
		Hardened Steels 55-65 Rc	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035

\*For TiAlN Coated Tool Increase RPM by 20% and Feed by 10%

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## CUTTING SPEED CHART

### Series F114/F132 METRIC

Workpiece Material Group		Example	Vc
Steels	P	Steel - Mild (.2 - .3 Carbon) 1018	135 - 150
		Steel - Mild (.4 - .5 Carbon) 4140	75 - 90
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	40 - 75
Cast Iron	K	Iron Cast (Soft)	135 - 185
		Iron - Cast (Medium Hard)	90 - 120
		Iron (Hard Chilled)	75 - 90
		Iron (Malleable)	70 - 90
Stainless Steels	M	Stainless Free Machining	60 - 90
		Austenitic Stainless 304/316	55 - 70
		Ferritic	60 - 85
		Martensitic	45 - 60
Special Alloys	S	PH Stainless 17-4 PH	40 - 60
		Titanium 6AL-4V	55 - 115
		Cobalt-Based Alloys Stellite	25 - 40
		Nickel-Based Alloys Inconel 625/718	25 - 40
Hardened Steels	H	Iron-Based Alloys Incoloy Incoloy 625/718	25 - 40
		Hardened Steels 35-45 Rc	60 - 75
		Hardened Steels 45-55 Rc	45 - 60

#RPM = SMM x 318.057/Tool Dia.

#mm/min = RPM x number of teeth x mm/tooth

## FEED RATE CHART

### Series F114/F132 METRIC

Workpiece Material Group	Example	Tool Diameter (mm)									
		3	5	6	8	10	14	16	18	25	
		mm/Tooth									
Steels	P	Steel - Mild (.2-.3 Carbon) 1018 Steel - Mild (.4-.5 Carbon) 4140	.013 - .020	.025 - .30	.038 - .051	.038 - .064	.053 - .076	.056 - .076	.058 - .102	.056 - .109	0.081 - .127
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.060 - .081	.060 - .081
Cast Iron	K	Iron Cast (Soft) Iron - Cast(Medium Hard) Iron (Hard Chilled) Iron (Malleable)	.013 - .020	.020 - .025	.038 - .051	.038 - .064	.053 - .076	.056 - .076	.058 - .102	.056 - .109	.081 - .127
		Stainless Steel Free Machining Ferritic	.013 - .020	.020 - .025	.038 - .051	.038 - .064	.053 - .076	.056 - .076	.058 - .102	.056 - .109	.081 - .127
Stainless Steel	M	Austenitic Stainless 304/316 Martensitic PH Stainless 17-4 PH	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.060 - .081	.060 - .081
		Titanium 6AL-4V	.008 - .010	.010 - .015	.015 - .020	.020 - .030	.020 - .030	.030 - .041	.041 - .046	.046 - .051	.051 - .076
Special Alloys	S	Stellite Inconel 625/718 Incoloy 800-802	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.060 - .081	.060 - .081
		Hardened Steels 35-45 Rc Hardened Steels 45-55 Rc Hardened Steels 55-65 Rc	.008 - .013	.013 - .038	.013 - .038	.025 - .051	.025 - .051	.025 - .076	.051 - .076	.064 - .089	.064 - .089

\*For TiAlN Coated Tool Increase RPM by 20% and Feed by 10%

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## CUTTING SPEED CHART

### Series F135 INCH

Workpiece Material Group	Example	Coolant	Slotting				Small Radial Depth ==> Large Radial Depth			
			1 x Diameter Axial Depth							
			Profile Milling							
			Max	25% Axial	50% Axial	100% Axial	25% Dia.	50% Dia.	100% Dia.	
			SFM							
Non-Ferrous	N	Aluminium < 10% Si	•	1000-2000			2000	1625	1000	
		Aluminium > 10% Si	•	800-1500			1500	1230	800	
		Brass	•	500-900			900	750	500	
		Plastic	•	800-1200			1200	1050	800	

## FEED RATE CHART

### Series F135 INCH

Workpiece Material Group	Example	Milling Type	Tool Diameter (inch)									
			1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
			Inch/Tooth									
Non-Ferrous	N	Aluminium / Aluminium Alloys < 10% Si	Slotting	0.0012	0.0018	0.0025	0.0032	0.0037	0.0005	0.0065	0.0075	0.01
		Aluminium / Aluminium Alloys > 10% Si Brass Plastics	Profile Milling	0.003 - 0.004	0.004 - 0.006	0.004 - 0.008	0.006 - 0.009	0.007 - 0.012	0.010 - 0.045	0.015 - 0.04	0.015 - 0.04	0.015 - 0.04

### Above 20,000 RPM, Tool Balancing Is Required

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = IPM (inch/min)

### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$



## CUTTING SPEED CHART

### Series F135 METRIC

Workpiece Material Group	Example	Coolant	Slotting			Small Radial Depth ==> Large Radial Depth			
						1 x Diameter Axial Depth			
		Max	25% Axial	50% Axial	100% Axial	25% Dia.	50% Dia.	100% Dia.	
									Profile Milling
Type	Vc (m/min)								
Non-Ferrous	N	Aluminium < 10% Si	•	305 - 610			610	495	305
		Aluminium > 10% Si	•	245 - 460			460	375	245
		Brass	•	150 - 275			900	230	155
		Plastic	•	245 - 365			365	320	245

## FEED RATE CHART

### Series F135 METRIC

Workpiece Material Group	Example	Milling Type	Tool Diameter (mm)									
			1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
			mm/Tooth									
Non-Ferrous	N	Aluminium / Aluminium Alloys < 10% Si	Slotting	0.03	0.046	0.064	0.081	0.094	0.127	0.165	0.191	0.254
		Aluminium / Aluminium Alloys > 10% Si Brass Plastics	Profile Milling	.076 - 0.102	.102 - 0.152	.102 - 0.203	.152 - 0.229	.178 - 0.305	0.254 - 1.143	.381 - 1.1016	.381 - 1.1016	.381 - 1.1016

### Above 20,000 RPM, Tool Balancing Is Required

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

#### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = mm/min

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

#### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$



## CUTTING SPEED CHART

### Series F136 INCH

Workpiece Material Group	Example	Coolant	Slotting			Small Radial Depth ==> Large Radial Depth			
			1 x Diameter Axial Depth						
		Profile Milling							
		Max	25% Axial	50% Axial	100% Axial	25% Dia.	50% Dia.	100% Dia.	
		Type	SFM						
Non-Ferrous	N	Aluminium < 10% Si	•	1400-2000			2000	1775	1400
		Aluminium > 10% Si	•	1000-1500			1500	1310	1000
		Brass	•	500-900			900	750	500
		Plastic	•	800-1200			1200	1050	800

## FEED RATE CHART

### Series F136 INCH

Workpiece Material Group	Example	Milling Type	Tool Diameter (inch)									
			1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
			Inch/Tooth									
Non-Ferrous	N	Aluminium / Aluminium Alloys < 10% Si	Slotting	0.0012	0.0018	0.0025	0.0032	0.0037	0.0005	0.0065	0.0075	0.01
		Aluminium / Aluminium Alloys > 10% Si Brass Plastics	Profile Milling	0.0024	0.0036	0.005	0.0064	0.0074	0.01	0.012	0.014	0.02

### Above 20,000 RPM, Tool Balancing Is Required

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = IPM (inch/min)

### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$



## CUTTING SPEED CHART

### Series F136 METRIC

Workpiece Material Group	Example	Coolant	Slotting					Small Radial Depth ==> Large Radial Depth		
			1 x Diameter Axial Depth							
			Profile Milling							
			Max	25% Axial	50% Axial	100% Axial	25% Dia.	50% Dia.	100% Dia.	
Type	Vc									
Non-Ferrous	N	Aluminium < 10% Si	•	425-610			610	540	425	
		Aluminium > 10% Si	•	305-460			460	400	305	
		Brass	•	150-275			275	230	150	
		Plastic	•	245-365			365	320	245	

## FEED RATE CHART

### Series F136 METRIC

Workpiece Material Group	Example	Milling Type	Tool Diameter (mm)									
			3	5	6	8	10	14	16	18	25	
			mm/Tooth									
Non-Ferrous	N	Aluminium / Aluminium Alloys < 10% Si	Slotting	0.03	0.046	0.064	0.081	0.094	0.127	0.165	0.191	0.254
		Aluminium / Aluminium Alloys > 10% Si Brass Plastics	Profile Milling	0.061	0.091	0.127	0.163	0.188	0.254	0.305	0.356	0.508

### Above 20,000 RPM, Tool Balancing Is Required

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

#### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = mm/min

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

#### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$



## CUTTING SPEED CHART

### Series F177/F179 INCH

Workpiece Material Group	Example	Coolant			Slotting		1 x Diameter Axial Depth							
		Max	Air	MMS	25% Axial	50% Axial	Small Radial Depth Profiling > Largest Radial Depth							
							1% of Dia	5% of Dia	10% of Dia	15% of Dia	20% of Dia	30% of Dia	50% of Dia	
		Type			SFM									
Steels	P	Free Machining	•	•	•	500	500	2400	2250	2050	1850	1660	1260	500
		Low Carbon	•	•	•	500	500	2400	2250	2050	1850	1660	1260	500
		Medium Carbon	•	•	•	300	300	1100	1030	950	875	790	620	300
		Alloys Steels	•	•	•	250	250	500	480	450	430	400	350	250
		High Strength Alloys	•	•	•	250	250	500	480	450	430	400	350	250
		Structural Steels	•	•	•	500	500	2400	2250	2050	1850	1660	1260	500
Stainless Steels	M	Die/Tool Steels	•	•	•	200	200	400	390	380	370	360	300	200
		Free Machining	•	X	o	300	300	500	485	460	450	430	380	300
		Moderate Stainless	•	X	o	250	250	500	390	380	370	360	320	250
		Difficult Stainless	•	X	o	200	200	350	330	320	300	295	260	200
		PH Stainless	•	X	o	125	125	250	245	240	235	230	195	125
		Cobalt Chrome Alloys	•	X	o	150	150	250	245	230	225	215	190	150
		Duplex (22%)	•	X	o	125	125	250	245	230	225	215	185	125
Special Alloys	S	Super Duplex (25%)	•	X	o	100	100	200	195	180	180	170	140	100
		High Temp Alloys	•	X	X	150	150	250	240	220	215	200	180	150
Cast Iron	K	Titanium Alloys	•	X	X	175	175	425	400	380	350	325	275	175
		Gray Cast Iron	•	o	o	400	400	1500	1420	1315	1210	1100	860	400
		SG Iron	•	o	o	350	350	1200	1130	1050	980	900	710	350
		Ductile Cast Iron	•	o	o	300	300	500	485	460	450	430	380	300
		Malleable Iron	•	o	o	300	300	400	385	375	360	345	330	300

• Preferred	o Possible	X Not Possible
-------------	------------	----------------

If axial depth is less than the ball diameter, the speed is figured using the effective cutting diameter.

## FEED RATE CHART

### Series F177/F179 INCH

Workpiece Material Group	Example	Tool Diameter										
		1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
		Inch/Tooth										
Steels	P	Free Machining, Low Carbon, Medium Carbon, Alloys Steels, High Strength Alloys, Structural Steels, Die/Tool Steels	0.0002	0.0004	0.0007	.0010 - .0016	.0013 - .0021	.0016 - .0026	.0020 - .0031	.0026 - .0033	.0031 - .0035	.0035 - .0051
Stainless Steels	M	Free Machining, Moderate Stainless, Difficult Stainless, PH Stainless, Cobalt Chrome Alloys, Duplex (22%), Super Duplex (25%)	0.0002	0.0004	0.0007	.0010 - .0016	.0012 - .0021	.0012 - .0026	.0020 - .0031	.0020 - .0033	.0022 - .0035	.0024 - .0039
Special Alloys	S	High Temp Alloys, Titanium Alloys	0.0001	0.0002	0.0008	.0005 - .0008	.0007 - .0011	-.0013	.0010 - .0016	.0010 - .0016	.0011 - .0018	.0012 - .0020
Cast Iron	K	Gray Cast Iron, SG Iron, Ductile Cast Iron, Malleable Iron	0.0002	0.0004	0.0007	.0007 - .0016	.0010 - .0022	.0015 - .0028	.0018 - .0033	.0024 - .0035	.0028 - .0039	.0024 - .0050

#### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = IPM (Inches per Minute)

#### Example: Slotting

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per chart
- 4) Multiply Feed per tooth x Number of teeth x RPM
- 5) Answer: IPM (Inches Per Minute)

**Spindle Max.**  
Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:  
$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.





## CUTTING SPEED CHART

Series F177/F179 METRIC

Workpiece Material Group	Example	Coolant			Slotting		1 x Diameter Axial Depth							
		Max	Air	MIST	25% Axial	50% Axial	Small Radial Depth Profiling > Largest Radial Depth							
							1% of Dia	5% of Dia	10% of Dia	15% of Dia	20% of Dia	30% of Dia	50% of Dia	
		Type			Vc (m/min)									
Steels	P	Free Machining	•	•	•	150	150	730	685	620	565	500	380	150
		Low Carbon	•	•	•	150	150	730	685	620	565	500	380	150
		Medium Carbon	•	•	•	90	90	335	310	290	260	240	180	90
		Alloys Steels	•	•	•	75	75	150	140	130	130	120	105	75
		High Strength Alloys	•	•	•	75	75	150	140	130	130	120	105	75
		Structural Steels	•	•	•	150	150	730	685	620	565	500	380	150
Stainless Steels	M	Free Machining	•	X	o	90	90	150	145	140	130	130	115	90
		Moderate Stainless	•	X	o	75	75	150	115	115	105	105	95	75
		Difficult Stainless	•	X	o	60	60	105	100	95	90	90	75	60
		PH Stainless	•	X	o	40	40	75	75	75	70	70	60	40
		Cobalt Chrome Alloys	•	X	o	45	45	75	75	75	70	70	60	45
		Duplex (22%)	•	X	o	40	40	75	75	75	70	70	60	40
Special Alloys	S	Super Duplex (25%)	•	X	o	30	30	60	60	55	55	50	45	30
		High Temp Alloys	•	X	X	45	45	75	75	75	70	60	55	45
Cast Iron	K	Titanium Alloys	•	X	X	55	55	125	120	115	105	100	80	55
		Gray Cast Iron	•	o	o	120	120	450	430	400	360	335	250	120
		SG Iron	•	o	o	105	105	365	345	320	295	275	215	105
		Ductile Cast Iron	•	o	o	90	90	150	145	140	130	130	115	90
		Malleable Iron	•	o	o	90	90	120	115	110	105	105	100	90

• Preferred	X Possible	o Not Possible
-------------	------------	----------------

If axial depth is less than the ball diameter, the speed is figured using the effective cutting diameter.

## FEED RATE CHART

Series F177/F179 METRIC

Workpiece Material Group	Example	Tool Diameter (mm)										
		1	3	4	6	8	10	12	16	18	25	
		mm/Tooth										
Steels	P	Free Machining, Low Carbon, Medium Carbon, Alloys Steels, High Strength Alloys, Structural Steels, Die/Tool Steels	0.005	0.01	0.017	.025 - .040	.033 - .053	0.04	0.066	.066 - .083	.078 - .088	.088 - .129
Stainless Steels	M	Free Machining, Moderate Stainless, Difficult Stainless, PH Stainless, Cobalt Chrome Alloys, Duplex (22%), Super Duplex (25%)	0.005	0.01	0.017	.025 - .040	.033 - .053	0.04	0.066	.066 - .083	.078 - .088	.088 - .129
Special Alloys	S	High Temp Alloys, Titanium Alloys	0.002	0.005	0.02	.012 - .020	.017 - .027	.017 - .033	.025 - .040	.025 - .043	.027 - .045	.030 - .050
Cast Iron	K	Gray Cast Iron, SG Iron, Ductile Cast Iron, Malleable Iron	0.005	0.01	0.017	.017 - .040	.025 - .055	.038 - .071	.045 - .083	.060 - .088	.071 - .099	.060 - .127

### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = mm/min (millimetres per minute)

### Example: Slotting

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per chart
- 4) Multiply Feed per tooth x Number of teeth x RPM
- 5) Answer: mm/min (Millimetres Per Minute)

### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## CUTTING SPEED CHART

Series F178 INCH

Workpiece Material Group	Example	Coolant			1 x Diameter Axial Depth							
		Max	Air	MMS	Small Radial Depth Profiling > Largest Radial Depth							
					1% of Dia	5% of Dia	10% of Dia	15% of Dia	20% of Dia	30% of Dia	50% of Dia	
Type			SFM									
Steels	P	Free Machining	•	•	•	2400	2250	2050	1850	1660	1260	500
		Low Carbon	•	•	•	2400	2250	2050	1850	1660	1260	500
		Medium Carbon	•	•	•	1100	1030	950	875	790	620	300
		Alloys Steels	•	•	•	500	480	450	430	400	350	250
		High Strength Alloys	•	•	•	500	480	450	430	400	350	250
		Structural Steels	•	•	•	2400	2250	2050	1850	1660	1260	500
Stainless Steels	M	Die/Tool Steels	•	•	•	400	390	380	370	360	300	200
		Free Machining	•	X	o	500	485	460	450	430	380	300
		Moderate Stainless	•	X	o	500	390	380	370	360	320	250
		Difficult Stainless	•	X	o	350	330	320	300	295	260	200
		PH Stainless	•	X	o	250	245	240	235	230	195	125
		Cobalt Chrome Alloys	•	X	o	250	245	230	225	215	190	150
Special Alloys	S	Duplex (22%)	•	X	o	250	245	230	225	215	185	125
		Super Duplex (25%)	•	X	o	200	195	180	180	170	140	100
		High Temp Alloys	•	X	X	250	240	220	215	200	180	150
Cast Iron	K	Titanium Alloys	•	X	X	425	400	380	350	325	275	175
		Gray Cast Iron	•	o	o	1500	1420	1315	1210	1100	860	400
		SG Iron	•	o	o	1200	1130	1050	980	900	710	350
		Ductile Cast Iron	•	o	o	500	485	460	450	430	380	300
		Malleable Iron	•	o	o	400	385	375	360	345	330	300

• Preferred	X Possible	o Not Possible
-------------	------------	----------------

If axial depth is less than the ball diameter, the speed is figured using the effective cutting diameter.

## FEED RATE CHART

Series F178 INCH

Workpiece Material Group	Example	Tool Diameter (inches)										
		1/16	1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
		Inch/Tooth										
Steels	P	Free Machining, Low Carbon, Medium Carbon, Alloys Steels, High Strength Alloys, Structural Steels, Die/Tool Steels	0.0002	0.0004	0.0007	.0010 - .0016	.0013 - .0021	.0016 - .0026	.0020 - .0031	.0026 - .0033	.0031 - .0035	.0035 - .0051
Stainless Steels	M	Free Machining, Moderate Stainless, Difficult Stainless, PH Stainless, Cobalt Chrome Alloys, Duplex (22%), Super Duplex (25%)	0.0002	0.0004	0.0007	.0010 - .0016	.0012 - .0021	.0012 - .0026	.0020 - .0031	.0020 - .0033	.0022 - .0035	.0024 - .0039
Special Alloys	S	High Temp Alloys, Titanium Alloys	0.0001	0.0002	0.0008	.0005 - .0008	.0007 - .0011	-.0013	.0010 - .0016	.0010 - .0016	.0011 - .0018	.0012 - .0020
Cast Iron	K	Gray Cast Iron, SG Iron, Ductile Cast Iron, Malleable Iron	0.0002	0.0004	0.0007	.0007 - .0016	.0010 - .0022	.0015 - .0028	.0018 - .0033	.0024 - .0035	.0028 - .0039	.0024 - .0050

### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = IPM (Inches per Minute)

### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## CUTTING SPEED CHART

### Series F178 METRIC

Workpiece Material Group	Example	Coolant			1 x Diameter Axial Depth							
		Max	Air	MMS	Small Radial Depth Profiling > Largest Radial Depth							
					1% of Dia	5% of Dia	10% of Dia	15% of Dia	20% of Dia	30% of Dia	50% of Dia	
Type					Vc (m/min)							
Steels	P	Free Machining	•	•	•	730	685	620	565	500	380	150
		Low Carbon	•	•	•	730	685	620	565	500	380	150
		Medium Carbon	•	•	•	335	310	290	260	240	180	90
		Alloys Steels	•	•	•	150	140	130	130	120	105	75
		High Strength Alloys	•	•	•	150	140	130	130	120	105	75
		Structural Steels	•	•	•	730	685	620	565	500	380	150
Stainless Steels	M	Die/Tool Steels	•	•	•	120	115	115	110	110	90	60
		Free Machining	•	X	o	150	145	140	135	130	115	90
		Moderate Stainless	•	X	o	150	115	115	110	105	95	75
		Difficult Stainless	•	X	o	105	100	95	90	90	75	60
		PH Stainless	•	X	o	75	75	75	70	70	60	40
		Cobalt Chrome Alloys	•	X	o	75	75	75	70	70	60	45
Special Alloys	S	Duplex (22%)	•	X	o	75	75	75	70	70	60	40
		Super Duplex (25%)	•	X	o	60	60	55	55	50	45	30
Cast Iron	K	High Temp Alloys	•	X	X	75	75	75	70	60	55	45
		Titanium Alloys	•	X	X	125	120	115	105	100	80	55
		Gray Cast Iron	•	o	o	450	430	400	360	335	250	120
		SG Iron	•	o	o	365	345	320	295	275	215	105
		Ductile Cast Iron	•	o	o	150	145	140	130	130	115	90
		Malleable Iron	•	o	o	120	115	110	105	105	100	90

• Preferred	X Possible	o Not Possible
-------------	------------	----------------

If axial depth is less than the ball diameter, the speed is figured using the effective cutting diameter.

## FEED RATE CHART

### Series F178 METRIC

Workpiece Material Group	Example	Tool Diameter (mm)										
		1	3	4	6	8	10	12	16	18	25	
		mm/Tooth										
Steels	P	Free Machining, Low Carbon, Medium Carbon, Alloys Steels, High Strength Alloys, Structural Steels, Die/Tool Steels	0.005	0.01	0.017	.025 - .040	.033 - .053	0.04	0.066	.066 - .083	.078 - .088	.088 - .129
Stainless Steels	M	Free Machining, Moderate Stainless, Difficult Stainless, PH Stainless, Cobalt Chrome Alloys, Duplex (22%), Super Duplex (25%)	0.005	0.01	0.017	.025 - .040	.033 - .053	0.04	0.066	.066 - .083	.078 - .088	.088 - .129
Special Alloys	S	High Temp Alloys, Titanium Alloys	0.002	0.005	0.02	.012 - .020	.017 - .027	.017 - .033	.025 - .040	.025 - .043	.027 - .045	.030 - .050
Cast Iron	K	Gray Cast Iron, SG Iron, Ductile Cast Iron, Malleable Iron	0.005	0.01	0.017	.017 - .040	.025 - .055	.038 - .071	.045 - .083	.060 - .088	.071 - .099	.060 - .127

#### Example: Profile Milling

- 1) Select material from chart
- 2) Select tool size
- 3) Select feed per tooth
- 4) Figure percentage of cutter diameter radial cut depth
- 5) Select chip load factor for radial depth
- 6) Select chip load factor x Feed per tooth
- 7) Answer: New feed per tooth
- 8) New feed per tooth x Number of teeth x RPM = mm/min (millimetres per minute)

#### Spindle Max.

Should the calculated Spindle Speed be more than your actual Spindle Max., Use the Formula given below:

$$\frac{\text{Calculated Feed} \times \text{Spindle Max.}}{\text{Calculated Speed}}$$

During Profile Milling less than 50% of the cutter diameter's Radial depth, the actual chipload at the cutting edge is less than the programmed chip load. Below are Chip Load factors depending on Radial Depth Percentage. Multiply your inches per tooth by the factor before figuring your IPM.

Radial Depth in Percentage of Cutter Diameter	Increase Chip Load Factor
50%	1
30%	1.1
20%	1.2
15%	1.4
10%	1.8
5%	2.3
1%	5

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## CUTTING SPEED CHART

### General Purpose Technical Metric

	2 Flute Series			3 Flute Series		4 Flute Series		
Stub	F164	F166				F163	F165	
standard	F121	F150		F116	F145	F111	F140	
long length/reach	F123		F183 / F186			F122		F181 / F184 / F187

Workpiece Material Group		Example	VC
Steels	P	Steel - Mild (.2 - .3 Carbon) 1018	105 - 150
		Steel - Mild (.4 - .5 Carbon) 4140	75 - 105
		Tool Steels (1.2 carbon) A2/D2/H13/P20	60 - 75
		Forgings	40 - 75
Cast Iron	K	Iron Cast (Soft)	140 - 185
		Iron - Cast (Medium Hard)	90 - 120
		Iron (Hard Chilled)	75 - 90
		Iron (Malleable)	70 - 90
Stainless Steels	M	Stainless Free Machining	90 - 120
		Austenitic Stainless 304/316	55 - 70
		Ferritic	60 - 85
		Martensitic	45 - 60
		PH Stainless 17-4 PH	40 - 60

Workpiece Material Group		Example	VC
Special Alloys	S	Titanium 6AL-4V	55 - 115
		Cobalt-Based Alloys Stellite	30 - 60
		Nickel-Based Alloys Inconel 625/718	30 - 60
		Iron-Based Alloys Incoloy 800-802	40 - 60
Hardened Steels	H	Hardened Steels 35-45 Rc	60 - 75
		Hardened Steels 45-55 Rc	45 - 60
		Hardened Steels 55-65 Rc	15 - 30
Non-Ferrous	N	Aluminium / Aluminium Alloys	150 - 215
		Brass / Bronze	120 - 185
		Magnesium / Magnesium Alloys	215 - 305
		Plastics / Bakelite	245 - 365

## FEED RATE CHART

### General Purpose Technical Metric

Workpiece Material Group	Example	Tool Diameter (mm)									
		3	5	6	8	10	12	16	20	25	
		mm/Tooth									
Steels	P	Steel - Mild (.2-.3 Carbon) 1018	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Steel - Mild (.4-.5 Carbon) 4140									
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.061 - .081	.061 - .081
Cast Iron	K	Iron Cast (Soft)									
		Iron - Cast (Medium Hard)	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Iron (Hard Chilled)									
		Iron (Malleable)									
Stainless Steel	M	Stainless Steel Free Machining									
		Ferritic	.013 - .020	.025 - .030	.038 - .051	.038 - .051	.053 - .076	.051 - .089	.058 - .102	.056 - .109	.081 - .127
		Austenitic Stainless 304/316 Martensitic PH Stainless 17-4 PH	.008 - .013	.020 - .025	.030 - .038	.036 - .046	.046 - .051	.051 - .058	.058 - .076	.061 - .081	.061 - .081
Special Alloys	S	Titanium 6AL-4V	.008 - .010	.010 - .015	.015 - .020	.020 - .030	.020 - .030	.030 - .041	.041 - .046	.046 - .051	.051 - .076
		Stellite Inconel 625/718 Incoloy 800-802	.008 - .013	.013 - .038	.013 - .038	.025 - .051	.025 - .051	.025 - .076	.051 - .076	.064 - .089	.064 - .089
Hardened Steels	H	Hardened Steels 35-45 Rc									
		Hardened Steels 45-55 Rc	.008 - .013	.013 - .038	.013 - .038	.025 - .051	.025 - .051	.025 - .076	.051 - .076	.064 - .089	.064 - .089
		Hardened Steels 55-65 Rc									
Non-Ferrous	N	Aluminium/Aluminium Alloys									
		Brass/Bronze Magnesium/Magnesium Alloys Plastics/Bakelite	.020 - .038	.038 - .051	.051 - .064	.064 - .076	.076 - .089	.089 - .127	.127 - .216	.191 - .241	.216 - .254

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## CUTTING SPEED CHART

### General Purpose Technical Inch

	2 Flute Series			3 Flute Series		4 Flute Series		
Stub	F164	F166		F169		F163	F165	
standard	F121	F150		F116	F145	F111	F140	
long length/reach	F123		F183 / F186			F122		F181 / F184 / F187

Workpiece Material Group	Example	SFM	
Steels	P	Steel - Mild (.2 - .3 Carbon) 1018	350 - 500
		Steel - Mild (.4 - .5 Carbon) 4140	250 - 350
		Tool Steels (1.2 carbon) A2/D2/H13/P20	200 - 250
		Forgings	125 - 250
Cast Iron	K	Iron Cast (Soft)	450 - 600
		Iron - Cast (Medium Hard)	300 - 400
		Iron (Hard Chilled)	250 - 300
		Iron (Malleable)	225 - 300
Stainless Steels	M	Stainless Free Machining	300 - 400
		Austenitic Stainless 304/316	180 - 225
		Ferritic	200 - 275
		Martensitic	150 - 200
		PH Stainless 17-4 PH	125 - 200

Workpiece Material Group	Example	SFM	
Special Alloys	S	Titanium 6AL-4V	175 - 375
		Cobalt-Based Alloys Stellite	100 - 200
		Nickel-Based Alloys Inconel 625/718	100 - 200
		Iron-Based Alloys Incoloy 800-802	125 - 200
Hardened Steels	H	Hardened Steels 35-45 Rc	200 - 250
		Hardened Steels 45-55 Rc	150 - 200
		Hardened Steels 55-65 Rc	50 - 100
Non-Ferrous	N	Aluminium / Aluminium Alloys	500 - 700
		Brass / Bronze	400 - 600
		Magnesium / Magnesium Alloys	700 - 1000
		Plastics / Bakelite	800 - 1200

## FEED RATE CHART

### General Purpose Technical Inch

Workpiece Material Group	Example	Tool Diameter (inch)									
		1/8	3/16	1/4	5/16	3/8	1/2	5/8	3/4	1	
		Inch/Tooth									
Steels	P	Steel - Mild (.2-.3 Carbon) 1018	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Steel - Mild (.4-.5 Carbon) 4140									
		Tool Steels (1.2 carbon) A2/D2/H13/P20 Forgings	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
Cast Iron	K	Iron Cast (Soft)	.0005 - .0008	.0010 - .0012	.0015 - .0020	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Iron - Cast (Medium Hard)									
		Iron (Hard Chilled) Iron (Malleable)									
Stainless Steel	M	Stainless Steel Free Machining Ferritic	.0005 - .0008	.0010 - .0012	.0012 - .0015	.0015 - .0025	.0021 - .0030	.0020 - .0035	.0023 - .0040	.0022 - .0043	.0032 - .0050
		Austenitic Stainless 304/316	.0003 - .0005	.0008 - .0010	.0012 - .0015	.0014 - .0018	.0018 - .0020	.0020 - .0023	.0023 - .0030	.0024 - .0032	.0024 - .0032
		Martensitic PH Stainless 17-4 PH									
Special Alloys	S	Titanium 6AL-4V	.0003 - .0004	.0004 - .0006	.0006 - .0008	.0008 - .0012	.0008 - .0012	.0012 - .0016	.0016 - .0018	.0018 - .0020	.0020 - .0030
		Stellite Inconel 625/718 Incoloy 800-802	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
Hardened Steels	H	Hardened Steels 35-45 Rc	.0003 - .0005	.0005 - .0015	.0005 - .0015	.0010 - .0020	.0010 - .0020	.0010 - .0030	.0020 - .0030	.0025 - .0035	.0025 - .0035
		Hardened Steels 45-55 Rc									
		Hardened Steels 55-65 Rc									
Non-Ferrous	N	Aluminium/Aluminium Alloys Brass/Bronze	.0008 - .0015	.0015 - .0020	.0020 - .0025	.0025 - .0030	.0030 - .0035	.0035 - .0050	.0050 - .0080	.0075 - .0095	.0085 - .100
		Magnesium/Magnesium Alloys Plastics/Bakelite									

