

ISO	Material	Condition	Tensile Strength [N/mm ²]	Hardness HB	Material No. ⁽¹⁾	Lead (mm)				
						0.25-1.00	1.25-1.50	1.75-2.00	2.50-6.00	
						Number of passes				
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	1	1	2	3
		≥0.25% C	annealed	650	190	2				
		<0.55% C	quenched and tempered	850	250	3				
		≥0.55% C	annealed	750	220	4				
			quenched and tempered	1000	300	5				
	low alloy and cast steel (less than 5% of alloying elements)	annealed	600	200	6					
		quenched and tempered	930	275	7					
			1000	300	8					
			1200	350	9					
	high alloyed steel, cast steel and tool steel	annealed	680	200	10					
		quenched and tempered	1100	325	11					
	stainless steel and cast steel	ferritic / martensitic	680	200	12					
		martensitic	820	240	13					
M	stainless steel and cast steel	austenitic, duplex	600	180	14	1	1	2	3	
K	gray cast iron (GG)	ferritic / pearlitic		180	15	1	1	2	3	
		pearlitic / martensitic		260	16					
	nodular cast iron (GGG)	ferritic		160	17					
		pearlitic		250	18					
	malleable cast iron	ferritic		130	19					
		pearlitic		230	20					
N	aluminum-wrought alloys	not hardenable		60	21	1	1	1	1	
		hardenable		100	22					
	aluminum-cast alloys	≤12% Si	not hardenable		75					23
		hardenable		90	24					
	>12% Si	high temperature		130	25					
	copper alloys	>1% Pb	free cutting		110					26
		brass			90					27
			electrolytic copper		100					28
	non metallic	duroplastics, fiber plastics		70 Shore D	29					
			hard rubber	55 Shore D	30					
S	high temperature alloys	Fe based	annealed		200	31	2	2	2	3
			hardened		280	32				
		Ni or Co based	annealed		250	33				
			hardened		350	34				
			cast		320	35				
	titanium alloys	pure	400	190	36					
		alpha+beta alloys, hardened	1050	310	37					
H	hardened steel	hardened		55 HRC	38	3	3	3	3	
		hardened		60 HRC	39					
	chilled cast iron	cast		400	40					
	cast iron	hardened		55 HRC	41					

Rm - ultimate tensile strength, MPa

⁽¹⁾ For workpiece materials list, see pages 443-472

Machining Data for Solid Carbide and Indexable Mill Thread

ISO	Material	Condition	Tensile Strength [N/mm ²]	Hardness HB	Material No. ⁽¹⁾	Cutting Speed (m/min)	Cutting Diameter													
							Feed mm/tooth													
						IC908	2	3	4	6	8	10	12	14	16	20	25	30		
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	420	125	1	100-250	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21	
		≥0.25% C	annealed	650	190	2	80-210	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21	
		<0.55% C	quenched and tempered	850	250	3	65-170													
		≥0.55% C	annealed	750	220	4	110-180	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.1	0.12	0.15	0.18	
			quenched and tempered	1000	300	5	95-160	0.02	0.03	0.03	0.05	0.06	0.07	0.08	0.09	0.1	0.12	0.15	0.18	
	low alloy and cast steel (less than 5% of alloying elements)	annealed	600	200	6	90-160	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
		quenched and tempered	930	275	7	65-200	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
			1000	300	8	70-210	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
			1200	350	9	95-160	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
	high alloyed steel, cast steel and tool steel	annealed	680	200	10	130-170	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
		quenched and tempered	1100	325	11	75-100	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
	stainless steel and cast steel	ferritic / martensitic	680	200	12	110-170	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
		martensitic	820	240	13	70-155	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
M	stainless steel and cast steel	austenitic, duplex	600	180	14	85-100	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.1	0.11		
K	gray cast iron (GG)	ferritic / pearlitic		180	17	120-160	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21		
		pearlitic / martensitic		260	18	75-160	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21		
	nodular cast iron (GGG)	ferritic		160	15	70-150	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21		
		pearlitic		250	16	110-140	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21		
	malleable cast iron	ferritic		130	19	120-160	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21		
		pearlitic		230	20	110-140	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.21	0.15	0.18	0.21		
N	aluminum-wrought alloys	not hardenable		60	21	160-300	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21		
		hardenable		100	22															
	aluminum-cast alloys	≤12% Si	not hardenable		75	23	150-350	0.03	0.04	0.04	0.06	0.07	0.08	0.09	0.11	0.12	0.15	0.18	0.21	
		hardenable		90	24															
	>12% Si	high temperature		130	25	100-250	0.02	0.02	0.03	0.03	0.04	0.05	0.05	0.06	0.07	0.08	0.10	0.12		
	copper alloys	>1% Pb	free cutting		110	26														
		brass			90	27														
			electrolytic copper		100	28														
	non metallic	duroplastics, fiber plastics			70 Shore D	29	100-400	0.05	0.06	0.07	0.09	0.1	0.11	0.12	0.13	0.15	0.18	0.22	0.25	
			hard rubber		55 Shore D	30														
S	high temperature alloys	Fe based	annealed		200	31														
			hardened		280	32														
		Ni or Co based	annealed		250	33	20-80	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05	
			hardened		350	34														
	titanium alloys	cast		320	35															
		pure	400	190	36															
H	hardened steel	alpha+beta alloys, hardened	1050	310	37	20-80	0.02	0.02	0.02	0.03	0.03	0.03	0.03	0.04	0.04	0.04	0.05	0.05		
		hardened		55 HRC	38	55-65														
	hardened		60 HRC	39	45-55															
	chilled cast iron	cast	400	40	90-105															
cast iron	hardened		55 HRC	41	55-65															

