

AISI 410 Stainless Steel

Grade: AISI 410 martensitic stainless steel (UNS S41000, ASTM A 182, A276, ASTM A479 chemistry only), NACE MR-0175/ISO 15156*

Type: Typically supplied in the hardened and double tempered condition (197-237HBW/*22 HRC max)

Nominal Composition	
Element	Weight %
Carbon	0.15 max
Silicon	1.0 max
Manganese	2.0 max
Phosphorus	0.040 max
Sulphur	0.030 max
Chromium	11.5 – 13.5

Notes

The grade has good wear and corrosion resistance. Use is limited within NACE to supply the grade in the hardened and double tempered condition to a maximum hardness of 22 HRC.

Mechanical Properties Condition

Typical values are shown below.

Also produced in 60 KSI MSYS and non-NACE above 105 KSI MSYS conditions.

Property	Values
Ultimate Tensile Strength *	100 KSI min (698 N/mm ²)
0.2 % Yield Strength *	80 KSI min (551 N/mm ²)
Elongation *	18 % min
Reduction of Area *	35 % min
Charpy Impact Toughness	20/27 min/min ave J at -29° C
Hardness	237 BHN (22 HRC maximum)

Notes:

* Designations shown are based on API 6A PSL 3 requirements

Low temperature impact toughness of this grade is not as good as other substitute grades. Maximum hardness shown is based on compliance with NACE MR0175/ ISO 15156. Material must also be double tempered to meet sour service requirements. Care must be exercised using this grade in sour environments containing H₂S.

Grade is typically used for pressure containing applications such as valve bodies, tubing hangers, it is also used for valve gates and stems.

Good weldability, and so may be welded to itself or weld inlayed. The grade does require a post weld heat treatment at 621°C min in order to meet sour service (NACE MR017/ ISO 15156) requirements.

Non-NACE condition hardened and single tempered product can be supplied where applications call for 105K min yield, however this condition significantly reduces the impact toughness.