

## CHART 1 MACHINABILITY GUIDE — SELECTION OF SPEEDS AND FEEDS

CHART 1 — HSS speed and feed recommendations (chip load) on face mills, side mills, plain mills, saws and form relieved cutters. Carbide speed and feed recommendation for face milling. Cutting tool material recommendation for HSS and Carbide.

MATERIAL TO BE MACHINED	MACHINE CAPABILITY RATING	HARDNESS BHN	CUTTING MATERIAL	SIDE MILLING			FACE MILLING			PLAIN MILLING			FORM MILLING			SAW-BLOTTING			CARBIDE FACE MILLING			
				SFM RANGE	CHIP LOAD RANGE	DEPTH	SFM RANGE	CHIP LOAD RANGE	DEPTH	SFM RANGE	CHIP LOAD RANGE	DEPTH	SFM RANGE	CHIP LOAD RANGE	DEPTH	SFM RANGE	CHIP LOAD RANGE	DEPTH	SFM RANGE	CHIP LOAD RANGE	DEPTH	SFM RANGE
HIGH TEMP. ALLOYS	.09	300, 400	T-15 M-40-47	10 15	.002 .005	.050 .250	10 25	.004 .008	.050 .250	10 20	.002 .004	.025 .200	10 15	.001 .003	.050 .250	10 20	.0005 .001	.700 .750	C-2 C-2	40 60	.002 .006	.050 .250
STRUCTURAL STEEL WROUGHT	.12	50 HC	T-15 M-40-47	15 20	.001 .003	.050 .250	20 40	.004 .006	.050 .250	20 35	.004 .004	.025 .150	15 20	.001 .002	.050 .250	15 25	.0002 .001	.200 .750	C-7 C-5	80 130	.002 .004	.050 .250
ALLOY STEEL CAST	.16	350, 400	T-15 M-40-47	20 30	.002 .004	.050 .250	30 45	.003 .006	.050 .250	35 35	.007 .004	.025 .150	20 30	.001 .002	.050 .250	20 30	.0005 .0015	.700 .750	C-7 C-5	100 175	.003 .006	.050 .250
ALLOY STEEL WROUGHT	.20	375, 425	T-15 M-40-47	25 35	.002 .004	.050 .250	35 45	.002 .005	.050 .250	40 40	.002 .002	.025 .150	25 35	.001 .002	.050 .250	25 35	.0008 .0015	.700 .750	C-7 C-5	160 235	.002 .006	.050 .250
HIGH STRENGTH STEEL WROUGHT	.24	300, 350	M-2 M-40-47	30 45	.002 .004	.050 .250	40 50	.002 .005	.050 .250	45 60	.002 .004	.025 .150	30 45	.001 .002	.050 .250	30 45	.0008 .001	.700 .750	C-7 C-5	250 300	.002 .006	.050 .250
MARAGING STEEL WROUGHT	.36	275, 325	T-15 M-40-47	40 60	.002 .004	.050 .250	50 70	.002 .005	.050 .250	60 60	.002 .004	.025 .150	40 60	.002 .003	.050 .250	40 60	.001 .002	.700 .750	C-2 C-2	250 300	.004 .006	.050 .250
ALLOY STEEL WROUGHT	.40	175, 225	M-2 M-40-47	50 65	.002 .004	.050 .250	60 80	.003 .006	.050 .250	65 65	.002 .004	.025 .150	50 65	.002 .003	.050 .250	50 65	.001 .002	.700 .750	C-2 C-5	275 375	.004 .006	.050 .250
FREE MACH STEEL WROUGHT	.44	200, 250	M-2	55 70	.002 .005	.050 .250	90 125	.003 .006	.050 .250	70 70	.002 .005	.025 .150	55 70	.002 .003	.050 .250	55 70	.001 .002	.700 .750	C-2 C-5	310 420	.004 .006	.050 .250
