



MATERIAL MACHINABILITY IN STANDARD GEAR CUTTING APPLICATIONS

STEEL	MACHINABILITY (B1112 = 100%)
1018	70%
1018 HR	52%
1020	72%
1020 HR	52%
1035	65%
1040/42	64%
1045	64%
1045 HR	56%
1050	54%
1095	42%
1117	90%
11L17	115%
1137	70%
1141	71%
1144	76%
1144 HR	64%
1144 STRESSPROOF/A311	83%
1144 FATIGUEPROOF	80%
1212	100%
12L14	170%
1215	136%
2335	70%
4130	72%
4140/42	66%
4140/42 HR	57%
41L42	85%
4140/42 A434	50%
4145	55%
4150	60%
ETD150	73%
4340	50%
300M	50%
4340 A434	32/39 HRC
4620	60%
4820	49%
5120	30%
6150	50%
8620	64%
8620 HR	60%
86L20	90%
8740	65%
9310	51%
A36	70%
A572	62%
A514 (T-1)	40%
SPECIALTY STEEL	
NITRONIC 60	17%
MARAGING 300	36%

269/321 Bhn

STAINLESS STEEL	MACHINABILITY (B1112 = 100%)
302	45%
302/304 "B"	28%
303	69%
303 HT	40%
304	42%
304 L	458%
316	42%
321	35%
347	35%
410	54%
416 ANN	75%
416 HT	41%
420	39%
420 F	51%
430	50%
430 F	55%
431	42%
440A	40%
440C	26%
440 F Se	45%
15-5PH-A	43%
17-4PH H1150	45%
17-4PH-A	42%
17-4PH H1025	34%
17-4PH H900	411 BHN!
A286 AGED	30%

ALUMINUM	MACHINABILITY
A-132-T	110%
A-214	200%
A-356-T	140%
112/B-113	180%
D-132-T/333-T	130%
108/122-T	140%
195-T	190%
212	160%
218-T	240%
220-T	230%
319-T/355-T	160%
750-T	180%
2011	200%
2014/7-T	140%
2024-T	150%
3003/4	180%
5052/6	190%
4032-T	110%
6051-T	140%
6061-T	180%
6063-T	190%
7075-T	120%

CAST IRON ASTM	MACHINABILITY (B1112 = 100%)	SAE J431 PREVIOUS	SAE J431 CURRENT
CLASS 20	73%	G1800	G7
CLASS 25	55%	G2500	G9
CLASS 30	48%	G3000	G10
CLASS 35	48%	G3500	G11
CLASS 40	48%	G4000	G12
CLASS 45	36%		
CLASS 50	36%		
60-40-18	61%		
65-45-12	61%	160%	
80-55-06	39%	80%	
100-70-03	30%		

MACHINABILITY BRASS - BRONZE (C36000 = 100%)		
C36000	100%	FREE CUTTING BRONZE
C46400	30%	NAVY BRASS (LEAD FREE)
C48500	70%	NAVY BRASS (LEADED)
C62400	50%	ALUMINUM BRONZE
C63000	30%	NICKEL ALUMINUM BRONZE
C64200	80%	SILICON ALUMINUM BRONZE
C67500	80%	MANGANESE BRONZE
C86300	20%	MANGANESE BRONZE SAE 430B
C90300	30%	SAE 620 TIN BRONZE, NAVY G
C90500	30%	TIN BRONZE SAE 62 GUN METAL
C90700	20%	TIN BRONZE SAE 65
C92200	42%	TIN BRONZE NAVY M SAE 622 STEAM
C93200	70%	SAE 660 BEARING BRONZE
C93700	80%	HIGH LEAD TIN BRONZE SAE 64
C95400	60%	ALUMINUM BRONZE
C95500	50%	NICKEL ALUMINUM BRONZE

