

Operating Guidelines • Series LPA Tips (General Purpose)

ISO	Material	Condition	Tensile Strength RM (N/mm ²)	Hardness HB	Matl. Group No.	Cutting Speed Vc (SFM)	Feed vs. Drill Diameter - IPR (inches/rev)*					
							Ø20-29.9 mm (.7874-1.1772")	Ø30-34.9 mm (1.1811-1.3740")	Ø35-41.9 mm (1.3800-1.6496")			
P	Non-alloy steel and cast steel, free cutting steel	<0.25%C	Annealed	420	125	1	260-460	.012-.020	.012-.020	.014-.022		
		≥0.25%C	Annealed	650	190	2	260-430					
		<0.55%C	Quenched/Tempered	850	250	3	260-400					
		≥0.55%C	Annealed	750	220	4	230-360					
		Quenched/Tempered	1000	300	5	165-300						
	Low alloy steel and cast steel (less than 5% alloying elements)	Quenched/Tempered	Annealed	600	200	6	260-400	.010-.018	.010-.018	.012-.020		
			930	275	7	230-360						
			1000	300	8	165-300						
			1200	350	9	135-230						
	High alloy steel, cast steel, and tool steel	Annealed	680	200	10	165-300	.010-.014	.010-.014	.012-.016			
Quenched/Tempered		1100	325	11	130-265							
M	Stainless steel and cast stainless steel	Ferritic/Martensitic	680	200	12	130-230	.006-.012	.006-.012	.008-.014			
		Martensitic	820	240	13	130-230						
		Austenitic	600	180	14	100-230						
K	Grey cast iron (GG)	Ferritic	-	160	15	300-600	.014-.022	.014-.022	.016-.024			
		Pearlitic	-	250	16	265-460						
	Cast iron nodular (GGG)	Ferritic	-	180	17	300-600						
		Pearlitic	-	260	18	265-460						
	Malleable cast iron	Ferritic	-	130	19	300-525						
		Pearlitic	-	230	20	265-460						
N	Aluminum - wrought alloy	Not Cureable	-	60	21	300-725	.016-.024	.016-.024	.020-.028			
		Cured	-	100	22	300-725						
	Aluminum - cast, alloyed	≤12% Si	Not Cureable	-	75	23				300-725		
		Cured	-	90	24	300-725						
		>12% Si	High Temperature	-	130	25				265-525		
	Copper alloys	>1% Pb	Free Cutting	-	110	26				300-725		
		Brass	-	90	27	300-725						
		Electrolytic Copper	-	100	28	300-725						
	Non-metallic	Duro/Fiber Plastics	-	-	29	-				-	-	-
		Hard Rubber	-	-	30	-				-	-	-
S	High temp alloys	Fe based	Annealed	-	200	31	100-200	.004-.008	.006-.010	.006-.010		
			Cured	-	280	32	70-165					
		Ni or Co based	Annealed	-	250	33	70-165					
			Cured	-	350	34	70-165					
			Cast	-	320	35	70-165					
	Titanium, Ti alloys	-	Rm 400	-	36	70-165						
		Alpha+Beta Alloys Cured	Rm 1050	-	37	70-165						
H	Hardened steel	Hardened	-	55 HRC	38	70-165	.004-.008	.006-.010	.006-.010			
		Hardened	-	60 HRC	39	70-165						
	Chilled cast iron	Cast	-	400	40	-				-	-	
	Cast iron nodular	Hardened	-	55 HRC	41	-				-	-	

*Feed rates are based on two effective - DO NOT DOUBLE