Description

Stainless Steel Grade **304LN/1.4318** is a low-carbon, nitrogen-enhanced version of the 304 stainless steel alloy. This grade is specifically designed to provide enhanced strength and improved corrosion resistance compared to standard 304 stainless steel. The addition of nitrogen increases the strength and helps to stabilize the structure, making it suitable for applications that require high tensile strength and resistance to stress corrosion cracking.

Chemical Composition

- **Chromium (Cr)**: 18.0 - 20.0%
- **Nickel (Ni)**: 8.0 - 12.0%
- **Manganese (Mn)**: ≤ 2.0%
- **Nitrogen (N)**: 0.10 - 0.20%
- **Carbon (C)**: ≤ 0.030%
- **Silicon (Si)**: ≤ 1.0%
- **Phosphorus (P)**: ≤ 0.045%
- **Sulfur (S)**: ≤ 0.030%

Mechanical Properties

- **Tensile Strength**: 520 MPa (75,000 psi) minimum
- **Yield Strength**: 275 MPa (40,000 psi) minimum
- **Elongation**: 40% minimum (in 50 mm)
- **Hardness**: Typically 200 HB (Brinell Hardness)

Thermal & Physical Properties

- **Density**: 7.93 g/cm³
- **Melting Point**: 1400 - 1450°C (2552 - 2642°F)
- **Thermal Conductivity**: 16.2 W/m·K (at 100°C)

- **Specific Heat**: 500 J/kg·K
- **Coefficient of Thermal Expansion**: 16.0 µm/m·K (at 20 - 100°C)

Other Designations

- **DIN Number**: 1.4318
- **UNS Number**: S30453
- **EN Number**: X2CrNiN18-9
- **ISO Number**: 1.4318

Fabrication and Heat Treatment

- **Welding**: Grade 304LN can be easily welded using standard techniques. It is suitable for all common welding methods including MIG and TIG welding.
- **Machining**: Machinability is comparable to that of Grade 304, with good results achieved with appropriate tooling and techniques.
- **Heat Treatment**: This grade is not hardened by heat treatment. It can be annealed at temperatures of 1010 - 1120°C (1850 - 2050°F) and then rapidly cooled to ensure optimal mechanical properties and corrosion resistance.

Applications

- **Chemical Processing**: Used in equipment and components exposed to corrosive environments.
- **Marine Environments**: Suitable for parts exposed to seawater or other chloride-rich environments.
- **Pressure Vessels**: Ideal for high-strength applications requiring resistance to stress corrosion cracking.
- **Structural Components**: Commonly used in construction and architecture where strength and durability are crucial.

Supplied Forms

- **Bars**: Available in various diameters and lengths.
- **Rods**
- **Sections**
- **Custom Shapes**: Can be supplied according to specific customer requirements.

Features

- **Enhanced Strength**: The addition of nitrogen improves tensile strength and resistance to deformation.
- **Corrosion Resistance**: Superior to standard 304 steel, especially in chloride-containing environments.
- **Stress Corrosion Resistance**: Better resistance to stress corrosion cracking compared to standard 304.
- **Low Carbon Content**: Reduces the risk of carbide precipitation and improves weldability.