DPC Line - Cutting Data

internal coolant

ISO	MC No.	Component material	Hardness Brinell	Cutting speed VC(m/min)		
				Min.	Start	Max.
P	**Unalloyed steel**					
	P1.1.Z.AN	C = 0.05 – 0.1%	125	90	130	170
	P1.1.Z.AN	C = 0.1-0.25%	125	90	130	170
	P1.2.Z.AN	C = 0.25-0.55%	150	90	120	170
	P1.3.Z.AN	C = 0.55-0.80%	170	90	120	170
	High carbon steel					
	P1.3.Z.AN	Carbon tool steel	210	100	110	150
	Low alloy steel					
	P2.1.Z.AN	Non-hardened	175	80	110	160
	P2.5.Z.HT	Hardeded and tempered	275	50	70	90
	P2.5.Z.HT	Hardeded and tempered	350	40	50	70
	High alloy steel					
	P3.0.Z.AN	Annealed	200	40	80	90
	P3.0.Z.HT	Hardened tool steel	300	40	50	70
	Steel castings					
	P1.5.C.UT	Unalloyed	150	80	110	140
	P2.6.C.UT	Low-alloy (alloying elements ⩽5%)	200	80	110	120

Drill diameter(mm)	Feed Fn(mm/r)*		
	Min.	Start	Max.
3	0.06	0.1	0.13
4	0.07	0.11	0.14
6	0.11	0.18	0.24
8	0.16	0.21	0.25
10	0.19	0.23	0.27
12	0.22	0.25	0.29
16	0.23	0.28	0.33
20	0.26	0.3	0.34

1.Cutting data is suitable for internal coolant

2.Coolant pressure recommendation min. 20bar

3.In case component material hardness increase, please decrease cutting speed proportionally

4.Under external coolant condition, please adjust cutting speed to secure good chips formation and evacuation

5.Under external coolant condition, please decrease feed per revolution to secure chips evacuation

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ISO	MC No.	Component material	Hardness Brinell	Cutting speed VC(m/min)		
				Min.	Start	Max.
M	**Austenitic stainless steel**					
	M1.0.C.UT	Cast+untreated	165	48	60	72
	M1.0.Z.AQ	Annealed/quenched	200	48	60	72
	M1.0.Z.PH	PH-hardened	350	44	55	66
	M1.1.Z.AQ	Machinability improved	165	48	60	72
	M1.2.Z.AQ	Free cutting	200	48	60	72
	M1.3.C.AQ	Ti-stabilized+cast	200	48	60	72
	M1.3.Z.AQ	Ti-stabilized	200	48	60	72
	M1.4.Z.AQ	High strength	250	64	80	96
	Super austenitic (Ni>20%) stainless steel					
	M2.0.C.AQ	Cast+annealed/quenched	165	30	40	50
	M2.0.Z.AQ	Annealed/quenched	200	30	40	50
	Duplex (austenitic/ferritic) stainless steel					
	M3.1.Z.AQ >60%	(N<0.10%)>60% ferrite (N<0.10%)	250	40	50	70
	M3.2.Z.AQ <60%	(N≥0.10%)<60% ferrite (N≥0.10%)	250	40	50	70

Drill diameter(mm)	Feed Fn(mm/r)*		
	Min.	Start	Max.
3	0.05	0.07	0.1
4	0.08	0.1	0.12
6	0.09	0.11	0.13
8	0.1	0.12	0.14
10	0.13	0.14	0.17
12	0.13	0.16	0.19
16	0.14	0.2	0.23
20	0.17	0.22	0.25

