

# Cromgard C18-1

## Introduction

Cromgard C18-1 is a low carbon, dual stabilized, ferritic stainless steel. With 18% chromium the steel has good corrosion resistance in moderately corrosive environments and good oxidation resistance at elevated temperatures.

Cromgard C18-1 has good high temperature oxidation resistance and creep resistance and this makes it suitable for use in applications in automotive exhaust systems.

Cromgard C18-1 is a chromium based stainless steel and can be stabilized with niobium and/or titanium.

Annealed Cromgard C18-1 is ductile and can be formed using a wide variety of roll forming or mild stretch bending operations as well as the more common drawing and bending operations. C18-1 does not harden excessively during cold working.

As a ferritic grade of Stainless Steel, Cromgard C18-1 is not susceptible to stress corrosion cracking (SCC).

## Welding

Cromgard C18-1 has limited weldability and should not be used in the as-welded condition for dynamic or impact loaded structures. C18-1 can undergo grain growth in the heat affected zone of weldments, which may adversely affect the mechanical properties in these zones.

Applications involving welded C18-1 are thus generally limited to a maximum thickness of 2.5mm (0.098"). Edge welds are not recommended for applications using Cromgard C18-1. This grade is not recommended for cryogenic applications as brittle fracture could occur at sub-zero temperatures.

## Corrosion Resistance

Cromgard C18-1 has good resistance to a wide variety of corrosive environments. Cromgard C18-1 is generally used in automotive industry for exhaust systems. Atmospheric corrosion resistance is good, although in highly polluted or marine environments staining may occur.

## Chemical Composition

Element	Range (%)
Carbon	0.030 max
Silicon	0.750 max
Manganese	1.000 max
Phosphorous	0.040 max
Sulfur	0.015 max
Nitrogen	
Chromium	17.50 - 18.50 max
Nickel	
Niobium	3xC+0..3 - 1.000
Titanium	0.1-0.6

Per ASTM A240 & EN 10088-2

## Mechanical Properties

Element	Range
Tensile Strength	62
0.2 % Proof Strength (ksi)	36
Elongation*	18%

Per ASTM A240 at transverse at ambient temperature

Values are minimum unless stated

\* Elongation over a length of 50.8 mm

## Physical Properties

Property		Value
Density (kg/m)		0.28
Specific Heat Capacity (J/ kg K)		460
Thermal Conductivity	100°C (W/ m K)	210
	500°C (W/ m K)	24.2
Resistivity (x10-9 Ωm)		26.3
Coefficient of Thermal Expansion	0-100°C (x10 <sup>-6</sup> K <sup>-1</sup> )	630
	0-300°C (x10 <sup>-6</sup> K <sup>-1</sup> )	10.2
	0-500°C (x10 <sup>-6</sup> K <sup>-1</sup> )	11.4
	0-700°C (x10 <sup>-6</sup> K <sup>-1</sup> )	11.6
Melting Point (°C)		1390-1460
Magnetic		Yes

Per ASTM A240 & EN 10088-2



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