

SOONV® alloy 028 (UNS N08028/W. Nr. 1.4563) is a highly alloyed austenitic stainless steel offering resistance to a variety of corrosive media. By virtue of its contents of chromium and molybdenum, the alloy offers resistance to both oxidizing and reducing acids and salts. The presence of copper increases its resistance to sulfuric acid. The alloy is used in the chemical and petrochemical processing industry. Alloy tubes are cold worked to high strength levels for downhole service in moderately corrosive deep sour gas wells.

## Physical Constants and Thermal Properties

**Table 2** - Physical & Thermal Properties

Density, lb/in <sup>3</sup> .....	0.29
g/cm <sup>3</sup> .....	8.0
Specific Heat (32-212°F), Btu lb °F .....	0.105
(0-100°C), J/kg °C .....	450
Coefficient of Expansion, 10 <sup>-6</sup> in/in °F (microm/m °C)	
70-200°F (21-93°C) .....	8.3 (15.0)
70-500°F (21-260°C) .....	8.8 (15.9)
70-800°F (21-427°C) .....	9.3 (16.8)
Thermal Conductivity <sup>A</sup> , Btu in/ft <sup>2</sup> h °F .....	66
W/m °C .....	11.4
Electrical Resistivity <sup>A</sup> , ohm circ mil/ft .....	594
micro ohm m .....	0.99
Young's Modulus <sup>A</sup> , 10 <sup>3</sup> ksi .....	29.0
GPa .....	200

<sup>A</sup> Annealed product, tested at room temperature

## Applicable Specifications

SOONV alloy 028 is designated as UNS N08028 and W. Nr. 1.4563. The alloy is listed in NACE MR-01-75.

ASTM B 668, B709, B 829  
ASME SB-668, SB-709, SB-829

**Table 1** - Limiting Chemical Composition, %

Nickel .....	30.0-34.0
Chromium .....	26.0-28.0
Molybdenum .....	3.0-4.0
Iron .....	Balance*
Carbon .....	0.030 max.
Silicon .....	1.00 max.
Manganese .....	2.50 max.
Phosphorus .....	0.030 max.
Sulfur .....	0.030 max.
Copper .....	0.6-1.4

\*Reference to the 'balance' of a composition does not guarantee this is exclusively of the element mentioned but that it predominates and others are present only in minimal quantities.

## Mechanical Properties

**Table 3** - Typical Mechanical Properties

<b>(Annealed)</b>	
Tensile Strength, ksi .....	73
MPa .....	500
Yield Strength (0.2% Offset), ksi .....	31
MPa .....	214
Elongation, % .....	40
Hardness (HRB) .....	80-90
<b>(Cold Worked)</b>	
Tensile Strength, ksi .....	130
MPa .....	896
Yield Strength (0.2% Offset), ksi .....	110
MPa .....	758
Elongation, % .....	15
Hardness (HRC) .....	33 max.

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