



**High Performance Cutting Tools**

**PRODUCT PORTFOLIO**



**Forbes & Company Limited**

## HIGH PERFORMANCE MACHINE TAPS

- Manufactured from High Grade HSSE & HSSE PM Steel
- Consistent and tight thread tolerance
- High operating parameters suitable for CNC / SPM Machines
- Material specific tool geometry for optimal performance
- Surface treatment to suit application material for greater wear & heat resistance

### SA – SPIRAL POINTED TAPS

- Material specific angular geometry ensures chips are pushed downwards
- Axial through coolant taps



#### SERIES

- SA:** General steel, SG Iron
- SAF:** Forged steel
- SAH:** Alloy and Hardened Steel
- SAS:** Stainless Steel
- SAI:** Super Alloys

### SB – SPIRAL FLUTED TAPS

- Specific flute design for excellent chip evacuation
- Helix angle as per material category
- Radial through coolant taps



#### SERIES

- SB:** General steel, SG Iron, Aluminium
- SBF:** Forged steel
- SBS:** Stainless steel
- SBI:** Super alloys

### SC – STRAIGHT FLUTED TAPS

- Cutting edge geometry production short chips
- Special process for stress relieving on cutting edge
- Radial and axial through coolant taps



#### SERIES

- SC:** Cast iron, SG Iron, Aluminium Casting
- SCC:** Ductile Cast Iron
- SCF:** Forged steel
- SCH:** Hardened steel

### SD – FORMING TAPS

- Optimized lobe form reduces friction
- Chamfer geometry for uniform load distribution
- Radial and axial through coolant taps



#### SERIES

- SD:** Aluminium and aluminium alloys
- SDF:** Steel and Forged steel

Standards	DIN, ISO, JIS, ANSI
Thread form	METRIC, UNC, UNF, BSP
Range	3mm - 25mm

<b>SA</b>	SPIRAL POINT	<b>SC</b>	STRAIGHT FLUTE
<b>SB</b>	SPIRAL FLUTE	<b>SD</b>	ROLL TAP OR FORMING TAP

## COATING

<b>1</b>	<b>BF</b>	Bright Finish	<b>5</b>	<b>TiCN</b>	Titanium Carbo Nitride Coating
<b>3</b>	<b>TiN</b>	Titanium Nitride Coating	<b>6</b>	<b>TiAlN + WC/C</b>	Hardlube
<b>4</b>	<b>TiAlN</b>	Titanium Aluminium Nitride Coating	<b>7</b>	<b>AlCrN</b>	HELICA



# TAP SELECTION CHART



SCF5	SDF5	SAS3	SAS5	SAS6	SBS5	SBS6	SBS5	SAI6	SBI6	SC3	SC4	SC4TC	SC4	SC4TC	SD1
Straight Flute	Forming	Spiral Point	Spiral Point	Spiral Point	Spiral Flute	Spiral Flute	Spiral Flute	Spiral Point	Spiral Flute	Straight Flute	Straight Flute	Straight Flute	Straight Flute	Straight Flute	Forming
HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE	HSSE-PM	HSSE-PM	HSSE-PM	HSSE	HSSE	HSSE	HSSE-PM	HSSE-PM	HSSE
-	-	-	-	-	45	45	45	-	-	-	-	-	-	-	-
TiCN	TiCN	TiN	TiCN	TiAlN + WC/C	TiCN	TiAlN + WC/C	TiCN	TiAlN + WC/C	TiAlN + WC/C	TiN	TiAlN	TiAlN	TiAlN	TiAlN	Bright
E/1-1.5P	C/2-3P	B/4-4.5P	B/4-4.5P	B/4-4.5P	C/2-3P	C/2-3P	C/2-3P	B/4-4.5P	C/2-3P	E/1-1.5P	E/1-1.5P	E/1-1.5P	E/1-1.5P	E/1-1.5P	C/2-3P
Through/Blind	Through/Blind	Through	Through	Through	Blind/Through	Blind/Through	Blind/Through	Through	Blind/Through	Through/Blind	Through/Blind	Blind	Through/Blind	Blind	Through/Blind
No	No	No	No	No	No	No		No	No	No	No	Yes	No	Yes	No
-	Yes	-	-	-	-	-	-	-	-	-	-	-	-	-	Yes
	15-20														
10-14	12-16														
8-12															
		5-10	5-10	8-14	5-8	10-12	10-12								
			4-6	8-10	4-6	8-10	8-10								
				4-8		6-8	6-8								
										25-30	30-40	30-40	40-50	40-50	
										15-20	20-25	20-25	30-40	30-40	
											12-15	15-20	25-30	25-30	
															20-25
										25-30					20-25
										20-25					
								10-15	6-10						
								6-12	5-8						
								8-12	6-8						
								4-6	3-5						



