

DRILLING (SOLID CARBIDE)

MWE/MWS

RECOMMENDED CUTTING CONDITIONS

MWS SB/MB/LB/XB/DB Type (l/d<10)

Drill Dia. DC		Mild Steel (≤180HB)		Carbon Steel, Alloy Steel (180—280HB)	
		AISI 1010 etc.		AISI 1045, 4140 etc.	
inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	130 (100—150)	.0004 (.0002—.0006)	130 (100—150)	.0004 (.0002—.0006)
.0248	0.63	130 (100—150)	.0006 (.0003—.0008)	130 (100—150)	.0006 (.0003—.0008)
.0315	0.80	150 (115—165)	.0011 (.0006—.0016)	150 (115—165)	.0011 (.0006—.0016)
.0394	1.00	165 (130—180)	.0014 (.0008—.0020)	165 (130—180)	.0014 (.0008—.0020)
.0472	1.20	165 (130—180)	.0018 (.0012—.0024)	165 (130—180)	.0018 (.0012—.0024)
.0630	1.60	165 (130—180)	.0022 (.0014—.0031)	165 (130—180)	.0022 (.0014—.0031)
.0787	2.00	165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	2.50	195 (150—230)	.0033 (.0020—.0049)	195 (150—215)	.0033 (.0020—.0049)
.1260	3.20	295 (230—330)	.0039 (.0024—.0051)	260 (195—295)	.0039 (.0024—.0051)
.1575	4.00	330 (260—360)	.0047 (.0031—.0063)	295 (230—330)	.0047 (.0031—.0063)
.1969	5.00	330 (260—360)	.0059 (.0039—.0079)	295 (230—330)	.0059 (.0039—.0079)
.2480	6.30	360 (280—395)	.0079 (.0051—.0102)	330 (260—360)	.0079 (.0051—.0102)
.3150	8.00	395 (310—425)	.0091 (.0071—.0110)	360 (280—395)	.0091 (.0071—.0110)
.3937	10.00	425 (330—460)	.0106 (.0087—.0126)	395 (310—425)	.0106 (.0087—.0126)
.4724	12.00	460 (360—490)	.0118 (.0102—.0134)	425 (330—460)	.0118 (.0102—.0134)
.6299	16.00	525 (410—560)	.0130 (.0106—.0150)	460 (360—490)	.0130 (.0106—.0150)
.7874	20.00	525 (410—560)	.0138 (.0118—.0157)	460 (360—490)	.0138 (.0118—.0157)
.9843	25.00	525 (410—560)	.0138 (.0118—.0157)	460 (360—490)	.0138 (.0118—.0157)

Drill Dia. DC		Carbon Steel, Alloy Steel (280—350HB)		Austenitic Stainless Steel (≤200HB)	
		AISI 4340 etc.		AISI 304, 316 etc.	
inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	100 (65—115)	.0004 (.0002—.0006)	65 (50—80)	.0003 (.0002—.0004)
.0248	0.63	100 (65—115)	.0006 (.0003—.0008)	65 (50—80)	.0004 (.0003—.0005)
.0315	0.80	115 (80—130)	.0011 (.0006—.0016)	80 (65—100)	.0008 (.0006—.0010)
.0394	1.00	130 (100—150)	.0014 (.0008—.0020)	100 (65—115)	.0012 (.0008—.0017)
.0472	1.20	130 (100—150)	.0018 (.0012—.0024)	100 (65—115)	.0016 (.0012—.0021)
.0630	1.60	130 (100—150)	.0022 (.0014—.0031)	100 (65—115)	.0020 (.0014—.0028)
.0787	2.00	130 (100—150)	.0028 (.0016—.0039)	100 (65—115)	.0024 (.0016—.0031)
.0984	2.50	165 (130—180)	.0033 (.0020—.0049)	130 (100—150)	.0030 (.0020—.0039)
.1260	3.20	230 (180—260)	.0039 (.0024—.0051)	130 (100—150)	.0031 (.0024—.0039)
.1575	4.00	260 (195—295)	.0043 (.0028—.0055)	130 (100—150)	.0035 (.0024—.0043)
.1969	5.00	260 (195—295)	.0055 (.0035—.0071)	130 (100—150)	.0043 (.0031—.0055)
.2480	6.30	295 (230—330)	.0071 (.0043—.0094)	165 (130—180)	.0055 (.0035—.0071)
.3150	8.00	330 (260—360)	.0083 (.0063—.0098)	165 (130—180)	.0059 (.0039—.0075)
.3937	10.00	360 (280—395)	.0091 (.0075—.0106)	165 (130—180)	.0063 (.0047—.0079)
.4724	12.00	395 (310—425)	.0102 (.0087—.0114)	195 (150—230)	.0071 (.0059—.0083)
.6299	16.00	425 (330—460)	.0110 (.0091—.0130)	195 (150—230)	.0075 (.0055—.0094)
.7874	20.00	425 (330—460)	.0118 (.0102—.0134)	195 (150—230)	.0083 (.0059—.0102)
.9843	25.00	425 (330—460)	.0126 (.0110—.0138)	195 (150—230)	.0083 (.0067—.0098)

(Note) 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.