MALLEABLE CAST IRON	.52	220, 260	M-2	65 80	.002 .005	.050 .250	80 125	.003 .006	.050 .250	80 80	.002 .005	.025 .150	65 80	.002 .003	.050 .250	65 80	.001 .002	.700 .750	C-2 C-5	300 380	.004 .006	.050 .250
CARBON STEEL - CAST	.60	125, 175	M-2	75 90	.002 .006	.050 .250	90 150	.004 .008	.050 .250	90 150	.002 .008	.025 .150	75 90	.002 .004	.050 .250	75 90	.001 .003	.700 .750	C-7 C-6	330 650	.004 .012	.050 .250
DUCTILE IRON	.64	190, 225	M-2	80 100	.002 .006	.050 .250	90 150	.004 .008	.050 .250	80 100	.002 .006	.025 .150	80 100	.002 .004	.050 .250	80 100	.001 .004	.700 .750	C-7 C-6	330 460	.004 .012	.050 .250
FREE MACH STEEL WROUGHT	.72	175, 225	M-2	90 110	.002 .006	.050 .250	95 155	.004 .012	.050 .250	110 110	.002 .006	.025 .150	90 110	.002 .004	.050 .250	90 110	.001 .004	.700 .750	C-7 C-6	350 600	.004 .012	.050 .250
CARBON STEEL WROUGHT	.80	85, 125	M-2	100 130	.002 .006	.050 .250	110 140	.004 .012	.050 .250	100 130	.002 .006	.025 .150	100 130	.002 .004	.050 .250	100 130	.001 .004	.700 .750	C-7 C-6	350 700	.004 .012	.050 .250
MALLEABLE CAST IRON	.88	160, 200	M-2	100 130	.002 .006	.050 .250	110 140	.004 .012	.050 .250	100 130	.002 .006	.025 .150	100 130	.002 .004	.050 .250	100 130	.001 .004	.700 .750	C-7 C-6	330 400	.004 .012	.050 .250
FREE MACH CARBON STEEL	1.00	100, 150	M-2	120 180	.002 .006	.050 .250	130 200	.004 .012	.050 .250	120 150	.002 .006	.025 .150	120 180	.002 .004	.050 .250	120 180	.001 .004	.700 .750	C-7 C-6	350 800	.004 .012	.050 .250
FREE MACH CARBON STEEL LEADED	1.12	100, 150	M-2	120 190	.002 .006	.050 .250	130 210	.004 .012	.050 .250	120 190	.002 .006	.025 .150	120 190	.002 .004	.050 .250	120 190	.001 .004	.700 .750	C-7 C-6	350 800	.004 .012	.050 .250
ZIRCONIUM ALLOY WROUGHT	1.20	140, 280	M-2	120 190	.002 .006	.050 .250	130 210	.004 .012	.050 .250	120 190	.002 .006	.025 .150	120 190	.002 .004	.050 .250	120 190	.001 .004	.700 .750	C-2 C-2	300 500	.004 .008	.050 .250
COPPER ALLOY WROUGHT	1.40	100RB, 70RB	M-2	140 210	.002 .008	.050 .250	160 220	.004 .012	.050 .250	140 210	.002 .006	.025 .150	140 210	.002 .004	.050 .250	140 210	.001 .004	.700 .750	C-2 C-2	400 500	.004 .012	.050 .250
COPPER ALLOY CAST	1.60	40, 150 500Kg	M-2	180 400	.002 .008	.050 .250	200 500	.004 .012	.050 .250	180 400	.002 .006	.025 .150	180 400	.002 .004	.050 .250	180 400	.001 .004	.700 .750	C-2 C-2	500 1000	.004 .012	.050 .250
ALUMINIUM ALLOY CAST	3.20	70, 125 500Kg	M-2	200 400	.002 .010	.050 .250	200 500	.004 .012	.050 .250	200 400	.002 .006	.025 .150	200 400	.002 .006	.050 .250	200 400	.002 .008	.700 .750	C-2 C-2	1000 2500	.004 .012	.050 .250