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## MATERIAL DETAILS

Material Group	Material Description	Content	Tensile Strength RM (MPa)*	Hardness (HB)	Hardness (HRC)
P0	Low-Carbon Steels, Long Chipping	C <0,25%	<530	<125	—
P1	Low-Carbon Steels, Short Chipping, Free Machining	C <0,25%	<530	<125	—
P2	Medium- and High-Carbon Steels	C >0,25%	<530	<220	<25
P3	Alloy Steels and Tool Steels	C >0,25%	600-850	<330	<35
P4	Alloy Steels and Tool Steels	C >0,25%	850-1400	340-450	35-48
P5	Ferritic, Martensitic, and PH Stainless Steels	—	600-900	<330	<35
P6	High-Strength Ferritic, Martensitic, and PH Stainless Steels	—	900-1350	350-450	35-48
M1	Austenitic Stainless Steel	—	<600	130-200	-
M2	High-Strength Austenitic Stainless and Cast Stainless Steels	—	600-800	150-230	<25
M3	Duplex Stainless Steel	—	<800	135-275	<30
K1	Grey Cast Iron	—	125-500	120-290	<32
K2	Low- and Medium-Strength Ductile Irons (Nodular Irons) and Compacted Graphite Irons (CGI)	—	<600	130-260	<28
K3	High-Strength Ductile Irons and Austempered Ductile Iron (ADI)	—	>600	180-350	<43
N1	Wrought Aluminium	—	—	—	—
N2	Low-Silicon Aluminium Alloys and Magnesium Alloys	Si <12,2%	—	—	—
N3	High-Silicon Aluminium Alloys and Magnesium Alloys	Si > 12,2%	—	—	—
N4	Copper-, Brass-, Zinc-Based on Machinability Index Range of 70-100	—	—	—	—
N5	Nylon, Plastics, Rubbers, Phenolics, Resins, Fibreglass	—	—	—	—
N6	Carbon, Graphite Composites, CFRP	—	—	—	—
N7	Metal Matrix Composites (MMC)	—	—	—	—
S1	Iron-Based, Heat-Resistant Alloys	—	500-1200	160-260	25-48
S2	Cobalt-Based, Heat-Resistant Alloys	—	1000-1500	250-450	25-48
S3	Nickel-Based, Heat-Resistant Alloys	—	600-1700	160-450	<48
S4	Titanium and Titanium Alloys	—	900-1600	300-400	33-48
H1	Hardened Materials	—	—	—	44-48
H2	Hardened Materials	—	—	—	48-55
H3	Hardened Materials	—	—	—	56-60
H4	Hardened Materials	—	—	—	>60

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



**MATERIAL DETAILS**

Material Group	ANSI	DIN
P0	A36, 1008, 1010, 1018 through 1029; 1108, 1117	
P1	10L18, 1200 Series, 1213, 12L14	C15, Ck22, ST37-2, S235JR, 9SMnPb28, GS38
P2	1035, 1045, 10L45, 1050, 10L50, 1080, 1137, 1144, 11L44, 1525, 1545, 1572	ST52, S355JR, C35, GS60, Cf53
P3	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T	16MnCr5, Ck45, 21CrMoV5-7, 38SMn28
P4	1300, 2000, 3000, 4000, 5000, 8000, P20, SAE: A, D, H, O, S, M, T	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P5	15-5 PH, 13-8 PH, 17-4 PH, 400 and 500 Series	100Cr6, 30CrNiMo8, 42CrMo4, C70W2, S6525, X120Mn12
P6	15-5 PH, 13-8 PH, 17-4 PH, 400 and 500 Series	X102CrMo17, G-X120Cr29
M1	200 Series, 301, 302, 304, 304L, 309	X5CrNi 18 10, X2CrNiMo 17 13 2, G-X25CrNiSi18 9, X15CrNiSi 20 12
M2	310, 316, 316L, 321, 347, 384 ASTM Cast XM-1, XM-5, XM-7, XM-21	X2CrNiMo 13 4, X5NiCr 32 21, X5CrNiNb 18 10, G-X15CrNi 25-20
M3	323, 329, F55, 2205, S329000	X8CrNiMo27 5, X2CrNiMoN22 5 3, X20CrNiSi25 4, G-X40CrNiSi27 4
K1	class 20, 25, 30, 35, 40, 45, 50, 55, 60, G1800, G3000, G3500, G4000	GG15, GG25, GG30, GG40, GTW40
K2	60-40-18, 65-45-12, 80-55-06, SAE J434:D4018, D4512, D5506, ASTM A47: Grade 32510, 35018, SAE J158: Grade M3210, M4504, M5003, M5503, M7002, ASTM A842: Grade 250, 300, 350, 400, 450	GGG40, GTS35
K3	ASTM A536:100-70-03, 120-90-02, SAE J434: D7003, SAE J158:Grade M8501AST A897: 125-80-10, 150-100-7, 175-125-4, 200-150-1, 230-185	GGG60, GTW55, GTS65
N1	2025, 5050, 7050, 1000, 2017	AlMg1, Al99.5, AlCuMg1, AlCuBiPb, AlMgSi1, AlMgSiPb
N2	2024, 6061, 7075	GAISiCu4, GDAISi10Mg
N3	—	G-ALSi12, G-AISi17Cu4, G-AISi21CuNiMg
N4	C81500	CuZn40, Ms60, G-CuSn5ZnPb, CuZn37, CuSi3Mn
N5	—	LEXAN®, HOSTALEN™, Polystyrol, Makralon®
N6	Graphite, CFK, CFRP	CFK, GFK
N7	C63000	—
S1	INCOLOY® 800 Series, A608, A567, Discaloy™, INVAR®, N-155, 16-25-6, 19-9 DL; Cast: ASTM A-297, A-351, A-567, A-608	X1NiCrMoCu32 28 7, X12NiCrSi36 16, X5NiCrAlTi31 20, X40CoCrNi20 20
S2	Haynes® 25 (L605), Haynes 188, J-1570, Stellite®, AiResist 213; Cast: AiResist 13, Haynes 21, MAR-M302, MAR-M509, NASA Co-W-Re, WI-52	Haynes® 188, Stellite® 6,21,31
S3	Astroloy™, Hastelloy® B/C/ C-276 /X, INCONEL® 600 and 700 Series, IN102,INCOLOY 900 Series, Rene 41, Waspalloy®, Monel®, K-500, MAR-M20, NIMONIC®, UDIMET®	INCONEL® 690, INCONEL 625, Hastelloy®, NIMONIC® 75
S4	Pure: Ti 98.8, Ti 98.9,Ti 99.9; Alloyed: Ti 5Al-2.5Sn, Ti6Al-4V, Ti6Al-2Sn-4Zr-2Mo,Ti-3Al-8V-6Cr-4Mo-4Zr, Ti-10V-2Fe-3Al, Ti-13V-11Cr-3Al	Ti1, TiAl5Sn2, TiAl6V4, TiAl4Mo4Sn2
H1	Tool Steel H10, H11, H13, D2, D3, 4340, P20	GX260NiCr42, GX330NiCr42, GX300CrNiSi952, GX300CrMo153, HARDOX® 400
H2	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—
H3	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—
H4	Tool Steel H10, H11, H13, D2, D3, 4340, P20	—

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## SURFACE TREATMENT

### **STEAM OXIDE:**

A black oxidized surface ( $Fe_3O_4$ ) produced on the surface of a finished tap by means of a steam furnace. This oxidized surface is porous and helps retain cutting fluid in the working portion of the tap. The materials on which steam oxide has shown improvement in performance are stainless steels, steel forgings, tool and die steels, hot and cold rolled steels, and high nickel alloys.

### **TITANIUM NITRIDE (TiN):**

A thin deposit (approx. 0.0001") applied to the surface of a finished tap utilizing PVD coating technology. TiN coating increases the surface hardness and wear resistance. Use of TiN coating on standard tools will help increase tool life in harder materials (up to 32 HRC), such as stainless steels, steel forgings, tool and die steels and hot and cold rolled steels. TiN coating also works very well with water-base cutting fluids.

### **TITANIUM CARBON NITRIDE (TiCN):**

Similar to TiN, TiCN is applied utilizing PVD coating technology. This coating combines high hardness (approx. 2800 vickers) with the anti-seizure properties of Nitride. A lower coefficient of friction helps reduce welding by 75% over TiN coated tools. These features make TiCN especially beneficial in non-ferrous material and hardened steels.

### **TITANIUM ALUMINUM NITRIDE (TiAlN):**

TiAlN is applied using PVD coating technology. The addition of aluminum reduces friction and increases the coating oxidation temperature. As a result, TiAlN has increased resistance to heat and oxidation wear. This makes TiAlN better suited for High Speed/High Heat applications. TiAlN coating is incorporated into many of our tools.

### **PROTON + COATING :**

Proton + coating devised explicitly for solid carbide tools used in roughing and finishing of hardened steels and difficult-to-machine materials.

Major competitive advantages in tool and die-making can be attained by cutting steels with hardness >60 HRC.

### **Cr BASED COATING**

Cr based coating, has made it possible to systematically optimize and decisively improve the key coating properties for milling applications.

Greater abrasion resistance, extra shear strength, lower adhesion tendency, maximum toughness and a very smooth surface achieve a quantum leap in drilling performance.





## END MILL TROUBLESHOOTING

Problem	Rigidity	Increase Inches/Tooth	Reduce Inches/Tooth	Material	Recutting Chips	Increase Rake Angle	Handling	Runout	Reduce Speed	Increase Speed	Depth of Cut	Fixturing	Coolant	Finish	Dull Tool	Chip Evaluation	Inadequate Number of Flutes	Insufficient Coolant	Plunge Cutting	Reduce Feed	Increase Feed	Tool Holder	Balance Holder & Tool	
Chipping	X		X	X	X		X	X															X	
Chatter	X	X							X		X	X											X	
Built Up Edge		X				X				X			X	X										
Breakage	X		X								X				X	X							X	
Chip Packing																	X	X	X					
Poor Slotting	X	X	X						X		X	X								X				
Premature Wear				X					X	X			X							X	X	X		
Chip Welding			X			X			X				X	X										
Cratering																							X	

### FORMULAS:-

#### INCH

$RPM = SFM \times 3.82 / \text{Tool Diameter}$

$IPM = RPM \times \text{number of teeth} \times (\text{inches/tooth})$

#### CONVERSION INCH TO METRIC

$Vc = SFM \times 3.084$

$mm/min. = IPM \times 25.4$

#### METRIC

$RPM = Vc \times 318.057 / \text{Tool Diameter}$

$mm/min. = RPM \times \text{number of teeth} \times (\text{mm/tooth})$

#### CONVERSION METRIC TO INCH

$SFM = Vc / .3048$

$IPM = (mm/min.) / 25.4$

### SAFETY NOTE:-

Always wear the appropriate personal protective equipment such as safety glasses and protective clothing when using solid carbide or HSS cutting tools. Machines should fully guarded. Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## END MILL TROUBLESHOOTING GUIDE

PROBLEM	CAUSE	SOLUTION
Chip packing	Too great a cutting amount	Adjust feed or speed
	Not enough chip room	Use end mill fewer flutes
	Not enough coolant	Apply more coolant. Use air pressure
Rough surface finish	Feed too fast	Slow down to correct feed
	Slow speed	Use higher speed
	Too much wear	Regrind earlier stage
	Chip biting	Cut less amount per pass
	No end tooth concavity	Add margin (touch primary with oilstone)
Burr	Too much wear on primary relief	Regrind sooner
	Incorrect condition	Correct milling condition
	Improper cutting angle	Change to correct cutting angle
No dimensional accuracy	Too tough condition	Change to easier condition
	Lack of accuracy (machine & holder)	Repair machine or holder
	Not enough rigidity (machine & holder)	Change machine or holder or condition
	Not sufficient number of flutes	Use end mill with greater number of flutes
No perpendicular side	Feed too fast	Slow down to correct feed
	Too great a cutting amount	Reduce cutting amount
	Too long a flute length or long overall length	Use proper length tool. Hold shank deeper
	Not sufficient number of flutes	Use end mill with greater number of flutes
Chipping	Feed too fast	Slow down to proper feed
	Feed too fast on first cut	Slow down on first bite
	Not enough rigidity of machine tool & holder	Change rigid machine tool or holder
	Loose holder	Tighten tool holder
	Loose holder (workpiece)	Tighten workpiece fixture
	Lack of rigidity (tool)	Use shortest end mill available. Hold shank deeper. Try down cut
	Teeth too sharp	Change to lower cutting angle, primary relief
Wear	Speed too fast	Slow down, use more coolant
	Hard material	Use higher grade tool material, add surface treatment
	Biting chips	Change feed speed to change chip size or clear chips with coolant or air pressure
	Improper feed speed (too slow)	Increase feed speed. Try down cut
	Improper cutting angle	Change to correct cutting angle
	Too low a primary relief angle	Change to larger relief angle
Breakage	Feed too fast	Slow down feed
	Too large cutting amount	Adjust to smaller cutting amount per teeth
	Too long flute length or long overall length	Hold shank deeper, use shorter end mill
	Too much wear	Regrind at earlier stage
Chattering	Feed and speed too fast	Correct feed and speed
	Not enough rigidity (machine & holder)	Use better machine tool or holder or change condition
	Too much relief angle	Change to smaller relief angle. Add margin (touch primary with oil stone)
	Loose holder (workpiece)	Hold workpiece tighter
	Cutting too deep	Correct to smaller cutting depth
	Too long flute length or long overall length	Hold shank deeper, use shorter end mill or try down cut

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

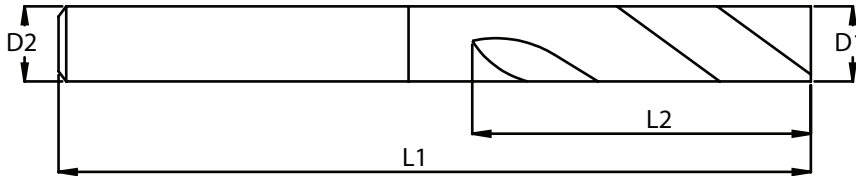


### CUSTOMER TOOL REQUEST FORM

Fill in information requested on drawing.  
(\*Required Fields)

Request Approval Drawing

D1 = \_\_\_\_\_  
D2 = \_\_\_\_\_  
L1 = \_\_\_\_\_  
L2 = \_\_\_\_\_



**\*Material**

- Solid Carbide
- Carbide Coolant Thru

**\*Number of Flutes**

\_\_\_\_\_

**\*Flute Form**

- Straight
- Helical \_\_\_\_\_ ° Helix

**\*Flute Form**

- Cylindrical
- Shank Flat
- Flat Style \_\_\_\_\_

**\*Flute Form**

- Corner Radius \_\_\_\_\_ +/- .002"
- Corner Chamfer \_\_\_\_\_ x \_\_\_\_\_ °
- Chipbreaker

**\*Coating**

- TiN
- TiCN
- TiAlN
- None
- Other \_\_\_\_\_

**Note:**

This information enables us to engineer and manufacture a tool for your specific requirements.

Customer Name: \_\_\_\_\_

Phone: \_\_\_\_\_

\* Work Material Machined:

Hardness: \_\_\_\_\_

Distributor: \_\_\_\_\_

Quantities: \_\_\_\_\_



### TRIAL TOOL RESULTS FORM

Customer Name		Ref No.	
Address		Date	
		Sales Engineer Name:	
		Contact No.:	
Contact Person :		Trial PO OA No:	
Tool Diameter :			
<b>Component Details:</b>		<b>Operation Details:</b>	
Name		End Milling Depth	
Material		No of Passes	
Material Hardness		Slotting/Profiling/Ramping	
Machine Make /Model/No.		Roughing/Finishing	
Tool No.		Tol/Finish required :	
<b>Machining Details :</b>			
<b>Parameters</b>	<b>Existing</b>	<b>Proposed</b>	
Holding			
M/c.Type			
Cycle Time			
Coolant			
Coolant Press.			
<b>Tool Data:</b>			
<b>Parameters</b>	<b>Existing</b>	<b>Trial 1</b>	<b>Trial 2</b>
Make			
Ext/Thru cool			
Cutting Speed (Vc) m/min			
RPM			
Feed			
Depth of cut			
Life Obtained (TIME)			
Kind of Failure			
<b>Cost Data:</b>			
Tool Cost (Rs.)			
Cost/Component (Rs.)			
Remarks:-			
Customer Benefit:-1.			
Customer Benefit:-2.			

Sales Engineer  
FORBES & COMPANY LIMITED

Authorised Signatory  
CUSTOMER

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

# CARBIDE & HSS



High Performance Cutting Tools













# DRILLS

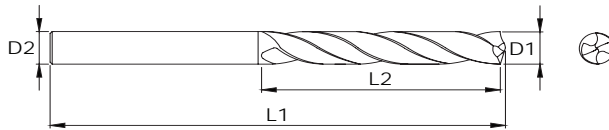
# SELECTION GUIDE



## DRILL

SERIES		MATERIAL	LENGTH	COOLANT	COATING	PAGES
2TDSS		Solid Carbide	3x	Solid	TiAlN	265
2TDSR		Solid Carbide	5x	Solid	TiAlN	268
2TDCR		Solid Carbide	5x	Coolant	TiAlN	271
2TDCL		Solid Carbide	7x	Coolant	TiAlN	274
F224		Solid Carbide	5x	Solid	Bright	276
F224A		Solid Carbide	5x	Solid	TiAlN	279
F226		Solid Carbide	3x	Solid	Bright	282
F226A		Solid Carbide	3x	Solid	TiAlN	285
		HSS	5x	Solid	Bright	288
		HSS	5x	Solid	Bright	292

# 3X Solid carbide 3x high performance drill



P0-P6

K1-K3

S1-S4

M1-M3

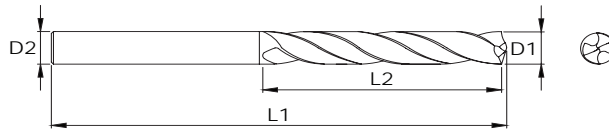
Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
3	FBJ0501006	16	57	3
3.1	FBJ0501007	22	63	4
3.2	FBJ0501008	22	63	4
3.3	FBJ0501009	22	63	4
3.4	FBJ0501010	22	63	4
3.5	FBJ0501011	22	63	4
3.6	FBJ0501012	22	63	4
3.7	FBJ0501013	22	63	4
3.8	FBJ0501014	22	63	4
3.9	FBJ0501015	22	63	4
4	FBJ0501016	22	63	4
4.1	FBJ0501017	26	63	5
4.2	FBJ0501018	26	63	5
4.3	FBJ0501019	26	63	5
4.4	FBJ0501020	26	63	5
4.5	FBJ0501021	26	63	5
4.6	FBJ0501022	26	63	5
4.7	FBJ0501023	26	63	5
4.8	FBJ0501024	26	63	5
4.9	FBJ0501025	26	63	5

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
5	FBJ0501026	26	63	5
5.1	FBJ0501027	30	76	6
5.2	FBJ0501028	30	76	6
5.3	FBJ0501029	30	76	6
5.4	FBJ0501030	30	76	6
5.5	FBJ0501031	30	76	6
5.7	FBJ0501032	30	76	6
5.8	FBJ0501033	30	76	6
5.9	FBJ0501034	30	76	6
6	FBJ0501035	30	76	6
6.1	FBJ0501037	35	82	8
6.2	FBJ0501038	35	82	8
6.3	FBJ0501039	35	82	8
6.4	FBJ0501040	35	82	8
6.5	FBJ0501041	35	82	8
6.6	FBJ0501042	35	82	8
6.7	FBJ0501043	35	82	8
6.8	FBJ0501044	35	82	8
6.9	FBJ0501045	35	82	8
7	FBJ0501046	35	82	8

3X

**Solid carbide 3x high performance drill**



P0-P6

K1-K3

S1-S4

M1-M3

Unit : mm

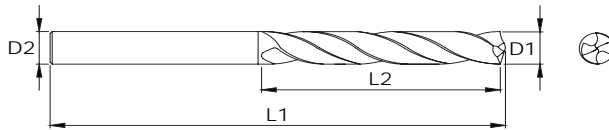
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
7.1	FBJ0501047	38	82	8
7.2	FBJ0501048	38	82	8
7.3	FBJ0501049	38	82	8
7.4	FBJ0501050	38	82	8
7.5	FBJ0501051	38	82	8
7.6	FBJ0501052	38	82	8
7.8	FBJ0501053	38	82	8
7.9	FBJ0501054	38	82	8
8	FBJ0501055	38	82	8
8.1	FBJ0501056	43	89	10
8.2	FBJ0501057	43	89	10
8.3	FBJ0501058	43	89	10
8.4	FBJ0501059	43	89	10
8.5	FBJ0501060	43	89	10
8.6	FBJ0501061	43	89	10
8.7	FBJ0501062	43	89	10
8.8	FBJ0501063	43	89	10
8.9	FBJ0501064	43	89	10
9	FBJ0501065	43	89	10
9.1	FBJ0501066	43	89	10

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
9.2	FBJ0501067	43	89	10
9.25	FBJ0501068	43	89	10
9.3	FBJ0501069	43	89	10
9.5	FBJ0501070	43	89	10
9.6	FBJ0501071	43	89	10
9.4	FBJ0501072	43	89	10
9.7	FBJ0501073	43	89	10
9.8	FBJ0501074	43	89	10
9.9	FBJ0501075	43	89	10
10	FBJ0501076	43	89	10
10.1	FBJ0501077	51	101	12
10.2	FBJ0501078	51	101	12
10.3	FBJ0501079	51	101	12
10.4	FBJ0501080	51	101	12
10.5	FBJ0501081	51	101	12
10.6	FBJ0501082	51	101	12
10.7	FBJ0501083	51	101	12
10.8	FBJ0501084	51	101	12
10.9	FBJ0501085	51	101	12
11	FBJ0501086	51	101	12





# 3X Solid carbide 3x high performance drill



P0-P6

K1-K3

S1-S4

M1-M3

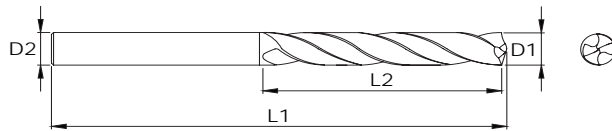
Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
11.1	FBJ0501087	51	101	12
11.2	FBJ0501088	51	101	12
11.3	FBJ0501089	51	101	12
11.4	FBJ0501090	51	101	12
11.5	FBJ0501091	51	101	12
11.6	FBJ0501092	51	101	12
11.7	FBJ0501093	51	101	12
11.8	FBJ0501094	51	101	12
11.9	FBJ0501095	51	101	12
12	FBJ0501096	51	101	12
12.1	FBJ0501097	54	107	14
12.5	FBJ0501098	54	107	14
12.8	FBJ0501099	54	107	14
12.83	FBJ0501100	54	107	14
12.9	FBJ0501101	54	107	14
13	FBJ0501102	54	107	14
13.5	FBJ0501103	54	107	14
13.7	FBJ0501104	54	107	14
14	FBJ0501105	54	107	14
14.5	FBJ0501106	60	117	16

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
14.7	FBJ0501107	60	117	16
15	FBJ0501108	60	117	16
15.3	FBJ0501109	60	117	16
15.5	FBJ0501110	60	117	16
15.7	FBJ0501111	60	117	16
16	FBJ0501112	60	117	16
16.08	FBJ0501113	63	122	18
16.3	FBJ0501114	63	122	18
16.5	FBJ0501115	63	122	18
17	FBJ0501116	63	122	18
17.5	FBJ0501117	63	122	18
18	FBJ0501118	63	122	18
18.5	FBJ0501119	70	133	20
19.16	FBJ0501120	70	133	20
19.25	FBJ0501121	70	133	20
19.3	FBJ0501122	70	133	20
19.5	FBJ0501123	70	133	20
20	FBJ0501124	70	133	20

5X

**Solid carbide 5x high performance drill**



P0-P6

K1-K3

S1-S4

M1-M3

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
3	FBJ0501125	24	63	3
3.1	FBJ0501126	32	69	4
3.2	FBJ0501127	32	69	4
3.3	FBJ0501128	32	69	4
3.4	FBJ0501129	32	69	4
3.5	FBJ0501130	32	69	4
3.6	FBJ0501131	32	69	4
3.7	FBJ0501132	32	69	4
3.8	FBJ0501133	32	69	4
3.9	FBJ0501134	32	69	4
4	FBJ0501135	32	69	4
4.1	FBJ0501136	38	80	5
4.2	FBJ0501137	38	80	5
4.3	FBJ0501138	38	80	5
4.4	FBJ0501139	38	80	5
4.5	FBJ0501140	38	80	5
4.6	FBJ0501141	38	80	5
4.7	FBJ0501142	38	80	5

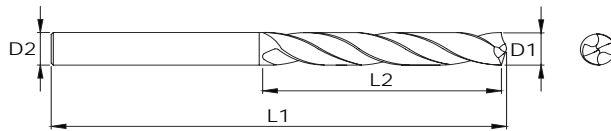
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
4.8	FBJ0501143	38	80	5
4.9	FBJ0501144	38	80	5
5	FBJ0501145	38	80	5
5.1	FBJ0501146	40	82	6
5.2	FBJ0501147	40	82	6
5.3	FBJ0501148	40	82	6
5.4	FBJ0501149	40	82	6
5.5	FBJ0501150	40	82	6
5.7	FBJ0501151	40	82	6
5.8	FBJ0501152	40	82	6
5.9	FBJ0501153	40	82	6
6	FBJ0501154	40	82	6
6.1	FBJ0501155	48	91	8
6.2	FBJ0501156	48	91	8
6.3	FBJ0501157	48	91	8
6.4	FBJ0501158	48	91	8
6.5	FBJ0501159	48	91	8
6.6	FBJ0501160	48	91	8

# 5X Solid carbide 5x high performance drill

Carbide

5X

30°
TiAlN



- P0-P6
- K1-K3
- S1-S4
- M1-M3

Unit : mm

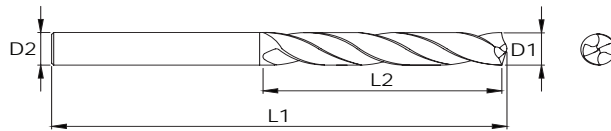
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
6.7	FBJ0501161	48	91	8
6.8	FBJ0501162	48	91	8
6.9	FBJ0501163	48	91	8
7	FBJ0501164	48	91	8
7.1	FBJ0501165	48	91	8
7.2	FBJ0501166	48	91	8
7.3	FBJ0501167	48	91	8
7.4	FBJ0501168	48	91	8
7.5	FBJ0501169	48	91	8
7.6	FBJ0501170	48	91	8
7.7	FBJ0501171	48	91	8
7.8	FBJ0501172	48	91	8
7.9	FBJ0501173	48	91	8
8	FBJ0501174	48	91	8
8.1	FBJ0501175	55	103	10
8.2	FBJ0501176	55	103	10
8.3	FBJ0501177	55	103	10
8.4	FBJ0501178	55	103	10

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
8.5	FBJ0501179	55	103	10
8.6	FBJ0501180	55	103	10
8.7	FBJ0501181	55	103	10
8.8	FBJ0501182	55	103	10
8.9	FBJ0501183	55	103	10
9	FBJ0501184	55	103	10
9.1	FBJ0501185	55	103	10
9.2	FBJ0501186	55	103	10
9.25	FBJ0501187	55	103	10
9.3	FBJ0501188	55	103	10
9.4	FBJ0501189	55	103	10
9.5	FBJ0501190	55	103	10
9.6	FBJ0501191	55	103	10
9.7	FBJ0501192	55	103	10
9.8	FBJ0501193	55	103	10
9.9	FBJ0501194	55	103	10
10	FBJ0501195	55	103	10
10.1	FBJ0501196	60	120	12



**5X**

**Solid carbide 5x high performance drill**



P0-P6

K1-K3

S1-S4

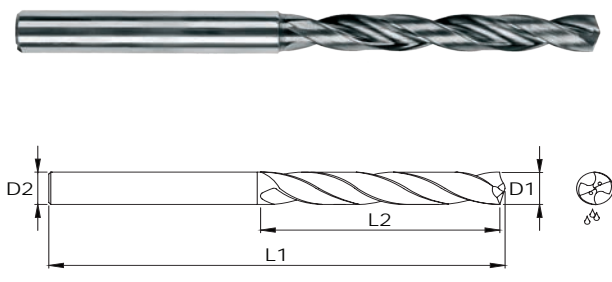
M1-M3

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
10.2	FBJ0501197	60	120	12
10.3	FBJ0501198	60	120	12
10.4	FBJ0501199	60	120	12
10.5	FBJ0501200	60	120	12
10.6	FBJ0501201	60	120	12
10.7	FBJ0501202	60	120	12
10.8	FBJ0501203	60	120	12
10.9	FBJ0501204	60	120	12
11	FBJ0501205	60	120	12
11.1	FBJ0501206	66	120	12
11.2	FBJ0501207	66	120	12
11.3	FBJ0501208	66	120	12
11.4	FBJ0501209	66	120	12
11.5	FBJ0501210	66	120	12
11.6	FBJ0501211	66	120	12
11.7	FBJ0501212	66	120	12
11.8	FBJ0501213	66	120	12
11.9	FBJ0501214	66	120	12

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
12	FBJ0501215	66	120	12
12.1	FBJ0501216	72	126	14
12.5	FBJ0501217	72	126	14
12.8	FBJ0501218	72	126	14
12.83	FBJ0501219	72	126	14
12.9	FBJ0501220	72	126	14
13	FBJ0501221	72	126	14
13.5	FBJ0501222	77	134	14
13.7	FBJ0501223	77	134	14
14	FBJ0501224	77	134	14
14.5	FBJ0501225	80	140	16
14.7	FBJ0501226	80	140	16
15	FBJ0501227	80	140	16
15.3	FBJ0501228	82	146	16
15.5	FBJ0501229	82	146	16
15.7	FBJ0501230	82	146	16
16	FBJ0501231	82	146	16

# 5X Solid carbide 5x high performance drill with coolant feed



- P0-P6
- K1-K3
- S1-S4
- M1-M3

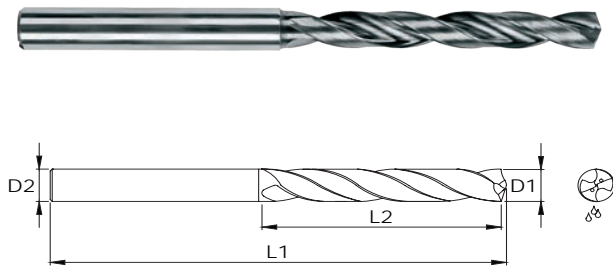
Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBJ0501232	24	75	3
3.1	FBJ0501233	32	80	4
3.2	FBJ0501234	32	80	4
3.3	FBJ0501235	32	80	4
3.4	FBJ0501236	32	80	4
3.5	FBJ0501237	32	80	4
3.6	FBJ0501238	32	80	4
3.7	FBJ0501239	32	80	4
3.8	FBJ0501240	32	80	4
3.9	FBJ0501241	32	80	4
4	FBJ0501242	32	80	4
4.1	FBJ0501243	38	82	5
4.2	FBJ0501244	38	82	5
4.3	FBJ0501245	38	82	5
4.4	FBJ0501246	38	82	5
4.5	FBJ0501247	38	82	5
4.6	FBJ0501248	38	82	5
4.7	FBJ0501249	38	82	5
4.8	FBJ0501250	38	82	5
4.9	FBJ0501251	38	82	5

