

# ICON

## LEGEND & DESCRIPTION

Material	<b>HSS</b>	High Speed Steel	<b>HSS Co5</b>	5% Cobalt High Speed Steel	<b>HSS Co8</b>	8% Cobalt High Speed Steel	<b>HSS Co8e</b>	8% Cobalt HSS, Eccentric Relief Sharpening		
	<b>HSS V3</b>	3% Vanadium High Speed Steel	<b>SOLID CARBIDE</b>	9-10% Cobalt, 0.2-0.8 µm Grain size.	<b>CARBON STEEL</b>	Carbon Steel				
Finish	<b>BLUE FINISH</b>	Steam (HOMO) Temper	<b>BRIGHT FINISH</b>	No Surface Treatment	<b>BRIGHT FINISH WITH TIN TIP</b>	TIN Coated for a length of 4 x diameter				
	<b>GOLD OXIDE</b>	Steam (HOMO) Temper Straw Colour	<b>TiAIN</b>	Titanium Aluminium Nitride (Black Finish)	<b>TIN</b>	Titanium Nitride (Gold Finish)	<b>X.TREME</b>	TiAlN suited to Solid Carbide (Violet -grey Finish)		
Type	<b>TYPE N</b>	Type N Standard	<b>TYPE W</b>	Type W For Soft Materials	<b>TYPE H</b>	Type H For Hard Materials	<b>TYPE FS</b>	Parabolic Flute Strong Core		
	<b>CBA</b>	Colour Band Application								
Milling Profile		Staggered Teeth Side & Face Cutters		Straight Teeth Side & Face Cutters						
		Fine Pitch Knuckle Type Roughing Profile		Coarse Pitch Knuckle Type Roughing Profile		Fine Pitch Flat Crest Rough Semi-finishing Profile		Coarse Pitch Flat Crest Rough Semi-finishing Profile		
Standard	<b>ISO 529</b>	ISO Standard 529	<b>DIN 371</b>	DIN Standard 371	<b>WORKS STD.</b>	Factory Specifications				
	<b>RF</b>	Refined Flute	<b>QS</b>	Quick Spiral	<b>H 7</b>	Reamer to produce H7 Tolerance				
Shank		Flatted Shank h6 Tolerance		Plain Shank h7 Tolerance		Threaded Shank h8 Tolerance		Carbide Plain Shank h6 Tolerance		
		Morse Taper Shank MT 3 - 5								
Point Angle								Drill Point Angles		
		Countersink Angles 60° & 90°								
Lengths		Drills Stub Series		Drills Jobber Series		Drills Long Series		Drills Extra Length Series		
		End Mills Regular Series		End Mills Long Series						
Flute Helix Angle										Right hand helix
				Left hand helix						
Centre Drills		Form A Standard		Form B Protected		Form R Radius				
Inclination		To Suit 1 in 10 Taper		To Suit 1 in 50 Taper		To Suit 1 in 48 Taper				



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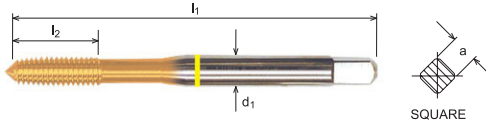
Threads	<b>M</b> Metric	<b>MF</b> Metric Fine	<b>BSW</b> British Standard Whitworth	<b>BSF</b> British Standard Whitworth Fine						
	<b>UNC</b> Unified National Coarse	<b>UNF</b> Unified National Fine	<b>BSPT</b> British Standard Pipe Taper "F" Series	<b>BSP</b> British Standard Pipe (Fine) "G" Series						
	<b>NPS</b> National Pipe Straight	<b>NPT</b> National Pipe Taper	<b>BA</b> British Association	<b>BSB</b> British Standard Brass						
	Thread Form - with 47½°/55°/60° flank angle									
Tolerance	<b>h8 (d)</b>	<b>h8</b>	<b>k10</b>	<b>h10</b>	<b>k12</b>	<b>e8</b>	Tolerance on cutting Diameter			
	<b>wre63 d=h12</b>	<b>wrd11 d=d11</b>	Woodruff Tolerance		<b>rH11 d1=js14</b>	Corner Rounding Tolerance				
Application		Taper, Through & Blind Hole			Through & Blind Hole			Blind Hole Tapping		Through Hole Tapping
		Left Hand Cutting			Right Hand Cutting			Hand Taps		
	Direction of Cut									