### ▶▶ NIB TAPS

#### High performance Nut taps for Mild Steels, High tensile Steel and Stainless Steel

- Manufactured from High Grade HSSE Steel
- Tight thread tolerance for better consistency
- Special treatment for stress relieving

#### MATERIAL

HSSE

#### RANGE

Metric – M3 – M24  
BSW/UNC/UNF – 3/16" – 1"

#### SURFACE TREATMENT

TiN/TiCN



### ▶▶ HOLLOW TAPS (CROWN TAPS)

- Special crown-shaped front portion of this tool provides excellent accuracy even in the first stage of the cutting process
- More cutting teeth than conventional tap ensure perfect load distribution. Extra clean and accurate threads can be cut in this way
- The special hollow face crown-shape allows chips to accumulate within the tap & can be tapped up to 2xD in blind holes without having to empty the chips.
- Maximum self-control achieved due to the unfluted guiding-part, results in a high process reliability

#### FEATURES

- Tapping up to 2D in blind hole
- More cutting teeth ensures perfect chip distribution
- Maximum self control due to non fluted guide portion

#### WORKPIECE MATERIAL

- Free Cutting Steel
- Structural Steel
- Carbon Steel
- Alloy Steel < 850 M/mm<sup>2</sup>
- Free Machining Stainless Steel
- Spheroidal Graphite
- Malleable Cast Iron



## HSS HAND AND SHORT / LONG MACHINE TAPS

- Manufactured in state of art CNC machines
- HSS- M2 steel – Straight Flute, Spiral Pointed taps and Long Shank Taps

### RANGE

Metric (Coarse and Fine Pitch) M10- M180  
Imperial 1/16" - 6"

### PIPE THREADS

1/16" - 4"

### THREAD FORM

Metric, BSW, BSF, BSCY, BA, BSB, ME,  
BSCON, UNC, UN, UNS, BSP, BSPT, NPT,  
NPTF, NPSI, NPSF



## HAND TAPS (SERIAL FORM)

### Super Alloys, Hardened Steel and Stainless Steel

- Material – HSS M42 and HSSE/HSS M42 Steel
- Set of 3 (OR) Set of 4 TiN coated
- Inconel, Titanium, Nickel based Alloy, Tool Steel, Maraging Steel, Die Steel, Stainless Steel
- Distribution of cutting load- Thread accuracy
- Thread accuracy and long life

### RANGE

M2.5 – M120





## CARBON STEEL TAPS

### All taps manufactured from first grade High Carbon Steel

- Heat treated in atmospheric controlled furnace with modern timers and temperature controllers
- Every tap passes through stringent inspection tests

### STANDARDS

Metric & British standard tap – BS949:1951  
American standard taps – ANSI 94.9- 1951

### RANGE

Metric – M2 – M52 (Coarse & Fine pitch)  
Imperial – 1/16” – 2”  
Pipe threads- 1/8” – 2”

### THREAD FORMS

Metric (Coarse & Fine)/BSW, BSF, BA, BSB, BSCY, ME, BSCON/  
UNC, UNF, UN, UNS, BSP, BSPT, NPT, NPS

LH taps can be supplied against requirement



## THREADING DIES & DIE NUTS (HSS & CARBON STEEL)

- HSS Dies manufactured of HSS M2 Steel
- Carbon Steel Dies manufactured of High Carbon Steel
- High Carbon Steel Split Round Dies (BS 1127:1976)
- HSS Ground Dies (DIN 223)
- High Carbon Steel Hexagonal Die Nuts
- HSS Hexagonal Die Nuts

### RANGE

OD – 13/16”- 4”

### SPLIT DIES

Metric – M2- M60 (Fine and Coarse pitch)  
Imperial – 1/8”- 1”  
Pipe thread – 1/8” – 2”

### SOLID ROUND DIES

Metric M2- M24  
Imperial 5/32”- 3/4”

### HEXAGONAL DIE NUTS

A/F – 0.710”-3.890”  
Metric- M3- M56  
Imperial – 1/8” – 2 ¼”  
Pipe thread – BSP- 1/8”- 2”

### THREAD FORM

Metric (Coarse & Fine) / BSW, BSF, BSB, BSCY,  
ME, BA, WF, BSP, BSPT/ UNC, UNF, NPT





## END MILLS FOR HARDENED STEELS 45-70 HRC

### PROTON HD

#### FEATURES

- Superior nano grain structure raw material
- Multilayer coating for Hardened moulds
- Ideal Chip flow geometry
- Close tolerance end mills for finishing for higher accuracy

#### FUNCTIONS & BENEFITS

- No EDM required as milling is a much faster operation
- Operates at high cutting speeds on hardened materials

- Polishing for hardened dies can be minimized
- No need of multiple setups, Job can be finished with single clamping and it is much easy to achieve high accuracy
- Higher Tool Life and consistency
- High Productivity

#### RANGE

- Standard 0.1mm- 25mm available in stub/standard/long/extra long/ long reach
- Specials 0.1mm- 32mm available in stub/standard/long/extra long/ long reach



## END MILLS FOR STAINLESS STEEL, SUPER ALLOYS & EXOTIC MATERIALS

### PROTON HD

#### FEATURES

- Variable pitch and Variable helix
- Stable core geometry
- Optimized centre cutting geometry
- New generation coating

#### FUNCTIONS & BENEFITS

- Higher productivity
- Ability to work at high Parameters due to the reinforced core.

