

# Formadur® PH X Superclean

## Technical Datasheet

### Chemistry

Typical	C	Cr	Ni	Cu	Nb
Analysis %	0.05	15.0	4.5	3.5	+

### Description

Formadur® PH X Superclean is a corrosion-resistant, martensitic precipitation hardened stainless steel.

It is supplied in prehardened condition with a hardness of 38-42 HRc.

### Characteristics

Excellent resistance to corrosion  
 Excellent polishability  
 Excellent dimensional stability

Good strength  
 Good toughness

### Applications

Formadur® PH X Superclean is recommended for tools / molds for the processing of corrosive plastics.

### Physical Properties (38-42 HRc)

Density: 0.285 lbs/in<sup>3</sup> (room temperature)

Coefficient of Thermal Expansion	70°F - 200°F 5.9 x 10 <sup>-6</sup> /°F	70°F - 400°F 6.0 x 10 <sup>-6</sup> /°F	70°F - 750°F 9.2 x 10 <sup>-6</sup> /°F
Thermal Conductivity	70°F 115Btu/in/ft <sup>2</sup> /hr/°F	300°F 125Btu/in/ft <sup>2</sup> /hr/°F	940°F 155Btu/in/ft <sup>2</sup> /hr/°F

### Mechanical Properties

Toughness (Charpy-V notch): 25 ft-lbs at 38 HRc

Hardness HRc	Y.S. (0.2%) Ksi	T.S. Ksi	EL (%)
38	160	162	12.8
40	170	172	12.2
42	175	180	12.2

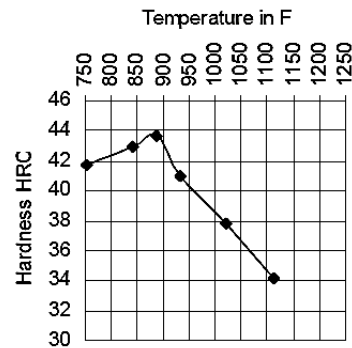
### Polishing

Tool should be polished using the guidelines for polishing stainless steel. When properly polished, an A-1 surface finish is achievable.

### Heat Treatment

Refer to aging diagram below for aging temperatures.

Aging is performed by uniformly heating to aging temperature, equalizing temperature from surface to center, holding for 4 hours at specified temperature, and air cooling.



### Welding

Formadur® PH X Superclean can be welded using shielded metal arc welding process. Oxyacetylene welding is not recommended. Formadur® PH X Superclean usually does not require preheating to prevent cracking.

AWS E/ER 630 filler material should be used to produce properties comparable to the parent material.

If welded in the solution-treated condition, the welds can be aged to the desired strength level after welding.

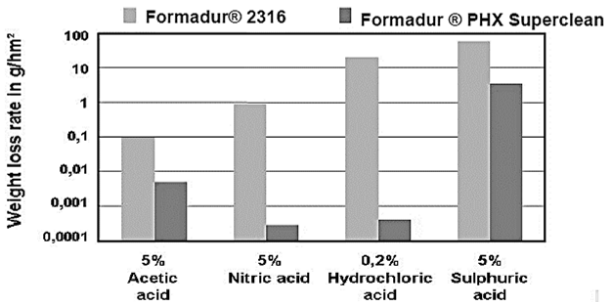
If welded in the over aged condition, the part must be solution treated and then aged. It may be advantageous to pre-heat to approximately 200°F and weld in the over aged (H 1150°F) condition for repair welds more than 1" deep or where high welding stresses are anticipated.

For less critical applications, where high weld strength, hardness, final polish or texture quality is not paramount, a standard austenitic stainless steel filler, E/ER308L, should be considered. This type of filler will not produce the precipitation hardening response.

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### Corrosion Properties



### 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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