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
5	FBJ0501252	38	82	5
5.1	FBJ0501253	40	82	6
5.2	FBJ0501254	40	82	6
5.3	FBJ0501255	40	82	6
5.4	FBJ0501256	40	82	6
5.5	FBJ0501257	40	82	6
5.7	FBJ0501258	40	82	6
5.8	FBJ0501259	40	82	6
5.9	FBJ0501260	40	82	6
6	FBJ0501261	40	82	6
6.1	FBJ0501262	48	91	8
6.2	FBJ0501263	48	91	8
6.3	FBJ0501264	48	91	8
6.4	FBJ0501265	48	91	8
6.5	FBJ0501266	48	91	8
6.6	FBJ0501267	48	91	8
6.7	FBJ0501268	48	91	8
6.8	FBJ0501269	48	91	8
6.9	FBJ0501270	48	91	8
7	FBJ0501271	48	91	8

5X

**Solid carbide 5x high performance drill with coolant feed**



P0-P6

K1-K3

S1-S4

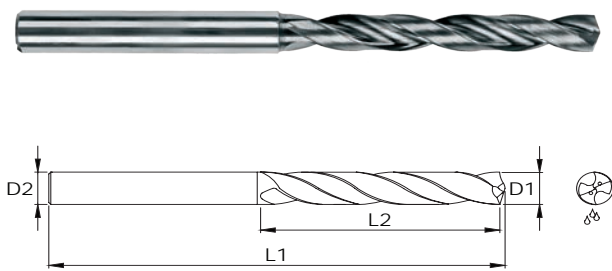
M1-M3

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter	Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2	ØD1		L2	L1	ØD2
7.1	FBJ0501272	48	91	8	9.25	FBJ0501295	55	103	10
7.2	FBJ0501274	48	91	8	9.3	FBJ0501296	55	103	10
7.3	FBJ0501275	48	91	8	9.4	FBJ0501297	55	103	10
7.4	FBJ0501276	48	91	8	9.5	FBJ0501298	55	103	10
7.5	FBJ0501277	48	91	8	9.6	FBJ0501299	55	103	10
7.6	FBJ0501278	48	91	8	9.7	FBJ0501300	55	103	10
7.7	FBJ0501279	48	91	8	9.8	FBJ0501301	55	103	10
7.8	FBJ0501280	48	91	8	9.9	FBJ0501302	55	103	10
7.9	FBJ0501281	48	91	8	10	FBJ0501303	55	103	10
8	FBJ0501282	48	91	8	10.1	FBJ0501304	60	120	12
8.1	FBJ0501283	55	103	10	10.2	FBJ0501305	60	120	12
8.2	FBJ0501284	55	103	10	10.3	FBJ0501306	60	120	12
8.3	FBJ0501285	55	103	10	10.4	FBJ0501307	60	120	12
8.4	FBJ0501286	55	103	10	10.5	FBJ0501308	60	120	12
8.5	FBJ0501287	55	103	10	10.6	FBJ0501309	60	120	12
8.6	FBJ0501288	55	103	10	10.7	FBJ0501310	60	120	12
8.7	FBJ0501289	55	103	10	10.8	FBJ0501311	60	120	12
8.8	FBJ0501290	55	103	10	10.9	FBJ0501312	60	120	12
8.9	FBJ0501291	55	103	10	11	FBJ0501313	60	120	12
9	FBJ0501292	55	103	10	11.1	FBJ0501314	66	120	12
9.1	FBJ0501293	55	103	10	11.2	FBJ0501315	66	120	12
9.2	FBJ0501294	55	103	10	11.3	FBJ0501316	66	120	12



**5X** Solid carbide 5x high performance drill with coolant feed



- P0-P6
- K1-K3
- S1-S4
- M1-M3

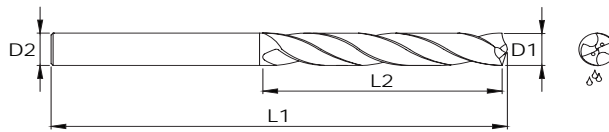
Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
11.4	FBJ0501317	66	120	12
11.5	FBJ0501318	66	120	12
11.6	FBJ0501319	66	120	12
11.7	FBJ0501320	66	120	12
11.8	FBJ0501321	66	120	12
11.9	FBJ0501322	66	120	12
12	FBJ0501323	66	120	12
12.1	FBJ0501324	72	126	14
12.5	FBJ0501325	72	126	14
12.8	FBJ0501326	72	126	14
12.83	FBJ0501327	72	126	14
12.9	FBJ0501328	72	126	14
13	FBJ0501329	72	126	14
13.5	FBJ0501330	77	134	14
13.7	FBJ0501331	77	134	14
14	FBJ0501332	77	134	14
14.5	FBJ0501333	80	146	16
14.7	FBJ0501334	80	146	16
15	FBJ0501335	80	146	16
15.3	FBJ0501336	82	146	16
15.5	FBJ0501337	82	146	16
15.7	FBJ0501338	82	146	16

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
16	FBJ0501339	82	146	16
16.08	FBJ0501340	90	158	18
16.3	FBJ0501341	90	158	18
16.5	FBJ0501342	90	158	18
17	FBJ0501343	90	158	18
17.5	FBJ0501344	95	158	18
18	FBJ0501345	95	158	18
18.5	FBJ0501346	100	160	20
19.16	FBJ0501347	100	160	20
19.25	FBJ0501348	100	160	20
19.3	FBJ0501349	100	160	20
19.5	FBJ0501350	100	160	20
20	FBJ0501351	100	160	20

7X

**Solid carbide 7x high performance drill with coolant feed**



P0-P6

K1-K3

S1-S4

M1-M3

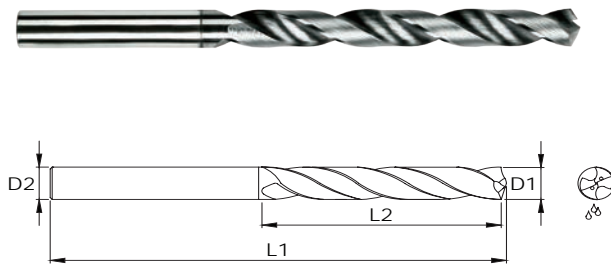
Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
3	FBJ0501352	33	81	3
3.1	FBJ0501353	40	92	4
3.2	FBJ0501354	40	92	4
3.3	FBJ0501355	40	92	4
3.4	FBJ0501356	40	92	4
3.5	FBJ0501357	40	92	4
3.6	FBJ0501358	40	92	4
3.7	FBJ0501359	40	92	4
3.8	FBJ0501360	40	92	4
3.9	FBJ0501361	40	92	4
4	FBJ0501362	40	92	4
4.1	FBJ0501363	45	100	5
4.2	FBJ0501364	45	100	5
4.3	FBJ0501365	45	100	5
4.4	FBJ0501366	45	100	5
4.5	FBJ0501367	45	100	5
4.6	FBJ0501368	45	100	5
4.7	FBJ0501369	45	100	5
4.8	FBJ0501370	45	100	5
4.9	FBJ0501371	45	100	5
5	FBJ0501372	45	100	5
5.1	FBJ0501373	51	100	6
5.2	FBJ0501374	51	100	6

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
5.3	FBJ0501375	51	100	6
5.4	FBJ0501376	51	100	6
5.5	FBJ0501377	51	100	6
5.7	FBJ0501378	51	100	6
5.8	FBJ0501379	51	100	6
5.9	FBJ0501380	51	100	6
6	FBJ0501381	51	100	6
6.1	FBJ0501382	60	109	8
6.2	FBJ0501383	60	109	8
6.3	FBJ0501384	60	109	8
6.4	FBJ0501385	60	109	8
6.5	FBJ0501386	60	109	8
6.6	FBJ0501387	60	109	8
6.7	FBJ0501388	60	109	8
6.8	FBJ0501389	60	109	8
6.9	FBJ0501390	60	109	8
7	FBJ0501391	60	109	8
7.1	FBJ0501392	70	118	8
7.2	FBJ0501393	70	118	8
7.3	FBJ0501394	70	118	8
7.4	FBJ0501395	70	118	8
7.5	FBJ0501396	70	118	8
7.6	FBJ0501397	70	118	8



**7X** Solid carbide 7x high performance drill with coolant feed



P0-P6

K1-K3

S1-S4

M1-M3

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
7.7	FBJ0501398	70	118	8
7.8	FBJ0501399	70	118	8
7.9	FBJ0501400	70	118	8
8	FBJ0501401	70	118	8
8.1	FBJ0501402	80	127	10
8.2	FBJ0501403	80	127	10
8.3	FBJ0501404	80	127	10
8.4	FBJ0501405	80	127	10
8.5	FBJ0501406	80	127	10
8.6	FBJ0501407	80	127	10
8.7	FBJ0501408	80	127	10
8.8	FBJ0501409	80	127	10
8.9	FBJ0501410	80	127	10
9	FBJ0501411	80	127	10
9.1	FBJ0501412	85	136	10
9.2	FBJ0501413	85	136	10
9.25	FBJ0501414	85	136	10
9.3	FBJ0501415	85	136	10
9.4	FBJ0501416	85	136	10
9.5	FBJ0501417	85	136	10
9.6	FBJ0501418	85	136	10
9.7	FBJ0501419	85	136	10
9.8	FBJ0501420	85	136	10

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
9.9	FBJ0501421	85	136	10
10	FBJ0501422	85	136	10
10.1	FBJ0501423	93	149	12
10.2	FBJ0501424	93	149	12
10.3	FBJ0501425	93	149	12
10.4	FBJ0501426	93	149	12
10.5	FBJ0501427	93	149	12
10.6	FBJ0501428	93	149	12
10.7	FBJ0501429	93	149	12
10.8	FBJ0501430	93	149	12
10.9	FBJ0501431	93	149	12
11	FBJ0501432	93	149	12
11.1	FBJ0501433	102	155	12
11.2	FBJ0501434	102	155	12
11.3	FBJ0501435	102	155	12
11.4	FBJ0501436	102	155	12
11.5	FBJ0501437	102	155	12
11.6	FBJ0501438	102	155	12
11.7	FBJ0501439	102	155	12
11.8	FBJ0501440	102	155	12
11.9	FBJ0501441	102	155	12
12	FBJ0501442	102	155	12

**5X****Solid carbide jobber drill**

Carbide

REG

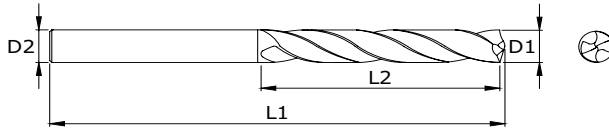


5X



30°

BF



P0-P6

K1-K3

M1-M3

H1-H4

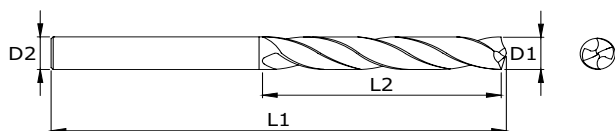
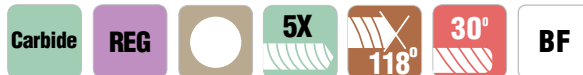
S1-S4

N1-N7

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBJ0500001	33	61	3
3.1	FBJ0500003	36	65	3.1
3.2	FBJ0500005	36	65	3.2
3.3	FBJ0500007	36	65	3.3
3.4	FBJ0500009	39	70	3.4
3.5	FBJ0500011	39	70	3.5
3.6	FBJ0500013	39	70	3.6
3.7	FBJ0500015	39	70	3.7
3.8	FBJ0500017	43	75	3.8
3.9	FBJ0500019	43	75	3.9
4	FBJ0500021	43	75	4
4.1	FBJ0500023	43	75	4.1
4.2	FBJ0500025	43	75	4.2
4.3	FBJ0500027	47	80	4.3
4.4	FBJ0500029	47	80	4.4
4.5	FBJ0500031	47	80	4.5
4.6	FBJ0500033	47	80	4.6
4.7	FBJ0500035	47	80	4.7

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
4.8	FBJ0500037	52	86	4.8
4.9	FBJ0500039	52	86	4.9
5	FBJ0500041	52	86	5
5.1	FBJ0500043	52	86	5.1
5.2	FBJ0500045	52	86	5.2
5.3	FBJ0500047	52	86	5.3
5.4	FBJ0500049	57	93	5.4
5.5	FBJ0500051	57	93	5.5
5.6	FBJ0500053	57	93	5.6
5.7	FBJ0500055	57	93	5.7
5.8	FBJ0500057	57	93	5.8
5.9	FBJ0500059	57	93	5.9
6	FBJ0500061	57	93	6
6.1	FBJ0500063	63	101	6.1
6.2	FBJ0500065	63	101	6.2
6.3	FBJ0500067	63	101	6.3
6.4	FBJ0500069	63	101	6.4

**5X**
**Solid carbide jobber drill**

**P0-P6**
**K1-K3**
**M1-M3**
**H1-H4**
**S1-S4**
**N1-N7**

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
6.5	FBJ0500071	63	101	6.5
6.6	FBJ0500073	63	101	6.6
6.7	FBJ0500075	63	101	6.7
6.8	FBJ0500077	69	109	6.8
6.9	FBJ0500079	69	109	6.9
7	FBJ0500081	69	109	7
7.1	FBJ0500083	69	109	7.1
7.2	FBJ0500085	69	109	7.2
7.3	FBJ0500087	69	109	7.3
7.4	FBJ0500089	69	109	7.4
7.5	FBJ0500091	69	109	7.5
7.6	FBJ0500093	75	117	7.6
7.7	FBJ0500095	75	117	7.7
7.8	FBJ0500097	75	117	7.8
7.9	FBJ0500099	75	117	7.9
8	FBJ0500101	75	117	8
8.1	FBJ0500103	75	117	8.1

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
8.2	FBJ0500105	75	117	8.2
8.3	FBJ0500107	75	117	8.3
8.4	FBJ0500109	75	117	8.4
8.5	FBJ0500111	75	117	8.5
8.6	FBJ0500113	81	125	8.6
8.7	FBJ0500115	81	125	8.7
8.8	FBJ0500117	81	125	8.8
8.9	FBJ0500119	81	125	8.9
9	FBJ0500121	81	125	9
9.1	FBJ0500123	81	125	9.1
9.2	FBJ0500125	81	125	9.2
9.3	FBJ0500127	81	125	9.3
9.4	FBJ0500129	81	125	9.4
9.5	FBJ0500131	81	125	9.5
9.6	FBJ0500133	87	133	9.6
9.7	FBJ0500135	87	133	9.7
9.8	FBJ0500137	87	133	9.8
9.9	FBJ0500139	87	133	9.9

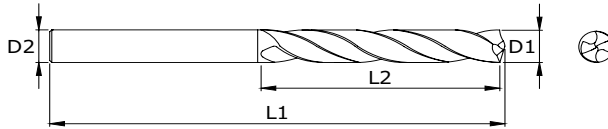
**5X****Solid carbide jobber drill**

Carbide

REG



BF



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

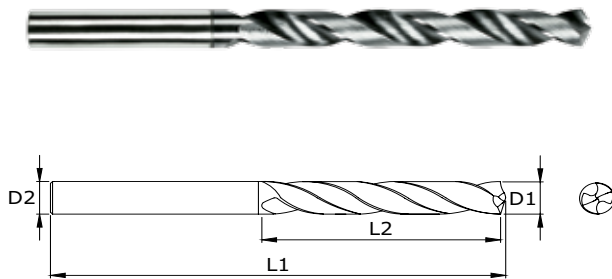
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
10	FBJ0500141	87	133	10
10.1	FBJ0500143	87	133	10.1
10.2	FBJ0500145	87	133	10.2
10.3	FBJ0500147	87	133	10.3
10.4	FBJ0500149	87	133	10.4
10.5	FBJ0500151	87	133	10.5
10.6	FBJ0500153	87	133	10.6
10.7	FBJ0500155	94	142	10.7
10.8	FBJ0500157	94	142	10.8
10.9	FBJ0500159	94	142	10.9
11	FBJ0500161	94	142	11
11.1	FBJ0500163	94	142	11.1
11.2	FBJ0500165	94	142	11.2
11.3	FBJ0500167	94	142	11.3
11.4	FBJ0500169	94	142	11.4
11.5	FBJ0500171	94	142	11.5
11.6	FBJ0500173	94	142	11.6
11.7	FBJ0500175	94	142	11.7
11.8	FBJ0500177	94	142	11.8

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
11.9	FBJ0500179	101	151	11.9
12	FBJ0500181	101	151	12
12.5	FBJ0500183	101	151	12.5
13	FBJ0500185	101	151	13
13.5	FBJ0500187	108	160	13.5
14	FBJ0500189	108	160	14
14.5	FBJ0500191	114	169	14.5
15	FBJ0500193	114	169	15
15.5	FBJ0500195	120	178	15.5
16	FBJ0500197	120	178	16
16.5	FBJ0500199	125	184	16.5
17	FBJ0500201	125	184	17
17.5	FBJ0500203	130	191	17.5
18	FBJ0500205	130	191	18
18.5	FBJ0500207	135	198	18.5
19	FBJ0500209	135	198	19
20	FBJ0500211	140	205	20



**5X**

**Solid carbide jobber drill**



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

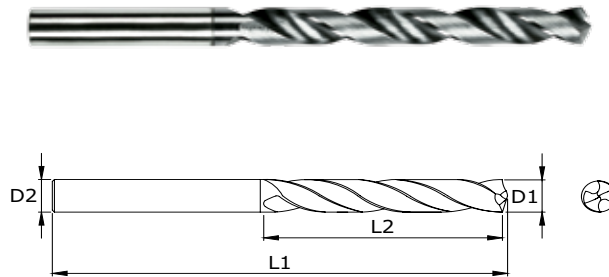
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBJ0500002	33	61	3
3.1	FBJ0500004	36	65	3.1
3.2	FBJ0500006	36	65	3.2
3.3	FBJ0500008	36	65	3.3
3.4	FBJ0500010	39	70	3.4
3.5	FBJ0500012	39	70	3.5
3.6	FBJ0500014	39	70	3.6
3.7	FBJ0500016	39	70	3.7
3.8	FBJ0500018	43	75	3.8
3.9	FBJ0500020	43	75	3.9
4	FBJ0500022	43	75	4
4.1	FBJ0500024	43	75	4.1
4.2	FBJ0500026	43	75	4.2
4.3	FBJ0500028	47	80	4.3
4.4	FBJ0500030	47	80	4.4
4.5	FBJ0500032	47	80	4.5
4.6	FBJ0500034	47	80	4.6

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
4.7	FBJ0500036	47	80	4.7
4.8	FBJ0500038	52	86	4.8
4.9	FBJ0500040	52	86	4.9
5	FBJ0500042	52	86	5
5.1	FBJ0500044	52	86	5.1
5.2	FBJ0500046	52	86	5.2
5.3	FBJ0500048	52	86	5.3
5.4	FBJ0500050	57	93	5.4
5.5	FBJ0500052	57	93	5.5
5.6	FBJ0500054	57	93	5.6
5.7	FBJ0500056	57	93	5.7
5.8	FBJ0500058	57	93	5.8
5.9	FBJ0500060	57	93	5.9
6	FBJ0500062	57	93	6
6.1	FBJ0500064	63	101	6.1
6.2	FBJ0500066	63	101	6.2
6.3	FBJ0500068	63	101	6.3

**5X****Solid carbide jobber drill**

Carbide

REG



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

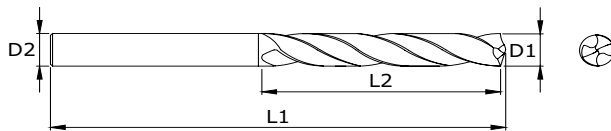
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
6.4	FBJ0500070	63	101	6.4
6.5	FBJ0500072	63	101	6.5
6.6	FBJ0500074	63	101	6.6
6.7	FBJ0500076	63	101	6.7
6.8	FBJ0500078	69	109	6.8
6.9	FBJ0500080	69	109	6.9
7	FBJ0500082	69	109	7
7.1	FBJ0500084	69	109	7.1
7.2	FBJ0500086	69	109	7.2
7.3	FBJ0500088	69	109	7.3
7.4	FBJ0500090	69	109	7.4
7.5	FBJ0500092	69	109	7.5
7.6	FBJ0500094	75	117	7.6
7.7	FBJ0500096	75	117	7.7
7.8	FBJ0500098	75	117	7.8
7.9	FBJ0500100	75	117	7.9
8	FBJ0500102	75	117	8
8.1	FBJ0500104	75	117	8.1
8.2	FBJ0500106	75	117	8.2
8.3	FBJ0500108	75	117	8.3
8.4	FBJ0500110	75	117	8.4

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
8.5	FBJ0500112	75	117	8.5
8.6	FBJ0500114	81	125	8.6
8.7	FBJ0500116	81	125	8.7
8.8	FBJ0500118	81	125	8.8
8.9	FBJ0500120	81	125	8.9
9	FBJ0500122	81	125	9
9.1	FBJ0500124	81	125	9.1
9.2	FBJ0500126	81	125	9.2
9.3	FBJ0500128	81	125	9.3
9.4	FBJ0500130	81	125	9.4
9.5	FBJ0500132	81	125	9.5
9.6	FBJ0500134	87	133	9.6
9.7	FBJ0500136	87	133	9.7
9.8	FBJ0500138	87	133	9.8
9.9	FBJ0500140	87	133	9.9
10	FBJ0500142	87	133	10
10.1	FBJ0500144	87	133	10.1
10.2	FBJ0500146	87	133	10.2
10.3	FBJ0500148	87	133	10.3
10.4	FBJ0500150	87	133	10.4
10.5	FBJ0500152	87	133	10.5



**5X**

**Solid carbide jobber drill**



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
10.6	FBJ0500154	87	142	10.6
10.7	FBJ0500156	94	142	10.7
10.8	FBJ0500158	94	142	10.8
10.9	FBJ0500160	94	142	10.9
11	FBJ0500162	94	142	11
11.1	FBJ0500164	94	142	11.1
11.2	FBJ0500166	94	142	11.2
11.3	FBJ0500168	94	142	11.3
11.4	FBJ0500170	94	142	11.4
11.5	FBJ0500172	94	142	11.5
11.6	FBJ0500174	94	142	11.6
11.7	FBJ0500176	94	142	11.7
11.8	FBJ0500178	94	142	11.8
11.9	FBJ0500180	101	151	11.9
12	FBJ0500182	101	151	12
12.5	FBJ0500184	101	151	12.5
13	FBJ0500186	101	151	13
13.5	FBJ0500188	108	160	13.5

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
14	FBJ0500190	108	160	14
14.5	FBJ0500192	114	169	14.5
15	FBJ0500194	114	169	15
15.5	FBJ0500196	120	178	15.5
16	FBJ0500198	120	178	16
16.5	FBJ0500200	125	184	16.5
17	FBJ0500202	125	184	17
17.5	FBJ0500204	130	191	17.5
18	FBJ0500206	130	191	18
18.5	FBJ0500208	135	198	18.5
19	FBJ0500210	135	198	19
20	FBJ0500212	140	205	20

**3X****Solid carbide jobber drill**

Carbide

STUB

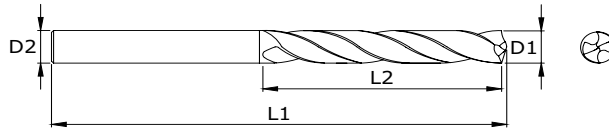


3X



30°

BF



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBJ0500213	16	46	3
3.1	FBJ0500215	18	49	3.1
3.2	FBJ0500217	18	49	3.2
3.3	FBJ0500219	18	49	3.3
3.4	FBJ0500221	20	52	3.4
3.5	FBJ0500223	20	52	3.5
3.6	FBJ0500225	20	52	3.6
3.7	FBJ0500227	20	52	3.7
3.8	FBJ0500229	22	55	3.8
3.9	FBJ0500231	22	55	3.9
4	FBJ0500233	22	55	4
4.1	FBJ0500235	22	55	4.1
4.2	FBJ0500237	22	55	4.2
4.3	FBJ0500239	24	58	4.3
4.4	FBJ0500241	24	58	4.4
4.5	FBJ0500243	24	58	4.5
4.7	FBJ0500247	24	58	4.7
4.8	FBJ0500249	26	62	4.8

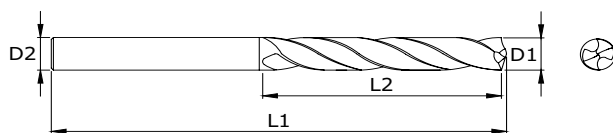
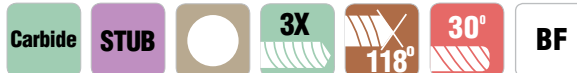
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
4.9	FBJ0500251	26	62	4.9
5	FBJ0500253	26	62	5
5.1	FBJ0500255	26	62	5.1
5.2	FBJ0500257	26	62	5.2
5.3	FBJ0500259	26	62	5.3
5.4	FBJ0500261	28	66	5.4
5.5	FBJ0500263	28	66	5.5
5.6	FBJ0500265	28	66	5.6
5.7	FBJ0500267	28	66	5.7
5.8	FBJ0500269	28	66	5.8
5.9	FBJ0500271	28	66	5.9
6	FBJ0500273	28	66	6
6.1	FBJ0500275	31	70	6.1
6.2	FBJ0500277	31	70	6.2
6.3	FBJ0500279	31	70	6.3
6.4	FBJ0500281	31	70	6.4
6.5	FBJ0500283	31	70	6.5
6.6	FBJ0500285	31	70	6.6





**3X**

**Solid carbide jobber drill**



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
6.7	FBJ0500287	31	70	6.7
6.8	FBJ0500289	34	74	6.8
6.9	FBJ0500291	34	74	6.9
7	FBJ0500293	34	74	7
7.1	FBJ0500295	34	74	7.1
7.2	FBJ0500297	34	74	7.2
7.3	FBJ0500299	34	74	7.3
7.4	FBJ0500301	34	74	7.4
7.5	FBJ0500303	34	74	7.5
7.6	FBJ0500305	37	79	7.6
7.7	FBJ0500307	37	79	7.7
7.8	FBJ0500309	37	79	7.8
7.9	FBJ0500311	37	79	7.9
8	FBJ0500313	37	79	8
8.1	FBJ0500315	37	79	8.1
8.2	FBJ0500317	37	79	8.2
8.3	FBJ0500319	37	79	8.3
8.4	FBJ0500321	37	79	8.4

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
8.5	FBJ0500323	37	79	8.5
8.6	FBJ0500325	40	84	8.6
8.7	FBJ0500327	40	84	8.7
8.8	FBJ0500329	40	84	8.8
8.9	FBJ0500331	40	84	8.9
9	FBJ0500333	40	84	9
9.1	FBJ0500335	40	84	9.1
9.2	FBJ0500337	40	84	9.2
9.3	FBJ0500339	40	84	9.3
9.4	FBJ0500341	40	84	9.4
9.5	FBJ0500343	40	84	9.5
9.6	FBJ0500345	43	89	9.6
9.7	FBJ0500347	43	89	9.7
9.8	FBJ0500349	43	89	9.8
9.9	FBJ0500351	43	89	9.9
10	FBJ0500353	43	89	10
10.1	FBJ0500355	43	89	10.1

**3X****Solid carbide jobber drill**

Carbide

STUB

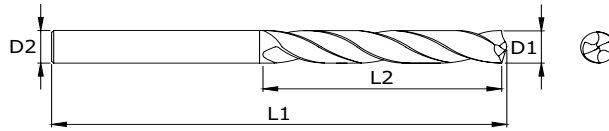


3X



30°

BF



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

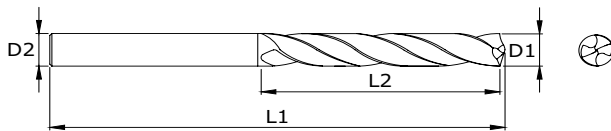
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
10.2	FBJ0500357	43	89	10.2
10.3	FBJ0500359	43	89	10.3
10.4	FBJ0500361	43	89	10.4
10.5	FBJ0500363	43	89	10.5
10.6	FBJ0500365	43	89	10.6
10.7	FBJ0500367	47	95	10.7
10.8	FBJ0500369	47	95	10.8
10.9	FBJ0500371	47	95	10.9
11	FBJ0500373	47	95	11
11.1	FBJ0500375	47	95	11.1
11.2	FBJ0500377	47	95	11.2
11.3	FBJ0500379	47	95	11.3
11.4	FBJ0500381	47	95	11.4
11.5	FBJ0500383	47	95	11.5
11.6	FBJ0500385	47	95	11.6
11.7	FBJ0500387	47	95	11.7
11.8	FBJ0500389	47	95	11.8

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	ØD2
11.9	FBJ0500391	51	102	11.9
12	FBJ0500393	51	102	12
12.5	FBJ0500395	51	102	12.5
13	FBJ0500397	51	102	13
13.5	FBJ0500399	54	107	13.5
14	FBJ0500401	54	107	14
14.5	FBJ0500403	56	111	14.5
15	FBJ0500405	56	111	15
15.5	FBJ0500407	58	115	15.5
16	FBJ0500409	58	115	16
16.5	FBJ0500411	60	119	16.5
17	FBJ0500413	60	119	17
17.5	FBJ0500415	62	123	17.5
18	FBJ0500417	62	123	18
18.5	FBJ0500419	64	127	18.5
19	FBJ0500421	64	127	19
20	FBJ0500423	66	131	20



**3X**

**Solid carbide jobber drill**



- P0-P6
- K1-K3
- M1-M3
- H1-H4
- S1-S4
- N1-N7

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
3	FBJ0500214	16	46	3
3.1	FBJ0500216	18	49	3.1
3.2	FBJ0500218	18	49	3.2
3.3	FBJ0500220	18	49	3.3
3.4	FBJ0500222	20	52	3.4
3.5	FBJ0500224	20	52	3.5
3.6	FBJ0500226	20	52	3.6
3.7	FBJ0500228	20	52	3.7
3.8	FBJ0500230	22	55	3.8
3.9	FBJ0500232	22	55	3.9
4	FBJ0500234	22	55	4
4.1	FBJ0500236	22	55	4.1
4.2	FBJ0500238	22	55	4.2
4.3	FBJ0500240	24	58	4.3
4.4	FBJ0500242	24	58	4.4
4.5	FBJ0500244	24	58	4.5
4.7	FBJ0500248	24	58	4.7
4.8	FBJ0500250	26	62	4.8