# GENERAL



## MATERIAL DESCRIPTIONS

Materials	Code 0	Code 1	Code 2	Code 3	Code 4	Code 5	Code 7
Free Cutting Steels	x	x	x	x	x	x	x
Carbon Steel	x	x	x	x	x	x	x
Alloy Steel	x	x	x	x	x	x	x
Stainless Steel	x	x	x	x	x	x	x
Heat Resisting Alloys		x	x				
Nimonic Alloys				x	x	x	x
Titanium	x	x	x	x	x	x	x
Tool Steel				x	x	x	x
Cast Irons	x	x	x	x	x	x	x
Nickel	x						
Manganese Steels		x	x			x	x
Aluminium Alloys	x	x	x	x	x	x	x
Magnesium Alloys		x	x			x	x
Zinc Alloys						x	x
Copper	x	x	x	x	x	x	x
Synthetics / Plastics	x	x	x	x	x	x	x



Size	Pitch	l <sub>1</sub>	l <sub>2</sub>	d <sub>1</sub>	a	Code
M3	0.5	56	11	3.5	2.7	5120300
M4	0.7	63	13	4.5	3.4	5120400
M5	0.8	70	16	6	4.9	5120500
M6	1.0	80	19	6	4.9	5120600
M8	1.25	90	22	8	6.2	5120800
M10	1.5	100	24	10	8	5121000
*M12	1.75	110	29	9	7	5121200

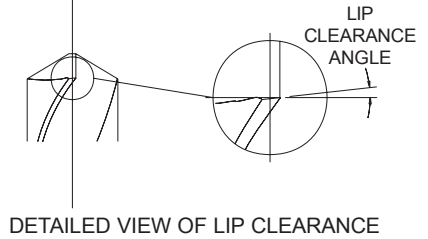
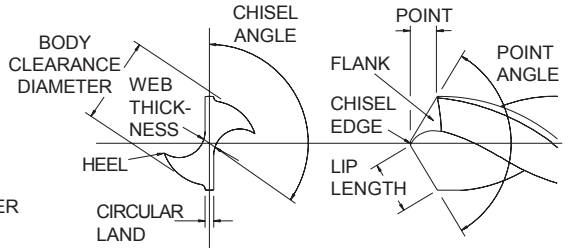
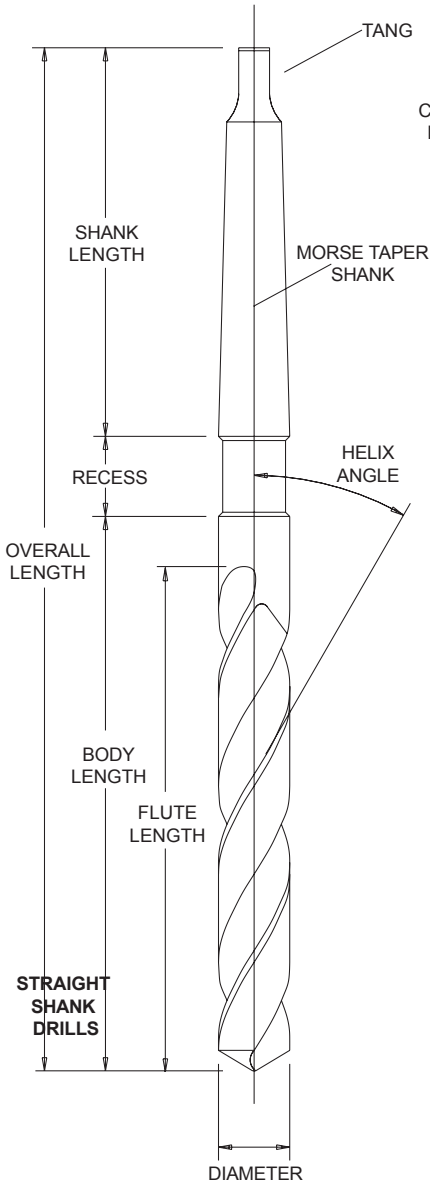
\* DIN 376

Code
<b>512</b>

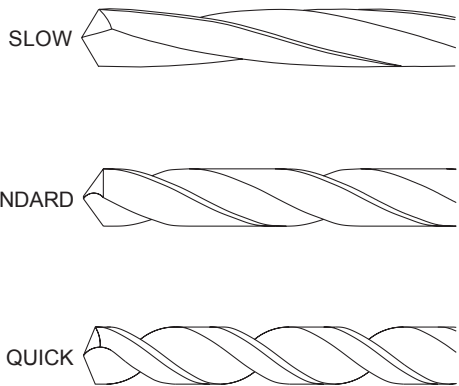
Properties		
<b>M</b>	<b>DIN 371</b>	<b>HSSE V3</b>
6HX		FLUTELESS
<b>CBA</b>		<b>TIN</b>

