

X-WIRES / Eco5 ALLOYED

SPECIAL ALLOYED SLICKLINE WIRE



CHEMICAL COMPOSITION OF STAINLESS STEEL

| Eco5 | | | | | | | | | | | | | | | |
|-------|------|-----|-----|-------|------|------|----|-----|------|------|-----|---|----|-----|-------|
| Grade | C | Si | Mn | p | S | Cr | Mo | Ni | N | Cu | Ti | W | Co | Fe | PREN* |
| Eco5 | 0.03 | 0.4 | 1.5 | 0.035 | 0.02 | 24.7 | 3 | 6.3 | 0.10 | 0.03 | 0.1 | - | - | 0.1 | 35 |

* PREN: Pitting Resistance Equivalent Number ($\text{PREN} = \% \text{Cr} + (3.3 \times \% \text{Mo}) + (30 \times \% \text{N})$)

PHYSICAL PROPERTIES

| Density: 0.278 lb./in ³ | | Eco5 | Melting Range: 2525-2630°F |
|------------------------------------|--|------|----------------------------|
| Specific Heat Capacity at 212°F | | | 0.119 Btu/lb/°F |
| Thermal Conductivity at 212°F | | | 8.4 Btu/hr-ft-°F |
| Poisson's Ratio | | | 0.3 |
| Elastic Modulus at 72°F | | | 29 x 10 psi |

MECHANICAL PROPERTIES

| Eco5 | |
|--------------------------|---------|
| 0.2% Yield Strength, ksi | 65 min |
| Tensile Strength, ksi | 90 min |
| Elongation, % | 25 min |
| Hardness [HRC] | 293 max |

COMPARISON OF CHARACTERISTICS OF GRADE IN DIFFERENT CORROSIVE MEDIA

| Eco5 | |
|--|--|
| Hydrogen Sulfide, Carbon Dioxide | |
| Very good corrosion resistance in CO ₂ concentration up to 35% | |
| Chloride, Seawater, Salty Solution, Etc. | |
| Excellent resistance to corrosion cracking in concentration up to 30% chloride | |
| Chloride, Hydrogen Sulfide, Carbon Dioxide | |
| Very good resistance to general corrosion, pitting corrosion and occurrence of inter-granular corrosion (IGC). temperature up to 150°C | |

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Corrosion Resistance

- **General Corrosion:**
Because of its high chromium (24.7%), molybdenum (3%), and nitrogen (0.10%) contents, the corrosion resistance properties of Eco5 are superior to that of Eco3 in most environments.
- **Localized Corrosion Resistance:**
The chromium, molybdenum, and nitrogen in Eco5 also provide excellent resistance to pitting and crevice corrosion even in very oxidizing and acidic solutions.
- **Stress Corrosion Resistance:**
The Eco5 microstructures is known to improve the stress corrosion cracking resistance of stainless steels. Chloride stress corrosion cracking of austenitic stainless steels can occur when the necessary conditions of temperature, tensile stress, oxygen, and chlorides are present. Since these conditions are not easily controlled, stress corrosion cracking has often been a barrier to utilizing Eco3.
- **Corrosion Fatigue Resistance:**
The Eco5 combines high strength and high corrosion resistance to produce high corrosion fatigue strength. Applications in which processing equipment is subject to both an aggressively corrosive environment and to cycle loading can benefit from the properties of Eco5.

Structure

The chemical analysis of Eco5 is optimized to obtain a typical 50 a/ 50 g microstructure after solution annealing treatment at 1900°/1922°F (1040°/1080°C). Heat treatments performed above 2000°F may result in an increase of ferrite content.

Like all duplex stainless steels, Eco5 is susceptible to precipitation of intermetallic phases, usually referred to as sigma phase. Intermetallic phases precipitate in the range of 1300°F to 1800°F, with the most rapid precipitation occurring at about 1600°F. Thus, it is prudent to have 2205 pass a test for the absence of intermetallic phases, such as those in ASTM A923.