- Superior Tool Life.
- Excellent Surface Finish.

#### RANGE

- Standard Roughing 3mm- 20mm / Standard Finishing 0.4mm-12mm
- Special- 0.4mm-25mm



## END MILLS FOR TROCHOIDAL MILLING

### PROTON HD

#### FEATURES

- Robust Core Design
- Multiflutes for High Productivity
- Available with alternate coating

#### FUNCTIONS & BENEFITS

- Operates at high cutting speeds
- Geometry programmed to suit adequate material removal at various enagemnet angles
- Highest dynamic speed rates

- Highest material removal rate
- Least cutting forces
- Prolonged tool life due to reduced shock
- High savings in cycle time when compared to the conventional milling strategy

#### RANGE

- Standard Roughing 3mm- 20mm
- Special- 3mm-25mm



## END MILLS FOR GRAPHITE MILLING

### PROTON HD

#### FEATURES

- Superior nano grain structure raw material
- Multilayer coating for Hardened moulds and Diamond Coating for graphite milling
- Wear resistant grade
- Ideal Chip flow geometry
- Close tolerance end mills for finishing for higher accuracy
- Special Roughing Pitch for graphite roughers

#### FUNCTIONS & BENEFITS

- No EDM required as milling is a much faster operation
- Operates at high cutting speeds on hardened materials

- Polishing for hardened dies can be minimized
- No need of multiple setups, Job can be finished with single clamping and it is much easy to achieve high accuracy
- Higher Tool Life and consistency
- High Productivity
- Superior Surface finish in graphite moulds

#### RANGE

- Standard 0.1mm- 25mm available in stub/standard/long/extra long/ long reach
- Specials 0.1mm- 32mm available in stub/standard/long/extra long/ long reach



## END MILLS FOR HIGH TEMPERATURE ALLOYS (TURBO - TR)

### F177TR / F178TR / F175TR

#### FEATURES

- Variable pitch and Variable helix
- Stable core geometry
- Optimized centre cutting geometry
- New generation coating
- Available in 4 Flutes, 5 Flutes, 6 Flutes and 7 Flutes
- Available with Neck options

#### FUNCTIONS & BENEFITS

- Higher productivity
- Reinforced core gives the ability to work at higher parameters.

- Superior Tool Life.
- Excellent Surface Finish.
- High MRR

#### RANGE

- Standard 6mm - 20mm
- Specials 1.5mm - 25.4mm



## ROUGHERS AND FINISHERS (CHIP BREAKER)

### F192CB / F193CB / F194CB

#### FEATURES

- 3-4 Flutes
- Center Cutting
- Sinosoidal Pitch
- Superior Coating

#### FUNCTIONS & BENEFITS

- High MRR
- Stable cutting at high cutting speeds
- Superior Tool Life

#### RANGE

- Standard 8mm - 20mm available in standard
- Specials 6mm - 25.4mm available in standard



## RAZOR CUT SERIES FOR ALUMINIUM

### FEATURES

- 3 Flutes
- Center Cutting
- Coarse Pitch
- Roughing for Aluminium
- Uncoated

### FUNCTIONS & BENEFITS

- High MRR
- Excellent for roughing and finishing of Aluminium
- Superior Tool Life

### RANGE

- Standard 6mm - 25mm available in regular/long reach
- Specials 4mm - 25mm available in regular/long reach



**CBC SERIES**  
coarse pitch  
roughing for Aluminium



**CBCH SERIES**  
chamfered pitch  
roughing for Aluminium



**3FWF SERIES**  
wiper design  
finishing for Aluminium



**3FWFXL SERIES**  
wiper design  
finishing for Aluminium



**3FWFCR SERIES**  
wiper design  
finishing for Aluminium



**2FWF SERIES**  
wiper design  
finishing for Aluminium

## GENERAL PURPOSE FOR END MILL

### FEATURES

- Excellent choice for application on variety of material
- Special nano grain carbide raw material with an optimum balance of hardness and toughness
- Special geometry better feed rates and longer tool life
- High performance TiAlN coating for superior wear resistance

### FUNCTIONS & BENEFITS

- Best value for money
- Best Suitable for Steel, Stainless Steel, Cast iron, Aluminium

### RANGE

- Standard 1mm to 25mm available in stub/standard/long/extra long/long reach
- Specials 0.3mm to 32mm available in stub/standard/long/extra long/long reach



### HIGH PERFORMANCE TD DRILLS

#### FEATURES

- Reinforced core geometry for higher feed rates
- Special flute form for effective chip evacuation
- Special nano grain carbide raw material with an optimum balance of hardness and toughness
- High performance coating for superior wear resistance at higher cutting speeds

#### FUNCTIONS & BENEFITS

- Universal geometry which can be used for Cast Iron and Steel
- Higher productivity

- High feed rate
- Stable core contributing to lower breakages and rejection rates.