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
Ø D1		L2	L1	Ø D2
4.9	FBJ0500252	26	62	4.9
5	FBJ0500254	26	62	5
5.1	FBJ0500256	26	62	5.1
5.2	FBJ0500258	26	62	5.2
5.3	FBJ0500260	26	62	5.3
5.4	FBJ0500262	28	66	5.4
5.5	FBJ0500264	28	66	5.5
5.6	FBJ0500266	28	66	5.6
5.7	FBJ0500268	28	66	5.7
5.8	FBJ0500270	28	66	5.8
5.9	FBJ0500272	28	66	5.9
6	FBJ0500274	28	66	6
6.1	FBJ0500276	31	70	6.1
6.2	FBJ0500278	31	70	6.2
6.3	FBJ0500280	31	70	6.3
6.4	FBJ0500282	31	70	6.4
6.5	FBJ0500284	31	70	6.5
6.6	FBJ0500286	31	70	6.6

HSS TAPS

DIES

END MILLS

DRILLS

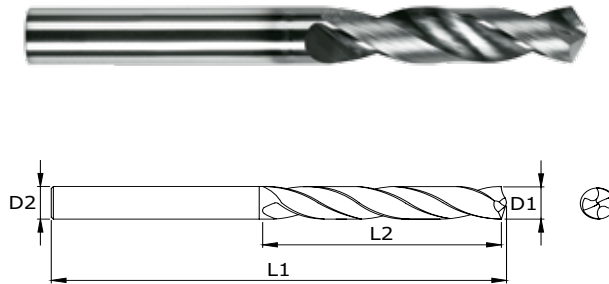
CARBIDE BURRS

CS TAPS

**3X****Solid carbide jobber drill**

Carbide

STUB



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

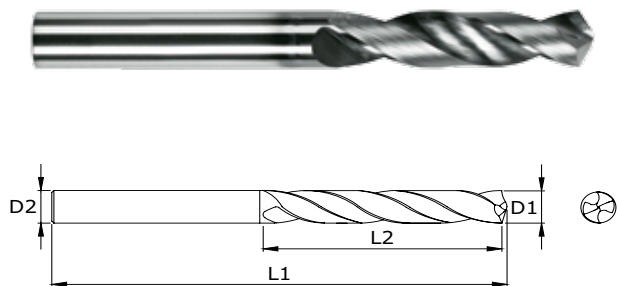
Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	D2
6.7	FBJ0500288	31	70	6.7
6.8	FBJ0500290	34	74	6.8
6.9	FBJ0500292	34	74	6.9
7	FBJ0500294	34	74	7
7.1	FBJ0500296	34	74	7.1
7.2	FBJ0500298	34	74	7.2
7.3	FBJ0500300	34	74	7.3
7.4	FBJ0500302	34	74	7.4
7.5	FBJ0500304	34	74	7.5
7.6	FBJ0500306	37	79	7.6
7.7	FBJ0500308	37	79	7.7
7.8	FBJ0500310	37	79	7.8
7.9	FBJ0500312	37	79	7.9
8	FBJ0500314	37	79	8
8.1	FBJ0500316	37	79	8.1
8.2	FBJ0500318	37	79	8.2
8.3	FBJ0500320	37	79	8.3
8.4	FBJ0500322	37	79	8.4

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	D2
8.5	FBJ0500324	37	79	8.5
8.6	FBJ0500326	40	84	8.6
8.7	FBJ0500328	40	84	8.7
8.8	FBJ0500330	40	84	8.8
8.9	FBJ0500332	40	84	8.9
9	FBJ0500334	40	84	9
9.1	FBJ0500336	40	84	9.1
9.2	FBJ0500338	40	84	9.2
9.3	FBJ0500340	40	84	9.3
9.4	FBJ0500342	40	84	9.4
9.5	FBJ0500344	43	89	9.5
9.6	FBJ0500346	43	89	9.6
9.7	FBJ0500348	43	89	9.7
9.8	FBJ0500350	43	89	9.8
9.9	FBJ0500352	43	89	9.9
10	FBJ0500354	43	89	10
10.1	FBJ0500356	43	89	10.1
10.2	FBJ0500358	43	89	10.2



**3X**

**Solid carbide jobber drill**



P0-P6

K1-K3

M1-M3

H1-H4

S1-S4

N1-N7

Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	D2
10.3	FBJ0500360	43	89	10.3
10.4	FBJ0500362	43	89	10.4
10.5	FBJ0500364	43	89	10.5
10.6	FBJ0500366	43	89	10.6
10.7	FBJ0500368	47	95	10.7
10.8	FBJ0500370	47	95	10.8
10.9	FBJ0500372	47	95	10.9
11	FBJ0500374	47	95	11
11.1	FBJ0500376	47	95	11.1
11.2	FBJ0500378	47	95	11.2
11.3	FBJ0500380	47	95	11.3
11.4	FBJ0500382	47	95	11.4
11.5	FBJ0500384	47	95	11.5
11.6	FBJ0500386	47	95	11.6
11.7	FBJ0500388	47	95	11.7
11.8	FBJ0500390	47	95	11.8
11.9	FBJ0500392	51	102	11.9
12	FBJ0500394	51	102	12

Diameter	EDP No	Flute Length	Overall Length	Shank Diameter
ØD1		L2	L1	D2
12.5	FBJ0500396	51	102	12.5
13	FBJ0500398	51	102	13
13.5	FBJ0500400	54	107	13.5
14	FBJ0500402	54	107	14
14.5	FBJ0500404	56	111	14.5
15	FBJ0500406	56	111	15
15.5	FBJ0500408	58	115	15.5
16	FBJ0500410	58	115	16
16.5	FBJ0500412	60	119	16.5
17	FBJ0500414	60	119	17
17.5	FBJ0500416	62	123	17.5
18	FBJ0500418	62	123	18
18.5	FBJ0500420	64	127	18.5
19	FBJ0500422	64	127	19
20	FBJ0500424	66	131	20



High Speed Steel Drills

HSS TAPS

DIES

END MILLS

DRILLS

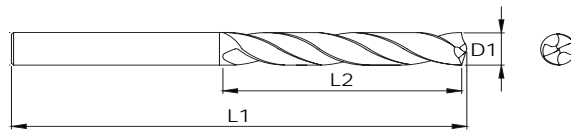
CARBIDE BURRS

CS TAPS

**5X**

## High speed steel straight shank jobber drill

HSS
DIN 338
5X
118°
30°
BF



Unit : mm

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
1.0	FBR0200001	12	34
1.1	FBR0200002	14	36
1.2	FBR0200003	16	38
1.3	FBR0200004	16	38
1.4	FBR0200005	18	40
1.5	FBR0200006	18	40
1.6	FBR0200007	20	43
1.7	FBR0200008	20	43
1.8	FBR0200009	22	46
1.9	FBR0200010	22	46
2	FBR0200011	24	49
2.1	FBR0200012	24	49
2.2	FBR0200013	27	53
2.3	FBR0200014	27	53
2.4	FBR0200015	30	57
2.5	FBR0200016	30	57
2.6	FBR0200017	30	57
2.7	FBR0200018	33	61
2.8	FBR0200019	33	61
2.9	FBR0200020	33	61
3	FBR0200021	33	61

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
3.1	FBR0200022	36	65
3.2	FBR0200023	36	65
3.3	FBR0200024	36	65
3.4	FBR0200025	39	70
3.5	FBR0200026	39	70
3.6	FBR0200027	39	70
3.7	FBR0200028	39	70
3.8	FBR0200029	43	75
3.9	FBR0200030	43	75
4.0	FBR0200031	43	75
4.1	FBR0200032	43	75
4.2	FBR0200033	43	75
4.3	FBR0200034	47	80
4.4	FBR0200035	47	80
4.5	FBR0200036	47	80
4.6	FBR0200037	47	80
4.7	FBR0200038	47	80
4.8	FBR0200039	52	86
4.9	FBR0200040	52	86
5	FBR0200041	52	86
5.1	FBR0200042	52	86

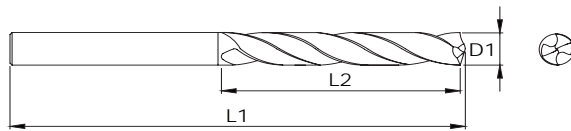


# 5X High speed steel straight shank jobber drill

HSS
DIN 338

5X 


BF



Unit : mm

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
5.2	FBR0200043	52	86
5.3	FBR0200044	52	86
5.4	FBR0200045	57	93
5.5	FBR0200046	57	93
5.6	FBR0200047	57	93
5.7	FBR0200048	57	93
5.8	FBR0200049	57	93
5.9	FBR0200050	57	93
6	FBR0200051	57	93
6.1	FBR0200052	63	101
6.2	FBR0200053	63	101
6.3	FBR0200054	63	101
6.4	FBR0200055	63	101
6.5	FBR0200056	63	101
6.6	FBR0200057	63	101
6.7	FBR0200058	63	101
6.8	FBR0200059	69	109
6.9	FBR0200060	69	109
7.0	FBR0200061	69	109
7.1	FBR0200062	69	109
7.2	FBR0200063	69	109

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
7.3	FBR0200064	69	109
7.4	FBR0200065	69	109
7.5	FBR0200066	69	109
7.6	FBR0200067	75	117
7.7	FBR0200068	75	117
7.8	FBR0200069	75	117
7.9	FBR0200070	75	117
8	FBR0200071	75	117
8.1	FBR0200072	75	117
8.2	FBR0200073	75	117
8.3	FBR0200074	75	117
8.4	FBR0200075	75	117
8.5	FBR0200076	75	117
8.6	FBR0200077	81	125
8.7	FBR0200078	81	125
8.8	FBR0200079	81	125
8.9	FBR0200080	81	125
9	FBR0200081	81	125
9.1	FBR0200082	81	125
9.2	FBR0200083	81	125
9.3	FBR0200084	81	125



High Speed Steel Drills

HSS TAPS

DIES

END MILLS

DRILLS

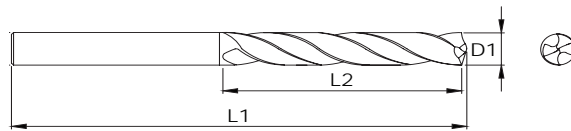
CARBIDE BURRS

CS TAPS

**5X**

## High speed steel straight shank jobber drill

HSS
DIN 338
5X
118°
30°
BF



Unit : mm

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
9.4	FBR0200085	81	125
9.5	FBR0200086	81	125
9.6	FBR0200087	87	133
9.7	FBR0200088	87	133
9.8	FBR0200089	87	133
9.9	FBR0200090	87	133
10.0	FBR0200091	87	133
10.1	FBR0200264	87	133
10.2	FBR0200092	87	133
10.3	FBR0200265	87	133
10.4	FBR0200266	87	133
10.5	FBR0200093	87	133
10.6	FBR0200141	87	133
10.7	FBR0200094	94	142
10.8	FBR0200095	94	142
10.9	FBR0200267	94	142
11	FBR0200096	94	142
11.1	FBR0200268	94	142
11.2	FBR0200269	94	142

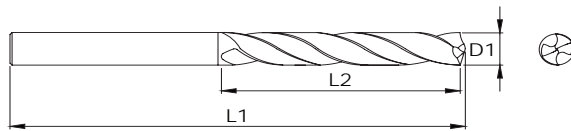
Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
11.3	FBR0200270	94	142
11.4	FBR0200271	94	142
11.5	FBR0200097	94	142
11.6	FBR0200272	94	142
11.7	FBR0200273	94	142
11.8	FBR0200098	94	142
11.9	FBR0200274	101	151
12	FBR0200099	101	151
12.1	FBR0200275	101	151
12.2	FBR0200276	101	151
12.3	FBR0200277	101	151
12.4	FBR0200278	101	151
12.5	FBR0200100	101	151
12.6	FBR0200142	101	151
12.7	FBR0200279	101	151
12.8	FBR0200280	101	151
12.9	FBR0200281	101	151
13.0	FBR0200101	101	151





# 5X High speed steel straight shank jobber drill

HSS
DIN 338
5X
118°
30°
BF



Unit : mm

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
1/16"	FBR0200158	20	43
5/64"	FBR0200159	24	49
3/32"	FBR0200160	30	57
7/64"	FBR0200103	33	61
1/8"	FBR0200102	36	65
9/64"	FBR0200104	39	70
5/32"	FBR0200105	43	75
11/64"	FBR0200106	47	80
3/16"	FBR0200107	52	86
13/64"	FBR0200109	52	86
7/32"	FBR0200161	57	93
15/64"	FBR0200282	57	93
1/4"	FBR0200108	63	101
17/64"	FBR0200110	69	109
9/32"	FBR0200162	69	109
19/64"	FBR0200163	75	117
5/16"	FBR0200111	75	117

Diameter	EDP No	Flute Length	Overall Length
ØD1		L2	L1
21/64"	FBR0200112	75	117
11/32"	FBR0200164	81	125
23/64"	FBR0200165	81	125
3/8"	FBR0200113	87	133
25/64"	FBR0200283	87	133
13/32"	FBR0200284	87	133
27/64"	FBR0200285	94	142
7/16"	FBR0200114	94	142
29/64"	FBR0200286	94	142
15/32"	FBR0200287	101	151
31/64"	FBR0200288	101	151
1/2"	FBR0200115	101	151



High Speed Steel Drills

HSS TAPS

DIES

END MILLS

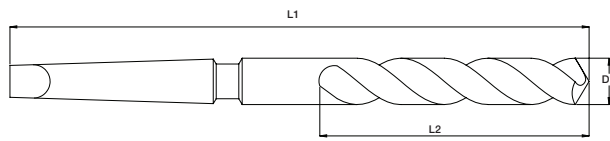
DRILLS

CARBIDE BURRS

CS TAPS

## High speed steel morse taper shank drill

HSS
DIN 345
118°
30°
BF



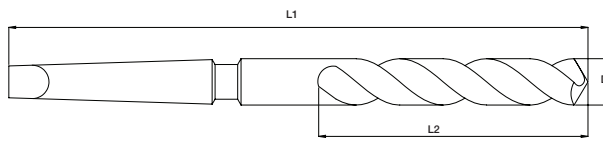
Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Morse Taper Shank Number
ØD1		L2	L1	
8	FBR0200198	75	156	MT-1
8.5	FBR0200199	75	156	MT-1
9	FBR0200200	81	162	MT-1
9.5	FBR0200201	81	162	MT-1
10	FBR0200204	87	168	MT-1
10.5	FBR0200206	87	168	MT-1
11	FBR0200208	94	175	MT-2
11.5	FBR0200210	94	175	MT-2
12	FBR0200116	101	182	MT-2
12.5	FBR0200212	101	182	MT-2
13	FBR0200117	101	182	MT-2
13.5	FBR0200214	108	189	MT-2
14	FBR0200119	108	189	MT-2
14.5	FBR0200216	114	212	MT-2
15	FBR0200121	114	212	MT-2
15.5	FBR0200217	120	218	MT-2
16	FBR0200123	120	218	MT-2
16.5	FBR0200218	125	223	MT-2
17	FBR0200219	125	223	MT-2
17.5	FBR0200220	130	228	MT-2

Diameter	EDP No	Flute Length	Overall Length	Morse Taper Shank Number
ØD1		L2	L1	
18	FBR0200125	130	228	MT-2
18.5	FBR0200221	135	233	MT-2
19	FBR0200126	135	233	MT-2
19.50	FBR0200222	140	238	MT-2
20	FBR0200128	140	238	MT-2
20.5	FBR0200223	145	243	MT-2
21	FBR0200130	145	243	MT-2
21.5	FBR0200224	150	248	MT-2
22	FBR0200308	150	248	MT-2
22.5	FBR0200309	155	253	MT-2
23	FBR0200225	155	253	MT-2
23.5	FBR0200226	155	276	MT-2
24	FBR0200132	160	281	MT-2
24.5	FBR0200227	160	281	MT-2
25	FBR0200133	160	281	MT-2
25.5	FBR0200228	165	286	MT-2
26	FBR0200135	165	286	MT-2
26.5	FBR0200229	165	286	MT-3
27	FBR0200230	170	291	MT-3
27.5	FBR0200231	170	291	MT-3



## High speed steel morse taper shank drill



Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Morse Taper Shank Number
ØD1		L2	L1	
28	FBR0200136	170	291	MT-3
28.5	FBR0200232	175	296	MT-3
29	FBR0200137	175	296	MT-3
29.5	FBR0200310	175	296	MT-3
30	FBR0200139	175	296	MT-3
30.5	FBR0200233	180	301	MT-3
31	FBR0200234	180	301	MT-3
31.5	FBR0200235	180	301	MT-3
32	FBR0200140	185	334	MT-3
32.5	FBR0200236	185	334	MT-3
33	FBR0200237	185	334	MT-3
33.5	FBR0200238	185	334	MT-3
34	FBR0200239	190	339	MT-3
34.5	FBR0200240	190	339	MT-3
35	FBR0200241	190	339	MT-3
35.5	FBR0200242	190	339	MT-3
36	FBR0200243	195	344	MT-3
36.5	FBR0200244	195	344	MT-3
37	FBR0200245	195	344	MT-3
37.5	FBR0200246	195	344	MT-3

Diameter	EDP No	Flute Length	Overall Length	Morse Taper Shank Number
ØD1		L2	L1	
38	FBR0200247	200	349	MT-3
38.5	FBR0200248	200	349	MT-3
39	FBR0200249	200	349	MT-3
39.5	FBR0200250	200	349	MT-3
40	FBR0200251	200	349	MT-3
40.5	FBR0200252	205	354	MT-3
41	FBR0200253	205	354	MT-3
41.5	FBR0200254	205	354	MT-3
42	FBR0200255	205	354	MT-3
43	FBR0200256	210	359	MT-3
44	FBR0200257	210	359	MT-3
45	FBR0200258	210	359	MT-3
46	FBR0200259	215	364	MT-3
47	FBR0200260	215	364	MT-3
48	FBR0200261	220	369	MT-3
49	FBR0200262	220	369	MT-3
50	FBR0200263	220	369	MT-4



High Speed Steel Drills

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

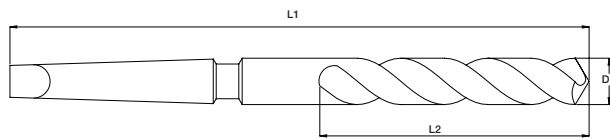
## High speed steel morse taper shank drill

HSS

DIN  
345



BF



Unit : mm

Diameter	EDP No	Flute Length	Overall Length	Morse Taper Shank Number
ØD1		L2	L1	
3/8"	FBR0200202	87	168	MT-1
25/64"	FBR0200203	87	168	MT-1
13/32"	FBR0200205	87	168	MT-1
27/64"	FBR0200207	94	175	MT-2
7/16"	FBR0200209	94	175	MT-2
15/32"	FBR0200211	101	182	MT-2
1/2"	FBR0200118	101	182	MT-2
17/32"	FBR0200213	108	189	MT-2
35/64"	FBR0200215	108	189	MT-2
9/16"	FBR0200120	114	212	MT-2
5/8"	FBR0200122	120	218	MT-2
11/16"	FBR0200124	130	228	MT-2
3/4"	FBR0200127	140	238	MT-2
13/16"	FBR0200129	145	243	MT-2
7/8"	FBR0200131	150	248	MT-2
1"	FBR0200134	165	286	MT-2
1.1/8"	FBR0200138	175	296	MT-3

# DRILLS

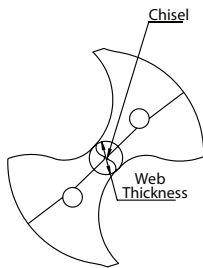
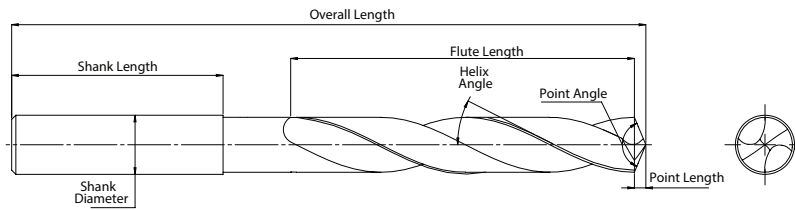


High Performance Cutting Tools



## TECHNICAL DETAILS

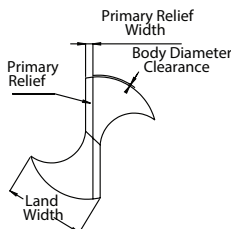
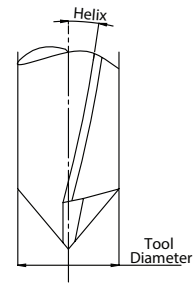
## SOLID CARBIDE DRILL NOMENCLATURE



**Chisel Edge** – The non-cutting tip of the drill. Pushes, rather than cuts material. Having a smaller chisel means that a tool will cut more aggressively. A larger chisel means that a tool will be stronger.

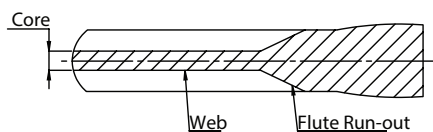
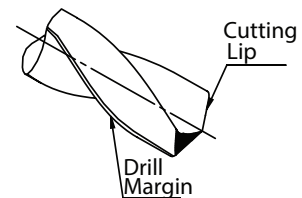
**Web** – The core of the drill that is left from the fluting operation. A thicker web means added rigidity, while a smaller web means more chip evacuation. On two flute drills, typically varies from 16% - 30% of the tool diameter.

**Helix Angle** - Varies from 0° to 35° helix on standard tools. Lower helix angle means more rigidity and strength and a higher helix angle means more aggressive drilling and better chip evacuation.



**Margin Width** – Provides a surface to support the drill inside the hole during the drilling operation. Totem® offers both single margin and double margin geometries. Margin widths are a balancing act between friction build-up vs. tool support in the drilling operation.

**Cutting Lip** - The cutting edges of a two flute drill extending from the chisel edge to the periphery.



**Land Width** – The amount of material left on the drill per side, from the fluting operation. Larger land widths mean more rigidity, while smaller land widths allow for better chip evacuation.

Having a problem with drill geometries? Circle the area where the problem exists. Include a detailed explanation of the issue and mail to [sales@forbes.co.in](mailto:sales@forbes.co.in)



## FEED RATE CHART

### Series 2TDSS/2TDSR METRIC

Workpiece Material Group	Material	SMM	Tool Diameter					
			3	6	10	12	16	20
			mm/rev					
Steels	Low Carbon Steels 1018/12L14	105-125	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
	Alloy Steels (up to 35 Rc) 4140/A2/D2/400	85-105						
	Alloy Steels (36-45 Rc) 4140/A2/D2	50-65						
Cast Irons	Gray Cast Iron A48, Class 20/G4000 405-500	125-150	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
	Ductile Cast Iron 60-40-18	95-115						
Austenitic	304/316	40-60	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
Precipitation Hardened Stainless Steels	17-4 PH	30-50	.051-.076	.102-.152	.127-.229	.152-.254	.229-.305	.254-.356
	13-8 PH							
Special Alloys	Titanium	45	0.025	0.064	0.102	0.127	0.152	0.191
	6AL-4V							
	Cobalt-Based Alloys	15						
	Stellite, Haynes 25/188							
	Nickel-Based Alloys	25						
	Inconel 625/718							
	Iron-Based Alloys							
	Incoloy 800-802/Multimet	30						
High Nickel Alloys								
Monel								

#RPM = SMM x 318.057/Tool Dia.

#mm/min = RPM x mm/rev

### Series 2TDSS/2TDSR INCH

Workpiece Material Group	Material	SFM	Tool Diameter					
			1/8	1/4	3/8	1/2	5/8	3/4
			IPR					
Steels	Low Carbon Steels 1018/12L14	345-405	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
	Alloy Steels (up to 35 Rc) 4140/A2/D2/400	280-350						
	Alloy Steels (36-45 Rc) 4140/A2/D2	170-210						
Cast Irons	Gray Cast Iron A48, Class 20/G4000 405-500	315-375	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
	Ductile Cast Iron 60-40-18							
Austenitic	304/316	125-190	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
Precipitation Hardened Stainless Steels	17-4 PH	95-155	.0019-.0031	.0038-.0063	.0050-.0088	.0063-.0100	.0088-.0120	.0100-.0140
	13-8 PH							
Special Alloys	Titanium	150	0.001	0.0025	0.004	0.005	0.006	0.0075
	6AL-4V							
	Cobalt-Based Alloys	40						
	Stellite, Haynes 25/188							
	Nickel-Based Alloys	80						
	Inconel 625/718							
	Iron-Based Alloys							
	Incoloy 800-802/Multimet	100						
High Nickel Alloys								
Monel								

#RPM = SFM x 3.82/Tool Dia.

#IPM = RPM x IPR

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## FEED RATE CHART

### Series 2TDCR METRIC

Workpiece Material Group		Material	SMM	Tool Diameter					
				3	6	10	12	16	20
				mm/rev					
Steels	P	Low Carbon Steels 1018/12L14	150-190	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
		Alloy Steels (up to 35 Rc) 4140/A2/D2/400	95-130						
		Alloy Steels (36-45 Rc) 4140/A2/D2	60-75						
Cast Irons	K	Gray Cast Iron A48, Class 20/G4000 405-500	150-190	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
		Ductile Cast Iron 60-40-18	106-129						
Austenitic	M	304/316	65-95	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
Precipitation Hardened Stainless Steels	M	17-4 PH	45-65	.051-.076	.102-.152	.127-.229	.152-.254	.229-.305	.254-.356
		13-8 PH							
Special Alloys	S	Titanium 6AL-4V	55	0.025	0.064	0.102	0.127	0.152	0.191
		Cobalt-Based Alloys Stellite, Haynes 25/188	15						
		Nickel-Based Alloys Inconel 625/718	30						
		Iron-Based Alloys Incoloy 800-802/Multimet							
		High Nickel Alloys Monel							

#RPM = SMM x 318.057/Tool Dia.

#mm/min = RPM x mm/rev

### Series 2TDCR INCH

Workpiece Material Group		Material	SFM	Tool Diameter					
				1/8	1/4	3/8	1/2	5/8	3/4
				IPR					
Steels	P	Low Carbon Steels 1018/12L14	500-625	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
		Alloy Steels (up to 35 Rc) 4140/A2/D2/400	315-435						
		Alloy Steels (36-45 Rc) 4140/A2/D2	190-250						
Cast Irons	K	Gray Cast Iron A48, Class 20/G4000 405-500	500-625	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
		Ductile Cast Iron 60-40-18	350-425						
Austenitic	M	304/316	220-315	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
Precipitation Hardened Stainless Steels	M	17-4 PH	155-220	.0019-.0031	.0038-.0063	.0050-.0088	.0063-.0100	.0088-.0120	.0100-.0140
		13-8 PH							
Special Alloys	S	Titanium 6AL-4V	180	0.001	0.0025	0.004	0.005	0.006	0.0075
		Cobalt-Based Alloys Stellite, Haynes 25/188	50						
		Nickel-Based Alloys Inconel 625/718	95						
		Iron-Based Alloys Incoloy 800-802/Multimet							
		High Nickel Alloys Monel							

#RPM = SFM x 3.82/Tool Dia.

#IPM = RPM x IPR

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.





## FEED RATE CHART

### Series 2TDCL METRIC

Workpiece Material Group		Material	SMM	Tool Diameter (mm)					
				3	6	10	12	16	19
				mm/rev					
Steels	P	Low Carbon Steels 1018/12L14	160-180	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
		Alloy Steels (up to 35 Rc) 4140/A2/D2/400	85-115						
		Alloy Steels (36-45 Rc) 4140/A2/D2	50-70						
Cast Irons	K	Gray Cast Iron A48, Class 20/G4000 405-500	160-180	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
		Ductile Cast Iron 60-40-18	106-129						
Austenitic	M	304/316	55-85	.102-.152	.152-.229	.229-.279	.254-.330	.279-.381	.305-.432
Precipitation Hardened Stainless Steels	M	17-4 PH	40-60	.051-.076	.102-.152	.127-.229	.152-.254	.229-.305	.254-.356
		13-8 PH							
Special Alloys	S	Titanium 6AL-4V	55	0.025	0.064	0.102	0.127	0.152	0.191
		Cobalt-Based Alloys Stellite, Haynes 25/188	15						
		Nickel-Based Alloys Inconel 625/718 Iron-Based Alloys Incoloy 800-802/Multimet	30						
		High Nickel Alloys Monel	35						

#RPM = SMM x 318.057/Tool Dia.

#mm/min = RPM x mm/rev

### Series 2TDCL INCH

Workpiece Material Group		Material	SFM	Tool Diameter (inch)					
				1/8	1/4	3/8	1/2	5/8	3/4
				IPR					
Steels	P	Low Carbon Steels 1018/12L14	530-595	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
		Alloy Steels (up to 35 Rc) 4140/A2/D2/400	280-375						
		Alloy Steels (36-45 Rc) 4140/A2/D2	170-225						
Cast Irons	K	Gray Cast Iron A48, Class 20/G4000 405-500	530-590	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
		Ductile Cast Iron 60-40-18	350-425						
Austenitic	M	304/316	185-280	.0038-.0063	.0063-.0088	.0088-.0110	.0100-.0125	.0110-.0150	.0120-.0170
Precipitation Hardened Stainless Steels	M	17-4 PH	125-190	.0019-.0031	.0038-.0063	.0050-.0088	.0063-.0100	.0088-.0120	.0100-.0140
		13-8 PH							
Special Alloys	S	Titanium 6AL-4V	180	0.001	0.0025	0.004	0.005	0.006	0.0075
		Cobalt-Based Alloys Stellite, Haynes 25/188	50						
		Nickel-Based Alloys Inconel 625/718 Iron-Based Alloys Incoloy 800-802/Multimet	95						
		High Nickel Alloys Monel	120						

#RPM = SFM x 3.82/Tool Dia.

#IPM = RPM x IPR

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## FEED RATE CHART

### Series F224/F226 METRIC

Workpiece Material Group		Material	SMM		Tool Diameter (mm)					
			F224	F226	3	6	10	12	20	25
Steels	P	Low Carbon Steels 1018/12L14	55	55	0.127	0.152	0.2	0.254	0.305	0.356
		Alloy Steels (up to 35 Rc) 4140/A2/D2/400	50	50						
		Alloy Steels (36-45 Rc) 4140/A2/D2	45	45						
Cast Irons	K	Gray Cast Iron A48, Class 20/G4000 405-500	40	40	0.127	0.152	0.2	0.254	0.305	0.356
		Ductile Cast Iron 60-40-18	55	55						
Austenitic	M	304/316	85	85	0.127	0.152	0.2	0.254	0.305	0.356
Precipitation Hardened Stainless Steels	M	17-4 PH	30	30	0.127	0.152	0.2	0.254	0.305	0.356
		13-8 PH								
Non Ferrous	N	Plastic	120	120	0.05	0.076	0.1	0.152	0.225	0.25
		Kevlar/Graphite	120	120	0.05	0.076	0.1	0.152	0.225	0.25

#RPM = SMM x 318.057/Tool Dia.

#mm/min = RPM x mm/rev

### Series F224/F226 INCH

Workpiece Material Group		Material	SFM		Tool Diameter (inch)					
			F224	F226	1/8	1/4	3/8	1/2	3/4	1
Steels	P	Low Carbon Steels 1018/12L14	175	175	0.004	0.006	0.008	0.01	0.012	0.014
		Alloy Steels (up to 35 Rc) 4140/A2/D2/400	165	165						
		Alloy Steels (36-45 Rc) 4140/A2/D2	150	150						
Cast Irons	K	Gray Cast Iron A48, Class 20/G4000 405-500	275	275	0.004	0.006	0.008	0.01	0.012	0.014
		Ductile Cast Iron 60-40-18	175	175						
Austenitic	M	304/316	135	135	0.004	0.006	0.008	0.01	0.012	0.014
Precipitation Hardened Stainless Steels	M	17-4 PH	100	100	0.004	0.006	0.008	0.01	0.012	0.014
		13-8 PH								
Non Ferrous	N	Plastic	400	400	0.002	0.004	0.006	0.008	0.01	0.012
		Kevlar/Graphite	400	400	0.002	0.004	0.006	0.008	0.01	0.012

#RPM = SFM x 3.82/Tool Dia.

