



## EDRO #15™

# Precipitation Hardening Stainless Mold Steel

UltraChem® is a chromium-nickel precipitation-hardening stainless steel, a modified PH alloy grade, which is characterized by:

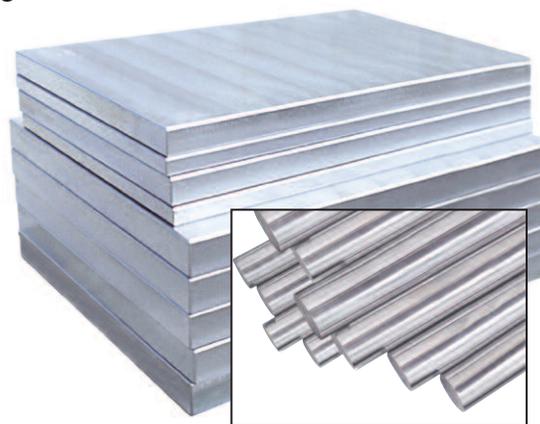
- Exceptional corrosion resistance
- Uniform hardness in all dimensions
- Excellent compressive strength
- Simple low temperature heat treatment with small dimensional change
- Good weldability
- Excellent toughness

UltraChem® is normally supplied in a fully heat treated condition, age hardened to 38 to 42 HRC. Age-hardening has a number of advantages:

- Distortion is virtually eliminated - only a small, predictable shrinkage is experienced (approx. 0.0005 in. per in.)
- Uniform hardness throughout thick sections, with minimum risk of cracking.
- No scale or decarburization of the part.

UltraChem's® excellent corrosion resistance reduces both mold maintenance costs and production costs. Consistently high molding productivity is assured since cooling channels are not subjected to corrosion and loss of cooling efficiency.

UltraChem® is recommended for use in long life molds subjected to severe working conditions, including corrosive materials and atmospheres, high stressed and indentation experienced in today's fast cycling molding operations.



## PROPERTIES

### PHYSICAL DATA

Age-hardened to 42 HRC. Data at room elevated temperatures.

Temperature	68°F (20°C)	390°F (200°C)	750°F (400°C)
Density kg/m <sup>3</sup> lbs/in <sup>3</sup>	7,800 .284	7,750 .282	7,700 .280
Modules of Elasticity N/mm <sup>2</sup> psi	196,000 28.5 x 10 <sup>6</sup>	185,000 27.0 x 10 <sup>6</sup>	174,400 25.4 x 10 <sup>6</sup>
Coefficient of Thermal Expansion			
/°C from 20°C	—	10.8 x 10 <sup>-6</sup>	11.7 x 10 <sup>-6</sup>
/°F from 68°F	—	6.0 x 10 <sup>-6</sup>	6.5 x 10 <sup>-6</sup>
Thermal Conductivity W/m °C Btu in (ft <sup>2</sup> h°F)	112	129	149
Specific heat			
J/kg °C	460	—	—
Btu/lb°F	0.110	—	—

### TENSILE STRENGTH

Typical values. Age hardened condition at 42 HRC.

Testing Temperature 68°F (20°C)	psi	N/mm <sup>2</sup>
Tensile Strength	190,000	1310
Yield Strength	175,000	1208
Reduction of Area	50%	
Elongation in 2"	14%	

### IMPACT STRENGTH

Typical values. Age hardened condition at 42 HRC.

Testing Temperature 68°F (20°C)	ft/lbs.	joules
Impact Strength	25	30

## Applications

- Ultimate mold base
- Cavities for plastics & rubber molds
- Stainless mold with corrosion resistance

Typical Analysis %	C .04	Mn .05	S .08	Cr 14.74
		Ni 4.50	Cu 3.20	Cb .25
Delivery condition	Prehardened to 38-42 RC Hardness is Uniform			
Color code	White			

## Welding

Weld overlays of worn areas and repair welds up to 1" deep can be made on Ultrachem® in the aged condition using shielded metal arc welding with W17-4 PH electrodes. In contrast to other die holder block steels no preheating is required to produce sound welds in Ultrachem® regardless of its pre-weld condition. However, welds should be stressed relieved at 900°F for 1 hour per inch of thickness after welding.

## Services

Saw cutting, Blanchard grinding up to 120" diameter and Surface grinding up to 40" x 192".

## Corrosion Resistance

The corrosion resistance of Ultrachem® makes it highly resistant to rusting from water and humidity. Cooling channels will remain clean indefinitely for maximum cooling efficiency. It can be safely stored without surface deterioration. It better resists corrosion from the more highly corrosive plastics than AISI 420 stainless steels.

## Stock

Sizes up to 8" thick are available from warehouse stock, saw cut to customers width and length.

Sizes above 8" can be produced to customer's exact requirements as individual forgings from billet stock.

Edro will be pleased to provide additional information on our full line of quality mold steels, machining capabilities, and special mold bases.

# UltraChem®

## EDRO

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