#### RANGE

- Standard 1mm- 20mm in L/D 3 -5 Solid Drills
- Standard 3mm - 20mm in L/D 3 -5-7 Through Coolant Drills
- Specials 1mm - 32mm



### DHD DEEP HOLE DRILLING

#### FEATURES

- Reinforced Core Design
- Superior Surface Treatment
- 4 Margins to Guide
- High Performance Coating
- Optimized Flute Design

#### FUNCTIONS & BENEFITS

- Stable cutting edge
- Better Chip Evacuation

- Better Hole Straightness
- Superior Tool Life
- Eliminate Breakages

#### RANGE

3mm to 16mm  
Available in 12X, 15X, 20X



Note: Always use with Totem Pilot Drills

## TMRT CARBIDE REAMERS

### ABOUT TMRT - TOTEM MULTIFLUTE REAMING TOOLS

- These reamers are designed for the highest metal removal rates from diameter 1.5mm to 12mm as a std
- All standard reamers are ground to an ISO H7 tolerance class hole to address most common applications.
- Special coatings and lead chamfer configurations enable high-speed machining of steel, stainless steel, cast iron, and non-ferrous materials at high speeds.

### FEATURES & BENEFITS

- Higher Productivity and Profitability
- Longer tool life with increased hole and surface quality
- Highest metal removal rate at higher speeds and feeds due to reaming-specific low cobalt grades and substrates.
- Intermediate diameters from 1.5mm to 20mm can be offered as per various lead chamfer configuration as a custom solution.
- All TMRT reamers are also offered with internal coolant supply.



## GENERAL PURPOSE SOLID CARBIDE DRILLS

### F226 SOLID CARBIDE DRILLS 3X STUB LENGTH DRILLS

**RANGE**  
1mm to 20mm

### F224 SOLID CARBIDE DRILLS 5X JOBBER LENGTH DRILLS

**RANGE**  
1mm to 20mm



## CARBIDE CENTER DRILLS IN DIN333

### CENTER DRILL AVAILABLE IN DIN 333 STANDARD IN LH/RH WITH BOTH FORM A & FORM B

**RANGE**  
1mm to 8mm



## SPOTTING DRILLS WITH TIN COATING

### 60 DEGREE SPOTTING DRILLS,

Right-hand helix, standard length Cut / Shank Dia. = h6 tolerance range; point angle tolerance  $+0^\circ/-1^\circ$

**RANGE:** 2mm to 16mm

### 90 DEGREE SPOTTING DRILLS,

Right-hand helix, standard length Cut / Shank Dia. = h6 tolerance range; point angle tolerance  $+0^\circ/-1^\circ$

**RANGE:** 2mm to 16mm

### 120 DEGREE SPOTTING DRILLS,

Right-hand helix, standard length Cut / Shank Dia. = h6 tolerance range; point angle tolerance  $+0^\circ/-1^\circ$

**RANGE:** 2mm to 16mm



## CHAMFER TOOLS WITH TIN COATING

### 60 DEGREE COUNTERSINK TOOLS WITH 4 FLUTES

**RANGE**  
3mm to 16mm

### 90 DEGREE COUNTERSINK TOOLS WITH 4 FLUTES

**RANGE**  
3mm to 16mm



## TUNGSTEN CARBIDE ROTARY BURRS

Workpiece Material	Workpiece Material groups		Cut Type				
			Standard (Single)	Supreme (Double)	Deluxe (Diamond)	Aluma	Chip Breaker
Steel (P)	Non Hardened, non heat treated steel upto 1200 N/mm <sup>2</sup> (<35 HRC)	Constructional Steels, Carbon Steel, Tool Steels, Non Alloyed Steels, Case Hardened Steels, Steel Casting	√	√			
	Hardened, Heat treated steels exceeding 1200 N/mm <sup>2</sup> (>35 HRC)	Tool Steels, Tempering Steels, Alloyed Steels, Steel Casting	√	√			
Stainless Steel (M)		Austenitic and Ferritic High Grade Steels			√		√
Non-Ferrous Metals (N)	Soft Non-Ferrous Metals	Aluminium Alloys, Brass, Copper, Zinc				√	
	Hard Non-Ferrous Metals	Bronze, Titanium/Titanium Alloys, Very Hard Aluminium Alloys (High Si content)	√	√		√	
	Heat Resistant Alloys	Nickel based Alloys, NiCo Alloys (Aircraft engine and turbine construction)	√	√		√	
Cast Iron (K)		Grey Cast Iron, Spheroidal Graphite Cast Iron	√	√		√	
Plastic /Other Materials		Fiber Reinforced Plastic, Thermoplastics Hard Rubber				√	
						√	



