

Recommended Cutting Conditions

(inch)

Workpiece Material			Mild Steels ($\leq 180\text{HB}$)		Carbon Steels, Alloy Steels ($180-250\text{HB}$)	
			AISI 1010 etc.		AISI 1045,4140 etc.	
DC		L/D	Cutting Speed vc (SFM)	Feed fr (Min.—Max.) (IPR)	Cutting Speed vc (SFM)	Feed fr (Min.—Max.) (IPR)
mm	inch					
1.0	.0394	2, 4	100	.0012 (.0008—.0016)	100	.0012 (.0008—.0016)
1.5	.0591	2, 4	100	.0020 (.0012—.0024)	100	.0020 (.0012—.0024)
2.0	.0787	2, 4	180	.0024 (.0016—.0031)	180	.0024 (.0016—.0031)
2.5	.0984	2, 4	180	.0031 (.0020—.0039)	180	.0031 (.0020—.0039)
3.0	.1181	2, 4	210	.0035 (.0028—.0043)	195	.0035 (.0028—.0043)
4.0	.1575	2, 4	230	.0045 (.0035—.0055)	210	.0045 (.0035—.0055)
5.0	.1969	2, 4	230	.0057 (.0043—.0071)	210	.0057 (.0043—.0071)
6.0	.2362	2, 4	260	.0069 (.0055—.0083)	245	.0069 (.0055—.0083)
7.0	.2756	2, 4	260	.0081 (.0063—.0098)	245	.0081 (.0063—.0098)
8.0	.3150	2, 4	280	.0091 (.0071—.0110)	260	.0091 (.0071—.0110)
10.0	.3937	2, 4	295	.0104 (.0083—.0126)	280	.0104 (.0083—.0126)
12.0	.4724	2, 4	310	.0110 (.0087—.0134)	295	.0110 (.0087—.0134)
14.0	.5512	2, 4	310	.0114 (.0091—.0138)	295	.0114 (.0091—.0138)

Workpiece Material			Carbon Steels, Alloy Steels ($280-350\text{HB}$)		Austenitic Stainless Steels ($\leq 200\text{HB}$) Ferritic, Precipitation Hardening Stainless Steels ($>200\text{HB}$) with water-insoluble coolant	
			AISI 4340 etc.		AISI 304, 431 etc.	
DC		L/D	Cutting Speed vc (SFM)	Feed fr (Min.—Max.) (IPR)	Cutting Speed vc (SFM)	Feed fr (Min.—Max.) (IPR)
mm	inch					
1.0	.0394	2, 4	80	.0008 (.0004—.0012)	100	.0008 (.0004—.0012)
1.5	.0591	2, 4	80	.0016 (.0008—.0020)	100	.0016 (.0008—.0020)
2.0	.0787	2, 4	165	.0020 (.0012—.0028)	115	.0016 (.0008—.0024)
2.5	.0984	2, 4	165	.0028 (.0016—.0035)	115	.0024 (.0012—.0031)
3.0	.1181	2, 4	180	.0030 (.0024—.0035)	130	.0028 (.0016—.0039)
4.0	.1575	2, 4	195	.0041 (.0031—.0051)	130	.0030 (.0020—.0039)
5.0	.1969	2, 4	195	.0051 (.0039—.0063)	130	.0039 (.0020—.0059)
6.0	.2362	2, 4	230	.0061 (.0047—.0075)	130	.0041 (.0024—.0059)
7.0	.2756	2, 4	230	.0071 (.0055—.0087)	130	.0047 (.0024—.0071)
8.0	.3150	2, 4	245	.0081 (.0063—.0098)	130	.0051 (.0024—.0079)
10.0	.3937	2, 4	260	.0094 (.0079—.0110)	130	.0055 (.0031—.0079)
12.0	.4724	2, 4	280	.0098 (.0079—.0118)	130	.0069 (.0039—.0098)
14.0	.5512	2, 4	280	.0098 (.0079—.0118)	130	.0069 (.0039—.0098)

- Note 1) The above cutting conditions is with the water soluble coolant is used. For stainless steels, water-insoluble coolant is recommended.
 Note 2) When using a water-insoluble coolant, reduce the cutting speed by 20% to ensure adequate lubrication.
 Note 3) Check the condition of chips and perform step machining if necessary. * Reference of step length: .2 to 1.0 DC
 Note 4) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.
 Note 5) Machining depths exceeding flute length (LU) are not recommended.
 Note 6) Clamp the drill so that the drill runout is within .0012".
 Note 7) Do not clamp the flute part of the drill.

Recommended Cutting Conditions

(inch)

Workpiece Material			Gray Cast Irons ($\leq 350\text{MPa}$)		Ductile Cast Irons ($\leq 450\text{MPa}$)	
			AISI No.45B etc.		AISI 60-40-18 etc.	
DC		L/D	Cutting Speed vc (SFM)	Feed fr (Min.—Max.) (IPR)	Cutting Speed vc (SFM)	Feed fr (Min.—Max.) (IPR)
mm	inch					
1.0	.0394	2, 4	100	.0012 (.0008—.0016)	80	.0008 (.0004—.0012)
1.5	.0591	2, 4	100	.0020 (.0012—.0024)	80	.0016 (.0008—.0020)
2.0	.0787	2, 4	180	.0024 (.0016—.0031)	165	.0020 (.0012—.0028)
2.5	.0984	2, 4	180	.0031 (.0020—.0039)	165	.0028 (.0016—.0035)
3.0	.1181	2, 4	195	.0041 (.0024—.0059)	180	.0033 (.0020—.0047)
4.0	.1575	2, 4	210	.0051 (.0031—.0071)	195	.0047 (.0028—.0067)
5.0	.1969	2, 4	210	.0059 (.0039—.0079)	195	.0055 (.0031—.0079)
6.0	.2362	2, 4	245	.0069 (.0047—.0091)	230	.0059 (.0039—.0079)
7.0	.2756	2, 4	245	.0069 (.0047—.0091)	230	.0069 (.0047—.0091)
8.0	.3150	2, 4	260	.0083 (.0067—.0098)	245	.0079 (.0059—.0098)
10.0	.3937	2, 4	280	.0091 (.0071—.0110)	260	.0091 (.0071—.0110)
12.0	.4724	2, 4	295	.0098 (.0079—.0118)	280	.0098 (.0079—.0118)
14.0	.5512	2, 4	295	.0098 (.0079—.0118)	280	.0098 (.0079—.0118)

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Note 2) When using a water-insoluble coolant, reduce the cutting speed by 20% to ensure adequate lubrication.

Note 3) Check the condition of chips and perform step machining if necessary. * Reference of step length: .2 to 1.0 DC

Note 4) Adjust the cutting conditions according to machine tool and workpiece clamp rigidity and machining geometry, etc.

Note 5) Machining depths exceeding flute length (LU) are not recommended.

Note 6) Clamp the drill so that the drill runout is within .0012".

Note 7) Do not clamp the flute part of the drill.