

RECOMMENDED CUTTING CONDITIONS

ISO	Material	Condition	Tensile Strength Rm (N/mm ²)	Hardness (HB)	Matl No.	Cutting Speed Vc (SFM)	Feed vs Drill Diameter									
							D= 7-9.9mm (.275-.390")	D= 10-11.9mm (.394-.469")	D= 12-13.9mm (.472-.547")	D= 14-15.9mm (.551-.626")	D= 16-19.9mm (.630-.783")					
							IPR (inches/rev)									
P	Non-alloy steel <0.25% C & cast steel, >= 0.25% C free cutting <0.55% C steel >= 0.55% C	Annealed	420	125	1	260-360-460	.005 .007 .009	.006 .008 .011	.007 .009 .012	.008 .011 .014	.010 .014 .018					
		Annealed	650	190	2	260-345-430										
		Quenched & Tempered	850	250	3	260-330-400										
		Annealed	750	220	4	230-295-360										
		Quenched & Tempered	1000	300	5	165-230-300										
	Low alloy steel & cast steel (less than 5% alloying elements)	Annealed	600	200	6	230-315-400	.005 .007 .010	.006 .008 .011	.006 .009 .013	.007 .010 .014	.009 .012 .016					
		Quenched & Tempered	930	275	7	230-295-360										
			1000	300	8	165-230-300										
			1200	350	9	135-180-230										
	High alloy steel, cast steel, & tool steel	Annealed	680	200	10	165-230-300	.005 .006 .008	.005 .006 .007	.006 .008 .010	.007 .009 .011	.008 .010 .012					
Quenched & Tempered		1100	325	11	130-200-265											
M	Stainless steel & cast stainless steel	Ferritic/martensitic	680	200	12	130-180-230	.004 .005 .006	.005 .006 .007	.006 .007 .008	.006 .008 .009	.006 .008 .010					
		Martensitic	820	240	13	130-180-230										
		Austenitic	600	180	14	100-165-230										
K	GreyCast Iron (GG)	Ferritic		160	15	300-410-525	.006 .009 .012	.008 .011 .014	.010 .013 .016	.012 .015 .018	.014 .018 .022					
		Pearlitic		250	16	265-360-460										
	Cast Iron Nodular (GGG)	Ferritic		180	17	300-450-600										
		Pearlitic		260	18	265-360-460										
	Malleable Cast Iron	Ferritic		130	19	300-410-525										
		Pearlitic		230	20	265-360-460										
N	Aluminum - wrought alloy	Not cureable		60	21	300-510-725	.008 .011 .014	.010 .013 .016	.012 .015 .018	.014 .017 .020	.016 .020 .024					
		Cured		100	22	300-510-725										
	Aluminum - cast, alloyed	Not cureable <= 12% Si		75	23	300-510-725										
		> 12% Si		90	24	300-510-725										
		High temperature		130	25	265-400-525										
	Copper alloys	Free cutting > 1% Pb		110	26	300-510-725										
		Brass		90	27	300-510-725										
		Electrolitic copper		100	28	300-510-725										
	Non-metallic	Duro & fiber plastics			29	-						-	-	-	-	-
		Hard rubber			30	-						-	-	-	-	-
S	High temp alloys Fe based Ni or Co based	Annealed		200	31	100-150-200	.002 .003 .004	.003 .004 .005	.004 .005 .006	.005 .006 .007	.005 .006 .008					
		Cured		280	32	70-115-165										
		Annealed		250	33	70-115-165										
		Cured		350	34	70-115-165										
		Cast		320	35	70-115-165										
	Titanium, Ti alloys	Rm 400		36	70-115-165											
	Alpha+beta alloys cured	Rm 1050		37	70-115-165											
H	Hardened steel	Hardened		55 HRC	38	70-115-165	.002 .004 .005	.003 .004 .006	.004 .006 .007	.005 .007 .008	.006 .007 .009					
		Hardened		60 HRC	39	70-115-165										
	Chilled cast iron		400	40	-	-						-	-	-		
	Cast iron nodular	Hardened		55 HRC	41	-						-	-	-	-	

* Feed Rates are Based on Two Effective - DO NOT DOUBLE