Series	Shape Description	Totem Reference
SA/ZYA	Cylindrical without end cut	C
SB/ZYAS	Cylindrical with end cut	CE
SC/WRC	Cylindrical with radius end	B
SD/KUD	Ball Shape	S
SE/TRE	Oval shape burr	O
SF/RBF	Tree shape with radius end	TB
SG/SPG	Tree shape with point end	T
SH	Flame shape	F
SL/KEL	Cone with radius burr	K
SM/SKM	Cone shaped burr	A
SN	Inverted cone shape burrs	N
RIM	Rim shape burrs	R

- Ask your local representative about our long shank program –Available in 4", 5", 6", 7", 8", 9", 10", 11" & 12"
- All sizes available as a special in left hand cut
- Coarse cut burrs available on request
- Full carbide burrs available on request

## BURR SETS

We also offer burr case sets in 6 mm and 3 mm shank

- BS1 - C8, B6, S4, TB3, T3, F4, K2, A3  
 BS2 - C4, B3, S3, TB2, T2, F3, K6, A11  
 MINI BS1 - MC1, MC5, MBO, MB1, MSO, M01, MTB2, MT5, MF1, MK3, MA5, MA3



## JOBBER, TAPER & REDUCED SHANK DRILLS

### FEATURES

- Made from Premium Grade HSS Steel
- Manufactured in State of Art CNC machine setup

### FUNCTIONS & BENEFITS

- An excellent general purpose drill with conventional 118° point angle
- Stable Cutting edge
- Better chip evacuation
- Better hole straightness
- Superior Tool life

SERIES	STANDARD	RANGE
HSS Parallel Shank Twist Drills – Jobber Series	IS 5101 : 2002, DIN 338 : 1984	1mm to 20mm & 3/64" to 13/16"
HSS Taper Shank Twist Drill – Fully Ground Taper Shank Drills	IS 5103 : 2002, DIN345 : 1986	8mm to 75mm & 3/8" to 2"
HSS Reduced Shank Drills	-	13.5mm to 30mm



## M35 SERIES – BLACK & GOLD DRILLS

### FEATURES

- Made from premium grade High Speed Steel (5% Cobalt)
- Special Black & Gold surface treatment to increase lubricity & reduce friction
- The strong web construction provides greater strength & rigidity to the drill
- Precision ground 135° Split Point angle is Self Centring & reduces Thrust during application

### FUNCTIONS & BENEFITS

- High performance drills suitable for Production applications & also for tough Maintenance applications
- Well suited for drilling on Stainless Steel & challenging Alloy Steel materials
- Operating at higher feeds

SERIES	STANDARD	RANGE
HSS Parallel Shank Twist Drill – Black & Gold (M35 Series)	IS 5101 : 2002, DIN 338	1mm to 13mm & 3/64" to 1/2"



## HSS STUB DRILLS

### FEATURES

- An excellent general purpose drill with conventional 118° point angle
- Shorter flute & overall length increases the rigidity

### FUNCTIONS & BENEFITS

- Less drill deflection, better hole accuracy & longer tool life
- Operating at higher feeds
- Ideal to use in manual hand held drilling application

SERIES	STANDARD	RANGE
HSS Parallel Shank Twist Drill – Stub Series	IS 5100 : 2002, DIN 1897 : 1984	1mm to 20mm & 3/64" to 9/16"



### HSS LONG DRILLS

#### FEATURES

- Stable cutting edge
- Better chip evacuation
- Better hole straightness

#### FUNCTIONS & BENEFITS

- Well suited for deep holes
- Superior tool life

SERIES	STANDARD	RANGE
Long Shank HSS Drill	IS 5102 : 2002 , DIN 340 : 1978, ISO 494 : 1975, BS 328	1mm to 13mm, 3/64" to 1/2"



### HSS DRILL CASE SETS



SERIES	DESCRIPTION	QTY PER CASE SET
HSS M2 DRILL SET	1mm to 13mm x 0.5mm	25 pcs
HSS M2 DRILL SET	2mm to 8mm x 0.5mm	13 pcs
HSS DRILLS CASE SET	1/16" to 1/4"	13 pcs
HSS DRILLS CASE SET	1/16" to 1/2"	29 pcs

### CENTRE DRILLS

#### FEATURES

- Made from Premium Grade HSS Steel in M2 Grade & M35 Grade
- Available in BS Standard, Type – A & Type –B
- Also available with TIN coating

#### FUNCTIONS & BENEFITS

- Excellent choice for centring application
- Stable cutting edge
- Superior tool life