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ISO	MC No.	Component material	Hardness Brinell	Cutting speed VC(m/min)		
				Min.	Start	Max.
K	Austenitic stainless steel					
	K1.1.C.NS	Ferritic Pearlitic	200	80	100	120
	Duplex (austenitic/ferritic) stainless steel					
	K2.1.C.UT	Low tensile strength	180	100	120	140
	K2.2.C.UT	High tensile strength	245	80	100	120
	K2.3.C.UT	High tensile strength	175	100	120	140
	Super austenitic (Ni>20%) stainless steel					
	K3.1.C.UT	Ferritic Pearlitic	155	100	120	140
	K3.2.C.UT	Perlitic	215	80	100	120
	K3.3.C.UT	Perlitic	265	100	120	140
	K3.5.C.UT	Perlitic	190	100	120	140
	K5.1.C.UT	ADI – Ausferritic Ductile Iron	300	60	80	100

Drill diameter(mm)	Feed Fn(mm/r)*		
	Min.	Start	Max.
3	0.08	0.1	0.12
4	0.1	0.12	0.14
6	0.12	0.16	0.18
8	0.16	0.2	0.24
10	0.2	0.25	0.3
12	0.22	0.28	0.33
16	0.25	0.32	0.38
20	0.26	0.34	0.4

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ISO	MC No.	Component material	Hardness Brinell	Cutting speed VC(m/min)	Drill diameter (mm)			
					3-6	6.01-10	10.01-14	14.01-20
					Feed Fn(mm/r) *			
S	S1.0.U.AN	Hardened HRSA	200	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S1.0.U.AG		280	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S2.0.Z.AN	Nickel base HRSA	250	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S2.0.Z.AG		350	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S2.0.Z.UT		275	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S2.0.Z.NS		320	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S3.0.Z.AN	Cobalt base HRSA	200	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S3.0.Z.AG		300	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S3.0.C.NS		320	15 - 25	0.06-0.12	0.08-0.14	0.10-0.14	0.12-0.16
	S4.1.Z.UT	Ti alloy	200	40 - 60	0.06-0.12	0.08-0.20	0.14-0.28	0.10-0.16
	S4.2.Z.AN		320	40 - 60	0.06-0.12	0.08-0.20	0.14-0.28	0.16-0.30
	S4.3.Z.AN		330	40 - 60	0.06-0.12	0.08-0.20	0.14-0.28	0.16-0.30
	S4.3.Z.AG		375	40 - 60	0.06-0.12	0.08-0.20	0.14-0.28	0.16-0.30
	S4.4.Z.AN		330	40 - 60	0.06-0.12	0.08-0.20	0.14-0.28	0.16-0.30
	S4.4.Z.AG		410	40 - 60	0.06-0.12	0.08-0.20	0.14-0.28	0.16-0.30

ISO	MC No.	Component material	Hardness Brinell	Cutting speed VC(m/min)	Drill diameter (mm)			
					3-6	6.01-10	10.01-14	14.01-20
					Feed Fn(mm/r) *			
H	H1.1.Z.HA	Hardened HRSA	50	16 - 24	0.05-0.12	0.08-0.14	0.10-0.16	0.12-0.2
	H2.0.C.UT.4	Chilled cast iron	64	14 - 20	0.05-0.12	0.08-0.14	0.10-0.16	0.12-0.2

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				Min.	Start	Max.
N	Aluminium					
	N1.2.Z.UT	Commercial pure	60	110	150	180
	N1.2.Z.AG	AlSi alloys, Si ⩽ 1%	100	110	150	180
	N1.3.C.UT	Cast, non-aging	75	110	150	180
	N1.3.C.UT	Cast or cast and aged	90	110	130	160
	N1.4.C.NS	AlSi cast alloys, Si ⩾ 13%	130	80	100	120
	Copper based alloys					
	N3.3.U.UT	Free cutting alloys	110	70	90	110
	N3.1.U.UT	Non-leaded copper alloys (incl. electrolytic copper)	100	70	80	100

Drill diameter(mm)	Feed Fn(mm/r)*		
	Min.	Start	Max.
3	0.08	0.18	0.28
4	0.1	0.19	0.28
6	0.16	0.28	0.35
8	0.16	0.2	0.24
10	0.2	0.4	0.8
12	0.22	0.5	0.8
16	0.3	0.6	1
20	0.3	0.6	1

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