RECOMMENDED CUTTING CONDITIONS

MWS SB/MB/LB/XB/DB Type (l/d<10)

Drill Dia. DC		Gray Cast Iron (≤350MPa)		Ductile Cast Iron (≤450MPa)	
		No45B etc.		60-40-8 etc.	
inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	130 (100—150)	.0004 (.0002—.0006)	100 (65—115)	.0004 (.0002—.0006)
.0248	0.63	130 (100—150)	.0006 (.0003—.0008)	100 (65—115)	.0006 (.0003—.0008)
.0315	0.80	150 (115—165)	.0011 (.0006—.0016)	115 (80—130)	.0011 (.0006—.0016)
.0394	1.00	165 (130—180)	.0014 (.0008—.0020)	130 (100—150)	.0014 (.0008—.0020)
.0472	1.20	165 (130—180)	.0018 (.0012—.0024)	130 (100—150)	.0018 (.0012—.0024)
.0630	1.60	165 (130—180)	.0022 (.0014—.0031)	130 (100—150)	.0022 (.0014—.0031)
.0787	2.00	165 (130—180)	.0028 (.0016—.0039)	130 (100—150)	.0028 (.0016—.0039)
.0984	2.50	195 (150—215)	.0033 (.0020—.0049)	165 (130—180)	.0033 (.0020—.0049)
.1260	3.20	295 (230—310)	.0039 (.0024—.0051)	215 (165—230)	.0039 (.0024—.0051)
.1575	4.00	330 (260—360)	.0047 (.0031—.0063)	215 (165—230)	.0047 (.0031—.0063)
.1969	5.00	330 (260—360)	.0059 (.0039—.0079)	215 (165—230)	.0059 (.0039—.0079)
.2480	6.30	360 (280—395)	.0079 (.0051—.0102)	230 (180—245)	.0079 (.0051—.0102)
.3150	8.00	395 (310—425)	.0098 (.0071—.0122)	230 (180—245)	.0091 (.0071—.0110)
.3937	10.00	425 (330—460)	.0114 (.0087—.0138)	230 (180—245)	.0106 (.0087—.0126)
.4724	12.00	460 (360—490)	.0126 (.0102—.0146)	295 (230—310)	.0118 (.0102—.0134)
.6299	16.00	525 (410—575)	.0138 (.0110—.0165)	295 (230—310)	.0130 (.0110—.0150)
.7874	20.00	525 (410—575)	.0146 (.0118—.0173)	330 (260—360)	.0138 (.0118—.0157)
.9843	25.00	525 (410—575)	.0146 (.0118—.0173)	330 (260—360)	.0138 (.0118—.0157)

Drill Dia. DC		Aluminium Alloy (Si<5%)		Heat Resistant Alloy	
		ASTM A6061, A7075 etc.		Inconel718 etc.	
inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0197	0.50	130 (100—150)	.0006 (.0003—.0008)	35 (15—50)	.0002 (.0002—.0003)
.0248	0.63	130 (100—150)	.0008 (.0005—.0012)	35 (15—50)	.0003 (.0003—.0004)
.0315	0.80	150 (115—165)	.0014 (.0009—.0020)	35 (15—50)	.0006 (.0005—.0008)
.0394	1.00	195 (150—215)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)
.0472	1.20	230 (180—245)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)
.0630	1.60	260 (195—280)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)
.0787	2.00	295 (230—310)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)
.0984	2.50	330 (260—360)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)
.1260	3.20	395 (310—425)	.0091 (.0039—.0138)	65 (50—80)	.0028 (.0020—.0035)
.1575	4.00	395 (310—425)	.0094 (.0047—.0138)	65 (50—80)	.0035 (.0024—.0043)
.1969	5.00	395 (310—425)	.0098 (.0059—.0138)	65 (50—80)	.0043 (.0031—.0055)
.2480	6.30	490 (395—540)	.0138 (.0079—.0197)	80 (65—100)	.0051 (.0035—.0063)
.3150	8.00	490 (395—540)	.0138 (.0079—.0197)	80 (65—100)	.0055 (.0043—.0067)
.3937	10.00	490 (395—540)	.0197 (.0079—.0315)	80 (65—100)	.0059 (.0047—.0067)
.4724	12.00	525 (410—575)	.0197 (.0079—.0315)	80 (65—100)	.0063 (.0051—.0071)
.6299	16.00	525 (410—575)	.0236 (.0079—.0394)	80 (65—100)	.0071 (.0055—.0083)
.7874	20.00	560 (445—605)	.0236 (.0079—.0394)	100 (65—115)	.0075 (.0059—.0087)
.9843	25.00	560 (445—605)	.0236 (.0079—.0394)	100 (65—115)	.0075 (.0059—.0087)

