AESTEIRON STEELS PVT. LTD.
AN ISO 9001-2008 COMPANY

Stainless Steel 253MA, WNR 1.4835, UNS S30815, AISI 253MA, Grade 253MA

Introduction :

Grade 253MA provides excellent service properties & ease of fabrication at high temperatures. It provides superior service to Grade 310 in carbon, nitrogen and sulphur containing atmospheres and resists oxidation at temperatures up to 1150°C. 253MA gives some advantage in reducing sulphide atmospheres when compared to high nickel alloys and to Grade 310, due to its fairly low nickel content. 253MA steel provides good oxide stability, high elevated temperature strength and excellent resistance to sigma phase precipitation due to its properties of inclusion of high silicon, nitrogen and cerium. Even down to cryogenic temperatures, the austenitic structure gives this grade excellent toughness. 253MA has high carbon content so is highly susceptible to sensitisation from service exposure or welding. Solution Treatment (Annealing) - Heat to 1050-1150°C and cool rapidly. To achieve maximum creep strength in service it is recommended that the material be solution treated after 10-20% cold work. It cannot be hardened by thermal treatment. It provides excellent weldability by all method standard fusion, using matching filler metals. 253MA welding with Grade 22.12HT rods or electrodes is pre-qualified by 1554.6. If lower creep strength can be tolerated Grade 309 fillers can be used. Pure argon shielding gas should be used.

Products Available in forms :

- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Plates
- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Pipes
- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Round Bar
- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Tube
- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Flanges
- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Wire
- Stainless Steel 253MA, WNR 1.4835, UNS S30815 Fittings

Chemical Composition

	TYPE 253MA	WNR 1.4835	UNS S30815	AISI 253MA	GRADE 253MA
Carbon	0.05-0.10	0.05-0.10	0.05-0.10	0.05-0.10	0.05-0.10
Manganese	0.80 max	0.80 max	0.80 max	0.80 max	0.80 max
Phosphorus	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
Silicon	1.40-2.00	1.40-2.00	1.40-2.00	1.40-2.00	1.40-2.00
Chromium	20.0-22.0	20.0-22.0	20.0-22.0	20.0-22.0	20.0-22.0
Nickel	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0	10.0-12.0
Nitrogen*	0.14-0.20	0.14-0.20	0.14-0.20	0.14-0.20	0.14-0.20
Cerium	0.03-0.08	0.03-0.08	0.03-0.08	0.03-0.08	0.03-0.08

Mechanical Properties

	TYPE 253MA	WNR 1.4835	UNS S30815	AISI 253MA	GRADE 253MA
Tensile Strength(Mpa)	600min	600min	600min	600min	600min
0.2% Yield Strength(Mpa)	310min	310min	310min	310min	310min
Elongation (% in 50mm)	40 min	40 min	40 min	40 min	40 min
Hardness, Brinell (HB)	217 max	217 max	217 max	217 max	217 max
Hardness, Rockwell B	95 max	95 max	95 max	95 max	95 max

Standard Available

in forms :

- ASTM A182/ ASME SA182 Stainlees 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

Corrosion Resistance

- Although not designed for aqueous corrosion resistance the high chromium and nitrogen contents give the grade a pitting resistance approximating that of 316.
- 253MA does however have a high carbon content so is highly susceptible to sensitisation from welding or service exposure.

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Heat Resistance

- **Oxidation** - Excellent resistance to air, at temperatures up to 1150°C. At high temperatures the steel quickly forms a thin, highly adherent and elastic oxide. This oxide gives good protection even under cyclic conditions.
- **Carburisation** - Under oxidising conditions this grade can perform well, but alloys with higher nickel content are preferred if the atmosphere is reducing.
- **Sulphidation** - Good resistance to sulphur- bearing gases in an oxidising atmosphere, even if only traces of oxygen are present. Reducing gases prevent the protective oxide forming. 253MA has high strength at elevated temperatures so is often used for structural and pressure-containing applications at temperatures above about 500°C and up to about 900°C. Its strength at these temperatures is higher than that of alternatives such as Grade 310.
  253MA will become sensitised in the temperature range of 425-860°C; this is not a problem for high temperature applications, but will result in reduced aqueous corrosion resistance.

Heat Treatment

- Solution Treatment (Annealing) - Heat to 1050-1150°C and cool rapidly. It is recommended that the material be solution treated after 10-20% cold work to achieve maximum creep strength in service.
- This grade cannot be hardened by thermal treatment.

Welding

- Excellent weldability by all standard fusion methods, using matching filler metals. AS 1554.6 pre- qualifies welding of 253MA with Grade 22.12HT rods or electrodes.
- Grade 309 fillers can be used if lower creep strength can be tolerated. Pure argon shielding gas should be used.

Machining

- As for other austenitic stainless steels, the machining requires sharp tools, slow speeds and heavy feed. This grade has a low sulphur content.

Applications

- Furnace components including burners, retorts, conveyor belts, fans, jigs and baskets, rollers, walking beams, radiant tubes, electric heater elements, refractory anchors, hoods, flues, grates, expansion bellows.
- Petrochemical and refinery tube hangers.






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