#IPM = RPM x IPR

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## DRILL TROUBLESHOOTING

	Problem	Tool Deterioration											Chip Formation				
		Flank wear	Margin wear	Breakage	Flaking	Creater wear	Chisel edge wear	Corner chipping	Flute chipping	Cutting edge chipping	Cutting edge wear	Point center chipping	Rake face	Scoring on tool body	Long stringy	Varied chip form	Blue/brown chips
Speed & Feed	Reduce feed or reduce at exit	X		X			X	X	X	X		X	X	X			
	Reduce feed at entrance			X													
	Consistent feed rate			X											X	X	
	Increase feed	X					X								X		
	Reduce speed	X	X			X		X			X						
	Increase speed										X						
Coolant	Coolant mix		X	X	X				X				X				
	Coolant increase flow	X		X			X	X	X							X	
	Coolant filter	X		X	X				X								
Setup	Workpiece clamp rigid		X	X			X	X	X				X				
	Collet accuracy			X					X								
	Tool holder fit .0008			X					X								
	Alignment			X					X								
	Peck drill			X													
	Concentricity		X	X	X			X	X				X				
	Do not extract tool during peck							X									

	Problem	Tool Life	Workpiece							Process						
		Tool Life	Undersized hole	Oversized hole	Poor alignment	Poor surface finish	Heavy burr breakout	Retract marks	Hole location	Hole straightness	Deflection	Point Deflection	Galling	Vibration	Abnormal noise	Chip packing
Speed & Feed	Reduce feed or reduce at exit	X	X	X		X	X			X					X	
	Reduce feed at entrance		X			X		X		X			X		X	
	Consistent feed rate														X	
	Increase feed		X	X								X		X		
	Reduce speed	X	X												X	
	Increase speed					X										
Coolant	Coolant mix	X	X			X	X								X	
	Coolant increase flow	X	X			X	X								X	
	Coolant filter	X	X			X	X								X	
Setup	Workpiece clamp rigid	X		X	X	X	X	X	X							X
	Collet accuracy			X				X	X				X			
	Tool holder fit .0008			X				X	X				X			
	Alignment			X												X
	Peck drill															
	Concentricity				X	X		X	X	X		X		X		
	Do not extract tool during peck															

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## DRILL TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Hole expansion	Run out of drill when attached to the machine	Check holder and/or select another one
	Loose hold	Check run out after fixing to the chuck
	Non-symmetric point angle	Regrind correctly
	Different lip height	Check preciseness after reground
	Run out of chisel edge	
Irregular hole size	Non-symmetric point angle	Regrind correctly
	Large lip height	Check precision after regrind
	Run out of chisel edge	
	Margin wear is large	
	Large run out after attached to the machine	Check holder and select another one
	Loose hold	Check run out after fixing to the chuck
	Low work holding rigidity	
	Feed rate to high	Decrease feed rate
Not enough lubrication	Use drill with an oil hole	
Low position accuracy	Large run out when attached to the machine	Check holder and/or select another one
	Large spindle run out	Check run out after fixing to the collet
	Run out when cutting material	Select more rigid tool and machine
		Increase work clamping rigidity
		Select a low cutting resistance thinning
		Use centering
		Work piece should be horizontal
	Use a drill bush	
Hole perpendicularity	Excessive tool wear	Regrind
	Low position accuracy	Increase position accuracy
	Non-symmetric point angle	Regrind correctly
	Large lip height	Check precision after regrinding
	Run out of chisel edge	
	Not enough drill rigidity	Increase drill rigidity
	Drilling surface is not horizontal	Work piece must be horizontal
	Poor alignment	Make a center hole. Check alignment
Bad cylindrical accuracy	Non-symmetric point angle	Regrind correctly
		Check precision after regrinding
	Large lip height	
	Run out of chisel edge	
	Large run out after attached to machine	Check holder and/or select another one
	Loose hold	Check run out after fixing to the chuck
	Low work holding rigidity	
	Relief angle is too large	Regrind correctly
Low drill rigidity	Use larger web drills	



## DRILL TROUBLESHOOTING

PROBLEM	CAUSE	SOLUTION
Poor surface finish	Poor regrinding	Take off all the wear
	Not suitable coolant for the material	Change supply method; increase volume
	Not enough coolant	Select higher coolant quality
	Large run out after attached to machine	Check holder and/or select another one
	Loose hold	Check run out after fixing to the chuck
	Feed rate is too high	Reduce feed rate
	Excessive tool wear	Regrind correctly
	Build up on margin is too large	Select a coated tool
	Chip packing	Select suitable drill (wide flute, high helix oil hole drill). Change cutting conditions (feed rate or adopt step drilling)
Bad cylindrical shape	Non-symmetric point angle	Regrind correctly
	Large lip height	Check precision after regrinding
	Run out of chisel edge	
	Large margin wear	
	Feed rate is too low	Increase the feed rate
Chipping of corner edge	In appropriate tool material	Choose suitable tool material
	Uneven hardness distribution on the work material	Iso static treatment
		Change tool, material & cutting conditions, machining method
	Cutting or feed speed is too high	Reduce cutting speed or feed
	Not enough coolant	Change lubrication method
Chipping of cutting edge	Large run out after attached to machine	Check holder and/or select another one
		Check run out after fixing to the collet
	Relief angle is too small	Regrind correctly
	Tool material is not suitable	Choose suitable tool material
	Cutting speed or feed is too high	Reduce cutting speed or feed
Abnormal wear on corner part	Too late regrinding	Regrind after a shorter time of use
	Bad alignment	Check/adjust the alignment
	Cutting speed too high	Decrease the cutting speed
	Point dimensions are not suitable	Select correct point dimensions
	Tool materials not suitable	Choose suitable tool material
	Coolant is not suitable	Change coolant
Large wear and chipping, crushing of the chisel edge	Feed rate is too large	Decrease feed rate
	Point dimensions are not suitable	Select correct point dimensions
	Tool materials is not suitable	Choose suitable tool material
	Relief angle is too small	Increase relief angle
Chipping of margin	Bush diameter is too small	Select correct bush diameter or select drill with chip breakers
	Chip packing between drill & bush	
Margin built-up	High heat generation due to large wear on the cutting edge	Regrind
	Lubrication is insufficient	Change lubrication method
	Coolant is not suitable	Change coolant
	Bad chip ejection	Change drill or the cutting conditions
	Ductile material	



**TABLE OF CUTTING SPEEDS - FRACTIONAL SIZE DRILLS - HSS DRILL**

Ft./min	50	60	70	80	100
M/.min	15	18	21	24	30
Drill dia "inch'	Revolutions Per Minute				
1/64"	12224	14656	17088	19520	24448
1/32"	6112	7328	8544	9760	12224
3/64"	4064	4896	5696	6528	8160
1/16"	3056	3664	4272	4880	6112
5/64"	2448	2928	3424	3904	4896
3/32"	2032	2448	2848	3264	4080
1/8"	1528	1832	2136	2440	3056
5/32"	1224	1464	1712	1952	2448
3/16"	1016	1224	1424	1632	2040
7/32"	872	1048	1224	1400	1744
1/4"	764	916	1068	1220	1528
5/16"	612	732	856	976	1224
3/8"	508	612	712	816	1020
7/16"	436	524	612	700	872
1/2"	382	458	534	670	764
9/16"	340	408	476	544	680
5/8"	306	366	428	488	612
11/16"	278	334	388	444	556
3/4"	254	306	356	408	510
13/16"	234	282	330	376	470
7/8"	218	262	306	350	436
15/16"	204	244	286	326	408
1"	191	229	267	305	382
1-2/8"	170	204	238	272	340
1-1/4"	153	183	214	244	306
1-1/2"	127	153	178	204	255
1-3/4"	109	131	153	175	218
2"	95	114	133	152	191
2-1/4"	85	102	119	136	170
2-1/2"	76	92	107	122	153
2-3/4"	69	83	97	111	139
3"	64	76	89	102	127
4"	48	57	67	76	95

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



**TABLE OF CUTTING SPEEDS - METRIC SIZE DRILLS - HSS DRILL**

Ft./min	50	60	70	80	100
M/.min	15	18	21	24	30
Drill dia "mm'	Revolutions Per Minute				
0.5	9695	11634	13573	15512	19390
1	4847	5817	6786	7756	9695
1.5	3237	3884	4532	5179	6474
2	2427	2912	3397	3883	4854
2.5	1941	2329	2717	3105	3882
3	1617	1940	2264	2587	3234
4	1213	1455	1698	1940	2425
5	970	1164	1359	1553	1941
6	808	970	1132	1294	1617
7	693	832	970	1109	1386
8	606	728	849	970	1213
9	539	647	755	862	1078
10	485	582	679	776	970
11	441	529	617	706	882
12	404	485	566	647	808
13	373	448	522	597	746
14	346	416	485	554	693
15	323	388	453	554	693
16	303	364	424	485	606
17	285	342	399	456	571
18	269	323	377	431	539
19	255	306	357	408	511
20	242	291	340	388	485
21	231	277	323	370	462
22	220	265	309	353	441
23	211	253	295	337	422
24	202	242	283	323	404
25	194	233	272	310	388
26	186	224	261	298	373
27	180	216	252	287	359
30	162	194	226	259	323
33	147	176	206	235	294
36	135	162	189	216	270
39	124	149	174	199	249
42	116	139	162	185	231
45	108	129	151	172	216
48	101	121	141	162	202
51	95	114	133	152	190
56	87	104	121	139	173
61	80	95	111	127	159
65	75	90	104	119	149

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## FEEDS FOR HSS TWIST DRILLS

Drills dia inch	Feed / rev inch	Drill dia inch	Feed mm / Rev
1/16 - 3/32	.0015 - .0025	1.6 - 3.0	0.04 - 0.06
1/8 - 5/32	.002 - .004	3.0 - 4.0	0.05 - 0.10
3/16 - 7/32	.003 - .006	4.0 - 5.5	0.075 - 0.15
1/4 - 5/16	.004 - .008	5.5 - 8.0	0.10 - 0.20
3/8 - 7/16	.006 - 0.10	8.0 - 11.0	0.15 - 0.25
1/2 - 9/16	.008 - .012	11.0 - 14.5	0.20 - 0.30
5/8 - 11/16	.009 - .013	14.5 - 17.5	0.23 - 0.33
3/4 - 13/16	.010 - .014	17.5 - 20.5	0.25 - 0.36
7/8 - 15/16	.011 - .015	20.5 - 24.0	0.28 - 0.38
1 - 1.1/8	.012 - .016	24.0 - 28.5	0.30 - 0.40
1.1/4 - 1.1/2	.014 - .018	28.5 - 38.0	0.35 - 0.45
over 1.1/2	.016 - .020	over 38.0	0.40 - 0.50*
1/16 - 3/32	.002 - .0035	1.6 - 3.0	0.05 - 0.09
1/8 - 5/32	.0025 - .006	3.0 - 4.0	0.06 - 0.015
3/16 - 7/32	.004 - .009	4.0 - 5.5	0.10 - 0.23
1/4 - 5/16	.005 - .012	5.5 - 8.0	0.125 - 0.30
3/8 - 7/16	.0075 - .015	8.0 - 11.0	0.19 - 0.38
1/2 - 9/16	.010 - .018	11.0 - 14.5	0.25 - 0.45
5/8 - 11/16	.011 - .020	14.5 - 17.5	0.28 - 0.50
3/4 - 13/16	.0125 - .021	17.5 - 20.5	0.31 - 0.53
7/8 - 15/16	.0135 - .022	20.5 - 24.0	0.34 - 0.56
1 - 1.1/8	.015 - .024	24.0 - 28.5	0.38 - 0.60
1.1/4 - 1.1/2	.0175 - .027	28.5 - 38.0	0.44 - 0.68
over 1.1/2	.020 - .030	over 38.0	0.50 - 0.75

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



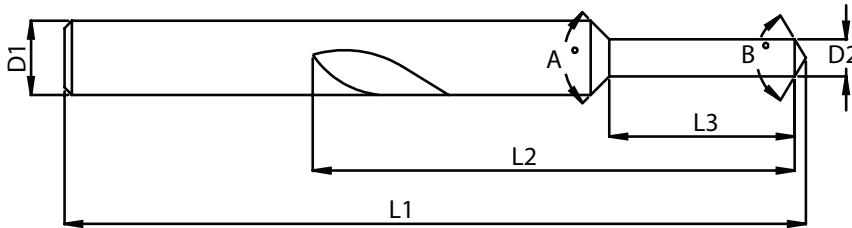


**CUSTOM TOOL REQUEST FORM**

Fill in information requested on drawing.  
(\*Required Fields)

Request Approval Drawing

A = \_\_\_\_\_  
 B = \_\_\_\_\_  
 D1 = \_\_\_\_\_  
 D2 = \_\_\_\_\_  
 L1 = \_\_\_\_\_  
 L2 = \_\_\_\_\_  
 L3 = \_\_\_\_\_



**\*Material**

- Solid Carbide
- Carbide Coolant Thru

**\*Number of Flutes**

- Solid Carbide
- Carbide Coolant Thru

**\*Margin Style**

- Single
- Double

**\*Margin Style**

- Cutting
- Non-Cutting

**\*Flute Form**

- Straight
- Helical \_\_\_\_\_ °Helix on Major Dia.

**\*Coating**

- TiN
- TiCN
- TiAlN
- None
- Other \_\_\_\_\_

**Note:**

This information enables us to engineer and manufacture a tool for your specific requirements.

Customer Name: \_\_\_\_\_

Phone: \_\_\_\_\_

\* Work Material Machined: \_\_\_\_\_

Hardness: \_\_\_\_\_

Distributor: \_\_\_\_\_

Quantities: \_\_\_\_\_



**TRIAL TOOL RESULTS FORM**

Customer Name		Ref No.	
Address		Date	
		Sales Engineer Name:	
		Contact No.:	
Contact Person :		Trial PO OA No:	
<b>Tool Diameter :</b>			
<b>Component Details:</b>		<b>Operation Details:</b>	
Name		Drilling Depth	
Material		No. of Holes/ Component	
Material Hardness		Drill Dia	
Machine Make /Model/No.		No. of Pecking	
Tool No.		Tol/Finish required :	
<b>Machining Details :</b>			
<b>Parameters</b>	<b>Existing</b>	<b>Trial 1</b>	
Holding			
M/c.Type			
Cycle Time			
Coolant			
Coolant Press.			
<b>Tool Data:</b>			
<b>Parameters</b>	<b>Existing</b>	<b>Trial 1</b>	<b>Regrinding Trial</b>
Make			
Ext/Thru cool			
Cutting Speed (Vc) m/min			
RPM			
Feed			
Depth of cut			
Life Obtained (TIME)			
Kind of Failure			
<b>Cost Data:</b>			
Tool Cost (Rs.)			
Cost/Component (Rs.)			
Remarks:-			
Customer Benefit:-1.			
Customer Benefit:-2.			

Sales Engineer  
FORBES & COMPANY LIMITED

Authorised Signatory  
CUSTOMER

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.

## Deep Hole High Performance Drills

Introducing the latest Range of High Performance Solid Carbide Drills for Deep Hole Drilling.

Deep Hole through coolant Drills Tailor made to your specification with an industry proven High Performance Geometry with the latest coating technology and superior substrate with a high toughness and micrograin structure to ensure superior tool life and lesser breakage.

Application:- Oil Hole Drilling in Crankshaft

Material:- Forged Steel

Dia = 3.0-10,0mm

Length = 15D, 20D

Cutting conditions within a range of  $vc = 60-100$  m/min,  $fz = 0,10-0,25$ mm/rev



## Connecting Rod Bolt Hole High Performance Drills

Introducing the latest Range of High Performance Solid Carbide Drills for Con Rod Drilling

Through Coolant Step Drills as per Con Rod specification available with the latest coating combined with the latest High Performance Geometry, sub micron substrate and superior coating to give you the lowest cost per part

Application :- Connecting Rod Bolt Hole Drilling

Material:- Drop Forged Steel ( Heat Treated)

Dia - 3-32mm

Length- 5D, 8D,10D

Cutting conditions within a range of  $vc = 60-100$  m/min,  $fz = 0,15-0,35$ mm/rev



## High Performance Custom Solution Drills

We have what you need....

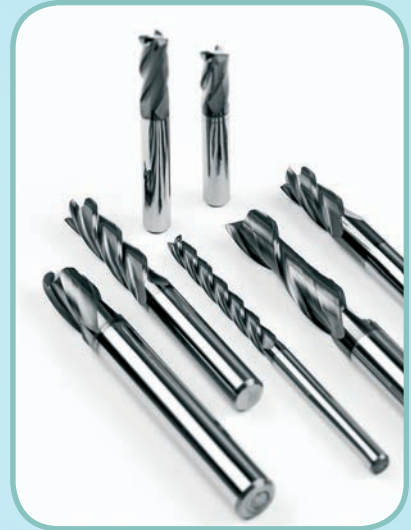
Solid Carbide High Performance round tools tailor made to your specification based on your

application needs. Please contact our trained sales and application experts to come and study your application. We commit to deliver superior solutions with the lowest cost per part.

Industry -

Aerospace, Automotive, Defense, Railways, General Engineering, Energy Equipments  
Dia 1.00- 32.00mm

Options :- Solid, Thorough Coolant 30 degree Helix, 40 Degree Helix, Axial Coolant Duct, Parallel Coolant Ducts



## High Performance Micro Drills



Automotive Fuel Injection Parts, Common Rail Parts, Turbo Charger Parts, Steering Components, Automatic Transmission Power Train Components  
Precision Machining, Jewellery Industry, Spinnerets & Spin Plates, Electronic Connector Parts, Screw Machine components

AeroSpace Valve Bodies, Thermocouples Integrated Sensors, Interior Cabin Fixtures, Fuel System Components, Hydraulic & Pneumatic Parts, Writing Instruments - Ball Pen Tips

Medical Traumatology  
Medical Devices  
Bone Screws & Plate  
Surgical Suture Needles  
Orthopedics Components  
Dental, Implants & Bridges  
Watch Industry Watch Case Watch Plates Small Precision Parts Watch Link Components

# CARBIDE















High Performance Cutting Tools



# CARBIDE BURRS

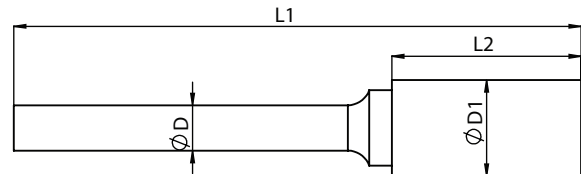
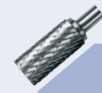


## CARBIDE BURR

SERIES		SHAPE DESCRIPTION	TOTEM REFERENCE	PAGE
SA/ZYA		Cylindrical without end cut	C	313
SB/ZYAS		Cylindrical with end cut	CE	316
SC/WRC		Cylindrical with radius end	B	319
SD/KUD		Ball Shape	S	322
SE/TRE		Oval shape burr	O	325
SF/RBF		Tree shape with radius end	TB	327
SG/SPG		Tree shape with point end	T	330
SH		Flame shape	F	332
SL/KEL		Cone with radius burr	K	334
SM/SKM		Cone shaped burr	A	336
SN		Inverted cone shape burrs	N	338
RIM		Rim shape burrs	R	339

SA

**Cylindrical without end cut**

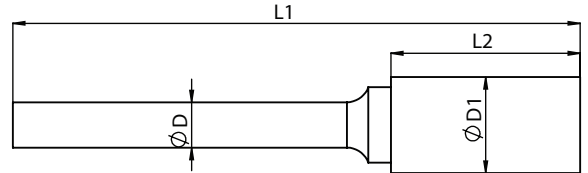


Unit : mm

3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
1.5	6	50	MC4L	FAC0200588	FAC0200589	FAC0200590	SA-41ML2
1.5	6	75	MC4L1	FAC0200591	FAC0200592	FAC0200593	SA-41ML3
1.5	6	38	MC4	FAC0200585	FAC0200586	FAC0200587	SA-41M
2.5	11	38	MC5	FAC0200594	FAC0200595	FAC0200596	SA-42M
2.5	11	50	MC5L	FAC0200597	FAC0200598	FAC0200599	SA-42ML2
2.5	11	75	MC5L1	FAC0200600	FAC0200601	FAC0200602	SA-42ML3
3	16	38	MC1	FAC0200563	FAC0200565	FAC0200566	SA-43M
3	16	75	MC1L1	FAC0200570	FAC0200571	FAC0200569	SA-43ML3
3	16	50	MC1L	FAC0200567	FAC0200568	FAC0200572	SA-43ML2
6.3	6.3	38	MC2	FAC0200573	FAC0200574	FAC0200575	
6.3	12.7	38	MC3	FAC0200582	FAC0200583	FAC0200584	SA-51M
6.3	6.3	50	MC2L	FAC0200576	FAC0200577	FAC0200578	
6.3	6.3	75	MC2L1	FAC0200579	FAC0200580	FAC0200581	

SA

**Cylindrical without end cut**



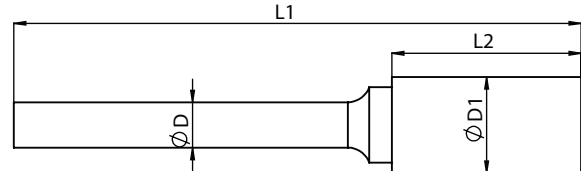
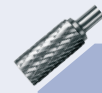
Unit : mm

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
3	12.7	50	C0	FAC0200208	FAC0200209	FAC0200210	SA-11M
3.8	14	50	C1	FAC0200211	FAC0200212	FAC0200213	SA-13M
5	16	50	C11	FAC0200306	FAC0200307	FAC0200308	SA-14M
6	20	50	C2	FAC0200220	FAC0200221	FAC0200222	
6	20	170	C2L2	FAC0200232	FAC0200233	FAC0200234	SA-1ML6
6	25	50	C2H	FAC0200223	FAC0200224	FAC0200225	
6.3	16	60	C12	FAC0200309	FAC0200310	FAC0200311	SA-1
8	19	69	C3	FAC0200236	FAC0200237	FAC0200238	SA-2M
9.5	19	69	C4	FAC0200246	FAC0200247	FAC0200248	SA-3M
9.5	19	169	C4L2	FAC0200252	FAC0200253	FAC0200254	SA-3ML6
10	25	69	C13	FAC0200312	FAC0200313	FAC0200314	SA-3MZ
11	25	69	C14	FAC0200315	FAC0200316	FAC0200317	SA-4M
12.7	19	69	C5	FAC0200259	FAC0200263	FAC0200265	
12.7	14	64	C7	FAC0200281	FAC0200282	FAC0200283	
12.7	25	75	C8	FAC0200285	FAC0200286	FAC0200287	SA-5M
12.7	25	175	C8L2	FAC0200288	FAC0200289	FAC0200290	SA-5ML6
16	25	75	C6	FAC0200273	FAC0200275	FAC0200277	SA-6M
19	25	70	C9	FAC0200294	FAC0200296	FAC0200298	SA-7M
25	25	70	C10	FAC0200300	FAC0200302	FAC0200304	SA-9M



SA

**Cylindrical without end cut**



Unit : mm

8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
9.5	19	69			FAC0200248		
12.7	19	69	C5Z	FAC0200261	FAC0200264	FAC0200266	
16	25	75	C6Z	FAC0200274	FAC0200276	FAC0200278	SA-6M8
19	25	70	C9Z	FAC0200295	FAC0200297	FAC0200299	SA-7M8
25	25	70	C10Z	FAC0200301	FAC0200303	FAC0200305	

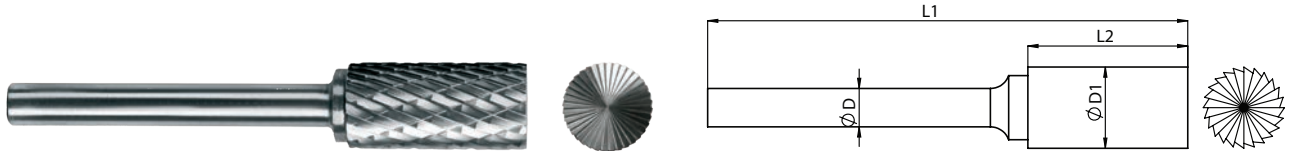
6mm Shank			Tool No	Aluma Cut	Coarse Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	
ØD1	L2	L1				
8	19	69	C3	FAC0200245	FAC0201408	SA-2M
9.5	19	69	C4	FAC0200258	FAC0201409	SA-3M
12.7	19	69	C5	-	FAC0201410	
12.7	14	64	C7	FAC0200284	-	
12.7	25	75	C8	FAC0200292	FAC0201411	SA-5M
12.7	25	175	C8L2	FAC0200293	-	SA-5ML6
16	25	75	C6	FAC0200279	-	SA-6M

8mm Shank			Tool No	Aluma Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	
ØD1	L2	L1			
16	25	75	C6Z	FAC0200280	SA-6M8



SB

**Cylindrical with end cut**

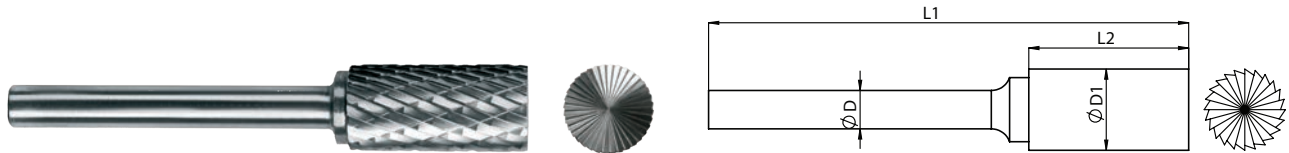


Unit : mm

3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
2.5	11	38	MCE5	FAC0200624	FAC0200625	FAC0200626	SB-42M
2.5	11	50	MCE5L	FAC0200627	FAC0200628	-	SB-42ML2
2.5	11	75	MCE5L1	FAC0200630	FAC0200631	FAC0200632	SB-42ML3
3	16	38	MCE1	FAC0200603	FAC0200604	FAC0200605	SB-43M
3	16	50	MCE1L	FAC0200606	FAC0200607	FAC0200608	SB-43ML2
3	16	75	MCE1L1	FAC0200609	FAC0200610	FAC0200611	SB-43ML3
6.3	6.3	38	MCE2	FAC0200612	FAC0200613	FAC0200614	
6.3	6.3	50	MCE2L	FAC0200615	FAC0200616	FAC0200617	
6.3	6.3	75	MCE2L1	FAC0200618	FAC0200619	FAC0200620	
6.3	12.7	38	MCE3	FAC0200621	FAC0200622	FAC0200623	SB-51M
6.3	16	60	CE12	FAC0200391	FAC0200392	FAC0200393	SB-1

SB

**Cylindrical with end cut**

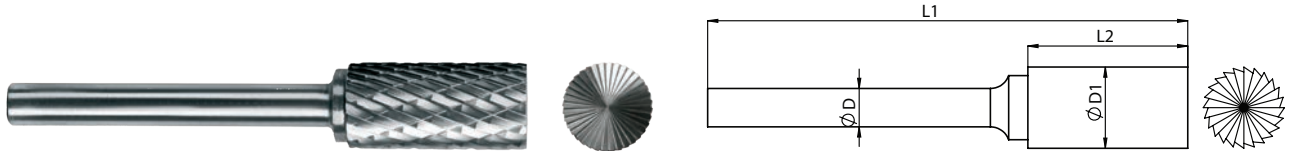


Unit : mm

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
3	12.7	50	CE0	FAC0200318	FAC0200319	FAC0200320	SB-11M
3.8	14	50	CE1	FAC0200321	FAC0200322	FAC0200323	SB-13M
5	16	50	CE11	FAC0200388	FAC0200389	FAC0200390	SB-14M
5.8	20	50	CE2	FAC0200326	FAC0200327	FAC0200328	
5.8	20	170	CE2L2	FAC0200335	FAC0200336	FAC0200337	SB-1ML6
5.8	25	50	CE2H	FAC0200329	FAC0200330	FAC0200331	
8	19	69	CE3	FAC0200339	FAC0200340	FAC0200341	SB-2M
9.5	19	69	CE4	FAC0200344	FAC0200345	FAC0200346	SB-3M
9.5	19	169	CE4L2	FAC0200349	FAC0200350	-	
10	25	69	CE13	FAC0200394	FAC0200395	FAC0200396	
11	25	69	CE14	FAC0200397	FAC0200398	FAC0200399	
12.7	19	69	CE5	FAC0200352	FAC0200353	FAC0200355	
12.7	14	64	CE7	FAC0200364	FAC0200365	FAC0200366	
12.7	25	75	CE8	FAC0200368	FAC0200369	FAC0200371	SB-5M
12.7	25	175	CE8L2	FAC0200372	FAC0200373	FAC0200374	SB-5ML6
16	25	75	CE6	FAC0200356	FAC0200358	FAC0200360	SB-6M
19	25	75	CE9	FAC0200276	FAC0200378	FAC0200380	SB-7M
25	25	70	CE10	FAC0200382	FAC0200384	FAC0200386	

SB

**Cylindrical with end cut**



Unit : mm

8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
9.5	19	69	CE4Z	-	FAC0201278	-	
12.7	19	69	CE5Z	-	FAC0200354	FAC0200355	
12.7	25	75	CE8Z	-	FAC0200370	FAC0201293	
19	25	75	CE9Z	FAC0200377	FAC0200379	FAC0200381	SB-7M8
16	25	75	CE6Z	FAC0200357	FAC0200359	FAC0200361	SB-6M8
25	25	70	CE10Z	FAC0200383	FAC0200385	FAC0200387	

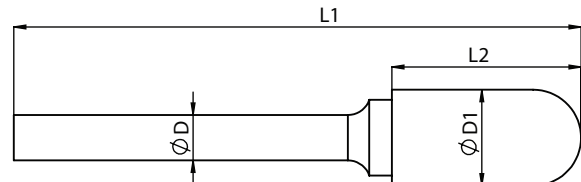


3mm Shank			Tool No	Aluma Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	
ØD1	L2	L1			
6.3	16	60	MCE12	FAC0201339	SB-1

6mm Shank			Tool No	EDP No.	CTI Number
Head Diameter	Head length	Overall Length			
ØD1	L2	L1			
3.8	14	50	CE1	FAC0201338	SB-13M
5.8	20	50	CE2	FAC0201270	
8	19	69	CE3	FAC0201340	SB-2M
10	25	69	CE13	FAC0201341	
12.7	19	69	CE5	FAC0201232	
12.7	14	64	CE7	FAC0200367	
12.7	25	75	CE8	FAC0201342	SB-5M
16	25	75	CE6	FAC0200362	SB-6M

