

## SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM, ASTM 415, Grade F6NM

### Introduction :

Stainless Steel 415 is a chromium nickel stainless steel with additional molybdenum. In a temperature range of -60 to 3000°C it provides good toughness. Due to its molybdenum content it provides equal corrosion resistance. It has moderately high base cost and high tensile strength among wrought martensitic stainless steel. The mechanical properties of Grade 415 are high due to the concentration of molybdenum and nickel in the chemical composition.

### Chemical Composition

	SS 415	TYPE 415	WNR 1.4314	UNS S41500	AISI F6NM	ASTM 415	GRADE F6NM
Carbon	0.05 max	0.05 max	0.05 max	0.05 max	0.05 max	0.05 max	0.05 max
Manganese	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00
Phosphorus	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max
Sulfur	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max
Silicon	0.60 max	0.60 max	0.60 max	0.60 max	0.60 max	0.60 max	0.60 max
Chromium	11.5-14.0	11.5-14.0	11.5-14.0	11.5-14.0	11.5-14.0	11.5-14.0	11.5-14.0
Nickel	3.5-5.5	3.5-5.5	3.5-5.5	3.5-5.5	3.5-5.5	3.5-5.5	3.5-5.5
Molybdenum	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00	0.50-1.00

### Mechanical Properties

	SS 415	TYPE 415	WNR 1.4314	UNS S41500	AISI F6NM	ASTM 415	GRADE F6NM
Tensile Strength $R_m$ N/mm <sup>2</sup>	700-800	700-800	700-800	700-800	700-800	700-800	700-800
0.2% Offset Yield Strength $R_p \geq$ N/mm <sup>2</sup>	520	520	520	520	520	520	520
Elongation in 2 inches, %	15 min	15 min	15 min	15 min	15 min	15 min	15 min

### Standard Available in forms :

- ASTM A182/ ASME SA182 Stainless Steel Pipe Fittings
- ASTM A213 / ASME SA213 Seamless Stainless Steel Pipes
- ASTM A240/ ASME SA240 Stainless Steels Sheets / Plates
- ASTM A249/ ASME SA249 Stainless Steel Welded Tubes
- ASTM A269/ ASME SA269 Stainless Steel Tubes
- ASTM A270/ ASME SA270 Stainless Steel Sanitary Tubes
- ASTM A312/ ASME SA312 Stainless Steel Pipes
- ASTM A403/ ASME SA403 Stainless Steel Pipe Fittings
- ASTM A554/ ASME SA554 Stainless Steel Welded Tubes
- ASTM A731/ ASME SA731 Stainless Steel Pipes
- ASTM A789/ ASME SA789 Stainless Steel Tubes
- ASTM A790/ ASME SA790 Stainless Steel Pipes
- ASTM A791/ ASME SA791 Stainless Steel Tubes

## Products Available in forms :

- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Plates
- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Pipes
- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Round Bar
- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Tube
- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Flanges
- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Wire
- SS 415, Type 415, WNR 1.4313, UNS S41500, AISI F6NM Fittings

## Application

- Valve Bodies
- Flanges
- Valve Seats
- Oil Field Equipment
- Hydro-electric turbine systems
- Pumps
- Chemical Process Plant
- Pressure Die Casting

## Characteristics

- Basic pitting and crevice corrosion resistance
- Moderate sulphide stress cracking resistance
- Good yield strength
- Better toughness than most martensitic grades
- Good weldability compared to other martensitic grades. Still requires pre- and post-weld heat treatment



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