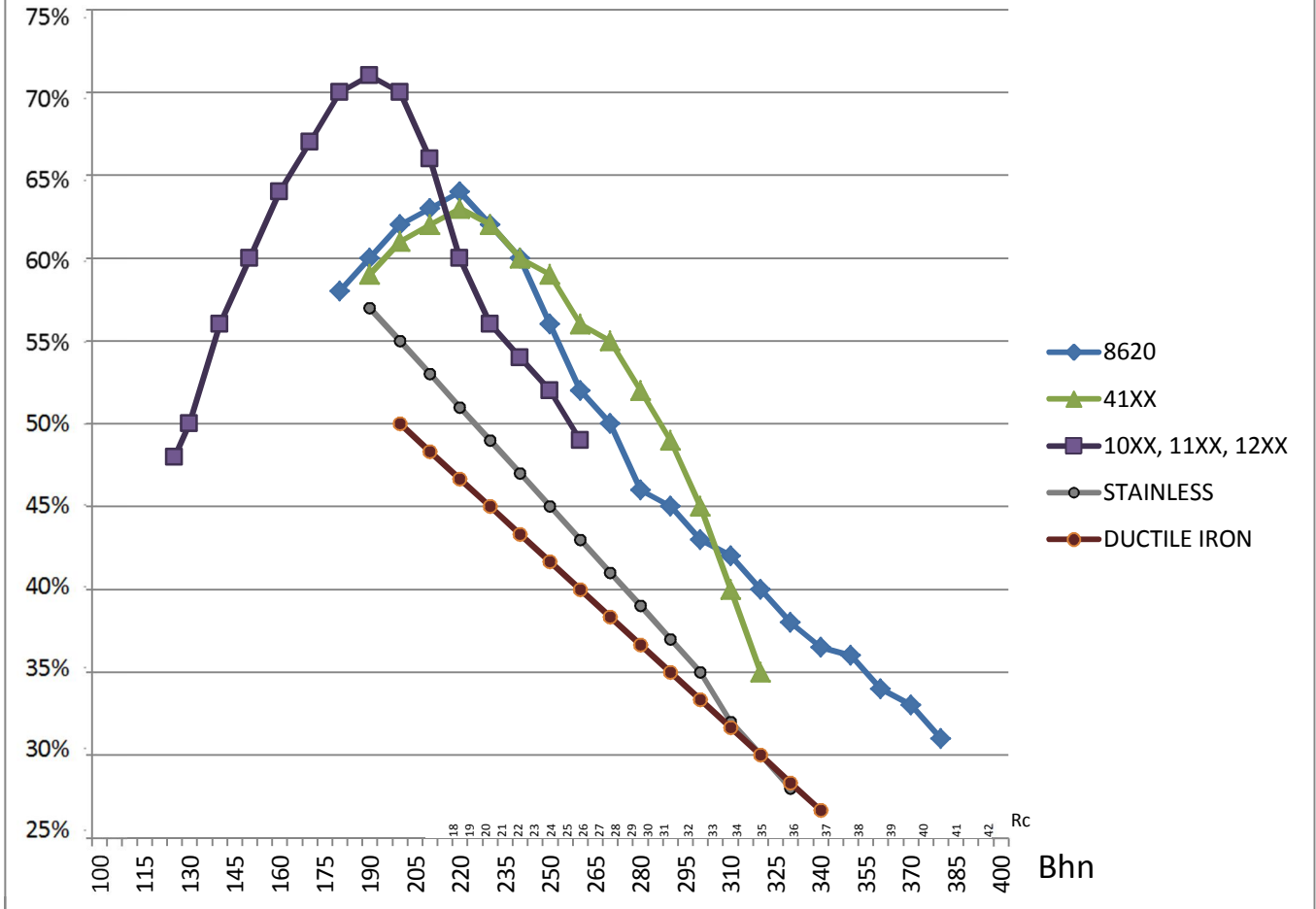
MACHINABILITY TOOL STEEL (W1 = 100%)	
A-11	40%
A-2	42%
A-6	33%
D-2	27%
D-3	27%
H-13	65%
M-2	39%
M-2	45%
M-3/4	36%
M-48	17%
O-1	42%
O-2	42%
S-7	65%
T-15	27%
W-1	100%

MACHINABILITY TITANIUM (B1112 = 100%)	
Ti 6Al 4V ANN	21%
Ti 6Al 4V AGED	12%

This summary table contains theoretical Maximum Machinability based on a variety of sources and actual experiences. It should be used as a reference only under the judgment of a qualified engineer. Note that these machinability ratings are highly dependent on the process of generation and the material's hardness. Reference "Machinability vs. Bhn" graph for additional information.



### Machinability vs. Material Hardness



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