

Chemistry

~AISI H13 – W.Nr. 1.2344 – X40CrMoV5-1

Typical	C	Mn	Si	Cr	Mo	V
Analysis %	0.38	0.35	1.00	5.25	1.50	1.00

Description

DC® is a single melt hot work die steel, designed to meet all die casting industry specifications.

- Excellent resistance to thermal shock and fatigue
- Excellent hardenability
- Good high-temperature strength
- Good toughness
- Good polishability

Typical Applications

- High pressure die casting dies
- Hot extrusion tooling
- Plastic molds
- Hot forging dies
- Forming dies
- Shot sleeves

Physical Properties

Density: 0.281 lbs/in³ (room temperature)
 Hardened and tempered to 46 HRC

Coefficient of Thermal Expansion	70°F - 200°F 6.0 x 10 ⁻⁶ /°F	70°F - 400°F 6.6 x 10 ⁻⁶ /°F	70°F - 750°F 7.0 x 10 ⁻⁶ /°F
Thermal Conductivity	70°F 177Btu/in/ft ² /hr/°F	650°F 191Btu/in/ft ² /hr/°F	1300°F 210 Btu/in/ft ² /hr/°F

Heat Treatment

Annealing

Temperature	Cooling	Hardness
1500°F - 1550°F	25°F max per hour	229 BHN Max.

Key parameter of the NADCA recommended procedure for hardening dies for die casting service are:

Hardening

Temperature	Quenching
Slowly preheat: 1200°F – 1300°F Hardening temp: 1875F - 1895°F Time at temp. 30-45 min.	To 300°F

Tempering

Tempering temperature: 1050°F minimum

Stress relieving

Temperature	Cooling
50°F - 100°F below final tempering temperature, Slow cool to 875°F	Air cool

Size (Finished / approx.)

Max weight	36,000lbs
Max section	1,400 sq in
Max width	50"
Max thickness	30"

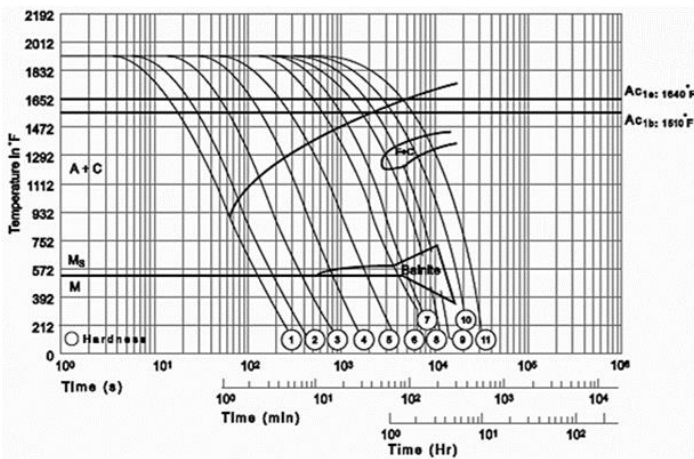
General Note

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.

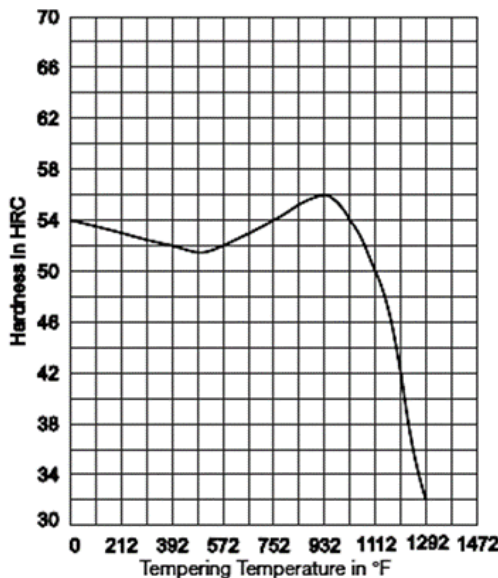
Cooling Curve Number	1	2	3	4	5	6	7	8	9	10	11
Hardness (HV 10)	707	681	673	657	642	634	599	572	488	236	219
Hardness (HRc approx.)	60	59.5	58.5	58	57.5	57	55	54	48	20	15

Time-Temperature-Transformation Diagram

Austenitizing temperature 1875°F - 1920°F



Tempering Diagram



Polishing

For highly cosmetic applications, the tool should be heat treated to the highest hardness possible. Size of the tool will determine the maximum hardness. A-1 polish is achievable when proper procedures are followed. A Swiss Steel representative should be consulted when determining the proper hardness.

Welding

DC® can be welded in an annealed and hardened condition if machining errors, design changes or minor cracking have occurred. TIG (Tungsten Inert Gas) should preferably be used.

Welding Guidelines

Process	Tig/MMA
Current	D.C.
Amperage (A)	100-150
Electrode	Tungsten Thorium
Electrode Diameter	0.10 – 0.17
Protective Gas	Argon Helium
Flow (L/mm)	10
Filler Rod	AISI H-13

Welding Temperatures

Preheat Temp.	Maintained Temperature during welding	Cool down to:	Stress Relieve
700°F to 800°F	Above 600°F	150°F	1050°F for 2 hours

Industry Standards

DC® meets or exceeds the following standards:

- NADCA #207 – Latest Revision
- General Motors Powertrain HPDC-G-2
- Ford Motor Company AMTD-DC2010
- Chrysler NP 2080





Technical Datasheet

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