MW Components

Special Steel H13 Fact Sheet

Do you need custom fasteners created with Steel Specials H13? Since our inception, Elgin Fastener Group has met every challenge of providing Quality, Timely, Cost-effective solutions for specialty fastener applications. Every product is built to your specifications, using your prints if necessary.

Below are the technical specifications of the Steel Specials H13 Bar Stock we have available to meet your needs.

AISI Type H13 Hot Work Tool Steel, air or oil quenched from 995-1025°C

Subcategory: Hot Work Steel; Metal; Tool Steel

Key Words: UNS T20813, ASTM A681, FED QQ-T-570, BS 4659 BH13, BS 4659 H13, BS EN ISO 4957 :2000 X40CrMoV5-1, Werkstoff 1.2344

Component	Wt. %
C	0.32 - 0.4
Cr	5.13 - 5.25
Fe	Min 90.95
Mo	1.33 - 1.4
Si	1
V	1

Material Notes:
Iron content is calculated as a remainder. High hardenability, excellent wear resistance and hot toughness. H13 has good thermal shock resistance and will tolerate some water cooling in service. Nitriding will improve hardness, but can diminish shock resistance if hardened layer is too thick. Electroslag Remelted (ESR) H13 has greater homogeneity and an exceptionally fine structure, resulting in improved machinability, polishability and high temperature tensile strength.

Applications: hot work applications: pressure die casting tools, extrusion tools, forging dies, hot shear blades, stamping dies, plastic molds. ESR H13 is great for aluminium die-casting tools and pastic mold tools requiring a very high polish.

Weldability: Pre and Post-heating recommended, can be welded with oxy-acetylene, inert shielded gas and shielded metal arc; Filler should be similar to the base metal.

Physical Properties	Metric	English	Comments
Density	7.8 g/cc	0.282 lb/in³	

Mechanical Properties			
Hardness, Knoop	570	570	Converted from Rockwell C Hardness.
Hardness, Rockwell C	52 - 54	52 - 54	air or oil quenched and tempered at 510°C (950°F) and 540°C (1000°F).
Hardness, Rockwell C	51 - 53	51 - 53	air or oil quenched and tempered at 565°C (1050°F).
Hardness, Rockwell C	49 - 51	49 - 51	air or oil quenched and tempered at 595°C (1100°F).
Hardness, Rockwell C	45 - 47	45 - 47	air or oil quenched and tempered at 620°C (1150°F).
Hardness, Rockwell C	39 - 41	39 - 41	air or oil quenched and tempered at 650°C (1200°F).
Hardness, Rockwell C	31 - 33	31 - 33	air or oil quenched and tempered at 675°C (1250°F).
Hardness, Rockwell C	28 - 30	28 - 30	air or oil quenched and tempered at 705°C (1300°F).
Hardness, Rockwell C	51 - 53	51 - 53	air quenched from 1025°C (1875°F) or oil quenched from 1010°C (1850°F) with no temper, or tempered for 1 hour at 315°C (600°F), 425°C (800°F), and 480°C (900°F).
Hardness, Vickers	549	549	Converted from Rockwell C Hardness.
Tensile Strength, Ultimate	1990 MPa	289000 psi	
Tensile Strength, Yield	1650 MPa	239000 psi	
Elongation at Break	9 %	9 %	
Modulus of Elasticity	210 GPa	30500 ksi	at 20°C
Bulk Modulus	140 GPa	20300 ksi	Typical for steel.
Poisson€™s Ratio	0.3	0.3	Calculated
Machinability	50 %	50 %	Based on 1% carbon steel. as 100% machinability
Shear Modulus	81 GPa	11700 ksi	Estimated from elastic modulus
Thermal Properties			
CTE, linear 20°C	11 µm/m-°C	6.11 µin/in-°F	25 €“ 95°C
CTE, linear 250°C	11.5 µm/m-°C	6.39 µin/in-°F	25 €“ 205ºC
CTE, linear 500°C	12.4 µm/m-°C	6.89 µin/in-°F	25 €“ 540°C
Heat Capacity	0.46 J/g-°C	0.11 BTU/lb-°F	from 0-100°C (32-212°F)

Thermal Conductivity	24.3 W/m-K	169 BTU-in/hr-ft²-°F	at 215°C; 24.4 W/m-K at 350°C, 24.3 at 475°C; 24.7 at 605°C
Descriptive Properties			
Annealing Temperature	850 - 870°C for 4 hours		furnace cool 20°C per hour max.
Stress Relieving Temperature	600 - 650°C for 2 hours (approx.)		cool in still air; always stess relief before hardening.

References are available for this material.