(Note) 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.

DRILLING (SOLID CARBIDE)

MWE/MWS

RECOMMENDED CUTTING CONDITIONS

MWS DB Type (l/d≥10)

Drill Dia. DC		Mild Steel (≤180HB)		Carbon Steel, Alloy Steel (180—280HB)	
		AISI 1010 etc.		AISI 1045, 4140 etc.	
inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0394	1.0	165 (130—180)	.0008 (.0004—.0012)	130 (100—130)	.0008 (.0004—.0012)
.0472	1.2	165 (130—180)	.0010 (.0006—.0015)	130 (100—130)	.0010 (.0006—.0015)
.0630	1.6	165 (130—180)	.0022 (.0013—.0031)	130 (100—130)	.0022 (.0013—.0031)
.0787	2.0	195 (150—215)	.0028 (.0016—.0039)	165 (130—180)	.0028 (.0016—.0039)
.0984	2.5	195 (150—215)	.0035 (.0025—.0049)	165 (130—180)	.0035 (.0022—.0049)
.1260	3.2	295 (230—310)	.0039 (.0024—.0051)	260 (195—280)	.0039 (.0024—.0051)
.1575	4.0	295 (230—310)	.0047 (.0031—.0063)	260 (195—280)	.0047 (.0031—.0063)
.1969	5.0	295 (230—310)	.0059 (.0039—.0079)	260 (195—280)	.0059 (.0039—.0079)
.2480	6.3	360 (280—395)	.0079 (.0051—.0102)	295 (230—310)	.0079 (.0051—.0102)
.3150	8.0	360 (280—395)	.0091 (.0071—.0110)	295 (230—310)	.0091 (.0071—.0110)
.3937	10.0	360 (280—395)	.0102 (.0079—.0126)	295 (230—310)	.0102 (.0079—.0126)
.4724	12.0	425 (330—460)	.0118 (.0098—.0134)	360 (280—395)	.0118 (.0098—.0134)
.6299	16.0	425 (330—460)	.0122 (.0094—.0150)	360 (280—395)	.0122 (.0094—.0150)

Drill Dia. DC		Carbon Steel, Alloy Steel (280—350HB)		Austenitic Stainless Steel (≤200HB)	
		AISI 4340 etc.		AISI 304, 316 etc.	
inch	mm	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)	Cutting Speed (Min.—Max.) (SFM)	Feed (Min.—Max.) (IPR)
.0394	1.0	100 (65—100)	.0006 (.0004—.0011)	100 (65—115)	.0006 (.0004—.0011)
.0472	1.2	100 (65—100)	.0008 (.0005—.0014)	100 (65—115)	.0008 (.0005—.0014)
.0630	1.6	100 (65—100)	.0020 (.0011—.0030)	100 (65—115)	.0020 (.0011—.0030)
.0787	2.0	165 (130—180)	.0026 (.0013—.0037)	100 (65—115)	.0026 (.0013—.0037)
.0984	2.5	165 (130—180)	.0031 (.0018—.0047)	130 (100—150)	.0031 (.0018—.0047)
.1260	3.2	230 (180—245)	.0035 (.0020—.0047)	130 (100—150)	.0028 (.0020—.0035)
.1575	4.0	230 (180—245)	.0043 (.0028—.0059)	130 (100—150)	.0031 (.0024—.0039)
.1969	5.0	230 (180—245)	.0055 (.0035—.0075)	130 (100—150)	.0039 (.0028—.0047)
.2480	6.3	260 (195—280)	.0071 (.0043—.0098)	165 (130—180)	.0047 (.0031—.0063)
.3150	8.0	260 (195—280)	.0083 (.0059—.0102)	165 (130—180)	.0055 (.0039—.0067)
.3937	10.0	260 (195—280)	.0091 (.0059—.0118)	165 (130—180)	.0059 (.0047—.0071)
.4724	12.0	295 (230—310)	.0098 (.0075—.0122)	195 (150—230)	.0067 (.0055—.0075)
.6299	16.0	295 (230—310)	.0110 (.0075—.0142)	195 (150—230)	.0071 (.0051—.0087)

(Note) 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.

