

Threading Heat Treated Materials



HREAD cutting generally is not recommended when material hardness is above 36 Rockwell C. Shown by the D area in the chart, tool life will decrease drastically in direct proportion to the increase in hardness.

It is possible to thread in the E area (32 to 36 Rc) but limited chaser life will be obtained. Super high-speed steel chasers can be supplied to thread in either range. These chasers can also be supplied for threading in the F area to improve chaser life.

Special heat treatment is given to chasers used to thread in the F range. The degree of heat treatment will vary depending upon the hardness of the material to be machined so it is necessary to specify the material and its hardness to allow correct heat treatment to be selected.

Chasers with standard heat treatment are used to thread in the G area. Being softer, these chasers will withstand more abuse and punishment and will give better results than harder tools.

Softer materials, especially those which are 170 Brinnell or lower, can be just as difficult to thread as harder materials. Softer materials tend to be gummy or stringy and will more readily break-off as opposed to shearing cleanly.

Using a higher lip rake on soft materials will give better shearing action. However, a higher rake has a thinner cutting edge which will dull quicker causing faster tool wear and/or chippage. Therefore, the user must compromise between tool life and finish.

The 1200 series steels will give best life and thread finish. Also, lead additives generally will improve the machineability factor of any given material by 10% to 25%.

Materials with silicon content are very abrasive, will result in rapid tool wear and are not conducive to a good threading operation.

Carbide tipped chasers are available for special applications. However, they require special manufacturing techniques which make them more expensive than regular chasers.

Threading Heat Treated Material

Dia. In. M/M	BRINELL (Steel Ball Only)			ROCKWELL			Approx. Tensile Strength in 1000 PSI	Approx. Tensile Strength in Kg./mm2
	Hardness Number 3000 Kg.	VICKERS Diamond Hardness 10 Kg	C Scale 150 Kg. Brale	B Scale 100 Kg. 1/16 Ball	A Scale 60 Kg. Brale			
3.10	388	410	42		71.5	195	137	
3.15	375	396	40		70.5	182	128	
3.20	363	383	39		70	177	125	
3.25	352	372	38		69.5	171	120	
3.30	341	363	37		69	164	115	
3.35	331	353	35		68.5	162	114	
3.40	321	343	35		68	155	109	
3.45	311	334	34		67.5	153	107	
3.50	302	319	32.5		66.5	144	101	
3.55	293	309	31		66	140	98	
3.60	285	301	30		65.5	136	95	
3.65	277	292	29		65	132	93	
3.70	269	284	28	104	64.5	128	90	
3.75	262	271	26	102.5	63.5	124	87	
3.80	255	264	25	101.5	63	121	85	
3.85	248	258	24	101	62.5	117	82	
3.90	241	253	23	100	61.8	115	81	
3.95	235	247	21.7	99	61.5	111	78	
4.00	230	238	20.5	98	60.8	109	77	
4.05	223	223	18	97	59.5	108	76	
4.10	217	217	16	96	59	103	72	
4.15	212	210	14	95	58	101	71	
4.20	207	207		94	57.5	98	69	
4.25	201	201		93	57	96	67	
4.30	197	197		92	56.5	93	65	
4.35	192	192		91	56	91	64	
4.40	187	187		90	55.5	89	62	
4.45	183	183		89.5	55.2	88	62	
4.50	179	179		89	55	87	61	
4.55	174	174		88	54	85	60	
4.60	170	170		86	53	81	57	
4.65	167	167		85	52.5	80	56	
4.70	163	163		84	52	78	55	
4.80	156	156		82	50.5	75	53	
4.90	149	149		80	49.5	72	51	
5.00	143	143		78	48.5	70	49	
5.10	137	137		75	46.5	67	47	
5.20	131	131		72	45	65	46	
5.30	126	126		71	44.5	63	44	
5.40	121	121		68	43	60	42	
5.50	116	116		65	42	58	41	
5.60	111	111		62	40.5	56	40	
5.70	107			60	39.5			
5.80	103			57	38			
5.90	99			55	37.5			

THREADING HEAT TREATED MATERIAL

The D area of the chart represents the hardness range where threading can be done but at the expense of greatly reduced chaser life. Threading in section E, although somewhat easier than D, will still result in limited chaser life. Special, super high speed chasers can be supplied for threading in either range.

To supply maximum life, the chasers used for threading materials in section F receive a special heat treatment. This processing will vary according to material hardness. Therefore, always submit material specifications.

Chasers with standard processing will be provided if material specifications are not given. These chasers are for cutting in the low hardness range (section G) and will withstand more abuse than those receiving special heat treating.