

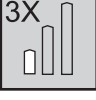
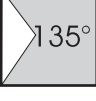












Twister® Drill Icon Glossary



High Performance Drill Technical Data 2018 Master Catalog

-  Solid
-  Coolant Fed
-  Drill Length
-  Drill Point Angle
-  Helix Angle
-  Coatings
-  ALtima®
-  >3mm
DIN
6537L

Workpiece Material Group

	P	Steels
	M	Stainless Steels
	K	Cast Iron
	S	Special Alloys
	H	Hardened Steels (35-65Rc)
	N	Non-Ferrous

Cutting Calculations and Definitions		Metric	U.S.
ae	=	Width of cut, radial depth of cut	(mm) (inch)
ap	=	Depth of cut, axial depth of cut	(mm) (inch)
Dc	=	Cutter diameter	(mm) (inch)
f	=	Feed per revolution	(mm/rev) (IPR)
fz	=	Feed per tooth	(mm/tooth) (IPT)
zn	=	Number of teeth	Number
n	=	RPM	(rev/min) (rev/min)
Q	=	Metal removal rate	(cm ³ /min) (in ³ /min)
vc	=	Cutting speed	(m/min) (SFM)
vf	=	Feed speed	(mm/min) (IPM)
Dw	=	Working diameter	(mm) (inch)

Formulas

Inch
 RPM (n) = SFM (vc) x 3.82/Tool Diam.
 IPM (vf) = RPM (n) x IPR (f)

Conversion Inch to Metric
 SFM (vc) to m/min (vc) = SFM (vc) x .3048
 IPM (vf) to mm/min (vf) = IPM (vf) x 25.4

Metric
 RPM (n) = m/min (vc) x 318.057/Tool Diam.
 mm/min (vf) = RPM (n) x mm/Revolution (f).

Conversion Metric to Inch
 m/min (vc) to SFM (vc) = (m/min)/.3048
 mm/min (vf) to IPM (vf) = (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 be fully guarded.

Drill Troubleshooting

Possible Solutions		Problem																														
		Tool Deterioration										Chip Formation		Tool Life		Workpiece				Process												
		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	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	x						x	x	x	x	x										x	
	Reduce feed at entrance			x															x		x			x							x	
	Consistent feed rate			x											x	x													x		x	
	Increase feed	x				x				x					x				x	x												
	Reduce speed	x	x			x				x								x	x										x	x	x	
	Increase speed																					x										
Coolant	Coolant mix		x	x	x				x				x				x	x			x	x									x	
	Coolant increase flow	x		x				x	x						x		x	x			x	x									x	
	Coolant filter	x		x	x					x							x	x			x	x									x	
Setup	Workpiece clamp rigid		x	x				x	x				x				x		x	x	x	x	x	x	x						x	
	Collet accuracy			x						x										x					x	x				x		
	Tool holder fit .0008									x										x					x	x						
	Alignment										x									x												x
	Peck drill																															
	Concentricity		x	x	x					x	x			x							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.