SC

**Cylindrical with radius end**



Unit : mm

**3mm Shank**

Head Diameter	Head length	Overall Length	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
ØD1	L2	L1		EDP No.	EDP No.	EDP No.	
2.5	11	38	MB0	FAC0200542	FAC0200543	FAC0200544	SC-41M
3	16	38	MB1	FAC0200545	FAC0200547	FAC0200548	SC-42M
3	16	50	MB1L	FAC0200549	FAC0200550	FAC0200551	SC-42ML2
3	16	75	MB1L1	FAC0200552	FAC0200553	FAC0200554	SC-43ML3
6.3	12.7	38	MB2	FAC0200556	FAC0200557	FAC0200558	SC-51
6.3	12.7	50	MB2L	FAC0200559	FAC0200560	FAC0200561	SC-51L2

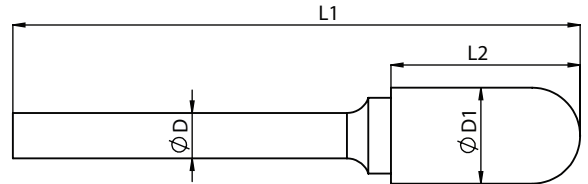
**6mm Shank**

3	16	60	B0	FAC0200074	FAC0200075	FAC0200076	SC-12M
4	19	55	B7	FAC0200175	FAC0200176	FAC0200177	SC-13M
5	19	70	B8	FAC0200178	FAC0200179	FAC0200180	SC-14M
6	20	50	B1	FAC0200077	FAC0200078	FAC0200079	
6	20	162	B1L2	FAC0200087	FAC0200088	FAC0200089	SC-1ML6
6	25	50	B1H	FAC0200080	FAC0200081	FAC0200082	SC-1ML
6.3	16	60	B11	FAC0200197	FAC0200198	FAC0200199	SC-1M
8	19	69	B2	FAC0200097	FAC0200098	FAC0200099	SC-2M
9.5	19	69	B3	FAC0200113	FAC0200115	FAC0200117	SC-3M
9.5	19	169	B3L2	FAC0200121	FAC0200122	FAC0200123	SC-3ML6



SC

**Cylindrical with radius end**



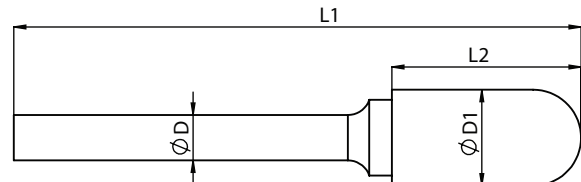
Unit : mm

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
10	25	69	B12	FAC0200200	FAC0200201	FAC0200202	SC-3MZ
11	25	69	B13	FAC0200204	FAC0200205	FAC0200206	SC-4M
12.7	19	69	B4	FAC0200132	FAC0200134	FAC0200136	
12.7	25	75	B6	FAC0200157	FAC0200159	FAC0200161	SC-5M
12.7	25	175	B6L2	FAC0200163	FAC0200164	FAC0200165	SC-5ML6
16	25	75	B5	FAC0200145	FAC0200147	FAC0200149	SC-6M
19	25	75	B9	FAC0200181	FAC0200183	FAC0200185	SC-7M
25	25	70	B10	FAC0200189	FAC0200191	FAC0200193	SC-9M

8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
8	19	69	B2Z	FAC0200098	FAC0200100	-	
9.5	19	69	B3Z	FAC0200114	FAC0200116	-	
12.7	19	69	B4Z	FAC0200133	FAC0200135	FAC0200137	
16	25	75	B5Z	FAC0200146	FAC0200148	FAC0200150	SC-6M8
12.7	25	75	B6Z	FAC0200158	FAC0200160	-	
19	25	75	B9Z	FAC0200182	FAC0200184	FAC0200186	SC-7M8
25	25	70	B10Z	FAC0200190	FAC0200192	FAC0200194	SC-9M8

SC

**Cylindrical with radius end**



Unit : mm

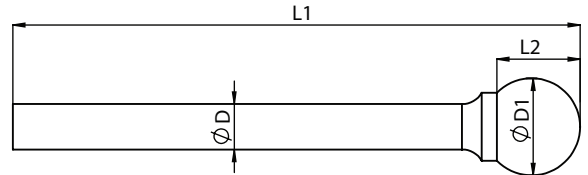
6mm Shank						
Head Diameter	Head length	Overall Length	Tool No	Aluma Cut	Coarse Cut	CTI Number
ØD1	L2	L1		EDP No.	EDP No.	
8	19	69	B2	-	FAC0201404	SC-2M
9.5	19	69	B3	FAC0200131	FAC0201405	SC-3M
10	25	69	B12	FAC0200203	-	SC-3MZ
11	25	69	B13	FAC0200207	-	SC-4M
12.7	19	69	B4	FAC0200144	FAC0201406	
12.7	25	75	B6	FAC0200173	FAC0201407	SC-5M
16	25	75	B5	FAC0200144	-	SC-6M
19	25	75	B9	FAC0200187	-	SC-7M
25	25	70	B10	FAC0200195	-	SC-9M

8mm Shank					
Head Diameter	Head length	Overall Length	Tool No	Aluma Cut	CTI Number
ØD1	L2	L1		EDP No.	
12.7	19	69	B6Z	FAC0200174	
16	25	75	B5Z	FAC0200156	SC-6M8
19	25	75	B9Z	FAC0200188	SC-7M8
25	25	70	B10Z	FAC0200196	SC-9M8



SD

**Ball Shape**



Unit : mm

3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
2.5	2.3	38	MS2	FAC0200691	FAC0200692	FAC0200693	SD-41M
3	2.5	38	MS0	FAC0200678	FAC0200679	FAC0200680	SD-42M
3	2.5	50	MS0L	FAC0200681	FAC0200682	FAC0200683	SD-42ML2
3	2.5	75	MS0L1	FAC0200684	FAC0200685	FAC0200686	SD-42ML3
3	3	75	MS3	FAC0201249	FAC0201250	FAC0201251	
4	3.4	38	MS1	FAC0200687	FAC0200689	FAC0200690	SD-52M

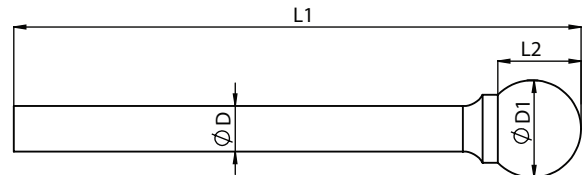
6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
6.3	6.3	50	S1	FAC0200805	FAC0200806	FAC0200807	SD-1
8	6.4	50	S2	FAC0200814	FAC0200815	FAC0200817	SD-2M
9.5	8	60	S3	FAC0200824	FAC0200826	FAC0200828	SD-3M
11	21	69	S7	FAC0200875	FAC0200877	FAC0200879	SD-9M
11	9.5	60	S9	FAC0200883	FAC0200884	FAC0200885	SD-4M
12.7	11	62	S4	FAC0200838	FAC0200840	FAC0200842	SD-5M
16	14	65	S5	FAC0200854	FAC0200856	FAC0200858	SD-6M
19	16	70	S6	FAC0200867	FAC0200869	FAC0200871	SD-7M
6.3	5	155	S1L2	FAC0200811	FAC0200812	FAC0200813	SD-1L6
9.5	8	158	S3L2	FAC0200831	FAC0200832	FAC0200833	SD-3ML6
12.7	11	161	S4L2	FAC0200846	FAC0200847	FAC0200848	SD-5ML6
16	14	164	S5L2	FAC0200862	-	-	





SD

**Ball Shape**

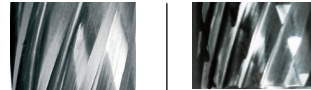
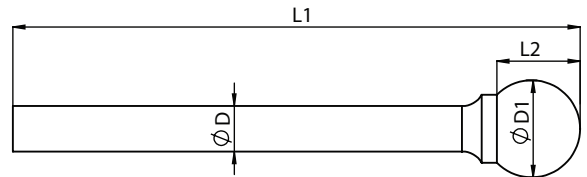


Unit : mm

8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
8	6.4	50	S2Z	-	FAC0200816	FAC0200880	
9.5	8	60	S3Z	FAC0200825	FAC0200827	-	
11	21	69	S7Z	FAC0200876	FAC0200878	-	SD-9M8
12.7	11	62	S4Z	FAC0200839	FAC0200841	FAC0200843	
16	14	65	S5Z	FAC0200855	FAC0200857	FAC0200859	
19	16	62	S6Z	FAC0200868	FAC0200870	FAC0200872	SD-7M8



**SD Ball Shape**



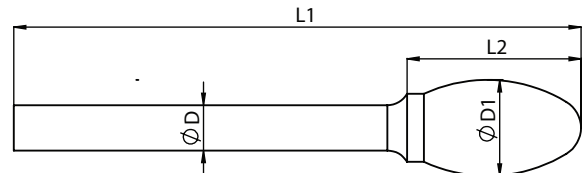
Unit : mm

6mm Shank			Tool No	Aluma Cut	Coarse Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	
ØD1	L2	L1				
6.3	6.3	50	S1	FAC0201351	-	SD-1
8	6.4	50	S2	-	FAC0201412	SD-2M
9.5	8	60	S3	FAC0200836	FAC0201413	SD-3M
9.5	8	158	S3L2	FAC0200837	-	SD-3ML6
11	21	69	S7	FAC0200881	-	SD-9M
11	9.5	60	S9	FAC0200886	-	SD-4M
12.7	11	62	S4	FAC0200852	FAC0201414	SD-5M
12.7	11	161	S4L2	FAC0200853	-	SD-5ML6
16	14	65	S5	FAC0200864	FAC0201415	SD-6M
19	16	70	S6	FAC0200873	-	SD-7M

8mm Shank			Tool No	Aluma Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	
ØD1	L2	L1			
11	21	69	S7Z	FAC0200882	SD-9M8
16	14	65	S5Z	FAC0200865	
19	16	62	S6Z	FAC0200874	SD-7M8

SE

Oval shape burr



Unit : mm

3mm Shank

Head Diameter	Head length	Overall Length	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
ØD1	L2	L1		EDP No.	EDP No.	EDP No.	
3	8	38	M01	FAC0200659	FAC0200660	FAC0200661	SE-41M
3	8	50	M01L	FAC0200662	FAC0200663	FAC0200664	SE-41ML2
3	8	75	M01L1	FAC0200665	FAC0200666	FAC0200667	SE-41ML3
6.3	9.5	38	M02	FAC0200668	FAC0200669	FAC0200670	SE-51M
6.3	9.5	50	M02L	FAC0200671	FAC0200672	FAC0200673	SE-51ML2
6.3	9.5	75	M02L1	FAC0200674	FAC0200675	FAC0200676	SE-51ML3

6mm Shank

6.3	10	60	04	FAC0200755	FAC0200756	FAC0200757	SE-1
6.3	10	160	04L2	FAC0200758	FAC0200759	FAC0200760	SE-1L6
8	12	62	01	FAC0200726	FAC0200727	FAC0200728	SE-2M
8	12	158	01L2	FAC0200731	-	FAC0200767	
9.5	16	65	05	FAC0200762	FAC0200763	FAC0200764	SE-3M
9.5	16	166	05L2	FAC0200765	FAC0200766	FAC0200775	SE-3ML6
12.7	19	69	02	FAC0200735	FAC0200737	FAC0200739	
12.7	22	71	06	FAC0200770	FAC0200771	FAC0200772	SE-5M
12.7	22	172	06L2	FAC0200773	FAC0200774	-	SE-5ML6
16	25	75	03	FAC0200747	FAC0200749	FAC0200751	SE-6M
19	25	69	07	FAC0200778	FAC0200780	FAC0200782	SE-7M



SE

Oval shape burr



3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
2.5	2.3	38	MS2	FAC0200691	FAC0200692	FAC0200693	SD-41M
3	2.5	38	MS0	FAC0200678	FAC0200679	FAC0200680	SD-42M
3	2.5	50	MS0L	FAC0200681	FAC0200682	FAC0200683	SD-42ML2
3	2.5	75	MS0L1	FAC0200684	FAC0200685	FAC0200686	SD-42ML3
3	3	75	MS3	FAC0201249	FAC0201250	FAC0201251	
4	3.4	38	MS1	FAC0200687	FAC0200689	FAC0200690	SD-52M



6mm Shank			Tool No	Aluma Cut	Coarse Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	
ØD1	L2	L1				
8	12	62	01	FAC0200734	FAC0201418	SE-2M
9.5	16	65	05	FAC0200768	-	SE-3M
9.5	16	166	05L2	FAC0200769	-	SE-3ML6
12.7	19	69	02	FAC0200746	FAC0201419	
12.7	22	71	06	FAC0200776	-	SE-5M
12.7	22	172	06L2	FAC0200777	-	SE-5ML6
16	25	75	03	FAC0200754	-	SE-6M
19	25	69	07	FAC0200784	-	SE-7M

HSS TAPS

DIES

END MILLS

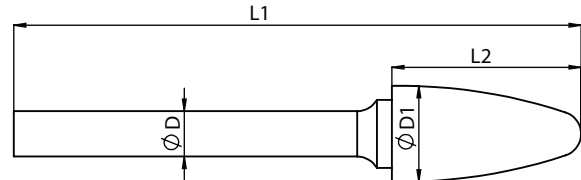
DRILLS

CARBIDE BURRS

CS TAPS

SF

Tree shape with radius end



Unit : mm

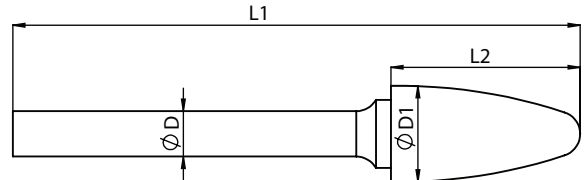
3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1		EDP No.	EDP No.	EDP No.	
3	6	38	MTB1	FAC0200714	FAC0200715	FAC0200716	SF-41M
3	12.7	38	MTB2	FAC0200717	FAC0200718	FAC0200719	
3	12.7	50	MTB2L	FAC0200720	FAC0200721	FAC0200722	
3	12.7	75	MTB2L1	FAC0200723	FAC0200724	FAC0200725	

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1		EDP No.	EDP No.	EDP No.	
6	69	19	TB1	FAC0200962	FAC0200963	FAC0200964	SF-1M
6	19	169	TB1L2	FAC0200966	FAC0200967	FAC0200968	SF-1ML6
6.3	65	16	TB6	FAC0201014	FAC0201015	FAC0201016	SF-1
8	69	19	TB5	FAC0201011	FAC0201012	FAC0201013	SF-2M
9.5	69	19	TB2	FAC0200971	FAC0200973	FAC0200975	SF-3M
9.5	19	169	TB2L2	FAC0200980	FAC0200981	FAC0200982	SF-3ML6
11	75	25	TB7	FAC0201017	FAC0201018	FAC0201019	SF-4M
12.7	75	25	TB3	FAC0200988	FAC0200990	FAC0200992	SF-5M
12.7	25	175	TB3L2	FAC0200997	FAC0200998	FAC0200999	SF-5ML6
16	82	32	TB4	FAC0201004	FAC0201006	FAC0201008	
16	75	25	TB8	FAC0201022	FAC0201024	FAC0201026	SF-6M
19	69	25	TB9	FAC0201030	FAC0201032	FAC0201034	SF-7M



SF

## Tree shape with radius end



Unit : mm

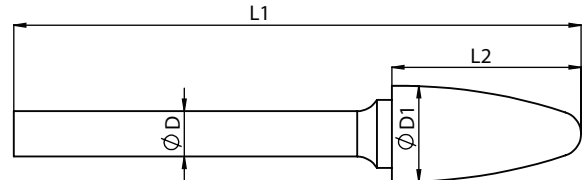
8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
9.5	69	19	TB2Z	FAC0200972	FAC0200974	FAC0200976	
12.7	75	25	TB3Z	FAC0200989	FAC0200991	FAC0200993	
16	82	32	TB4Z	FAC0201005	FAC0201007	FAC0201009	
16	75	25	TB8Z	FAC0201023	FAC0201025	FAC0201027	SF-6M88
19	69	25	TB9Z	FAC0201031	FAC0201033	FAC0201035	SF-7M8



6mm Shank			Tool No	Aluma Cut	Coarse Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	
ØD1	L2	L1				
6	19	169	TB1L2	FAC0200970	-	SF-1ML6
8	19	69	TB5	FAC0201345	-	SF-2M
9.5	19	69	TB2	FAC0200986	FAC0201420	SF-3M
9.5	19	169	TB2L2	FAC0200987	-	SF-3ML6
11	25	75	TB7	FAC0201021	FAC0201422	SF-4M
12.7	25	75	TB3	FAC0201002	FAC0201421	SF-5M
12.7	25	175	TB3L2	FAC0201003	-	SF-5ML6
16	25	75	TB8	FAC0201028	-	SF-6M
19	25	69	TB9	FAC0201036	-	SF-7M

SF

Tree shape with radius end

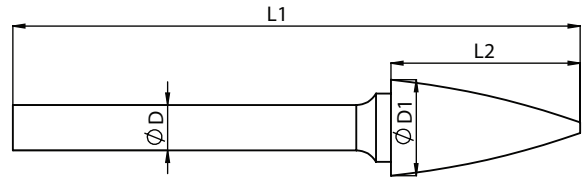


Unit : mm

8mm Shank			Tool No	Aluma Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	
ØD1	L2	L1			
9.5	69	19	TB2Z	-	
12.7	75	25	TB3Z	FAC0201288	
16	82	32	TB4Z	FAC0201010	
16	75	25	TB8Z	FAC0201029	SF-6M8
19	69	25	TB9Z	FAC0201037	SF-7M8

SG

Tree shape with point end



Unit : mm

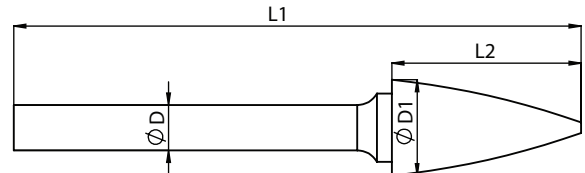
3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
3	16	38	MT1	FAC0200694	FAC0200697	FAC0200698	SG-41M
3	16	38	MT2	FAC0200700	FAC0200701	FAC0200703	
3	12.7	38	MT4	FAC0200708	FAC0200709	FAC0200710	
3	6	38	MT5	FAC0200711	FAC0200712	FAC0200713	SG-44M
3	8	75	MT6	FAC0200252	FAC0201253	FAC0200254	SG-41
6.3	10	38	MT3	FAC0200704	FAC0200705	FAC0200706	SG-51M

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
6	19	50	T1	FAC0200887	FAC0200888	FAC0200889	SG-1M
6	19	169	T1L2	FAC0200895	FAC0200896	FAC0200897	SG-1ML6
6.3	16	50	T7	FAC0200953	FAC0200954	FAC0200955	SG-1M
8	19	69	T5	FAC0200941	FAC0200942	FAC0200943	SG-2M
9.5	19	69	T2	FAC0200902	FAC0200903	FAC0200905	SG-3M
9.5	19	169	T2L2	FAC0200909	FAC0200910	FAC0200911	SG-3ML6
12.7	25	75	T3	FAC0200915	FAC0200920	FAC0200922	SG-5M
12.7	25	175	T3L2	FAC0200927	FAC0200928	FAC0200929	SG-5ML6
16	32	82	T4	FAC0200932	FAC0200934	FAC0200936	SG-6M
16	25	82	T6	FAC0200947	FAC0200949	FAC0200951	
19	25	69	T8	FAC0200956	FAC0200958	FAC0200960	SG-7M



SG

Tree shape with point end



Unit : mm

8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
ØD1	L2	L1					
9.5	19	69	T2Z	-	FAC0200904	-	
12.7	25	75	T3Z	FAC0200916	FAC0200921	FAC0201294	
16	32	82	T4Z	FAC0200933	FAC0200934	FAC0200935	SG-6ML8
16	25	82	T6Z	FAC0200948	FAC0200950	FAC0200952	
19	25	69	T8Z	FAC0200957	FAC0200959	FAC0200961	SG-7M8

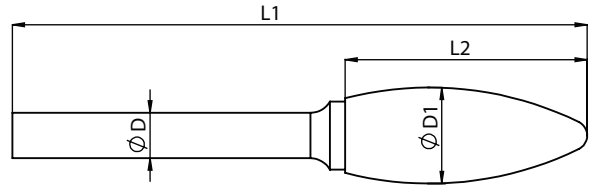


6mm Shank			Tool No	Aluma Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	
ØD1	L2	L1			
8	19	69	T5	FAC0201346	SG-2M
9.5	19	69	T2	FAC0201347	SG-3M



SH

Flame shape



Unit : mm

3mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
Ø D1	L2	L1					
3	6.3	38	MF1	FAC0200633	FAC0200634	FAC0200635	SH-41M
3	6.3	50	MF1L	FAC0200636	FAC0200637	FAC0200638	SH-41ML2
6.3	16	44	MF2	FAC0201242	-	-	

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
6.3	16	50	F1	FAC0200400	FAC0200401	FAC0200402	SH-1M
8	19	69	F2	FAC0200403	FAC0200404	FAC0200405	SH-2M
9.5	25	65	F3	FAC0200410	FAC0200411	FAC0200413	SH-3M
12.7	32	76	F4	FAC0200416	FAC02006418	FAC0200420	SH-5M
12.7	32	182	F4L2	FAC0200421	FAC0200422	FAC0200423	SH-5ML6
16	34	80	F5	FAC0200428	FAC0200430	FAC0201279	SH-6M
19	41	85	F6	FAC0200432	FAC0200434	FAC0200436	SH-7M

8mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.	
12.7	32	76	F4Z	FAC0200417	FAC0200419	FAC0201239	
16	34	80	F5Z	FAC0200429	FAC0200431	-	SH-6M8
19	41	85	F6Z	FAC0200433	FAC0200435	FAC0200437	SH-7M8

HSS TAPS

DIES

END MILLS

DRILLS

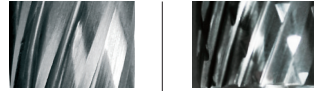
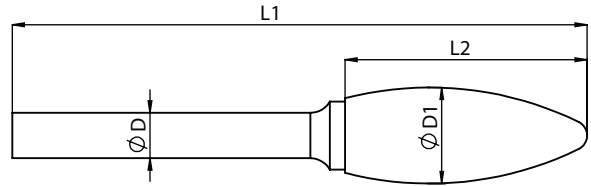
CARBIDE BURRS

CS TAPS



SH

Flame shape

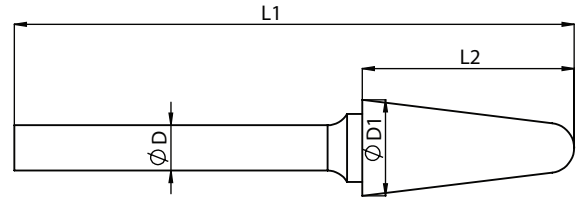


Unit : mm

6mm Shank			Tool No	Aluma Cut	Coarse Cut	CTI Number
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	
ØD1	L2	L1				
8	19	69	F2	FAC0200409	-	SH-2M
9.5	25	65	F3	FAC0200415	FAC0201423	SH-3M
12.7	32	76	F4	FAC0200425	-	SH-5M

SL

Cone with radius burr



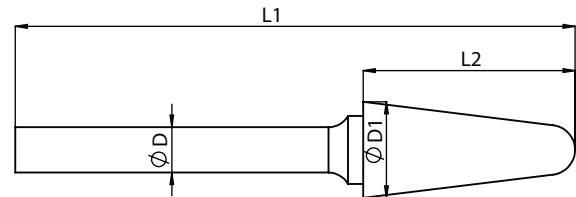
Unit : mm

3mm Shank			Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Shank Diameter	Overall Length			EDP No.	EDP No.	EDP No.	
ØD1	ØD2	L1						
3	38	8	10	MK1	FAC0200639	FAC0200641	FAC0200642	
3	38	9.5	8	MK1L	FAC0200643	FAC0200644	FAC0200645	SL-41M
3	38	12.7	8	MK3	FAC0200650	FAC0200651	FAC0200652	SL-42M
6.3	38	12.7	10	MK2	FAC0200646	FAC0200648	FAC0200649	SL-51M

6mm Shank			Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Shank Diameter	Overall Length			EDP No.	EDP No.	EDP No.	
6.3	50	16	14	K0	FAC0200438	FAC0200439	FAC0201311	SL-1M
9.5	64	19	16	K1	FAC0200442	FAC0200443	FAC0200445	
9.5	72	26	14	K6	FAC0200494	FAC0200495	FAC0200496	SL-3M
12.5	75	30	17	K4	FAC0200480	FAC0200481	FAC0200482	
12.7	64	19	24	K2	FAC0200454	FAC0200456	FAC0200458	
12.7	74	28	14	K7	FAC0200501	FAC0200502	FAC0200504	SL-4M
16	77	33	17	K3	FAC0200468	FAC0200470	FAC0200472	
16	77	33	14	K8	FAC0200507	FAC0200509	FAC0200511	SL-5M
19	85	40	14	K5	FAC0200486	FAC0200488	FAC0200490	SL-7M
3	58	10	26	GD-1	FAC0201141	-	-	
3	68	8.5	10	GD-2	FAC02001258	-	-	
3	58	13	26	GD-3	FAC0201259	-	-	
3	58	19	35	GD-4	FAC0201142	-	-	



**SL** Cone with radius burr



Unit : mm

**8mm Shank**

Head Diameter	Shank Diameter	Overall Length	Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
ØD1	ØD2	L1			EDP No.	EDP No.	EDP No.	
12.7	64	19	24	K2Z	FAC0200455	FAC0200457	FAC0200459	
16	77	33	17	K3Z	FAC0200469	FAC0200471	FAC0200473	
16	77	33	14	K8Z	FAC0200508	FAC0200510	FAC0200512	SL-5M8
19	85	40	14	K5Z	FAC0200487	FAC0200489	FAC0200491	SL-7M8

**6mm Shank**

Head Diameter	Shank Diameter	Overall Length	Angle	Tool No	Aluma Cut	Coarse Cut	CTI Number
ØD1	ØD2	L1			EDP No.	EDP No.	
6.3	50	16	14	K0	FAC0201344	-	SL-1M
9.5	64	19	16	K1	FAC0200453	FAC0201424	
9.5	72	26	14	K6	FAC0201226	-	SL-3M
12.5	75	30	17	K4	FAC0200485	-	
12.7	64	19	24	K2	FAC0200467	FAC0201425	
12.7	74	28	14	K7	-	FAC0201426	SL-4M
16	77	33	17	K3	FAC0201238	-	

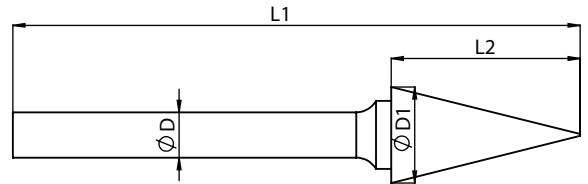
**8mm Shank**

Head Diameter	Shank Diameter	Overall Length	Angle	Tool No	Aluma Cut	CTI Number
ØD1	ØD2	L1			EDP No.	
12.7	64	19	24	K2Z	FAC0201166	
16	77	33	17	K3Z	FAC0200479	
19	85	40	14	K5Z	FAC0200493	SL-7M8



SM

## Cone shaped burr



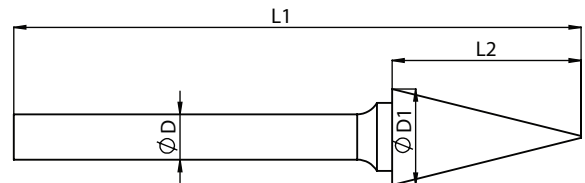
Unit : mm

3mm Shank			Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length			EDP No.	EDP No.	EDP No.	
ØD1	L2	L1						
3	8	38	20	MA1	FAC0200513	FAC0200514	FAC0200515	
3	11	38	14	MA5	FAC0200521	FAC0200522	FAC0200523	SM-42M
3	16	38	7	MA6	FAC0200255	FAC0200256	FAC0200257	SM-43M
6.3	10.5	38	30	MA2	FAC0200518	FAC0200519	FAC0200520	SM-51M

6mm Shank			Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length			EDP No.	EDP No.	EDP No.	
6	19	50	17	A1	FAC0200001	FAC0200002	FAC0200003	SM-2M
6.2	25	75	10	A10	FAC0200062	FAC0200063	FAC0200064	SM-3M
6.3	12.7	50	22	A13	FAC0200071	FAC0200072	FAC0200073	SM-1M
8	18	68	24	A8	FAC0200053	FAC0200054	FAC0200055	
9.5	20	70	24	A2	FAC0200012	FAC0200014	FAC0200016	
9.5	15	65	28	A11	FAC0200065	FAC0200066	FAC0200067	
9.5	9.5	60	90	A4	FAC0200036	FAC0200037	FAC0200038	SK-3M
10	18	68	28	A7	FAC0200050	FAC0200051	FAC0200052	SM-4M
12.7	25	75	28	A3	FAC0200022	FAC0200025	FAC0200027	
12.7	22	72	28	A12	FAC0200068	FAC0200069	FAC0200070	SM-5M
16	13	63	90	A5	FAC0200039	FAC0200040	FAC0200041	SK-6M
16	16	66	60	A6	FAC0200044	FAC0200046	FAC0200048	SJ-6M
16	25	75	31	A9	FAC0200056	FAC0200058	FAC0200060	SM-6M

SM

Cone shaped burr



Unit : mm

8mm Shank

Head Diameter ØD1	Head length L2	Overall Length L1	Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
					EDP No.	EDP No.	EDP No.	
9.5	20	70	24	A2Z	-	FAC0200015	-	
12.7	25	75	28	A3Z	-	FAC0200026	-	
16	16	66	60	A6Z	FAC0200045	-	-	
16	25	75	31	A9Z	FAC0200057	FAC0200059	FAC0200061	SM-6M8

6mm Shank

Head Diameter ØD1	Head length L2	Overall Length L1	Angle	Tool No	Coarse Cut	CTI Number
					EDP No.	
9.5	9.5	60	90	A4	FAC0201402	SK-3M
16	13	63	90	A5	FAC0201403	SK-6M

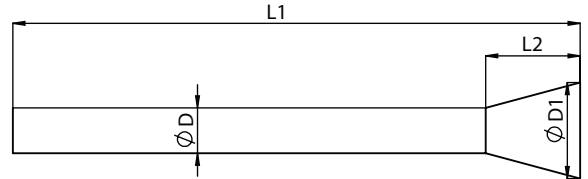


Carbide Rotary Burrs

SN Series

SN

**Inverted cone shape burrs**



Unit : mm

3mm Shank			Angle	Tool No	Standard cut	Supreme cut	Deluxe cut	CTI Number
Head Diameter	Head length	Overall Length			EDP No.	EDP No.	EDP No.	
ØD1	L2	L1						
3	8.5	38	10	MA3	FAC0200530	FAC0200531	FAC0200532	SN-42M
6.3	8	38	15	MA4	FAC0200533	FAC0200535	FAC0200536	

6 mm Shank			Angle	Tool No	Standard cut	Supreme cut		CTI Number
Head Diameter	Head length	Overall Length			EDP No.	EDP No.		
6.3	8	50	10	N1	FAC0200538	FAC0200539	-	SN-1M
12.7	12.7	69	16	N4	FAC0200540	FAC0200541	-	SN-4M

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

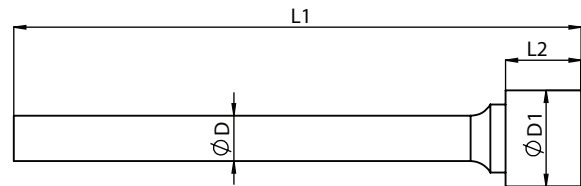
CS TAPS





# RIM

## Rim shape burrs



Unit : mm

6mm Shank			Tool No	Standard cut	Supreme cut	Deluxe cut
Head Diameter	Head length	Overall Length		EDP No.	EDP No.	EDP No.
ØD1	L1	L				
9.5	2	52	R1	FAC0200786	FAC0200787	FAC0200788
12.7	10	60	R3	FAC0200796	FAC0200797	FAC0200798
15	4	54	R4	FAC0200801	FAC0200802	FAC0200803
19.1	6	56	R2	FAC0200789	FAC0200790	FAC0200791



6mm Shank			Tool No	Aluma cut
Head Diameter	Head length	Overall Length		EDP No.
ØD1	L1	L		
12.7	10	60	R3	FAC0200800
19.1	6	56	R2	FAC0200795



# CARBIDE BURRS

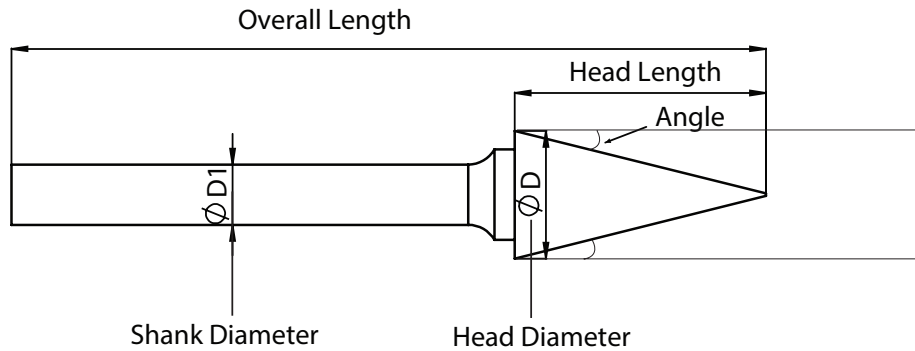


High Performance Cutting Tools



## TECHNICAL DETAILS

## CARBIDE BURRS NOMENCLATURE



## TYPE OF CUTS



### Standard Cut (Single Cut):

This flute structure is designed for superior material removal and general purpose application. These can be used on Steel, Steel alloys, Cast Iron, Stainless Steel, Hard Bronze and Copper. Produces longer chips.