STANDARD	TYPE	PILOT DIA
AS PER BS 328 : PART II – 1990	BS SERIES	3/64 to 3/16
AS PER IS 6708-2002	TYPE A	1mm to 10mm
AS PER IS 6709-2002: ISO 2540-1972	TYPE B	1.6mm to 10mm





## HSS / HSS-E ANNULAR CUTTERS

### FEATURES

- Made from premium grade High Speed Steel
- Multi – cut geometry for ply – cutting & lower friction to reach better performance of endurance & removal of chips
- Available in One Touch Shank (Universal shank Dia. 3/4" or 19.05mm )

### FUNCTIONS & BENEFITS

- Applicable to hole cutting & process of annular groove on various magnetic drills
- Meets requirements of hole cutting on various materials

RANGE	CUTTING DEPTH
12mm to 50mm	25mm & 50mm



## TCT ANNULAR CUTTERS

### FEATURES

- Premium quality Tungsten Carbide tips for ply – cutting & lower friction
- Multi – Cut geometry for increases chip removal

### FUNCTIONS & BENEFITS

- Applicable to hole cutting & process of annular groove
- Suitable on various materials
- Universal shank 3/4" (19.05mm) for various magnetic drill machines

RANGE	CUTTING DEPTH
11mm to 40mm	40mm & 55mm



## CONSTRUCTION DRILLS

### FEATURES

- High quality Tungsten Carbide Tip
- Automatic Brazing process
- Produced with Chrome Vanadium hardened & tempered shank

### FUNCTIONS & BENEFITS

- Guaranteed Tool life
- Extensive usage in Concrete, Natural Stone & Masonry etc.

SERIES	STANDARD	RANGE
HAMMER DRILL SDS PLUS	DIN 8035	Dia 5mm to 25mm
MASONRY GRANITE DRILL	DIN 8039, ISO 5468	Dia 4mm to 12.0mm
MASONRY CONCRETE DRILL	DIN 8039	Dia 3mm to 12mm, Dia 3/16" to 15/32"



» **SQUARE SECTION**



<b>STANDARD</b>	IS 6735 / 1994
<b>RANGE</b>	2.50 MM TO 45 MM



<b>STANDARD</b>	DIN -7980
<b>RANGE</b>	2.50 MM TO 45 MM



<b>STANDARD</b>	BS1802 / 1951
<b>RANGE</b>	4.76 MM TO 25.40 MM



<b>STANDARD</b>	BBBB STANDARD SQUARE SECTION
<b>RANGE</b>	3.18 MM TO 38.10 MM

» **FLAT SECTION**



<b>STANDARD</b>	IS 3063 / 1994
<b>RANGE</b>	2.50 MM TO 48 MM



<b>STANDARD</b>	DIN -127 B
<b>RANGE</b>	2.50 MM TO 48 MM

## FLAT SECTION



**STANDARD** BS 1802 / 1951  
**RANGE** 3.18 MM TO 25.40 MM



**STANDARD** BBBB STANDARD FLAT SECTION WITH ASA  
**RANGE** 4.76 MM TO 31.75 MM

## WAVE WASHERS



**RANGE** 6 MM TO 12 MM

## JIS WASHERS



**RANGE** 5 MM TO 27 MM

## STAINLESS STEEL WASHERS

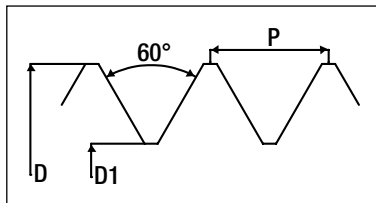


**RANGE** 3 MM TO 12 MM

All above washers are available in following plating

Zinc Green Passivation	Zinc White Passivation	Zinc Plating
Zinc Yellow Passivation	Trivalent Plating	Zinc Plating 40 Microns
Zinc Black Passivation	Phosphate Plating	Hot dip galvanising

## ISO METRIC THREADS



ISO METRIC COARSE THREADS

Metric Coarse (M)		
Nominal Diameter ØD	Pitch	Drill Size
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

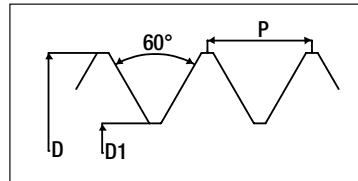
ISO METRIC FINE THREADS

Metric Fine (MF)		
Nominal Diameter ØD	Pitch	Drill Size
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	23
25	1.5	23.5

Metric Fine (MF)		
Nominal Diameter ØD	Pitch	Drill Size
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

## FORMING/ROLL TAP PRE - TAPPING DRILL HOLE

ISO METRIC THREADS



COARSE PITCH		
TAP SIZE	Pitch	Drill Size
M 2	0.4	1.8
M 2.5	0.45	2.3
M 3	0.5	2.8
M 3.5	0.6	3.25
M 4	0.7	3.7
M 4.5	0.75	4.15
M 5	0.8	4.6
M 6	1	5.55
M 7	1	6.55
M 8	1.25	7.5
M 10	1.5	9.3
M 11	1.5	10.3
M 12	1.75	11.2
M 14	2	13.1
M 16	2	15.1
M 18	2.5	16.9
M 20	2.5	18.9

