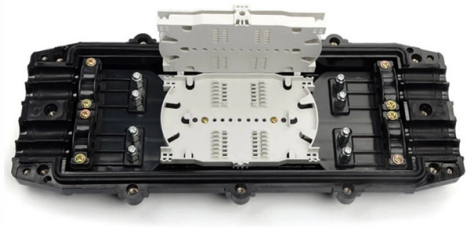
Data measured by the spectrometer for 316



Overview

In this work, we investigate the temperature-dependent evolution of the surface composition and optical properties (reflectivity, emissivity) of stainless steel 316L.

Key Takeaways

AISI 316 stainless steel typically shows a chemical composition of 16–18% chromium, 10–14% nickel, 2–3% molybdenum, and a carbon content below 0. 08% (0. 03% for 316L) as measured by optical emission spectrometry.

Chemical Composition

Spectrometer analysis of AISI 316 stainless steel provides the following typical elemental ranges: Chromium (Cr): 16–18%Nickel (Ni): 10–14%Molybdenum (Mo): 2–3%Carbon (C): ≤0. 08% for 316, ≤0. 03% for 316L to reduce carbide precipitation Manganese (Mn): ≤2%Silicon (Si): ≤1%Phosphorus (P): ≤0.

045%Sulfur (S): ≤0. 03%Iron (Fe): Balance These values are typically obtained using optical emission spectrometers, which detect the elemental composition by analyzing the light emitted from a sample when excited by an energy source.

Physical and Mechanical Properties

Spectrometer data often complements mechanical testing to verify material quality.

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

For AIS

I 316: Density: ~8. 0 g/cm³Melting point: 1375–1400°CTensile strength: 515–720 MPaYield strength: 205–290 MPaElongation: 40% minimumHardness: 145–190 HB Special Considerations316L is the low-carbon variant, preferred for welded components to minimize carbide precipitation. 316H has higher carbon content for elevated temperature applications.

Spectrometer readings are crucial for confirming molybdenum content, which enhances corrosion resistance, particularly against pitting and crevice corrosion in chloride environments.

Summary

Spectrometer measurements for AISI 316 stainless steel provide precise elemental composition, especially carbon, chromium, nickel, and molybdenum, which are critical for corrosion resistance and mechanical performance. These data ensure the material meets ASTM, AISI, and ASME specifications for industrial and engineering applications.

Article Content

Normal spectral emissivity measurement study of high-temperature

The analysis of the measured data indicates that the average emissivity of the 316L high-temperature alloy demonstrates an exponential relationship with thermal oxidation temperature and a

Optical properties, surface composition and desorption of Stainless ...

In this work, we investigate the temperature-dependent evolution of the surface composition and optical properties (reflectivity, emissivity) of stainless steel 316L.

Identification of high-grade steel type AISI 316/AISI 316L

This Data Bulletin shows analysis results of a high-grade steel analyzed with the optical emission spectrometer ferro.lyte ®.

Spectral directional and total hemispherical emissivity of virgin and ...

Experimental results obtained for this material at high temperatures and different pressure conditions together with microstructural characterization using SEM, XRD, Raman spectroscopy and

XPS Analysis of Stainless Steel Surfaces

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

The Thermo ScientificTM K-AlphaTM X-ray Photoelectron Spectrometer (XPS) System was used to analyze the surface and layer composition of stainless steel surfaces to identify the successfulness of

AISI 316 Stainless Steel Properties, SS 316 Grade Density,

The data sheet below shows SS 316 material physical properties, such as density, melting point, thermal conductivity, thermal expansion, magnetic, modulus of elasticity, specific heat capacity, etc.

Measurements of thermophysical properties of solid and liquid ...

In this work, we perform high accuracy measurements of thermophysical properties for the National Institute of Standards and Technology standard reference material for 316L stainless steel.

Determining Carbon Content to Identify High-Grade Steels

High-grade steel type AISI 316 and AISI 316L can be analyzed with the optical emission spectrometer ferro.lyte®, and by determining the carbon content.

Surface Tension and Thermal Conductivity of NIST SRM 1155a

Thermal diffusivity data were compared to both laser flash measurements, performed on the same material, as well as to data from the literature of other AISI 316 stainless steels with similar

BYJU''S Online learning Programs For K3, K10, K12, NEET, JEE,

What is a Quadrupole? Mass spectrometry determines the chemical by calculating the typical mass fragments formed by the ionization of the material. Test molecules are ionized by an electron beam,

Spectroscopic and microscopic investigation of the corrosion of 316 ...

The present study of oxide composition and morphology was undertaken in order to understand the corrosion of 316/316L stainless steel in oxygen-controlled LBE, and the anomalously

Compositional depth profiles of the type 316 stainless steel undergone ...

In this work, the feasibility of laser-induced breakdown spectroscopy for the compositional depth profile analysis of type 316 stainless steel which was corroded by liquid lithium

AISI 316 Stainless Steel Properties, SS 316 Grade

SS 316 Data Sheet & Specification ASTM SAE AISI 316 stainless steel data sheet and specification are listed in the table below, including chemical composition

© 2026 CJC FIBRE CONSULTANTS - All rights reserved

Austenitic Stainless Steel Alloy 316 / 316L

Type 316 is an austenitic stainless steel with added molybdenum which gives the alloy improved corrosion resistance. It is commercially almost as popular as 304.

Spectrometer Units: What Does a Spectrometer Measure?

Once you understand the basics of spectrometers, you will need to understand exactly how it measures and provides results before you can analyze the data the equipment offers. While a good bit of the

Characterisation of the growth of the oxide layer on wrought and LPBF ...

Passive film formation of wrought and laser powder bed fusion (LPBF) 316L with different heat treatments was investigated. The passive films of the samples were formed after

Estimating pitting descriptors of 316 L stainless steel by machine ...

Despite considerable achievements in the predictive modelling of pitting corrosion 1,2,3,4,5,6, more research is still undoubtedly needed. The challenge of estimating relevant pitting

Application of laser induced breakdown spectroscopy for fast depth ...

Depth profiling analysis for alloys which were corroded by liquid alkali metal can provide information on elemental distributions that is useful for determination of corrosion degree. In our

Contact Us

Continue your research online:

Website: https://cjcconsultants.co.za
Technical inquiry: https://cjcconsultants.co.za/contact.html

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

© 2026 CJC FIBRE CONSULTANTS - All rights reserved