



Material Specifications

NI-RESIST 210 SPECIFICATIONS

NI-RESIST 201 TYPE 1 IRON BAR MATERIAL SPECIFICATION

CHARACTERISTICS

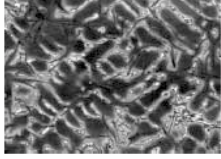
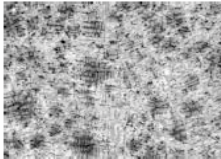
Ni-Resist is characterized by having an austenitic structure matrix produced by means of an alloy with Ni, along with approximately 10% carbide. Ni-Resist offers excellent resistance to heat, corrosion, and wear, without being magnetic. In addition, it has high values to resistance to wear without affecting machinability. It is non-magnetic at any temperature making it especially suitable for electrical applications and navigational components.

The more common applications, however, are corrosion-resisting part particularly in seawater, sulphuric acid, hydrochloric acid, and petroleum refining. Heat resistance is another area where Ni-resist is commonly used (furnace parts, etc.). Ni-Resist posses the same coefficient of expansion as aluminum, making it suitable for wear-resisting inserts in aluminum components such as valve guides in cylinder heads and ring carriers in aluminum pistons.

Specifications:	ASTM A36, Type 1																	
Size Range:	Round: 1.000" – 6.00" diameter (additional sizes available upon request)																	
Condition:	As-Cast and Cold Finished (Rounds)																	
Lengths:	Special Order; Sold 72" only																	
Chemistry	Required Ranges:	<table border="1"> <thead> <tr> <th>ELEMENT</th> <th>TYPICAL %</th> </tr> </thead> <tbody> <tr> <td>Carbon</td> <td>3.00 Max.</td> </tr> <tr> <td>Silicon</td> <td>1.00 – 2.80</td> </tr> <tr> <td>Manganese</td> <td>.50 – 1.50</td> </tr> <tr> <td>Sulfur</td> <td>.12 Max</td> </tr> <tr> <td>Nickel</td> <td>13.50 – 17.50</td> </tr> <tr> <td>Copper</td> <td>5.50 – 7.50</td> </tr> <tr> <td>Chromium</td> <td>1.00 – 2.50</td> </tr> </tbody> </table>	ELEMENT	TYPICAL %	Carbon	3.00 Max.	Silicon	1.00 – 2.80	Manganese	.50 – 1.50	Sulfur	.12 Max	Nickel	13.50 – 17.50	Copper	5.50 – 7.50	Chromium	1.00 – 2.50
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Typical Ranges:																		

MECHANICAL PROPERTIES: (As taken from bar mid-radius)

Tensile Strength:	*25,000 in bars up to 3.00" dia / 20,000 psi in bars over 3.00" dia (Due to the potential for centerline shrinkage in bars under 1.75" dia., tensile values may vary) * Approximate values
Brinell Hardness:	160 – 250 depending on section size. Bar Diameter: 1.00 – 6.00 Minimum BHN: 160 Maximum BHN: 250 Note: BHN in the center of bars 1.750" and smaller may be lower than the values shown because of thermal-center micro

Micro Structure:	 <p data-bbox="630 254 716 281">Figure 1</p> <p data-bbox="370 285 672 369">Typical center area microstructure (100X, etched in 5% Nitrol)</p>	 <p data-bbox="1015 254 1101 281">Figure 2</p> <p data-bbox="1101 285 1403 369">Typical rim area microstructure (100X, etched in 5% Nitrol)</p>
Heat Treat Response:	<p data-bbox="370 380 1370 527">Austenitic alloys cannot be hardened by heat treatment. Ni-Resist may be softened and homogenized by heating to 1800 – 1900 degree F (98 -140 degree C) for 3 – 5 hours and air cooling. Annealing softens the material without detrimental effects on the strength properties. Type 1 Ni-Resist should not be used in applications involving service above 1300 degrees F (704 degrees C).</p>	
Density:	<p data-bbox="370 533 1341 588">Average density is .265 lbs. / in³. To calculate the approximate weight/foot of Ni-R%esist, square \leq the actual diameter, then multiply by 2.5.</p>	

100-70-02 Ductile Iron

Material Specification:

CHARACTERISTICS: Offers very good machinability and excellent surface finishes combined with higher wear resistance, strength and heat treat response compared to Unibar 80-55-06. Noise and vibration damping are good in this grade

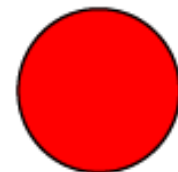
SPECIFICATIONS: ASTM A536, Grade 100-70-02, Meehanite SH-700 (SH100)

CONDITION: As Cast and Cold Finished (Rounds)
As Cast (Rectangles and Squares)

CHEMISTRY: Subordinate to Mechanical Properties

Typical Ranges:	Element	Typical %
	Carbon	3.40-3.85
	Silicon	2.3-3.1
	Manganese	0.1-0.3
	Sulphur	.02 Max
	Phosphorous	0.1 Max
	Balance	Residual

GRADE COLOR CODE



MECHANICAL PROPERTIES: (As taken from bar mid-Radius)

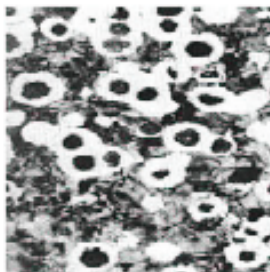
Tensile Strength	Yield Strength	Elongation
100,000 psi Min	70,000 psi Min	2% Min

Brinell Hardness: 240-300 Brinell depending on section size

Diameter (in)	Min BHN	Max BHN
< 1.50	240	300
1.50-3.00	240	290
3.00-6.00	240	280
6.00-10.00	240	270

Hardness Values for Rectangles depend on the ratio of height to width and can be supplied upon request

Microstructure:



Contains Type I & II nodular (spheroidal) graphite in accordance with ASTM A247. The rim contains approximately 200/250 nodules/square mm, and is essentially pearlitic, with the core containing 90/150 nodules/square mm. The matrix is essentially pearlite with some ferrite (approximately 10% depending on section size). Chill carbides will be less than 5%, well dispersed (at 100X magnification).

HEAT TREAT RESPONSE: Unibar Grade 100-70-02 can be hardened by conventional methods to Rc 50 on the bar surface