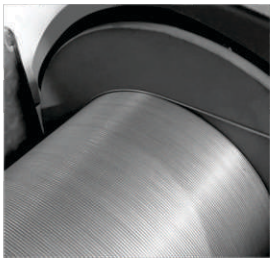
SPECIAL ALLOYED SLICKLINE WIRE



Chemical composition of stainless steel ECO-5															
Grade	C	Si	Mn	p	S	Cr	Mo	Ni	N	Cu	Ti	W	Co	Fe	PREN*
ECO-5	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 (PREN= %Cr + (3.3 x %Mo) + (30 x %N))

Physical properties		
Density: 0.278 lb/in3	ECO-5	MeltingRange: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 ECO-5	
0.2% Yield Strength, ksi	65 min
Tensile Strength, ksi	90 min
Elongation, %	25 min
Hardness [HRC]	293max

COMPARISON OF CHARACTERISTICS OF GRADE IN DIFFERENT CORROSIVE MEDIA ECO-5
Hydrogen sulfide, carbon dioxide
Very good corrosion resistance in CO2 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

Corrosion Resistance

General Corrosion:

Because of its high chromium (24.7%), molybdenum (3%), and nitrogen (0.10%) contents, the corrosion resistance properties of ECO-5 are superior to that of ECO-3 in most environments.

Localized Corrosion Resistance:

The chromium, molybdenum, and nitrogen in ECO-5 also provide excellent resistance to pitting and crevice corrosion even in very oxidizing and acidic solutions.

Stress Corrosion Resistance:

The ECO-5 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 ECO-3.

Corrosion Fatigue Resistance:

The ECO-5 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 ECO-5.

Structure

The chemical analysis of ECO-5 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, ECO-5 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.