Thermodur® 2714

Technical Datasheet

Chemistry
Comparable Standard: Grade AISI 6F3

Typical	C	Ni	Cr	Mo	V
Analysis %	0.56	1.7	1.1	0.5	0.1

Description
Thermodur® 2714 is an Extra Fine Structure (EFS) nickel based tool steel. Supplied in the quench and tempered condition with a hardness of 370-410 HB (Rounds) and 355-400 HB (Flats).

Characteristics
Excellent high temperature strength
Good resistance to thermal shock
Good toughness

Applications

Forging dies	Hydroform tooling
Die holders	Plastic tooling
Die rings	Wedge blocks

Physical Properties
Density: 0.281 lbs/in³ (room temperature)

Coefficient of Thermal Expansion	70°F - 200°F 7.0 x 10^{-6} /°F	70°F - 400°F 7.2 x 10^{-6} /°F	70°F - 750°F 7.5 x 10^{-6} /°F
Thermal Conductivity	70°F 254Btu/in/ft²/hr/°F	400°F 258/in/ft²/hr/°F	750°F 260/in/ft²/hr/°F

Mechanical Properties
Tensile Properties: (room temperature)

Hardness HRc	Y.S. (0.2%) KSI	T.S. KSI	EL (%)	RA (%)
40-42	150	175	16	45
42-44	172	195	15	40
44-48	198	230	13	38

Heat Treatment
Soft Annealing

Temperature	Cooling	Hardness
1400°F – 1425°F 1hr/in/max 6hrs	Cool to 1260°F and hold 4hrs and let furnace cool to 800°F	250 HB Max.

Stress Relieving

Temperature	Cooling	Hardness
1000°F for 2 hours	Cool slowly to 800°F, then air cool	230 HB Max.

Hardening (refer to TTT diagram on page 2)

Temperature	Cooling	Hardness
1580°F – 1650°F Hold at temperature for 30 minutes	Vacuum quench to 400°F, then place immediately in a tempering furnace	56 HRc Max quenched

Tempering (See tempering diagram on page 2)

Temperature °F	752	842	932	1022	1112	1202
Hardness HRc	47	45	43	40	36	32

Tempering hardness is approximate and based on two hours at temperature.
Please contact your Swiss Steel heat treat representative for more detailed information.

General Note
All statements regarding the properties or utilization of the materials or products mentioned are for the purpose of description only. Guarantees regarding the existence of certain properties or a certain utilization are only valid if agreed upon in writing.

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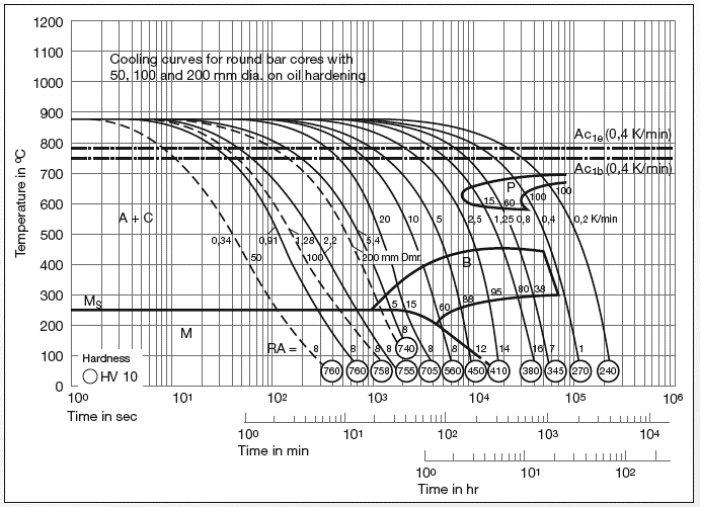
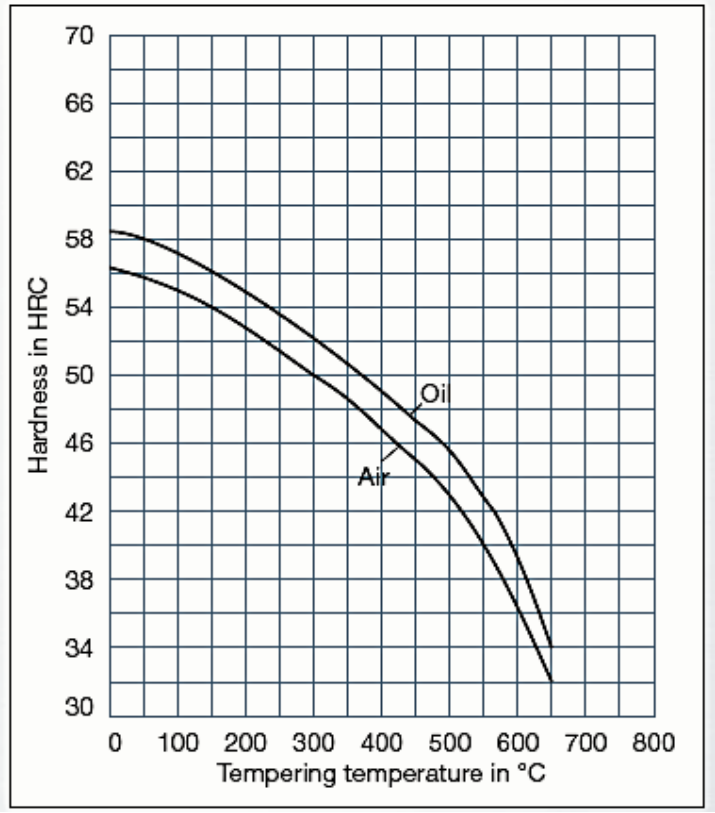
Cooling Curve Number	1	2	3	4	5	6	7	8	9	10	11	12
Hardness (HV 10)	760	760	758	755	740	705	560	450	410	380	345	270
Hardness (HRc approx.)	63	63	62.5	61	60.5	59	53	45.5	42	39	35	26

Time-Temperature-Transformation Diagram



Tempering Diagram



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Machining Data

Face Milling

Cutting Parameters	Milling with Carbide	
	Rough	Fine
Cutting Speeds (feet/min)	250 - 450	450 - 550
Feed (inch/tooth)	0.008” – 0.016”	0.004” – 0.008”
Depth of cut (inch)	0.080” – 0.200”	0.080”
Carbide Designation	C6 – C5 Coated Carbide	C6 – C7 Coated Carbide or Cement

End Milling

Cutting Parameters	Type of Milling		
	Solid Carbide	Carbide Index	High Speed
Cutting Speeds (feet/min)	200 – 300	200 – 300	26 - 40
Feed (inch/tooth)	0.0002” – 0.008”	0.002” – 0.008”	0.0004” – 0.014”
Carbide Designation	C3, C5	C6, C5	-

Drilling with High Speed Twist Drills

Drill Diameter Inch	Cutting Speed (feet/inch)	Feed (inch/rev)
< 3/16	33 - 39	0.002” – 0.004”
3/16 – 3/8	33 - 39	0.004” – 0.008”
3/8 – 5/8	33 - 39	0.008” – 0.010”
5/8 – 3/4	33 - 39	0.010” – 0.012”

Carbide Drills

Cutting Parameters	Type of Drill		
	Indexable Insert	Solid Carbide	Brazed Carbide
Cuttings Speeds (feet/min)	500 – 550	325 – 425	160 – 225
Feed (inch/rev)	0.002” – 0.004”	0.004” – 0.014”	0.006” – 0.016”

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NORTH AMERICAN DISTRIBUTION

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