FINE PITCH		
TAP SIZE	Pitch	Drill Size
M 3	0.35	2.85
M 4	0.5	3.8
M 5	0.5	4.8
M 6	0.75	5.65
M 8	1	7.55
M 10	1	9.55
M 10	1.25	9.45
M 12	1	11.55
M 12	1.25	11.45
M 12	1.5	11.3
M 14	1.25	13.45
M 14	1.5	13.3
M 16	1.5	15.3
M 18	1.5	17.3
M 20	1.5	19.3
M 18	2.5	16.9
M 20	2.5	18.9

UNC TAPS		
TAP SIZE	Pitch	Drill Size
NO. 1	64	1.7
NO. 2	56	2
NO. 3	48	2.3
NO. 4	40	2.6
NO. 5	40	2.9
NO. 6	32	3.2
NO. 8	32	3.8
NO. 10	24	4.4
NO. 12	24	5
1/4"	20	5.8
5/16"	18	7.3
3/8"	16	8.8
7/16"	14	10.3
1/2"	13	11.9

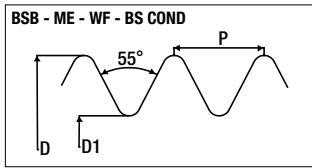
UNF TAPS		
TAP SIZE	Pitch	Drill Size
NO. 1	72	1.7
NO. 2	64	2
NO. 3	56	2.3
NO. 4	48	2.6
NO. 5	44	2.9
NO. 6	40	3.2
NO. 8	36	3.9
NO. 10	32	4.5
NO. 12	28	5.1
1/4"	28	6
5/16"	24	7.5
3/8"	24	9.1
7/16"	20	10.6
1/2"	20	12.1

WHITWORTH PIPE THREADS		
TAP SIZE	Pitch	Drill Size
G 1/8"	28	9.25
G 1/4"	19	12.5
G 3/8"	19	16
G 1/2"	14	20
G 3/4"	14	25.5
G 1"	11	32

# THREAD CHART

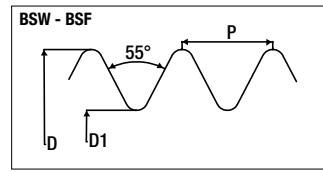
## BRITISH STANDARD THREADS

BSB		
Nominal Diameter Ø D	TPI	Drill Size in mm
1/4"	26	5.3
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
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



BS COND.		
Nominal Diameter Ø D	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

ME		
Nominal Diameter Ø D	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	10.50
1/2"	26	12.10



British Standard  
Whitworth Threads

British Standard  
Fine Threads

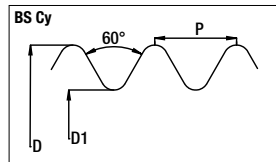
BSW		
Nominal Diameter Ø D	TPI	Drill Size in mm
1/16"	60	1.2
3/32"	48	1.9
1/8"	40	2.55
5/32"	32	3.2
3/16"	24	3.7
7/32"	24	4.5
1/4"	20	5.1
9/32"	20	5.8
5/16"	18	6.5
3/8"	16	7.9
7/16"	14	9.3
1/2"	12	10.5
9/16"	12	12.1
5/8"	11	13.5
11/16"	11	15.1
3/4"	10	16.3
7/8"	9	19.3
15/16"	9	20.6
1"	8	22.0
1.1/8"	7	24.75
1.1/4"	7	28.0
1.3/8"	6	30.5
1.1/2"	6	33.5
1.5/8"	5	36.0
1.3/4"	5	39.0
1.7/8"	4 1/2	41.3
2"	4 1/2	44.5

BSF		
Nominal Diameter Ø D	TPI	Drill Size in mm
3/16"	32	4
7/32"	28	4.6
1/4"	26	5.30
9/32"	26	6.00
5/16"	22	6.80
3/8"	20	8.30
7/16"	18	9.70
1/2"	16	11.10
9/16"	16	12.70
5/8"	14	14.00
11/16"	14	15.50
3/4"	12	16.75
7/8"	11	19.75
15/16"	11	21.50
1"	10	22.75
1.1/8"	9	25.50
1.1/4"	9	28.50
1.3/8"	8	31.50
1.1/2"	8	34.50
1.5/8"	8	37.70
1.3/4"	7	41.00
1.7/8"	7	43.70
2"	7	47.00

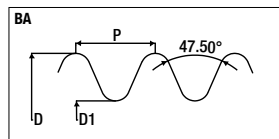
WHITWORTH FORM SPECIAL		
Nominal Diameter Ø D	TPI	Drill Size in mm
1/4"	24/28/32	5.3, 5.4, 5.5
5/16"	24/40	6.75, 7.3
3/8"	24, 40	8.4, 8.9
7/16"	20/24/40	9.8/10, 10.5
1/2"	20/24/40	11.5, 11.9, 12
9/16"	20	13.1