### Supreme Cut (Double Cut / Cross Cut):

This burr allows for efficient stock removal in the harder materials. Its design reduces tool chatter and breaks the chips into granular shapes. These smaller chips also help to eliminate loading on the flutes. This design helps to have better control on the burr and grinder.



### Deluxe Cut (Diamond Cut):

This design of tool is like triangular style of point, which produces extremely small chips (powder like chips). The cut eliminates pulling action of the main cut, and offers the operator good control over the tool and produces excellent finish. Effective in heat treated Steels and Tough alloy steels.



### Aluma Cut:

Designed for rapid stock removal on Non-ferrous materials. Recommended to work on Aluminium, Zinc alloy, Hand rubber and Wood.



**MATERIAL APPLICATION**

Material Groups			Application	Cut Type				
				Standard	Supreme	Deluxe	Aluma	Coarse
Steel and Steel castings	Non Hardened, non heat treated steels upto 1200 N/mm <sup>2</sup> (<35 HRC)	Constructional steels Carbon steels Tool steels Non-alloyed steels Case-hardened steels Steel castings	Coarse machining = high stock removal	X	X			
			Fine machining - eg: deburring			X		
	Hardened, heattreated steels exceeding 1200 N/mm <sup>2</sup> (>35 HRC)	Tool steels Tempering steels Alloyed steels Steel castings	Coarse machining = high stock removal	X	X			
			Fine machining - eg: deburring			X		
High-grade steels	Stainless steels	Austenitic and ferritic high-grade steels	Coarse machining = high stock removal					X
			Fine machining - eg: deburring			X		
Non - ferrous metals	Soft non-ferrous metals	Aluminium alloys Brass Copper Zinc	Coarse machining = high stock removal				X	
			Fine machining - eg: deburring				X	
	Hard non-ferrous metals	Bronze Titanium / titanium alloys Very hard aluminium alloys (high Si content)	Coarse machining = high stock removal	X	X			
			Fine machining - eg: deburring			X		
	Heat resisting alloys	Nickel based alloys NiCo alloys (aircraft engine and turbine construction)	Coarse machining = high stock removal	X	X			
			Fine machining - eg: deburring			X		
Cast Iron	Grey Cast Iron Spheroidal Graphite cast iron	Coarse machining = high stock removal	X	X				
		Fine machining - eg: deburring			X			
Plastics / Other materials	Fibre Reinforced plastics Thermoplastics hard rubber	Coarse machining = high stock removal				X		
		Fine machining - eg: deburring				X		

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

Technical data provided should be considered advisory only as variations may be necessary depending on the particular application.



## SPEED RECOMMENDATION CHART

Material	3mm	6mm	8mm	10mm	12mm	16mm	20mm	25mm
Steel	60-90	30-45	25-35	20-30	15-25	10-18	10-14	8-10
Hardened / Tool Steel	30-40	15-20	10-15	10-15	8-10	5-8	4-7	3-5
Stainless Steel	30-50	15-25	12-20	10-15	9-12	7-10	5-7	4-5
Nickel / Titanium	30-40	15-20	10-15	10-15	8-10	5-8	4-7	3-5
Cast Iron	60-90	30-45	25-35	20-30	15-20	10-18	10-14	8-10
Aluminium / Plastics	30-90	15-60	12-50	10-50	8-35	6-30	5-20	4-15
Brass	40-50	20-30	15-20	13-17	10-15	8-12	6-8	5-6
Copper	30-90	15-60	12-50	10-50	8-35	6-30	5-20	4-15
Zinc	60-90	30-45	25-35	20-30	15-25	10-18	10-14	8-10

The table lists recommended rotational speeds (RPM) as a function of burr diameter.

### SAFETY NOTE:-

Tools with long shanks must be placed on the workpiece, or inserted into the bore or groove, before the power source is switched on. For safety reasons we urge you to reduce idling speeds (RPM) by up to one-third from the values stated.

## RECOMMENDATIONS FOR USE:

TOTEM Tungsten Carbide Burrs are designed for machining materials of virtually any strength; the superior performance reflects an optimum combination of key parameters such as shape, number of flutes, spiral angle, rake angle and concentricity. The precise concentricity of TOTEM tungsten carbide burrs

- Ensures an improved protection of operator safety and health
- Reduces power tool wear
- Provides smooth operating behaviour
- Prevents chatter marks

An optimum power output and RPM of the power source (air-powered or electric machine, flexible shaft system) are necessary conditions for an economically efficient use of tungsten carbide burrs. We therefore recommend you to observe the following rules:

- Work with maximum RPM. Do not use speeds below 3000 RPM except in special cases (eg: on stationery machines or when countersinking with fully immersed burr).
- Chucks and collets must be absolutely concentric to avoid chipping. Tool runout and chatter will result in premature wear.
- Work with significantly reduced RPM on poorly heat conducting materials (eg: stainless steel, titanium alloys, etc.) to prevent tool damage. Avoid the typical blue Discoloration of the shank and the tool.
- In light cutting applications (deburring, chamfering, light surface work) the tool speed may be increased up to twice indicated rate.
- When machining very sticky materials, the use of a suitable lubricant (grease, kerosene, chalk or similar) is recommended to prevent loading.

# CARBON STEEL





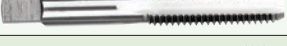














High Performance Cutting Tools



# CARBON STEEL HAND TAPS



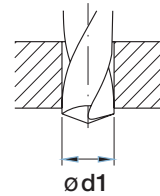
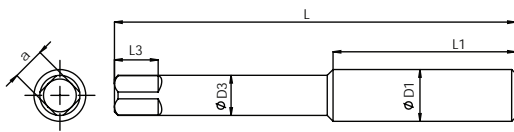
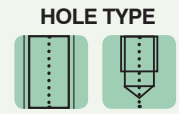
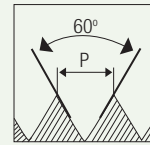
## CARBON STEEL HAND TAPS

	THREAD FORM	BLANK STANDARD	TOLERANCE	CHAMFER	PAGE
	M	BS 949	Zone 5	T/S/B	347
	MF	BS 949	Zone 5	T/S/B	349
	BSW	BS 949	Zone 5	T/S/B	351
	BSF	BS 949	Zone 5	T/S/B	353
	BA	BS 949	Zone 5	T/S/B	354
	BSB	BS 949	Zone 5	T/S/B	355
	BS Con	BS 949	Zone 5	T/B	356
	ME	BS 949	Zone 5	T/S/B	357
	BS Cy	BS 949	Zone 5	T/S/B	358
	WF	BS 949	Zone 5	T/S/B	359
	BSP	BS 949	Zone 5	T/B	360
	BSPT	BS 949	Zone 5	T/B	361
	UNC	BS 949	2B	T/S/B	362
	UNF	BS 949	2B	T/S/B	363
	NPT	BS 949	Zone 5	T/B	365
	NPS	ANSI 949	Zone 5	T/B	366
	UNS	ANSI 949	Zone 5	T/S/B	367





# M Metric coarse threads



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 2	0.4	FBA0204977	44.03	11.5	3.25	2.58	4.46	1.6
M 2.2	0.45	FBA0205005	45.72	15	3.25	2.58	4.46	1.75
M 2.5	0.45	FBA0205061	47.51	15	3.25	2.58	4.46	2.05
M 3	0.5	FBA0205117	49.4	17	3.25	2.58	4.46	2.5
M 3.5	0.6	FBA0205174	52.85	20.6	3.66	2.86	4.46	2.9
M 4	0.7	FBA0205231	56.33	22.5	4.22	3.26	6.05	3.3
M 4.5	0.75	FBA0205318	62.99	26.6	4.8	3.69	6.05	3.7
M 5	0.8	FBA0205404	63.29	26.6	5.41	4.15	6.05	4.2
M 6	1	FBA0205632	67.04	30.7	6.15	4.71	6.84	5
M 7	1	FBA0205716	67.68	30.7	7.21	5.5	7.64	6
M 8	1.25	FBA0205831	69.85	30.5	8.2	6.23	8.43	6.8
M 9	1.25	FBA0205943	74.61	33.7	9.12	6.9	10.02	7.8
M 10	1.5	FBA0206091	74.61	33.7	10.29	7.73	10.02	8.5
M 11	1.5	FBA0206204	80.17	36.5	8.2	6.06	10.02	9.5
M 12	1.5	FBA0206324	85.83	42.1	9.32	6.9	10.81	10.5
M 12	1.75	FBA0206356	85.83	42.1	9.32	6.9	10.81	10.2
M 14	1.5	FBA0206529	91.28	42	10.91	8.07	12.4	12.5
M 14	2	FBA0206560	91.28	42	10.91	8.07	12.4	12



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

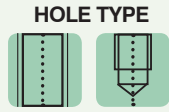
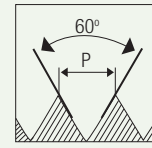
DRILLS

CARBIDE BURRS

CS TAPS

M

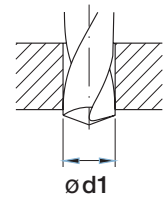
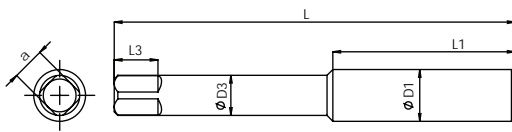
## Metric coarse threads



CS

BS 949

ZONE 5



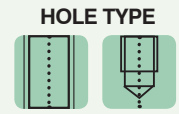
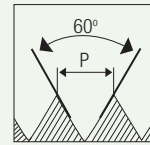
Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 16	2	FBA0206759	96.84	46	12.2	9.04	13.99	14
M 18	2.5	FBA0206986	102.4	46	13.78	10.2	15.58	15.5
M 20	2.5	FBA0207100	107.95	50.8	15	11.12	17.16	17.5
M 22	2.5	FBA0207215	119.06	56.4	17.71	13.17	18.75	19.5
M 24	3	FBA0207359	124.62	56.35	19.31	14.37	18.75	21
M 27	3	FBA0207559	129.8	63.5	20.35	15.13	20.2	24
M 30	3.5	FBA0207815	137.8	65	22.79	16.96	21.9	26.5
M 33	3.5	FBA0208015	145.8	65	25.98	19.34	25.2	29.5
M 36	4	FBA0208155	153.8	76	28.17	20.99	26.7	32
M 39	4	FBA0208211	161.8	76	31.35	23.38	28.2	35
M 42	4.5	FBA0208295	169.8	81	33.18	24.75	28.2	37.5
M 45	4.5	FBA0208323	177.8	81	36.35	27.12	31.7	40.5
M 48	5	FBA0208351	185.3	90.5	38.61	28.82	31.7	43
M 52	5	FBA0208407	193.3	90.5	38.61	28.82	31.7	47



**MF**

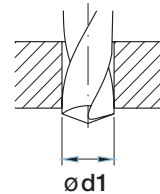
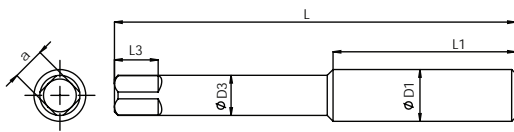
**Metric fine threads**



**CS**

**BS 949**

**ZONE 5**



Unit : mm

Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 2.3	0.4	FBA0205033	45.81	15.00	3.25	2.58	4.46	1.9
M 2.6	0.45	FBA0205089	49.16	17.00	3.25	2.58	4.46	2.1
M 3	0.6	FBA0205146	49.36	17.00	3.25	2.58	4.46	2.4
M 4	0.5	FBA0205202	56.33	22.50	4.22	3.26	6.05	3.5
M 4	0.75	FBA0205259	56.33	22.50	4.22	3.26	6.05	3.25
M 5	0.5	FBA0205346	63.29	26.60	5.41	4.15	6.05	4.5
M 5	0.9	FBA0205432	63.29	26.60	5.41	4.15	6.05	4.1
M 5.5	0.9	FBA0205517	63.58	26.60	5.61	4.30	6.05	4.6
M 6	0.75	FBA0205573	67.13	30.70	6.15	4.71	6.84	5.2
M 8	0.75	FBA0205772	69.85	30.50	8.20	6.23	8.43	7.2
M 8	1	FBA0205800	69.85	30.50	8.20	6.23	8.43	7
M 9	1	FBA0205915	74.61	33.70	9.12	6.90	10.02	8
M 10	0.75	FBA0205999	74.61	33.70	10.29	7.73	10.02	9.2
M 10	1	FBA0206027	74.61	33.70	10.29	7.73	10.02	9
M 10	1.25	FBA0206059	74.61	33.70	10.29	7.73	10.02	8.8
M 12	1	FBA0206260	76.20	31.75	9.32	6.90	10.81	11
M 12	1.25	FBA0206292	76.20	31.75	9.32	6.90	10.81	10.75
M 14	1.25	FBA0206497	76.20	31.75	10.91	8.07	12.40	12.75



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

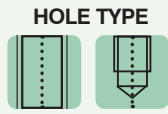
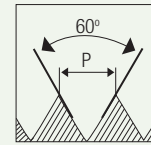
DRILLS

CARBIDE BURRS

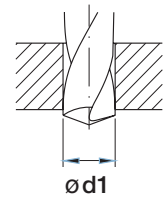
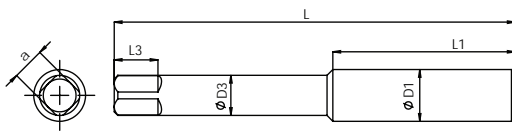
CS TAPS

**MF**

**Metric fine threads**



CS
BS 949
ZONE 5
T/S/B



Unit : mm

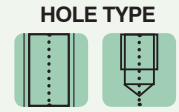
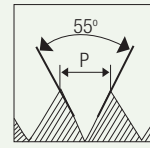
Nominal Diameter	Pitch	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1	p		L	L1	ØD3	a	L3	Ød1
M 16	1	FBA0206672	76.20	31.75	12.20	9.04	13.99	15
M 18	1.5	FBA0206927	76.20	31.75	13.78	10.20	15.58	16.5
M 20	1	FBA0207014	82.55	38.10	15.00	11.12	17.16	19
M 22	1.5	FBA0207156	82.55	38.10	17.71	13.17	18.75	20.5
M 24	1.5	FBA0207271	82.55	38.10	19.31	14.37	18.75	22.5
M 25	1.5	FBA0207387	82.55	38.10	20.33	15.13	20.34	23.5
M 26	1.5	FBA0207445	82.35	38.10	20.35	15.13	20.20	24.5
M 27	1.5	FBA0207501	82.35	38.10	20.35	15.13	20.20	25.5
M 28	1.5	FBA0207615	101.40	38.10	21.21	15.77	20.30	26.5
M 30	1.5	FBA0207700	101.40	38.10	22.79	16.96	21.90	28.5
M 30	2	FBA0207729	101.40	38.10	22.79	16.96	21.90	28
M 32	1.5	FBA0207871	101.40	38.10	25.98	19.34	25.20	31.5
M 40	1.5	FBA0208239	101.40	38.10	31.35	23.38	28.20	38



Carbon Steel Hand Taps

**BSW**

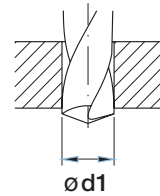
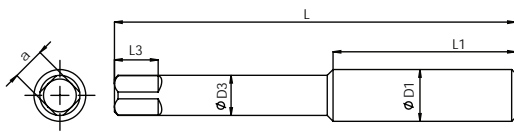
**Whitworth coarse threads**



**CS**

**BS  
949**

**ZONE  
5**



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	ød1
1/16"	60	FBA0200001	42.19	10.5	3.25	2.58	4.46	-
3/32"	48	FBA0200029	47.41	15	3.25	2.58	4.46	-
1/8"	40	FBA0200057	51.05	18.8	3.25	2.58	4.46	-
5/32"	32	FBA0200085	56.28	22.3	4.04	3.03	6.05	-
3/16"	24	FBA0200113	63.04	26.6	4.8	3.69	6.05	3.7
7/32"	24	FBA0200141	63.56	26.6	5.61	4.3	6.05	4.5
1/4"	20	FBA0200169	67.17	30.7	6.43	4.91	6.84	5.1
9/32"	20	FBA0200197	67.68	30.7	7.21	5.5	7.64	5.8
5/16"	18	FBA0200225	69.85	30.5	8	6.06	8.43	6.5
3/8"	16	FBA0200253	74.61	33.7	9.58	7.38	10.02	7.9
7/16"	14	FBA0200281	80.17	36.5	8.2	6.06	10.02	9.3
1/2"	12	FBA0200309	85.83	42.1	9.32	6.9	10.81	10.5
9/16"	12	FBA0200338	91.28	42	10.91	8.07	12.4	12.1
5/8"	11	FBA0200366	96.84	46	12.2	9.04	13.99	13.5
11/16"	11	FBA0200394	102.4	46	13.78	10.2	15.58	15
3/4"	10	FBA0200422	107.95	50.8	15	11.12	17.16	16.25
7/8"	9	FBA0200478	119.06	56.4	17.71	13.18	18.75	19.25
1"	8	FBA0200534	130.18	63.5	20.33	15.13	20.34	22

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

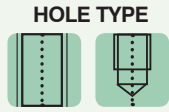
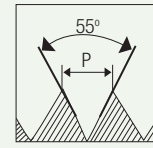
DRILLS

CARBIDE BURRS

CS TAPS

**BSW**

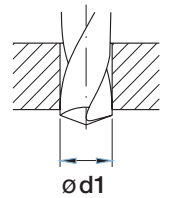
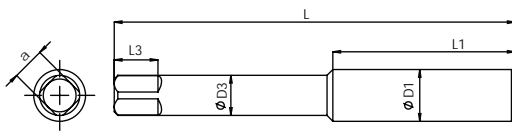
**Whitworth coarse threads**



CS

BS 949

ZONE 5



Unit : mm

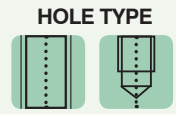
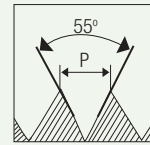
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ø d1
1.1/8"	7	FBA0200562	137.8	65	22.79	16.96	21.7	24.75
1.1/4"	7	FBA0200590	145.8	65	25.96	19.34	25.2	28
1.3/8"	6	FBA0200618	153.8	76	28.17	20.99	26.7	31
1.1/2"	6	FBA0200646	161.8	76	31.35	23.38	28.2	33.5
1.3/4"	5	FBA0200702	177.8	81	36.35	27.12	31.7	39
2"	4.5	FBA0200758	193.3	90.5	41.79	31.21	34.7	44.5



Carbon Steel Hand Taps

**BSF**

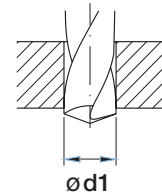
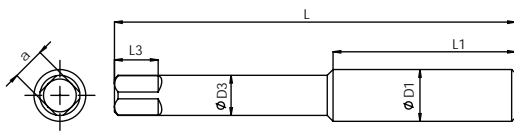
**Whitworth fine threads**



**CS**

**BS  
949**

**ZONE  
5**



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	ød1
3/16"	32	FBA0200842	63.15	26.6	4.8	3.69	6.05	4
7/32"	28	FBA0200870	63.61	26.6	5.61	4.3	6.05	4.6
1/4"	26	FBA0200898	67.27	30.7	6.43	4.91	6.84	5.3
9/32"	26	FBA0200926	67.79	30.7	7.21	5.5	7.64	6.1
5/16"	22	FBA0200954	69.85	30.5	8	6.06	8.43	6.8
3/8"	20	FBA0200982	74.61	33.7	9.58	7.38	10.02	8.3
7/16"	18	FBA0201011	80.17	36.5	8.2	6.06	10.02	9.7
1/2"	16	FBA0201039	85.83	42.1	9.32	6.9	10.81	11.1
9/16"	16	FBA0201067	91.28	42	10.91	8.07	12.4	12.7
5/8"	14	FBA0201095	96.84	46	12.2	9.04	13.99	14
11/16"	14	FBA0201123	102.4	46	13.78	10.19	15.58	15.5
3/4"	12	FBA0201151	107.95	50.8	15	11.12	17.16	16.75
7/8"	11	FBA0201207	119.06	56.4	17.71	13.18	18.75	19.75
1"	10	FBA0201263	130.18	63.5	20.33	15.13	20.34	22.75
1.1/8"	9	FBA0201291	137.8	65	22.79	16.96	21.7	25.5
1.1/4"	9	FBA0201319	145.8	65	25.96	19.34	25.2	28.5
1.3/8"	8	FBA0201347	153.8	76	28.17	20.99	26.7	31.5
1.1/2"	8	FBA0201375	161.8	76	31.35	23.38	28.2	34.5

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

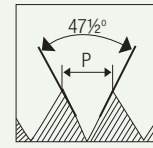
DRILLS

CARBIDE BURRS

CS TAPS

BA

British association threads



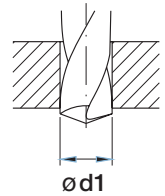
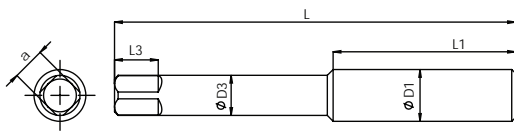
HOLE TYPE



CS

BS 949

ZONE 5



Unit : mm

Nominal Diameter	p	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	ød1
# 12	0.28	FBA0209359	42.00	10.50	3.25	2.58	4.46	1.05
# 11	0.31	FBA0209387	42.08	10.50	3.25	2.58	4.46	1.2
# 10	0.35	FBA0209415	42.29	11.50	3.25	2.58	4.46	1.4
# 9	0.39	FBA0209443	43.98	11.50	3.25	2.58	4.46	1.55
# 8	0.43	FBA0209471	45.76	15.00	3.25	2.58	4.46	1.8
# 7	0.48	FBA0209499	47.52	15.00	3.25	2.58	4.46	2.05
# 6	0.53	FBA0209527	49.29	17.00	3.25	2.58	4.46	2.3
# 5	0.59	FBA0209555	51.11	18.80	3.25	2.58	4.46	2.65
# 4	0.66	FBA0209583	52.92	20.60	3.66	2.86	4.46	3
# 3	0.73	FBA0209611	56.42	22.50	4.22	3.26	6.05	3.4
# 2	0.81	FBA0209639	63.13	26.60	4.80	3.69	6.05	4
# 1	0.9	FBA0209667	63.47	26.60	5.41	4.15	6.05	4.5
# 0	1	FBA0209695	67.07	30.70	6.15	4.71	6.84	5.1

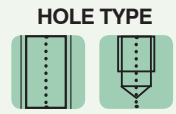
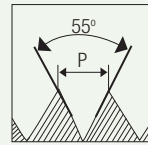




Carbon Steel Hand Taps

**BSB**

**British brass threads**



**CS**

**BS 949**

**ZONE 5**



HSS TAPS

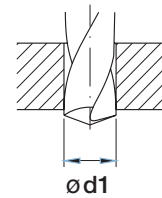
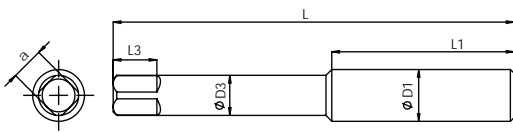
DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/4"	26	FBA0201487	67.27	30.7	6.43	4.91	6.84	5.3
5/16"	26	FBA0201515	69.85	30.5	8	6.06	8.43	6.9
3/8"	26	FBA0201543	74.61	33.7	9.58	7.38	10.02	8.4
7/16"	26	FBA0201571	76.2	31.75	8.2	6.06	10.02	9.9
1/2"	26	FBA0201599	76.2	31.75	9.32	6.9	10.81	11.5
9/16"	26	FBA0201627	76.2	31.75	10.91	8.07	12.4	13.1
5/8"	26	FBA0201655	76.2	31.75	12.2	9.04	13.99	14.65
3/4"	26	FBA0201683	82.55	38.1	15	11.12	17.16	17.86
1"	26	FBA0201711	82.55	38.1	20.33	15.13	20.34	17.86



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

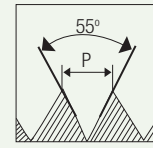
DRILLS

CARBIDE BURRS

CS TAPS

# BS Con

## British conduit threads



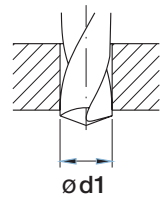
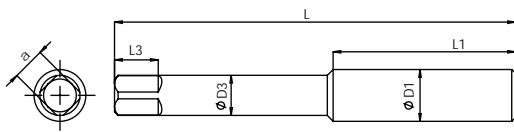
HOLE TYPE



CS

BS  
949

ZONE  
5



Unit : mm

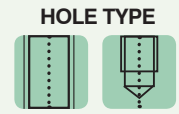
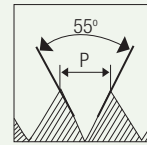
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/2"	18	FBA0209023	76.2	31.75	9.32	6.9	10.81	11.1
5/8"	18	FBA0209051	76.2	31.75	12.2	9.04	13.99	14
3/4"	16	FBA0209079	82.55	38.1	15	11.12	17.16	17.5
1"	16	FBA0209107	82.55	38.1	20.33	15.13	20.34	23.5



Carbon Steel Hand Taps



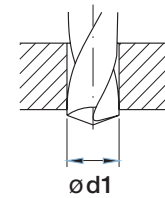
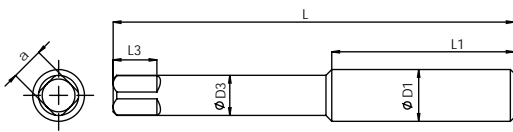
Model engineer threads



CS

BS  
949

ZONE  
5



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	40	FBA0203295	51.05	18.8	3.25	2.58	4.46	2.55
5/32"	40	FBA0203323	56.34	22.5	4.04	3.03	6.05	3.25
3/16"	40	FBA0203351	63.21	26.6	4.8	3.69	6.05	4.1
7/32"	40	FBA0203379	63.73	26.6	5.61	4.3	6.05	4.9
1/4"	40	FBA0203407	67.4	30.7	6.43	4.91	6.84	5.8
9/32"	32	FBA0203435	67.87	30.7	7.21	5.5	7.64	6.1
5/16"	32	FBA0203463	69.85	30.5	8	6.06	8.43	7.1
3/8"	32	FBA0203491	74.61	33.7	9.58	7.38	10.02	8.6

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

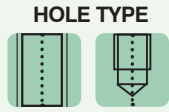
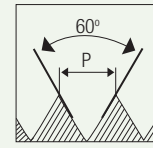
DRILLS

CARBIDE BURRS

CS TAPS

**BS Cy**

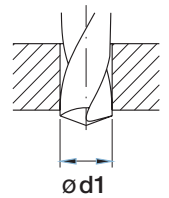
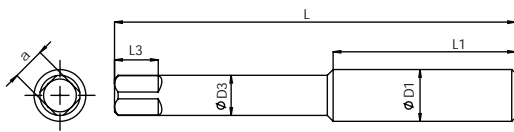
**British cycle threads**



CS

BS 949

ZONE 5



Unit : mm

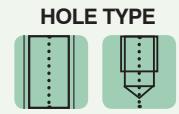
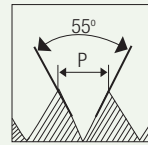
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
3/16"	32	FBA0208435	63.21	26.6	4.8	3.69	6.05	4.1
1/4"	26	FBA0208491	67.36	30.7	6.43	4.91	6.84	5.6
5/16"	26	FBA0208519	69.85	30.5	8	6.06	8.43	7.1
3/8"	26	FBA0208547	74.61	33.7	9.58	7.38	10.02	8.7
7/16"	26	FBA0208575	76.2	31.75	8.2	6.06	10.02	10.3
1/2"	26	FBA0208603	76.2	31.75	9.32	6.9	10.81	11.9



Carbon Steel Hand Taps

**WF**

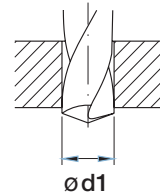
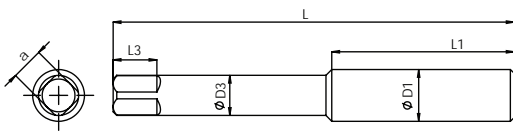
**Whitworth fine threads special**



**CS**

**BS  
949**

**ZONE  
5**



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
3/16"	28	FBA0204641	63.1	26.6	4.8	3.69	6.05	
7/32"	32	FBA0204669	63.73	26.6	5.61	4.3	6.05	
1/4"	32	FBA0204697	67.36	30.7	6.43	4.91	6.84	5.6
5/16"	40	FBA0204753	69.85	30.5	8	6.06	8.43	7.3
3/8"	40	FBA0204809	74.61	33.7	9.58	7.38	10.02	8.9
7/16"	40	FBA0204837	76.2	31.75	8.2	6.06	10.02	
7/16"	32	FBA0204865	76.2	31.75	8.2	6.06	10.02	
1/2"	40	FBA0204893	76.2	31.75	9.32	6.9	10.81	
1/2"	32	FBA0204921	76.2	31.75	9.32	6.9	10.81	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

