

SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430, ASTM 430, Grade 430, AFNOR Z8C-17

Introduction :

430 stainless steel grade belongs to the ferritic group of steels, it is a non-hardenable steel containing straight chromium. It is known for formability and good corrosion resistance and, coupled with practical mechanical properties. It can be useful in certain chemical applications due to its resistance to nitric acid. All ferritic steel, such as grade 430 stainless steel, have excellent stress corrosion cracking resistance. It has good corrosion resistance to numerous substances, such as nitric acid and certain organic acids. The pitting and crevice corrosion resistance is quite alike to that of stainless steel 304. Stainless steel 430 is capable of resisting oxidation up to 870°C in intermittent usage, and up to 815°C in continuous usage. By heating stainless steel grade 430 to 815 - 845°C solution annealing can be performed. Then it has to be slow furnace cooled to 600°C and followed by air-cooling in a quick manner - as slow cooling between 540 and 400°C tends to cause embrittlement. Stainless steel grade 430 has to be pre-heated at 150-200°C, to perform any welding. The particular area can be post-weld annealed at 790-815°C in case of embrittlement in the welded metal however grain refinement will not happen.

Chemical Composition

	SS 430	TYPE 430	WNR 1.4016	UNS S43000	AISI 430	ASTM 430	GRADE 430	AFNOR Z8C-17
Carbon	0.12max	0.12max	0.08 max	0.08 max	0.08 max	0.08 max	0.08 max	0.08 max
Manganese	1.00max	1.00max	2.00 max	2.00 max	2.00 max	2.00 max	2.00 max	2.00 max
Phosphorus	0.045 max	0.045 max	0.045 max	0.045 max	0.045 max	0.045 max	0.045 max	0.045 max
Sulfur	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max
Silicon	1.00max	1.00max	0.75 max	0.75 max	0.75 max	0.75 max	0.75 max	0.75 max
Chromium	16.0-18.0	16.0-18.0	18.0-20.0	18.0-20.0	18.0-20.0	18.0-20.0	18.0-20.0	18.0-20.0
Nickel	0.50max	0.50max	8.0-10.5	8.0-10.5	8.0-10.5	8.0-10.5	8.0-10.5	8.0-10.5

Mechanical Properties

	SS 430	TYPE 430	WNR 1.4016	UNS S43000	AISI 430	ASTM 430	GRADE 430	AFNOR Z8C-17
Tensile Strength (Mpa) min	483	483	75 min	75 min	75 min	75 min	75 min	75 min
Yield Strength 0.2% Proof (Mpa) min	310	310	310	310	310	310	310	310
Elongation (% in 50mm) min'	22	22	22	22	22	22	22	22
Reduction in Area, %	-	-	-	-	-	-	-	-
Hardness, Rockwell B	85 max	85 max	85 max	85 max	85 max	85 max	85 max	85 max

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 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Plates
- SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Pipes
- SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Round Bar
- SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Tube
- SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Flanges
- SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Wire
- SS 430, Type 430, WNR 1.4016, UNS S43000, AISI 430 Fittings

Corrosion Resistance

- All ferritic grades, such as stainless steel grade 430, have excellent stress corrosion cracking resistance.
- Grade 430 has good corrosion resistance to numerous substances, such as certain organic acids and nitric acid.
- The corrosion resistance is maximized in well-polished or buffed condition.
- Its pitting and crevice corrosion resistance is quite similar to that of grade 304.
- 430F is a high-sulfur free machining grade, and therefore the resistance to pitting and crevice corrosion is comparatively lesser than those grades that are non-free machining.

Heat Resistance

- Stainless steel grade 430 is capable of resisting oxidation up to 870°C (1598°F) in intermittent usage, and up to 815°C (1499°F) in continuous usage.
- At room temperature, it has the tendency to become brittle, especially when it has been heated for a long time in the 400-600°C (752-1112°F) range.
- This issue can be overcome with annealing.

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Heat Treatment

- Solution annealing can be performed by heating stainless steel grade 430 to 815 - 845°C (1499-1553°F).
- Then it has to be slow furnace cooled to 600°C (1112°F) and followed by air-cooling in a quick manner - as slow cooling between 540 and 400°C (1004 and 752°F) tends to cause embrittlement.
- For sub-critical annealing, heating should be performed to 760-815°C (1400-1499°F), followed by air-cooling or water quenching.
- This stainless steel cannot be hardened by thermal treatment.

Welding

- To perform any welding, stainless steel grade 430 has to be pre-heated at 150-200°C (302-392°F).
- In case of embrittlement in the welded metal, the particular area can be post-weld annealed at 790-815°C (1454-1499°F); however grain refinement will not happen.
- It is recommended that grade 430, 308L, 309 or 310 filler rod should be used based on the application.

Machining

- The machinability of stainless steel grade 430 is a lot easier than standard austenitic steels such as grade 304 - but there is a chance for galling.
- Lightly drawn bars are easier to machine than bars in the annealed condition.
- Grade 430F is easy to machine.

Fabrication

- Stainless steel grade 430 has a low work hardening rate which enables easy bending and forming.
- The low ductility rate, however, makes it difficult to perform very rigorous operations.
- It is possible for grade 430 wire to handle rigorous cold heading.
- Sub-critical intermediate annealing may be required for extreme cold working.

Applications

The following are the applications for stainless steel grade 430:

- Dish washer linings
- Refrigerator cabinet panels
- Element supports and fasteners
- Stove trim rings and chimney liners
- Automotive trim and lashing wires

The key application of grade 430F is in repeatedly used machined parts.



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