

CarTech® 22-3 Alloy High Thermal Expansion Alloy

Type Analysis

Single figures are nominal except where noted.

Carbon	0.10 %	Manganese	0.50 %
Silicon	0.25 %	Chromium	3.10 %
Nickel	22.00 %	Iron	Balance

General Information

Description

CarTech 22-3 Alloy has been used in applications requiring a ferrous alloy with a high coefficient of thermal expansion. The thermal expansion properties are higher than any of the alloys in the Type 300 stainless series. CarTech 22-3 Alloy is austenitic and nonmagnetic and is one of the principal high thermal expansion alloys used in the bimetal industry.

Corrosion Resistance

Important Note: The following 4-level rating scale is intended for comparative purposes only. Corrosion testing is recommended; factors which affect corrosion resistance include temperature, concentration, pH, impurities, aeration, velocity, crevices, deposits, metallurgical condition, stress, surface finish and dissimilar metal contact.

Humidity	Good	
----------	------	--

Properties

Physical Properties

Specific Gravity	8.18
Density	0.2940 lb/in ³
Mean CTE	
77 to 212°F, Annealed	10.6 x 10 ⁻⁶ in/in/°F
77 to 392°F, Annealed	10.9 x 10 ⁻⁶ in/in/°F
77 to 572°F, Annealed	11.1 x 10 ⁻⁶ in/in/°F
77 to 662°F, Annealed	11.1 x 10 ⁻⁶ in/in/°F
77 to 752°F, Annealed	11.0 x 10 ⁻⁶ in/in/°F
77 to 842°F, Annealed	11.1 x 10 ⁻⁶ in/in/°F
77 to 932°F, Annealed	11.1 x 10 ⁻⁶ in/in/°F
77 to 1112°F, Annealed	11.1 x 10 ⁻⁶ in/in/°F
77 to 1292°F, Annealed	11.1 x 10 ⁻⁶ in/in/°F

Coefficient of thermal expansion: as annealed

Temperature		Average Coefficient	
77°F to	25°C to	10 ⁻⁶ /°F	10 ⁻⁶ /°C
212	100	10.55	18.99
392	200	10.94	19.69
572	300	11.06	19.91
662	350	11.08	19.94
752	400	11.00	19.80
842	450	11.05	19.89
932	500	11.06	19.91
1112	600	11.11	19.99
1292	700	11.14	20.05

Modulus of Elasticity (E)

27.0 x 10³ ksi

CarTech® 22-3 Alloy High Thermal Expansion Alloy

Electrical Resistivity (70°F)

462.0 ohm-cir-mil/ft

Other Information

Forms Manufactured

- Bar-Flats
- Bar-Squares
- Strip
- Wire-Shapes
- Bar-Rounds
- Billet
- Wire

Technical Articles

- [Selecting Controlled Expansion Alloys](#)

Disclaimer:

The information and data presented herein are typical or average values and are not a guarantee of maximum or minimum values. Applications specifically suggested for material described herein are made solely for the purpose of illustration to enable the reader to make his/her own evaluation and are not intended as warranties, either express or implied, of fitness for these or other purposes. There is no representation that the recipient of this literature will receive updated editions as they become available.

Unless otherwise specified, registered trademarks are property of CRS Holdings Inc., a subsidiary of [Carpenter Technology Corporation](#)
Copyright © 2020 CRS Holdings Inc. All rights reserved.

Visit us on the web at www.cartech.com

Edition Date: 01/01/1983