WHITWORTH FORM SPECIAL		
Nominal Diameter Ø D	TPI	Drill Size in mm
5/8"	20	14.5
11/16"	20	16.2
3/4"	14/20	17.1, 17.8
7/8"	14/16/20	20.2, 20.6, 21.0
1"	12/20	23.0, 24.0

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

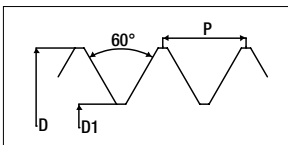


BS Cy		
Size	TPI	Drill Size in mm
1/8"	40	2.65
5/32"	32	3.30
3/16"	32	4.10
7/32"	26	4.80
1/4"	26	5.60
5/16"	26	7.20
3/8"	26	8.70
7/16"	26	10.30
1/2"	26	11.90
9/16"	26	13.50
5/8"	26	15.00
3/4"	26	18.20
1"	24	24.50



## UNIFIED COARSE THREADS

### AMERICAN STANDARD THREADS



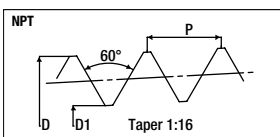
UNC		
Nominal Diameter Ø D	Pitch	Drill Size
# 1	64	1.55
# 2	56	1.8
# 3	48	2.1
# 4	40	2.3
# 5	40	2.6
# 6	32	2.9
# 8	32	3.5
# 10	24	3.9
# 12	24	4.5
1/4"	20	5.2
5/16"	18	6.6
3/8"	16	8
7/16"	14	9.4

UNC		
Nominal Diameter Ø D	Pitch	Drill Size
1/2"	13	10.9
9/16"	12	12.3
5/8"	11	13.6
3/4"	10	16.6
7/8"	9	19.5
1"	8	22.3
1.1/8"	7	25
1.1/4"	7	28.3
1.3/8"	6	30.8
1.1/2"	6	34
1.3/4"	5	39.5
2"	4.5	45.3

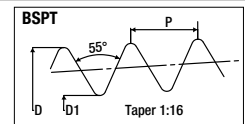
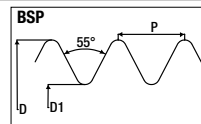
UNF		
Nominal Diameter Ø D	Pitch	Drill Size
# 0	80	1.25
# 1	72	1.55
# 2	64	1.85
# 3	56	2.1
# 4	48	2.4
# 5	44	2.7
# 6	40	2.9
# 8	36	3.5
# 10	32	4.1
# 12	28	4.6
1/4"	28	5.5
5/16"	24	6.9
3/8"	24	8.5

UNF		
Nominal Diameter Ø D	Pitch	Drill Size
7/16"	20	9.9
1/2"	20	11.5
9/16"	18	12.9
5/8"	18	14.5
3/4"	16	17.5
7/8"	14	20.5
1"	12	23.3
1.1/8"	12	26.5
1.1/4"	12	29.6
1.3/8"	12	32.8
1.1/2"	12	36
2"	12	48.6

### STRAIGHT AND TAPER PIPE THREADS



Nominal Diameter Ø D	TPI	Drill Size in mm		
		Tapping With Reamer	Tapping Without Reamer	NPS
1/16"	27	5.94	6.15	6.35
1/8"	27	8.33	8.43	8.75
1/4"	18	10.72	11.13	11.13
3/8"	18	14.27	14.68	14.68
1/2"	14	17.48	17.86	18.26
3/4"	14	22.63	23.01	23.42
1"	11.5	28.58	28.98	29.36
1.1/4"	11.5	37.31	37.69	38.1
1.1/2"	11.5	43.26	43.66	44.45
2"	11.5	55.17	55.58	56.36
2.1/2"	8	65.48	66.27	67.46



BSP		
Nominal Diameter Ø D	TPI	Drill Size in mm
1/8"	28	8.8
1/4"	19	11.8
3/8"	19	15.3
1/2"	14	19
5/8"	14	21
3/4"	14	24.5
7/8"	14	28.3
1"	11	30.8
1.1/4"	11	39.5
1.1/2"	11	45
1.3/4"	11	51
2"	11	57

BSPT			
Nominal Diameter Ø D	TPI	Drill Size in mm	
		Tapping With Reamer	Tapping Without Reamer
1/16"	28	6.1	6.2
1/8"	28	8.1	8.2
1/4"	19	10.7	11
3/8"	19	14.2	14.5
1/2"	14	17.6	18
3/4"	14	23	23.5
1"	11	29	29.5
1.1/4"	11	37.5	38
1.1/2"	11	43.5	44
2"	11	54.9	55.5



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