

# DRILLING (SOLID CARBIDE)



## RECOMMENDED CUTTING CONDITIONS

Work Material		Mild Steel ( $\leq 180\text{HB}$ ) Carbon Steel, Alloy Steel (180-280HB) AISI 1010, 1045, 4140 etc.		Austenitic Stainless Steel ( $\leq 200\text{HB}$ ) Ferritic, Martensitic Stainless Steel ( $>200\text{HB}$ ) AISI 304, 316 AISI 431, 420 etc.	
Drill Dia. DC		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
<b>.0394</b>	<b>1.0</b>	130 (100—150)	.0015 (.0008—.0016)	65 (50—80)	.0011 (.0008—.0016)
<b>.0472</b>	<b>1.2</b>	165 (130—180)	.0018 (.0010—.0020)	100 (65—115)	.0013 (.0010—.0020)
<b>.0630</b>	<b>1.6</b>	195 (150—230)	.0024 (.0012—.0026)	130 (100—150)	.0017 (.0012—.0026)
<b>.0787</b>	<b>2.0</b>	230 (180—260)	.0030 (.0016—.0031)	165 (130—180)	.0021 (.0016—.0031)
<b>.0984</b>	<b>2.5</b>	260 (195—295)	.0037 (.0020—.0039)	195 (150—230)	.0026 (.0020—.0039)
<b>.1260</b>	<b>3.2</b>	260 (195—295)	.0047 (.0028—.0051)	195 (150—230)	.0035 (.0028—.0051)
<b>.1575</b>	<b>4.0</b>	260 (195—295)	.0059 (.0035—.0043)	195 (150—230)	.0043 (.0031—.0035)
<b>.1969</b>	<b>5.0</b>	260 (195—295)	.0075 (.0043—.0055)	195 (150—230)	.0055 (.0039—.0047)
<b>.2480</b>	<b>6.3</b>	260 (195—295)	.0067 (.0055—.0071)	195 (150—230)	.0059 (.0051—.0059)
<b>.3150</b>	<b>8.0</b>	260 (195—295)	.0087 (.0071—.0091)	195 (150—230)	.0075 (.0063—.0075)
<b>.3937</b>	<b>10.0</b>	260 (195—295)	.0106 (.0087—.0110)	195 (150—230)	.0094 (.0079—.0091)
<b>.4724</b>	<b>12.0</b>	260 (195—295)	.0126 (.0106—.0134)	195 (150—230)	.0114 (.0094—.0110)

Work Material		Pre-hardened Steel (35-45HRC) Alloy Tool Steel ( $\leq 350\text{HB}$ ) AISI P21, P20 ASTM H13, AISI L6 etc.		Hardened Steel (40-55HRC) Precipitation Hardening Martensitic Stainless Steel ( $<450\text{HB}$ ) AISI 431, 420 S17400, S17700 etc.	
Drill Dia. DC		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm				
<b>.0394</b>	<b>1.0</b>	65 (50—80)	.0009 (.0008—.0012)	130 (100—150)	.0007 (.0006—.0010)
<b>.0472</b>	<b>1.2</b>	100 (65—115)	.0011 (.0008—.0014)	130 (100—150)	.0009 (.0008—.0012)
<b>.0630</b>	<b>1.6</b>	130 (100—150)	.0015 (.0012—.0018)	165 (130—180)	.0012 (.0010—.0016)
<b>.0787</b>	<b>2.0</b>	165 (130—180)	.0019 (.0014—.0024)	165 (130—180)	.0015 (.0012—.0020)
<b>.0984</b>	<b>2.5</b>	195 (150—230)	.0023 (.0018—.0030)	195 (150—230)	.0019 (.0016—.0026)
<b>.1260</b>	<b>3.2</b>	195 (150—230)	.0031 (.0024—.0035)	195 (150—230)	.0024 (.0020—.0031)
<b>.1575</b>	<b>4.0</b>	195 (150—230)	.0039 (.0028—.0039)	195 (150—230)	.0031 (.0024—.0039)
<b>.1969</b>	<b>5.0</b>	195 (150—230)	.0047 (.0035—.0051)	195 (150—230)	.0039 (.0031—.0051)
<b>.2480</b>	<b>6.3</b>	195 (150—230)	.0055 (.0043—.0063)	195 (150—230)	.0043 (.0035—.0051)
<b>.3150</b>	<b>8.0</b>	195 (150—230)	.0067 (.0055—.0079)	195 (150—230)	.0055 (.0047—.0063)
<b>.3937</b>	<b>10.0</b>	195 (150—230)	.0083 (.0067—.0098)	195 (150—230)	.0071 (.0055—.0079)
<b>.4724</b>	<b>12.0</b>	195 (150—230)	.0098 (.0083—.0118)	195 (150—230)	.0083 (.0067—.0094)

Work Material		Hardened Steel (40-55HRC) Heat Resistant Alloy ASTM H13, AISI L6 Inconel718 etc.	
Drill Dia. DC		Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
inch	mm		
<b>.0394</b>	<b>1.0</b>	35 (15—50)	.0006 (.0006—.0008)
<b>.0472</b>	<b>1.2</b>	35 (15—50)	.0007 (.0006—.0010)
<b>.0630</b>	<b>1.6</b>	35 (15—50)	.0010 (.0008—.0012)
<b>.0787</b>	<b>2.0</b>	65 (50—80)	.0013 (.0010—.0016)
<b>.0984</b>	<b>2.5</b>	65 (50—80)	.0015 (.0012—.0020)
<b>.1260</b>	<b>3.2</b>	65 (50—80)	.0024 (.0016—.0028)
<b>.1575</b>	<b>4.0</b>	100 (65—115)	.0028 (.0020—.0031)
<b>.1969</b>	<b>5.0</b>	100 (65—115)	.0031 (.0024—.0039)
<b>.2480</b>	<b>6.3</b>	100 (65—115)	.0039 (.0031—.0043)
<b>.3150</b>	<b>8.0</b>	130 (100—150)	.0047 (.0039—.0051)
<b>.3937</b>	<b>10.0</b>	130 (100—150)	.0059 (.0051—.0067)
<b>.4724</b>	<b>12.0</b>	130 (100—150)	.0071 (.0059—.0079)

(Note 1) When using the drill with a length over  $l/d$  10, it is necessary to use a pilot hole as a guide. (If no pilot hole is used then drill breakage can occur)

(Note 2) Use the shortest flute drill in the respective size as a pilot drill.

(Note 3) For the spindle revolution of diameters not shown in the table, please adjust to the conditions of larger and closest diameter, or calculate from the cutting speed of the closest diameter. For the feed rate per revolution, please set up within the recommended feed rate of the closest diameter appropriately.