

SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405,

Grade 405, AFNOR Z4 CA 13

Introduction :

Stainless steel 405 is a ferritic stainless steel with lower corrosion resistance than stainless steel 430. It has similar corrosion resistance to that of stainless steel 410. 405 stainless steel is been annealed by soaking at 649-760°C (1200-1400°F) and then cooled in air. For welding grade 405 stainless steel shielded fusion and resistance methods are recommended. For this grade 405 oxyacetylene welding is not suitable. Grade 405 stainless steel hardening is controlled by the use of 405 Cb electrodes that contain columbium. 405 stainless steel ductility is maximized by post weld annealing. 405 stainless steel is soaked at 817-871°C and the temperature is then increased to 1038-1121°C. For this stainless steel grade forging below 816°C (1500°F) is not recommended. Forging is followed by air cooling and finally annealing. In grade 405 stainless steel usage of forming techniques enables to be easily spun, drawn and formed. For machinability process of grade 405 stainless steel standard methods are used. By soaking at 982-1010°C and then oil quenched grade 405 stainless steel can be hardened. It is used in fabrications that cannot be annealed after welding and it is also used for quenching racks, annealing boxes, partitions, steam nozzles and various others.

Chemical Composition

	SS 405	TYPE 405	WNR 1.4002	UNS S40500	AISI 405	GRADE 405	AFNOR Z4 CA 13
Carbon	0.08 max	0.08 max	0.08 max	0.08 max	0.08 max	0.08 max	0.08 max
Manganese	1.00 max	1.00 max	1.00 max	1.00 max	1.00 max	1.00 max	1.00 max
Phosphorus	0.040 max	0.040 max	0.040 max	0.040 max	0.040 max	0.040 max	0.040 max
Sulfur	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max
Silicon	1.00 max	1.00 max	1.00 max	1.00 max	1.00 max	1.00 max	1.00 max
Chromium	11.5-14.5	11.5-14.5	11.5-14.5	11.5-14.5	11.5-14.5	11.5-14.5	11.5-14.5
Nickel	0.5max	0.5max	0.5max	0.5max	0.5max	0.5max	0.5max
Aluminum	0.1-0.3	0.1-0.3	0.1-0.3	0.1-0.3	0.1-0.3	0.1-0.3	0.1-0.3
Iron	Bal	Bal	Bal	Bal	Bal	Bal	Bal

Mechanical Properties

	SS 405	TYPE 405	WNR 1.4002	UNS S40500	AISI 405	GRADE 405	AFNOR Z4 CA 13
Tensile Strength, Mpa(psi)	448 (65000)	448 (65000)	448 (65000)	448 (65000)	448 (65000)	448 (65000)	448 (65000)
0.2% Yield Strength, Mpa(psi)	276 (40000)	276 (40000)	276 (40000)	276 (40000)	276 (40000)	276 (40000)	276 (40000)
Elongation in 2" (50mm), %	25	25	25	25	25	25	25

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 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Plates
- SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Pipes
- SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Round Bar
- SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Tube
- SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Flanges
- SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Wire
- SS 405, Type 405, WNR 1.4002, UNS S40500, AISI 405 Fittings

Fabrication and Heat Treatment

Annealing

- Grade 405 stainless steel is soaked at 649-760°C (1200-1400°F) and then cooled in air.

Welding

- Shielded fusion and resistance methods are recommended for welding grade 405 stainless steel.
- Oxyacetylene welding is not suitable for this stainless steel grade.
- Hardening of grade 405 stainless steel is controlled by the use of 405 Cb electrodes that contain columbium.
- Ductility of 405 stainless steel is maximized by post weld annealing.

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Forging

- Grade 405 stainless steel is soaked at 817-871°C (1500-1600°F) and the temperature is then increased to 1038-1121°C (1900-2050°F).
- Forging below 816°C (1500°F) is not recommended for this stainless steel grade.
- Forging is followed by air cooling and finally annealing.

Forming

- Usage of forming techniques enable grade 405 stainless steel to be easily spun, drawn and formed.

Machinability

- Standard methods are used to carry out the machinability process for grade 405 stainless steel.

Hardening

- Grade 405 stainless steel can be hardened by soaking at 982-1010°C (1800-1850°F) and then oil quenched.

Applications

- Grade 405 stainless steel is used in quenching racks, annealing boxes, partitions, steam nozzles and various other fabrications that cannot be annealed after welding.



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