

## SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202, Grade 202, SUS 202, ASTM 202

### Introduction :

Stainless Steel 202 is one of the widely used precipitation hardening grade which possesses high hardness, strength & good corrosion resistance. It is similar to the properties of 302 stainless steel. Stainless Steel Grade 202 machinability produces long gummy chips. In annealed condition machining can also be performed. For full martensite transformation & heat treatment the material has to be soaked at 1038°C [1900°F] for 30 min and cooled below 16°C [60°F]. It should not be joined using oxyacetylene welding method. But by using common fusion and resistance method stainless steel 202 material can be welded. AWS E/ER630 is the recommended filler metal. By pre-soaking for 1 h at 1177°C [2150°F] Forging can be done. Below 1010°C [1850°F] is not advisable for forging. The toughness of SS 202 at low temperature is excellent.

### Chemical Composition

	SS 202	WNR 1.4373	UNS S20200	AISI 202	GRADE 202	SUS 202	ASTM 202
Carbon	0.15 max	0.15 max	0.15 max	0.15 max	0.15 max	0.15 max	0.15 max
Manganese	7.5-10.0	7.5-10.0	7.5-10.0	7.5-10.0	7.5-10.0	7.5-10.0	7.5-10.0
Phosphorus	0.060 max	0.060 max	0.060 max	0.060 max	0.060 max	0.060 max	0.060 max
Sulfur	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max	0.030 max
Silicon	0.75max	0.75max	0.75max	0.75max	0.75max	0.75max	0.75max
Chromium	17.0-19.0	17.0-19.0	17.0-19.0	17.0-19.0	17.0-19.0	17.0-19.0	17.0-19.0
Nickel	4.0-6.0	4.0-6.0	4.0-6.0	4.0-6.0	4.0-6.0	4.0-6.0	4.0-6.0
Nitrogen*	0.25 max	0.25 max	0.25 max	0.25 max	0.25 max	0.25 max	0.25 max

### Mechanical Properties

	SS 202	WNR 1.4373	UNS S20200	AISI 202	GRADE 202	SUS 202	ASTM 202
Tensile Strength [Mpa]	515	515	515	515	515	515	515
Yield Strength [Mpa]	275	275	275	275	275	275	275
Elongation	40	40	40	40	40	40	40
Reduction in Area, %	-	-	-	-	-	-	-
Hardness, Rockwell B	-	-	-	-	-	-	-

### 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 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Plates
- SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Pipes
- SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Round Bar
- SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Tube
- SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Flanges
- SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Wire
- SS 202, Type 202, WNR 1.4373, UNS S20200, AISI 202 Fittings

## Manufacturing Process

- The machinability of grade 202 stainless steel produces long, gummy chips.
- Machining can also be performed in the annealed condition.
- For heat treatment, the material has to be soaked at 1038°C [1900°F] for 30 min and cooled below 16°C [60°F] for full martensite transformation.
- The material can be welded by common fusion and resistance methods; however, this steel should not be joined using oxyacetylene welding method.
- The recommended filler metal is AWS E/ER630.
- Forging can be done by pre-soaking for 1 h at 1177°C [2150°F]. Forging below 1010°C [1850°F] is not advisable.

## Typical applications

- |   |                           |
|---|---------------------------|
| · Household appliances & consumer goods | · Window frames           |
| · Kitchen utensils                      | · Conveyor chains         |
| · Tableware                             | · Clips                   |
| · Cutlery                               | · Hinges                  |
| · Pots & pans                           | · Clamps                  |
| · Countertops                           | · Rebar in concrete       |
| · Shoe inserts                          | · Railroad coaches        |
| · Indoor cladding                       | · Automotive applications |

## Welding

- Type 202 has excellent weldability and is suitable for the full range of conventional welding methods [like MMA, MIG, MAG, TIG, SAW, LBW, or RSW], except gas welding.
- Type 202 has about 50% higher thermal expansion and lower heat conductivity compared to carbon steels.
- This means that larger deformation and higher shrinkage stresses may result from welding.
- In thin sections, autogenous welding may be used. In thicker section, low carbon containing Type 202 is recommended.
- To ensure that the weld metal properties [e.g. strength and corrosion resistance] are equivalent to those of the parent metal, matching or slightly overalloyed fillers should preferably be used.
- The recommended filler metals are 19 9 L, 18 8 Mn, or 23 12 L.
- Post-weld heat treatment is generally not required. In special cases with high risks of stress corrosion cracking or fatigue, stress relief treatment may be considered.
- In order to fully restore the corrosion resistance of the weld seam, the weld discoloration should be removed by pickling and passivation.

## Corrosion Resistance

- Type 202 has excellent corrosion resistance in solutions of many halogen-free organic and inorganic compounds over a wide temperature and concentration range.
- It can withstand many organic and sufficiently diluted mineral acids depending on the temperature of the solution.
- Type 202 may suffer from uniform corrosion in mineral acids and hot strong alkaline solutions.
- Resistance against pitting and crevice corrosion of Type 202 is, however, slightly lower than that of the basic austenitic CrNi standard grades.
- For short periods, for instance when cooking in stainless steel dishes, Type 202 can tolerate even relatively high chloride concentrations.
- Type 202 is prone to chloride-induced stress corrosion cracking at temperatures over about 50 °C depending on the applied stress and the chloride concentration in the environment.
- Type 202 can be used for indoor and outdoor applications in rural areas and urban environments where chloride contamination is low.



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