Table 5. Machinability

Surface Cutting Speeds

Surface cutting speeds given below are approximate and are intended as a guide in calculating the proper speed for the part in hand. The figures are average for the general run of parts and are based on the use of high speed cutting tools. Any extraordinary features in the part to be made should be taken into consideration and speeds altered accordingly.

For the carbon and alloy grades listed, the figures are based on cold drawn bars in the as-drawn condition, except when it is noted that the grade is annealed.

Surface cutting speeds for hot rolled as-rolled bars and hot rolled heat treated bars are not available, since the machining qualities of these bars vary according to hardness, microstructure, condition of the surface, etc.

For the stainless steels and super alloys listed, all grades are annealed or solution annealed except where otherwise indicated.

CARBON STEELS

Grade	Surface Feet per Minute	Rating*
1015	120	72%
1018	130	78%
1020	120	72%
1022	130	78%
1030	115	70%
1040	105	64%
1042	105	64%
1050	90	54%
1095	70	42%
1117	150	91%
1137	120	72%
1141	115	70%
1141 Ann.	135	81%
1144	125	76%
1144 Ann.	140	85%
1212	165	100%
1213	225	136%
12L14	280	170%
1215	225	136%
1144 Hi Stress	130	79%
Stressproof	140	83%
Fatigue-proof	134	80%
Leaded Grade A	325	193%
Ledloy A, La-Led	325	193%
Leaded Grade AX,AY,AZ	420	250%
Ledloy AZ, La-Led X	420	250%

ALLOY STEELS

Grade	Surface Feet per Minute	Rating*
2355 Ann.	115	70%
4130 Ann.	120	72%
4140 Ann.	110	66%
4142 Ann.	110	66%
41L42 Ann.	127	77%
4150 Ann.	100	60%
4150 Resul. Heat Treat	65	40%
4330 Mod. Ann.	95	59%
4340 Ann.	95	57%
4340 Mod. (300M) Ann.	95	57%
4620	110	66%
4820 Ann.	80	49%
52100 Ann.	65	40%
6150 Ann.	100	60%
8620	110	66%
86L20	127	77%
9310 Ann.	85	51%
D6AC Ann.	50	30%
"e.t.d." 150	125	75%
H-11 Ann.	49	29%
HS 220-18 Ann.	85	51%
Nitriding #3 135 Mod. Ann.	76	45%

STAINLESS & SUPER ALLOYS

Grade	Surface Feet per Minute	Rating"
302	75	45%
303	130	78%
303MA	135	82%
304	75	45%
304L	75	45%
316	75	45%
321	60	36%
347	60	36%
410	90	54%
416	180	110%
420	75	45%
430	90	54%
430F	150	91%

Grade	Surface Feet per Minute	Rating"
431	75	45%
440A	75	45%
440B&C	65	40%
15-5 Condition A	80	48%
Condition H1150	90	55%
Condition H1150M	125	76%
17-4 Condition A	80	48%
Nitronic 50 (22-13-5)	50	21%
A286 Aged	55	33%
Hastelloy X	32	19%
Maraging 18 Ni 250	50	30%

*"Rating" refers to relative speed, base on 1212 as 100%.