

## Haynes® HR-120® alloy

UNS N08120  
W. Nr 2.4854

### Applicable Specifications

Wire & Bar    ASTM B408

**Description:** Haynes® HR-120® alloy is a solid solution strengthened heat resistant alloy that provides excellent strength at elevated temperature combined with very good resistance to carburizing and sulfidizing environments. Its oxidation resistance is comparable to other widely used Fe-Ni-Cr materials but its strength at temperatures up to 2200°F is significantly higher. HR-120® also has excellent resistance to hot corrosion in molten salt environments used for parts heat treating. The alloy can be readily cold or hot formed and is commonly welded using Haynes 556® filler wire and MULTIMET® electrodes.

**Applications include:** Heat treatment baskets, Wire mesh belts, Heat treating fixtures, Basket liners, Muffles/retorts, Recuperators, Fluidized bed components, Waste incinerators, Turbine engine parts

**Industries supplied include:** Industrial Heat Treating, Chemical/Waste Processing, Food Processing

### Nominal Composition

|     | C    | Mn  | Si   | B    | Ni    | Cr    | Co   | Mo   | Nb (Cb) | W    | N    | Al   | Fe     |
|-----|------|-----|------|------|-------|-------|------|------|---------|------|------|------|--------|
| min | 0.03 | -   | -    | -    | 35.00 | 23.00 | -    | -    | 0.40    | -    | 0.15 | -    | 33 Bal |
| max | 0.10 | 1.5 | 0.03 | 0.01 | 39.00 | 27.00 | 3.00 | 2.50 | 0.90    | 2.50 | 0.30 | 0.40 | -      |

### Physical Properties

|                           | At 70°F                          | At 20°C                  |
|---------------------------|----------------------------------|--------------------------|
| Density                   | 0.291 lb/in <sup>3</sup>         | 8.07 g/cm <sup>3</sup>   |
| Modulus of Elasticity (E) | 28.7 x 10 <sup>3</sup> ksi       | 198 GPa                  |
| Modulus of Rigidity (G)   | 11.0 x 10 <sup>3</sup> ksi       | 76 GPa                   |
| Coefficient of Expansion  | 9.87 µin/in-°F (70-1800°F)       | 17.8 µm/m-°C (25-1000°C) |
| Electrical Resistivity    | 41.4 µohm-in                     | 105.2 µohm-cm            |
| Thermal Conductivity      | 83 Btu-in/ft <sup>2</sup> -hr-°F | 12.0 W/m-°C              |

### Typical Mechanical Properties

| Condition | Heat Treatment            | Tensile Strength          | Suggested Operating Conditions |
|-----------|---------------------------|---------------------------|--------------------------------|
| Annealed  | 2048-2246°F (1120-1230°C) | 110-140 ksi (758-965 MPa) | Up to 2200°F (1205°C)          |

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