Suited Materials		
ALUMINIUM	COPPER	SOFT BRASS
FREE CUTTING STEEL		



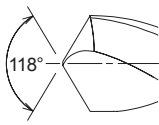


## TYPES OF SPIRAL (OR HELIX) ANGLES

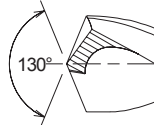
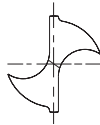


**Note :** Selecting the correct Drill  
Refer to the User Guide for detailed information.

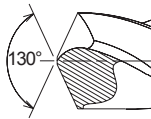
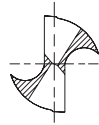
## DRILL POINT STYLES



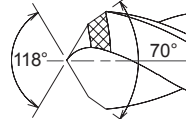
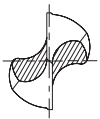
Standard Point



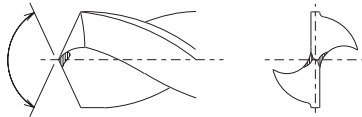
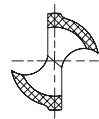
Split Point  
Din 1412 Form C



"UX Point"  
DIN 1412 TYPE B



Cast Iron Point  
"DX Point"  
DIN 1412 TYPE D

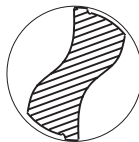


DIN 1412 TYPE A

## FLUTE FORMS



- Conventional Web



- Parabolic Flute Form
- Thicker Web



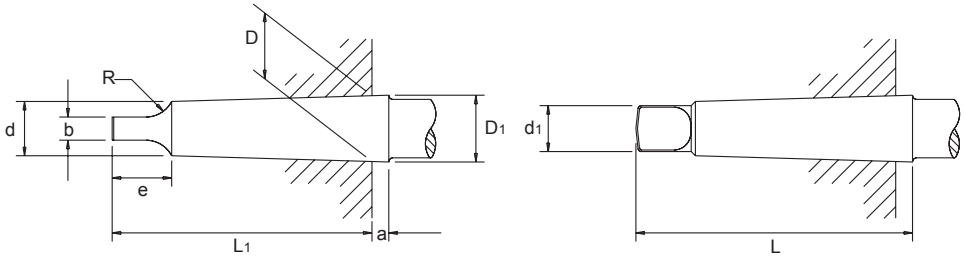
- Chipbreak SHANK DRILLS

### Benefits of the Parabolic Flute Form

Heavy web construction increases rigidity under torsional load thus eliminating chatter at the cutting edges which cause edge break down and early failure. The Parabolic drill web is 50-90% thicker than the standard drill, depending on drill diameter.

Wider flute form, together with quicker spiral, promotes better chip removal while allowing easier coolant flow to the drill point.

## STANDARD MORSE TAPER SHANK To I.S.O. 296 DIN228 BS1660



No. of Taper	Fitting line Diameter D	Diameter d	Overall Length Max L	D 1	a	Max L1	Max e	H13 b	Max d1	Taper / mm on Dia	Max R
1	12.065	9.0	65.5	12.2	3.5	62.0	13.5	5.2	8.7	0.04998	5.0
2	17.780	14.0	80.0	18.0	5.0	75.0	16.0	6.3	13.5	0.04995	6.0
3	23.825	19.0	99.0	24.1	5.0	94.0	20.0	7.9	18.5	0.05020	7.0
4	31.267	25.0	124.0	31.6	6.5	117.5	24.0	11.9	24.5	0.05194	8.0
5	44.399	36.0	156.0	44.7	6.5	149.5	29.0	15.9	35.7	0.05263	10.0
6	63.348	52.0	218.0	63.8	8.0	210.0	40.0	19.0	51.0	0.05214	13.0

## HOW TO ORDER SPECIALS

### MODIFIED STANDARDS

There are many instances when a special tool (a tool not found in the Somta catalogue or price list) can be manufactured from a standard product. We call this a 'modified standard'. Somta has both the capability and capacity to offer this service which, under normal circumstances, means a short delivery time.

The following are typical drill modifications:

#### Intermediate Diameters

Standard sizes can be ground down to special diameters and tolerances.

#### Reduced Overall Lengths

Standard drills can be cut to special lengths.

#### Drill Points

The standard drill point angle is 118° included. This can be modified to any angle required. Many special

points are available which include web thinning, notch points, split points, double angle points, spur and brad points etc.

## Tangs and Flats

Tangs can be produced to DIN, ASA and ISO, also special whistle notch flats on shanks.

