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VWE 304 information sheet

Information

304 falls under the category of austenitic Stainless steels.

304 Composition

ELEMENT	RANGE (%)
Carbon (C)	0.07
Silicon (Si)	0.75
Manganese (Mn)	2.00
Phosphorous (P)	0.045
Sulphur (S)	0.015
Nitrogen (N)	0.10
Chromium (Cr)	18.0 to 19.5
Nickel (Ni)	8.0 to 10.50

Introduction

The Cr-(Mn)-Ni austenitics are the most versatile and widely used of all the stainless steel. Their chemical composition, mechanical properties, weldability and corrosion / oxidation resistance provide the best all-round performance stainless steels at relatively low cost. They have excellent low temperature properties and respond well to hardening by cold working.

The carefully controlled chemical composition of the CR-(Mn)-Ni austenitics enables them to be deep drawn without intermediate annealing. This has made them dominant in the manufacture of drawn stainless steel parts such as sinks and saucepans. They are readily press-braked or roll formed into a variety of shapes for applications in the industrial, architectural and transportation fields.

Atmospheric Corrosion

The atmospheric corrosion resistance of austenitic stainless steel is unequalled by virtually all other uncoated engineering material. From the report 'Atmospheric Corrosion Testing in Southern Africa - Results of a Twenty Year Exposure Programme' by BG Callaghan, Division of Materials Science and Technology, CSIR.

In tests conducted by the CSIR of which the results were published in a report called "Atmospheric Corrosion Testing in South Africa – Results of a twenty year exposure programme" the following was noted:

"In appearance, all the metals showed discolouration at the more severe sites after 20 years. Even the most corrosion resistant alloy tested here, 316 stainless steel, showed severe staining.

None of the metals were washed during the exposure programme and this clearly emphasises the importance of keeping stainless steel clean and that stainless steel is a LOW maintenance (not NO maintenance) option in atmospheric corrosion applications. All the stainless steels and aluminium showed some pitting.

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*304 PERFORMANCE AFTER 20 YEARS SERVICE IN
MEDIUM TO SEVERE MARINE ENVIRONMENT*

Pitting Corrosion

Pitting resistance is important, mainly in applications involving contact with chloride solutions, particularly in the presence of oxidizing media. These conditions may be conducive to localized penetration of the passive surface film on the steel and a deep pit may well be more damaging than a much greater number of relatively shallow pits. Where pitting corrosion is anticipated, steels containing molybdenum (such as the CR-Ni-Mo austenitics) should be considered.

Painting & Linishing

VWE products in 304 can go through the standard powder coating process, which follows the 7 Stage Zinc Phosphate system as outlined in the VWE Paint spec document, further enhancing the corrosion resistance of the 304 material.

In many circumstances our 304 products remain unpainted and gets polished for a more aesthetically pleasing finish.

Oxidation Resistance

Cr-Ni-Mo have good oxidation resistance in intermittent service up to 870°C and in continuous service to 920°C.

Works Cited.

3CR12 Product information. England: Cromweld Stainless Steel. Print.

The Atmospheric Corrosion Resistance Of Stainless Steels. South Africa: Columbus Stainless (Pty). Print.

Cr-Ni-Mo Austenitic Stainless Steels. South Africa: Columbus Stainless (Pty). Print.