PRODUCT DATASHEET

F22

Grade

ASTM A182 Grade F22 (UNS K21590), also known as 2 1/4 Cr. 1Mo. Low alloy steel typically containing 2.25% Chromium and 1% Molybdenum to give enhanced mechanical properties.

Type

Alloy Steel usually supplied in the hardened, quenched and tempered condition

Overview

Very good weldability, and so may be readily welded to itself or weld inlayed. The grade does require a post weld heat treatment at 620°C min in order to meet sour service (NACE MR0175/ ISO 15156) requirements. The good weldability of the grade means that it is frequently used where welding is a requirement, such as for weld clad or inlaid components.

Composition	
Element	**Weight%**
Carbon	0.08 - 0.15
Silicon	0.15 - 0.5
Manganese	0.3 - 0.6
Phosphorus	0.025 max
Sulphur	0.025 max
Molybdenum	0.9 - 1.1
Chromium	2 - 2.5
Nickel	0.5 max
Manganese	0.3 - 0.6

Notes: Various other hybrid analysis available in order to enhance mechanical properties.

S and P values conform with API 6A, PSL 3 requirements. Higher values may be permitted if delivered to alternative specifications

Application

Grade is typically used for pressure containing applications such as larger valve bodies, wellheads, connectors or pipework.

Mechanical Propeties

Hardened followed by oil or water quenching and tempering

Typical tempering range is 620 – 680°C, depending on properties required

Property	Values
0.2% Yeild Strength	75 KSI min (517 MPA min)
Ultimate Tensile Strength	95 KSI min (655 MPA min)
Elongation	18
Reduction of area	35% min
Hardness	197 - 237 HBN

Notes: Impact toughness is excellent to temperatures as low as -60 °C with typically 27J average and 20J single achieved, this is limited though dependent on a number of factors such as ruling section, chemical composition and heat treatment condition, with impact toughness achieved decreasing with higher strength, ruling section and at lower test temperatures due to the materials Ductile / Brittle transition temperature.

Minimum hardness is based on API 6A requirements. Maximum hardness shown is based on compliance with NACE MR0175 / ISO 15156