* For cutters with long cutting flute, reduce feed rate by 40%.

⁽¹⁾ For workpiece materials list, see pages 443-472

Machining Data for Solid Carbide and Indexable Mill Thread

ISO	Material		Condition	Tensile Strength [Kspi]	Hardness HB	Material No. ⁽¹⁾	Cutting Speed (SFM)	Cutting Diameter											
								Feed (in/tooth)											
								IC908	3/32	1/8	5/32	1/4	5/16	3/8	1/2	5/8	3/4	1.0	1.25
P	non-alloy steel and cast steel, free cutting steel	<0.25% C	annealed	61	125	1	330-820	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
		≥0.25% C	annealed	94	190	2	260-690	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
		<0.55% C	quenched and tempered	123	250	3	210-560												
		≥0.55% C	annealed	109	220	4	360-590	.0008	.0012	.0012	.0020	.0024	.0028	.0031	.0039	.0047	.0059	.0071	
			quenched and tempered	145	300	5	310-520	.0008	.0012	.0012	.0020	.0025	.0028	.0031	.0039	.0047	.0059	.0071	
	low alloy and cast steel (less than 5% of alloying elements)		annealed	87	200	6	300-520	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043	
			quenched and tempered	135	275	7	210-660	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043	
				145	300	8	230-690	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043	
				174	350	9	310-520	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043	
	high alloyed steel, cast steel and tool steel		annealed	99	200	10	430-560	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043	
quenched and tempered			160	325	11	250-330	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043		
stainless steel and cast steel		ferritic / martensitic	99	200	12	360-560	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043		
		martensitic	119	240	13	230-510	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043		
M	stainless steel and cast steel	austenitic, duplex	87	180	14	280-330	.0008	.0008	.0012	.0012	.0016	.0020	.0020	.0028	.0031	.0039	.0043		
K	gray cast iron (GG)		ferritic / pearlitic		180	17	230-490	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
			pearlitic / martensitic		260	18	360-460	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
	nodular cast iron (GGG)		ferritic		160	15	390-520	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
			pearlitic		250	16	250-520	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
	malleable cast iron		ferritic		130	19	390-520	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
			pearlitic		230	20	360-460	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
N	aluminum-wrought alloys		not hardenable		60	21	520-980	.0012	.0016	.0016	.0024	.0028	.0031	.0035	.0047	.0059	.0071	.0083	
			hardenable		100	22													
	aluminum-cast alloys	≤12% Si	not hardenable		75	23													
			hardenable		90	24													
	copper alloys	>12% Si	high temperature		130	25													
			>1% Pb	free cutting		110	26												
				brass		90	27												
	non metallic		electrolytic copper		100	28													
			duroplastics, fiber plastics		70 Shore D	29	330-460	.0020	.0024	.0028	.0035	.0039	.0043	.0047	.0059	.0071	.0087	.0110	
	hard rubber				55 Shore D	30													
S	high temperature alloys	Fe based	annealed		200	31													
			hardened		280	32													
		Ni or Co based	annealed		250	33	70-260	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0016	.0016	.0020	.0020	
			hardened		350	34													
	titanium alloys		cast		320	35													
			pure		58	190	36												
alpha+beta alloys, hardened		152	310	37	70-260	.0008	.0008	.0008	.0012	.0012	.0012	.0012	.0016	.0016	.0020	.0020			
H	hardened steel		hardened		55 HRC	38	180-210												
			hardened		60 HRC	39	150-180												
	chilled cast iron		cast		400	40	300-340												
	cast iron		hardened		55 HRC	41	180-210												

⁽¹⁾ For workpiece materials list, see pages 443-472