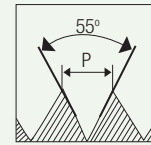
DRILLS

CARBIDE BURRS

CS TAPS

**BSP**

**British standard pipe threads**



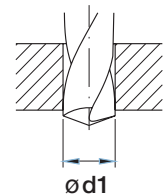
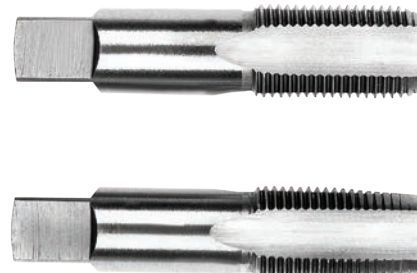
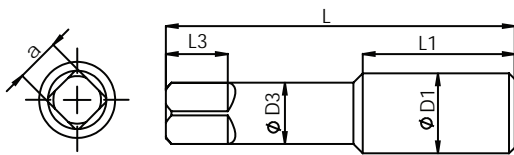
HOLE TYPE



CS

BS  
949

ZONE  
5



Unit : mm

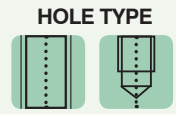
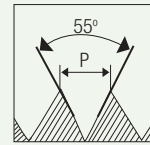
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	28	FBA0208631	53.98	19.05	8.08	5.96	7.64	8.8
1/4"	19	FBA0208659	61.91	26.99	10.91	8.07	10.81	11.8
3/8"	19	FBA0208687	65.09	26.99	13.78	10.2	12.4	15.25
1/2"	14	FBA0208715	79.38	34.92	17.46	12.97	15.58	19
5/8"	14	FBA0208743	80.96	34.92	20.33	15.13	17.16	21
3/4"	14	FBA0208771	82.55	34.92	22.99	17.14	17.16	24.5
7/8"	14	FBA0208799	88.9	39.69	27.74	20.51	18.75	28.25
1"	11	FBA0208827	95.25	44.45	28.56	21.3	20.34	30.75
1.1/4"	11	FBA0208883	101.3	44.5	33.35	24.88	23.7	39.5
1.1/2"	11	FBA0208939	107.8	44.5	38.13	28.46	25.2	45
1.3/4"	11	FBA0208967	110.8	44.5	41.3	30.82	26.7	51
2"	11	FBA0208995	114.3	44.5	47.65	35.54	28.2	57



Carbon Steel Hand Taps

**BSPT**

**British standard taper pipe threads**



HSS TAPS

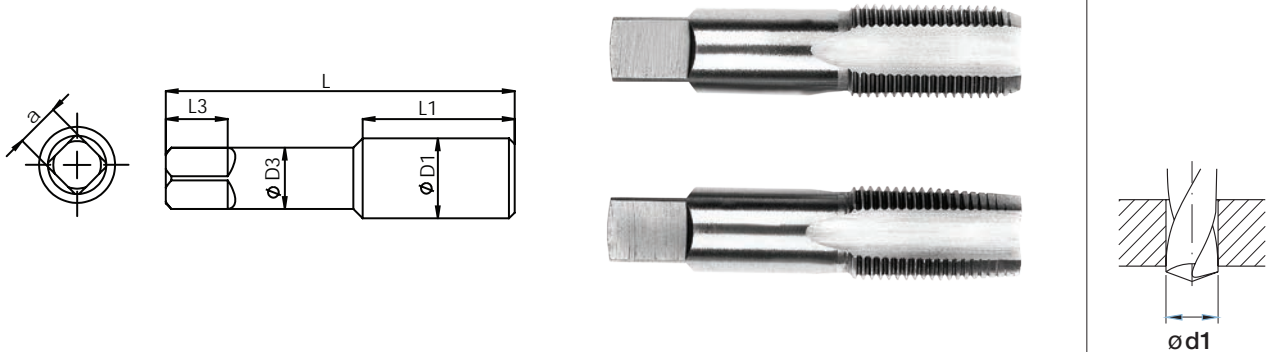
DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	28	FBA0209135	54	19.1	8.08	6.05	7.9	8.4
1/4"	19	FBA0209163	61.9	27	10.9	8.18	11.1	11.5
3/8"	19	FBA0209191	65.1	27	13.77	10.31	12.7	14.75
1/2"	14	FBA0209219	79.4	34.9	17.45	13.08	15.9	18.25
5/8"	14	FBA0211009	81	34.9	20.32	15.24	17.5	20.25
3/4"	14	FBA0209247	82.6	34.9	23.01	17.25	17.5	23.4
1"	11	FBA0209275	95.3	44.5	28.58	21.41	20.6	29.75
1.1/4"	11	FBA0209303	101.6	44.5	33.32	24.99	23.8	38.1
1.1/2"	11	FBA0209331	108	44.5	38.1	28.58	25.4	44.5
2"	11	FBA0211037	114.3	44.5	47.63	35.71	28.6	56.4



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

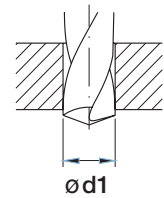
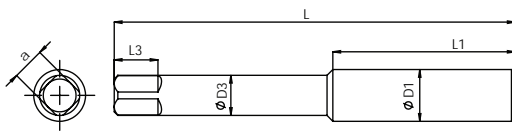
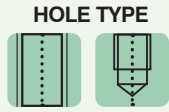
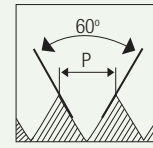
DRILLS

CARBIDE BURRS

CS TAPS

**UNC**

**Unified coarse threads**



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	ød1
# 4	40	FBA0202566	49.26	17	3.58	2.7	4.46	2.35
# 5	40	FBA0202622	51.04	18.8	3.58	2.7	4.46	2.65
# 6	32	FBA0202650	52.79	20.6	3.58	2.7	4.46	2.85
# 8	32	FBA0202706	56.39	22.5	4.27	3.24	6.05	3.5
# 10	24	FBA0202734	63.07	26.6	4.93	3.77	6.05	3.9
# 12	24	FBA0202790	63.5	28.5	5.61	4.1	6.84	4.5
1/4"	20	FBA0202818	67.15	30.7	6.48	4.76	7.64	5.1
5/16"	18	FBA0202846	73.68	35.2	8.08	5.96	9.23	6.6
3/8"	16	FBA0202874	74.61	33.7	9.68	7.17	10.81	8
7/16"	14	FBA0202902	80.17	36.5	8.2	6.06	10.02	9.4
1/2"	13	FBA0202930	85.83	42.1	9.32	6.9	10.81	10.8
9/16"	12	FBA0202958	91.28	42	10.91	8.07	12.4	12.2
5/8"	11	FBA0202986	96.84	46	12.2	9.04	13.99	13.5
3/4"	10	FBA0203042	107.95	50.8	15	11.12	17.16	16.5
7/8"	9	FBA0203070	119.06	56.4	17.71	13.18	18.75	19.5
1"	8	FBA0203098	130.18	63.5	20.33	15.13	20.34	22.25
1.1/8"	7	FBA0203126	137.8	65	22.79	16.96	21.7	25
1.1/4"	7	FBA0203155	145.8	65	25.96	19.34	25.2	28
1.3/8"	6	FBA0203183	153.8	76	28.17	20.99	26.7	30.75
1.1/2"	6	FBA0203211	161.8	76	31.35	23.38	28.2	34
1.3/4"	5	FBA0203239	177.8	81	36.35	27.12	31.7	39.5
2"	4.1/2	FBA0203267	193.7	90.5	41.79	31.21	34.7	45

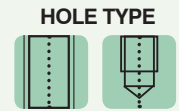
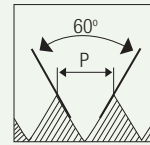




Carbon Steel Hand Taps

**UNF**

**Unified fine threads**



**CS**

**BS  
949**

**2B**



HSS TAPS

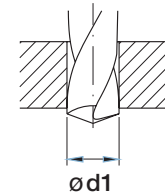
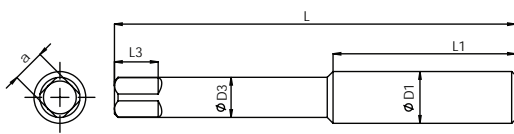
DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	ød1
# 5	44	FBA0201879	51.06	18.8	3.58	2.7	4.46	2.7
# 6	40	FBA0201907	52.85	20.6	3.58	2.7	4.46	2.95
# 8	36	FBA0201963	56.43	22.5	4.27	3.24	6.05	3.5
# 10	32	FBA0201991	63.17	26.6	4.93	3.77	6.05	4.1
# 12	28	FBA0202048	63.56	28.5	5.61	4.1	6.84	4.7
1/8"	44	FBA0201851	51.06	18.8	3.58	2.7	4.46	
5/32"	36	FBA0201935	63.13	22.5	4.27	3.24	6.05	
3/16"	32	FBA0202020	63.13	26.6	4.93	3.77	6.05	
1/4"	28	FBA0202077	67.28	30.7	6.48	4.76	7.64	5.5
5/16"	24	FBA0202106	73.82	35.2	8.08	5.96	9.23	6.9
3/8"	24	FBA0202135	74.61	33.7	9.68	7.17	10.81	8.5
7/16"	20	FBA0202164	80.17	36.5	8.2	6.06	10.02	9.9
1/2"	20	FBA0202193	85.83	42.1	9.32	6.9	10.81	11.5
9/16"	18	FBA0202222	91.28	42	10.91	8.07	12.4	12.9
5/8"	18	FBA0202252	96.84	46	12.2	9.04	13.99	14.5
3/4"	16	FBA0202281	107.95	50.8	15	11.12	17.16	17.5



Carbon Steel Hand Taps

HSS TAPS

DIES

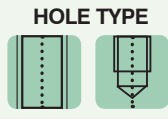
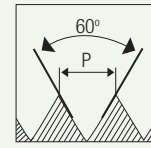
END MILLS

DRILLS

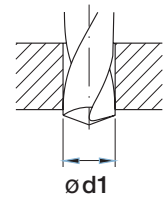
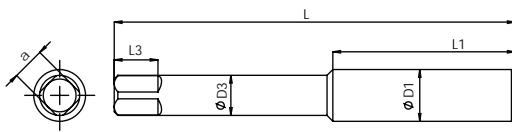
CARBIDE BURRS

CS TAPS

# UNF Unified fine threads



CS
BS 949
2B
T/S/B



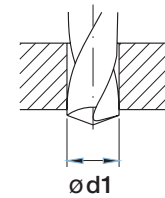
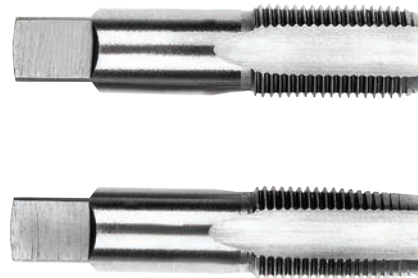
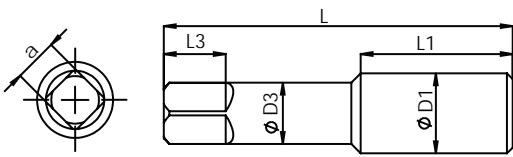
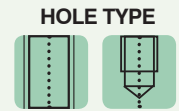
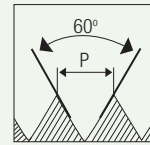
Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
7/8"	14	FBA0202310	119.06	56.4	17.71	13.18	18.75	20.4
1"	12	FBA0202339	130.18	63.5	20.33	15.13	20.34	23.25
1.1/8"	12	FBA0202368	137.8	65	22.79	16.96	21.7	26.5
1.1/4"	12	FBA0202396	145.8	65	25.96	19.34	25.2	29.5
1.3/8"	12	FBA0202425	153.8	76	28.17	20.99	26.7	32.75
1.1/2"	12	FBA0202454	161.8	76	31.35	23.38	28.2	36



**NPT**

**American taper pipe threads**



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD			L	L1	ØD3	a	L3	Ød1
1/8"	27	FBA0209891	54	19.1	8.08	6.05	7.9	8.7
1/4"	18	FBA0209919	61.9	27	10.9	8.18	11.1	11.1
3/8"	18	FBA0209947	65.1	27	13.77	10.31	12.7	14.7
1/2"	14	FBA0209975	79.4	34.9	17.45	13.08	15.9	17.9
3/4"	14	FBA0210031	82.6	34.9	23.01	17.25	17.5	23.4
1"	11.1/2	FBA0210059	95.3	44.5	28.58	21.41	20.6	29.4
1.1/4"	11.1/2	FBA0210087	101.6	44.5	33.32	24.99	23.8	38.1
1.1/2"	11.1/2	FBA0210115	108	44.5	38.1	28.58	25.4	44
2"	11.1/2	FBA0210143	114.3	44.5	47.63	35.71	28.6	56.4



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

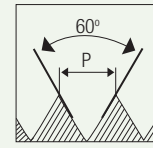
DRILLS

CARBIDE BURRS

CS TAPS

NPS

National pipe threads special



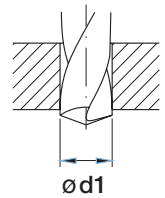
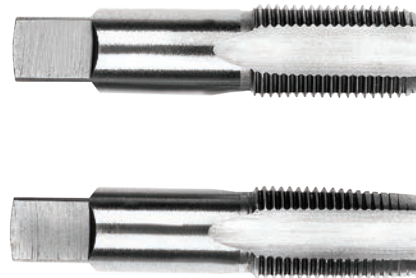
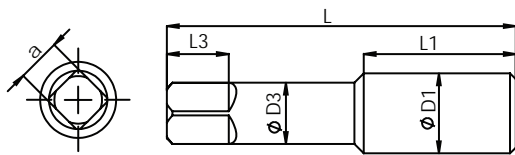
HOLE TYPE



CS

ANSI 949

ZONE 5



Unit : mm

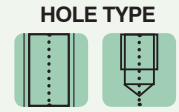
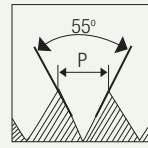
Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	27	FBA0209723	53.97	19.05	8.08	5.96	7.64	9.1
1/4"	18	FBA0209751	61.91	26.98	10.91	8.07	10.81	11.9
3/8"	18	FBA0209779	65.09	26.99	13.78	10.2	12.4	15.25
1/2"	14	FBA0209807	79.38	34.92	17.46	12.97	15.58	19
3/4"	14	FBA0209835	82.55	34.92	22.99	17.14	17.16	27
1"	11.5	FBA0209863	95.25	44.45	28.56	21.3	20.34	30.5



Carbon Steel Hand Taps

UNS

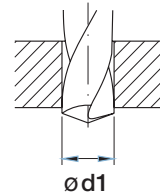
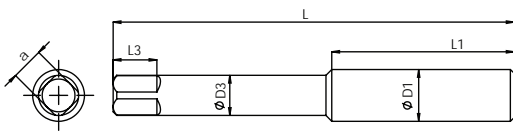
Unified threads special



CS

ANSI 949

ZONE 5



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1/8"	40	FBA0203547	51.04	18.8	3.58	2.7	4.46	
5/32"	32	FBA0203631	56.26	22.5	4.27	3.24	6.05	3.6
5/32"	36	FBA0203659	56.31	22.5	4.27	3.24	6.05	3.65
7/32"	24	FBA0203743	63.55	28.5	5.61	4.1	6.84	
7/32"	28	FBA0203715	63.65	28.5	5.61	4.1	6.84	
7/32"	32	FBA0203771	63.65	28.5	5.61	4.1	6.84	
3/16"	24	FBA0203799	63.03	26.6	4.93	3.77	6.05	4.25
3/16"	32	FBA0203829	63.13	26.6	4.93	3.77	6.05	4.4
1/4"	20	FBA0203857	67.01	30.7	6.48	4.76	7.64	
1/4"	24	FBA0203885	67.23	30.7	6.48	4.76	7.64	
1/4"	32	FBA0203913	67.34	30.7	6.48	4.76	7.64	
5/16"	32	FBA0203941	73.68	35.2	8.08	5.96	10.02	7.5
11/16"	11	FBA0203969	102.4	46	13.78	10.2	15.58	16.4
11/16"	16	FBA0203997	102.4	46	13.78	10.2	15.58	16.7
7/8"	12	FBA0204053	119.06	56.4	17.71	13.18	18.75	
7/8"	18	FBA0204025	119.06	56.4	17.71	13.18	18.75	
1"	14	FBA0204081	130.18	63.5	20.33	15.13	20.34	24.6
1-1/8"	8	FBA0204137	137.8	65	22.79	16.96	21.7	

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



Carbon Steel Hand Taps

HSS TAPS

DIES

END MILLS

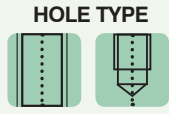
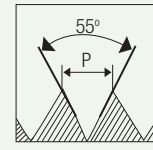
DRILLS

CARBIDE BURRS

CS TAPS

**UNS**

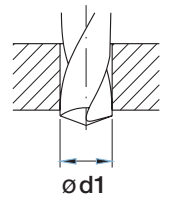
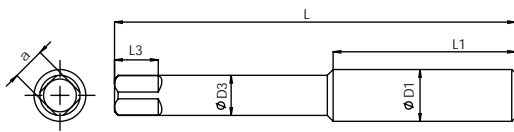
**Unified threads special**



**CS**

**ANSI 949**

**ZONE 5**



Unit : mm

Nominal Diameter	TPI	EDP No.	Overall Length	Thread Length	Shank Diameter	Square Size	Square Length	Tapping Drill Diameter
ØD1			L	L1	ØD3	a	L3	Ød1
1-1/4"	8	FBA0204165	145.8	65	25.96	19.34	25.2	
1-3/8"	8	FBA0204193	153.8	76	28.17	20.99	26.7	
1-1/2"	8	FBA0204221	161.8	76	31.35	23.38	28.2	
1-5/8"	8	FBA0204249	169.8	81	33.18	24.75	28.2	
1-3/4"	8	FBA0204277	177.8	81	36.35	27.12	31.7	
1-3/4"	12	FBA0204305	177.8	81	36.35	27.12	31.7	
1-7/8"	8	FBA0204333	185.3	90.5	38.61	28.82	31.7	
2"	8	FBA0204389	193.3	90.5	41.79	31.21	34.7	
2"	12	FBA0204417	193.3	90.5	41.79	31.21	34.7	



## TAP AND DIE CASE SETS

Description	EDP No	Content
Ref. No METRIC 1 M6-M20 SECS (20Pc)	FBI0200001	"Taps (Second): M6, M8, M10, M12, M14, M16, M20 Dies: 1" OD- M6 TO M10 & 1.1/2" OD - M12 TO M20 Accessories: Tap Wrenches - 2nos. & Die stock - 2nos."
Ref. No METRIC 2 M6-M20 T&B (28Pc)	FBI0200002	"Taps (Taper & Bottom): M6, M8, M10, M12, M14, M16, M20 Dies: 1" OD- M6 TO M10 & 1.1/2" OD - M12 TO M20 Accessories: Tap Wrenches - 2nos. & Die stock - 2nos."
Ref. No METRIC C119 M6-M20 T&B (37Pc)	FBI0200003	"Taps (Taper & Bottom): M6, M7, M8, M9, M10, M11, M12, M14, M16, M20 Dies: 1" OD- M6 TO M10 & 1.1/2" OD - M11 TO M20 Accessories: Tap Wrenches - 2nos. & Die stock - 2nos."
Ref. No METRIC 3 M3-M10 T&B (21Pc)	FBI0200004	"Taps (Taper & Bottom): M3, M4, M5, M6, M8, M10 Dies: 13/16" OD- M3 TO M5 & 1" OD - M6 TO M10 Accessories: Tap Wrenches - 1no. & Die stock - 2nos."
Ref. No METRIC 4P M2-M6 T&B (17Pc)	FBI0200005	"Taps (Taper & Bottom): M2, M3, M4, M5, M6 Dies: 13/16" OD- M2 TO M6 Accessories: Tap Wrenches - 1no. & Die stock - 1no."
Ref. No METRIC 4S M2-M6 SET (22Pc)	FBI0200006	"Taps (Taper, Second & Bottom): M2, M3, M4, M5, M6 Dies: 13/16" OD- M2 TO M6 Accessories: Tap Wrenches - 1no. & Die stock - 1no."
Ref. No METRIC 5F M6-M24 T&B (35Pc)	FBI0200007	"Taps (Taper & Bottom): MF6, MF8, MF10, MF12, MF14, MF16, MF18, MF20, MF22, MF24 Dies: 1" OD- MF6 TO MF10 & 1.1/2" OD - MF12 TO MF20 & 2" OD -MF22 TO MF24 Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."
Ref. No METRIC C120 M6-M24 T&B (44Pc)	FBI0200008	"Taps (Taper & Bottom): M6, M7, M8, M9, M10, M11, M12, M14, M16, M20, M22, M24 Dies: 1" OD- M6 TO M10 & 1.1/2" OD - M11 TO M16 & 2" OD -M18 TO M24 Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."
Ref. No METRIC 5C M6-M24 T&B (35Pc)	FBI0200009	"Taps (Taper & Bottom): M6, M8, M10, M12, M14, M16, M18, M20, M22, M24 Dies: 1" OD- M6 TO M10 & 1.1/2" OD - M12 TO M20 & 2" OD -M22 TO M24 Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."
Ref. No METRIC 6P M3-M12 T&B (24Pc)	FBI0200010	"Taps (Taper & Bottom): M3, M4, M5, M6, M8, M10, M12 Dies: 1" OD- M3 TO M12 Accessories: Tap Wrenches - 2nos. & Die stock - 1nos."
Ref. No METRIC 6S M3-M12 SET (31Pc)	FBI0200011	"Taps (Taper, Second & Bottom): M3, M4, M5, M6, M8, M10, M12 Dies: 1" OD- M3 TO M12 Accessories: Tap Wrenches - 2nos. & Die stock - 1nos."
Ref. No METRIC C114 M2-M12 T&B (36Pc)	FBI0200012	"Taps (Taper, Second & Bottom): M2, M3, M4, M5, M6, M7, M8, ,M9, M10, M11, M12 Dies: 13/16" OD - M2 TO M6 & 1" OD- M7 TO M12 Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."
Ref. No METRIC 7 M6-M12 T&B (18Pc)	FBI0200013	"Taps (Taper, Second & Bottom): M6, M8, M10, M11, M12 Dies: 1" OD - M6 TO M10 & 1.1/2" OD- M11, M12 Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."
Ref. No METRIC C118 M6-M12 T&B (23Pc)	FBI0200014	"Taps (Taper, Second & Bottom): M6, M7, M8, M9, M10, M11, M12 Dies: 1" OD- M6 TO M12 Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No METRIC 8 M3-M12 T&B (23Pc)	FBI0200015	"Taps (Taper, Second & Bottom): M3, M4, M5, M6, M8, M10, M12 Dies: 1" OD- M3 TO M12 Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C37 1/4-3/4 BSW T&B (24Pc)	FBI0200016	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8", 3/4" Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."
Ref. No C37 1/4-3/4 BSF T&B (24Pc)	FBI0200017	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8", 3/4" Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."

HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS



## Carbon Steel Hand Taps



## TAP AND DIE CASE SETS

Description	EDP No	Content
Ref. No C37 1/4-3/4 NF T&B (24Pc)	FBI0200018	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8", 3/4" Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."
Ref. No C37 1/4-3/4 NC T&B (24Pc)	FBI0200019	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8", 3/4" Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."
Ref. No INCHES 9 1/4-3/4 BSW T&B (28Pc)	FBI0200020	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 1/2", 9/16", 5/8", 11/16", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 9/16", 5/8", 11/16", 3/4" Accessories: Tap Wrenches - 2nos. & Die stock - 2nos."
Ref. No INCHES 9 1/4-3/4 BSF T&B (28Pc)	FBI0200021	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 1/2", 9/16", 5/8", 11/16", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 9/16", 5/8", 11/16", 3/4" Accessories: Tap Wrenches - 2nos. & Die stock - 2nos."
Ref. No INCHES 9 1/4-3/4 NC T&B (28Pc)	FBI0200022	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 1/2", 9/16", 5/8", 11/16", 3/4" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 9/16", 5/8", 11/16", 3/4" Accessories: Tap Wrenches - 2nos. & Die stock - 2nos."
Ref. No C31 1/8-1/2 BSW T&B (24Pc)	FBI0200023	"Taps (Taper, Second & Bottom): 1/8", 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 13/16" OD- 1/8", 3/16" & 1" OD - 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 2nos."
Ref. No C82 1/4-1/2 BSW T&B (17Pc)	FBI0200024	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 1" OD- 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C82 1/4-1/2 BSF T&B (17Pc)	FBI0200025	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 1" OD- 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C82 1/4-1/2 NF T&B (17Pc)	FBI0200026	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 1" OD- 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C82 1/4-1/2 NC T&B (17Pc)	FBI0200027	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 1" OD- 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C52 3/16-1/2 BSW T&B (20Pc)	FBI0200028	"Taps (Taper, Second & Bottom): 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 1" OD - 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C52 3/16-1/2 BSF T&B (20Pc)	FBI0200029	"Taps (Taper, Second & Bottom): 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" Dies: 1" OD - 3/16", 1/4", 5/16", 3/8", 7/16", 1/2" Accessories: Tap Wrenches - 1nos. & Die stock - 1nos."
Ref. No C85 1/4-1" BSW T&B (32Pc)	FBI0200030	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4", 7/8", 1" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8" & 2" OD- 3/4", 7/8", 1" Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."
Ref. No C85 1/4-1" BSF T&B (32Pc)	FBI0200031	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4", 7/8", 1" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8" & 2" OD- 3/4", 7/8", 1" Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."
Ref. No C85 1/4-1" NF T&B (32Pc)	FBI0200032	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4", 7/8", 1" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8" & 2" OD- 3/4", 7/8", 1" Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."
Ref. No C85 1/4-1" NC T&B (32Pc)	FBI0200033	"Taps (Taper, Second & Bottom): 1/4", 5/16", 3/8", 7/16", 1/2", 5/8", 3/4", 7/8", 1" Dies: 1" OD- 1/4", 5/16", 3/8" & 1.1/2" OD - 7/16", 1/2", 5/8" & 2" OD- 3/4", 7/8", 1" Accessories: Tap Wrenches - 2nos. & Die stock - 3nos."





## Carbon Steel Hand Taps



HSS TAPS

DIES

END MILLS

DRILLS

CARBIDE BURRS

CS TAPS

## ADJUSTABLE TAP WRENCHES (FORGED STEEL)

Tap Capacity		EDP No.	Overall Nominal Length	
Inch	mm		Inch	mm
1/16"- 1/4"	2 - 6	FBN2200009	6- 1/4"	172
1/8"- 1/2"	3 - 12	FBN2200010	8-1/16"	205
5/32"- 3/8"	4 - 10	FBN2200011	8-1/16"	205
3/16"- 1/2"	5 - 12	FBN2200012	10-3/16"	258
3/16"-5/8"	5 - 16	FBN2200013	10-1/4"	264
1/4"-3/4"	6 - 20	FBN2200014	13-3/4"	350
5/16"-1"	8 - 25	FBN2200015	17-1/4"	435
3/8"-1"	10 - 25	FBN2200016	17-5/16"	440
3/4"-1.1/2"	18 - 38	FBN2200017	27"	685
1"-2"	25 - 50	FBN2200018	34-1/2"	875

## T-HANDLE TAP WRENCHES

Tap Capacity		EDP No.	Overall Nominal Length	
Inch	mm		Inch	mm
1/16"-5/32"	2 - 4	FBN2200019	2-3/8"	60
5/32"-1/4"	4 - 6	FBN2200020	2-11/16"	69
3/16"-5/16"	5 - 8	FBN2200021	2-5/32"	80
1/4"-1/2"	6 - 12	FBN2200022	3-1/2"	88

## T-HANDLE TAP WRENCHES RACHET TYPE

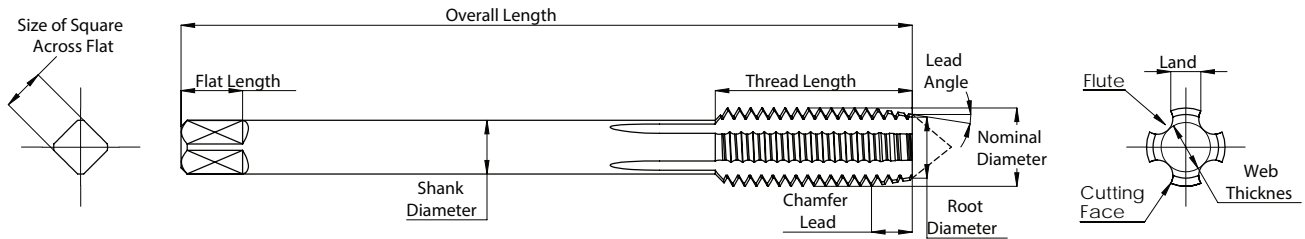
Tap Capacity		EDP No.	Overall Nominal Length	
Inch	mm		Inch	mm
5/32"-1/4"	4 - 6	FBN2200023	2-11/16"	69
1/4"-1/2"	6 - 12	FBN2200024	3-1/2"	88
5/32"-1/4"	4 - 6	ABM000022	10-1/4"	260
1/4"-1/2"	6 - 12	ABM000023	12"	305

## DIE STOCKS

Tap Capacity		EDP No.	Overall Nominal Length	
Inch	mm		Inch	mm
13/16"	20	FBN2200001	6-3/4"	170
1"	25	FBN2200002	8-3/4"	222
1.5/16"	33	FBN2200003	10"	254
1.1/2"	38	FBN2200004	12-1/2"	317
2"	50	FBN2200005	15-9/16"	395
2.1/4"	57	FBN2200006	16.1/2"	420
2.1/2"	63	FBN2200007	19"	480
3"	75	FBN2200008	22-1/2"	572
4"	100	FBN2200028	35"	890



## CARBON STEEL TAPS NOMENCLATURE



## CARBON TAPS APPLICATION

### AUTOMOBILE INDUSTRY

- Cylinder liner and Cylinder head manufacturers
- General purpose applications in small workshops, garages, tool rooms and maintenance departments
- Motor cycle body frames: Spatter cleaning and removing paint from threaded portion.
- Carburetor and speedometer manufacturers
- High Speed Steel Dies are used in removing paint from threaded portion in rear axles of cars, trucks, buses, etc.
- Dies are used by gas valve manufacturers.

### ENGINEERING INDUSTRY

- Air Compressors / Blower manufacturers
- Cooling towers and heat exchangers
- Brass component manufacturers
- Pipe and Pipe fitting manufacturers.
- Sheet Metal Industry
- Thread dressing of diesel engine components
- Steel furniture manufacturers
- Steel window manufacturers
- Bus and Truck body building workshops
- Textile industry
- Electrical industry

### HOUSEHOLD APPLIANCE MANUFACTURERS

- Pressure cookers
- Fans, Air coolers, Air conditioners
- Flour mills, Mixers and Grinders





**High Performance Cutting Tools**



## **Forbes & Company Limited**

Saki Powai Road, Chandivali,  
Mumbai 400 072, India

**Phone:** +91 22 2847 1861

**Email:** sales@forbes.co.in

**Website:** www.totem-forbes.com | www.forbes.co.in