RECOMMENDED CUTTING CONDITIONS

MWS DB Type (l/d≥10)

Drill Dia. DC		Work Material		Gray Cast Iron (≤350MPa)		Ductile Cast Iron (≤450MPa)			
				Cutting Speed (Min.—Max.) (SFM)		Feed (Min.—Max.) (IPR)		Cutting Speed (Min.—Max.) (SFM)	
inch	mm	No45B etc.				60-40-8 etc.			
.0394	1.0			130 (100—130)	.0008 (.0004—.0012)	100 (65—100)	.0006 (.0004—.0011)		
.0472	1.2			130 (100—130)	.0010 (.0006—.0015)	100 (65—100)	.0008 (.0005—.0014)		
.0630	1.6			130 (100—130)	.0022 (.0013—.0031)	100 (65—100)	.0020 (.0011—.0030)		
.0787	2.0			165 (130—180)	.0028 (.0016—.0039)	165 (130—180)	.0026 (.0013—.0037)		
.0984	2.5			165 (130—180)	.0035 (.0022—.0049)	165 (130—180)	.0031 (.0018—.0047)		
.1260	3.2			295 (230—310)	.0039 (.0024—.0051)	165 (130—180)	.0035 (.0020—.0047)		
.1575	4.0			295 (230—310)	.0047 (.0031—.0063)	165 (130—180)	.0043 (.0028—.0059)		
.1969	5.0			295 (230—310)	.0059 (.0039—.0079)	165 (130—180)	.0055 (.0035—.0075)		
.2480	6.3			360 (280—395)	.0079 (.0051—.0102)	195 (150—215)	.0071 (.0043—.0098)		
.3150	8.0			360 (280—395)	.0091 (.0071—.0110)	195 (150—215)	.0083 (.0059—.0102)		
.3937	10.0			360 (280—395)	.0102 (.0079—.0126)	195 (150—215)	.0091 (.0059—.0118)		
.4724	12.0			425 (330—460)	.0118 (.0098—.0134)	260 (195—280)	.0098 (.0075—.0122)		
.6299	16.0			425 (330—460)	.0122 (.0094—.0150)	260 (195—280)	.0110 (.0075—.0142)		

Drill Dia. DC		Work Material		Aluminium Alloy (Si<5%)		Heat Resistant Alloy			
				Cutting Speed (Min.—Max.) (SFM)		Feed (Min.—Max.) (IPR)		Cutting Speed (Min.—Max.) (SFM)	
inch	mm	AISI A6061, A7075 etc.				Inconel718 etc.			
.0394	1.0			165 (130—180)	.0020 (.0012—.0030)	35 (15—50)	.0008 (.0006—.0011)		
.0472	1.2			195 (150—215)	.0026 (.0018—.0035)	35 (15—50)	.0010 (.0009—.0013)		
.0630	1.6			230 (180—245)	.0033 (.0021—.0047)	35 (15—50)	.0012 (.0010—.0016)		
.0787	2.0			260 (195—280)	.0041 (.0024—.0059)	50 (35—65)	.0016 (.0013—.0020)		
.0984	2.5			295 (230—310)	.0053 (.0030—.0079)	50 (35—65)	.0020 (.0016—.0024)		
.1260	3.2			330 (260—360)	.0091 (.0039—.0138)	65 (50—80)	.0028 (.0020—.0035)		
.1575	4.0			330 (260—360)	.0094 (.0047—.0138)	65 (50—80)	.0035 (.0024—.0043)		
.1969	5.0			330 (260—360)	.0098 (.0059—.0138)	65 (50—80)	.0043 (.0031—.0055)		
.2480	6.3			425 (330—460)	.0138 (.0079—.0197)	65 (50—80)	.0051 (.0035—.0063)		
.3150	8.0			425 (330—460)	.0138 (.0079—.0197)	65 (50—80)	.0055 (.0043—.0063)		
.3937	10.0			425 (330—460)	.0197 (.0079—.0315)	65 (50—80)	.0059 (.0047—.0067)		
.4724	12.0			460 (360—490)	.0197 (.0079—.0315)	65 (50—80)	.0063 (.0051—.0071)		
.6299	16.0			460 (360—490)	.0197 (.0079—.0315)	65 (50—80)	.0067 (.0055—.0075)		

(Note) 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.