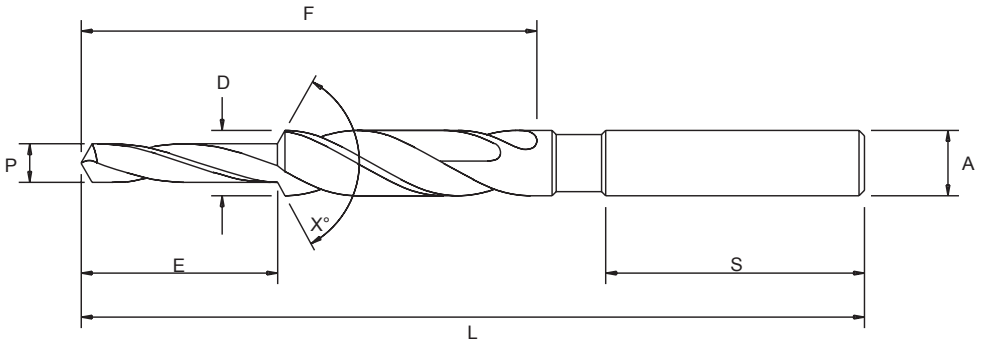
## Step Drills

Standard drills can be modified into step drills.

## Surface Treatments

A full range of surface treatments including nitriding, stream oxide, chemical blackening, gold oxide and various titanium coatings are available.

## MULTIPLE DIAMETER DRILLS



Specify whether drill is to be Step or Subland Type.

D = Diameter of large, fluted section.

P = Diameter of small, fluted section.

A = Shank Diameter.

L = Overall Length.

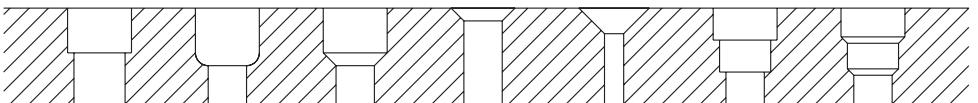
F = Flute Length.

E = Length of Small Diameter. This is measured from the extreme point to the bottom corner of the step angle.

X° = Included angle of the step angle.

S = Shank Length.

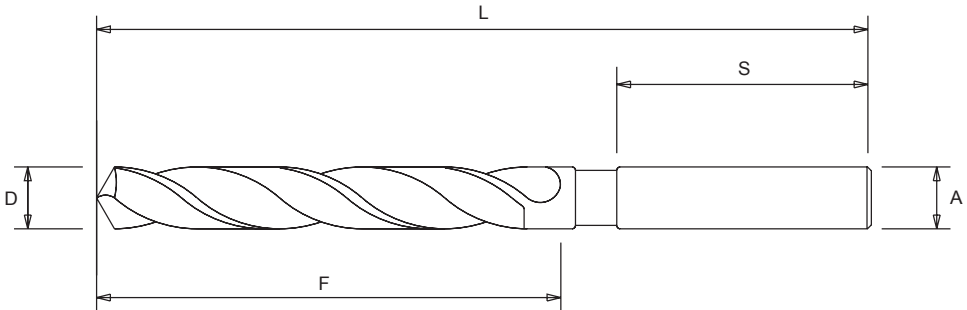
**It is possible to drill two or more diameters in a hole on one operation with a correctly designed drill and these are often used in mass production engineering.**



Some of the hole types that can be drilled in a single operation.

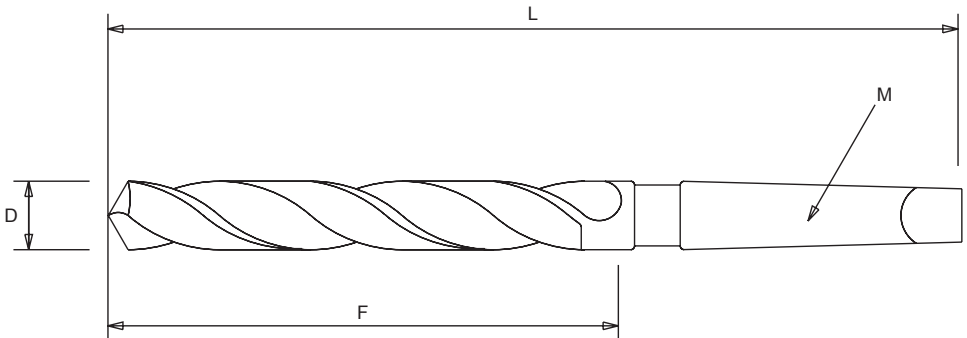
When an intermediate diameter or a non standard length of drill is required, the following diameters and lengths need to be specified.

### Straight Shank Drills



D = Drill Diameter  
A = Shank Diameter  
L = Overall Length  
F = Flute Length  
S = Shank Length

### Morse Taper Shank Drills



D = Drill Diameter  
L = Overall Length  
F = Flute Length  
M = Morse Taper Size