

RA 253 MA® is a lean austenitic heat resistant alloy with high strength and outstanding oxidation resistance. RA 253 MA obtains its heat resistant properties by advanced control of microalloying additions. The use of rare earth metals in combination with silicon gives superior oxidation resistance to 2000°F. Nitrogen, carbon and to some extent, rare earth and alkali metal oxides, combine to provide creep rupture strength comparable to the nickel base alloys. RA 253 MA has only fair resistance to carburization. Austenite stability in RA 253 MA is enhanced by the nitrogen addition, so that formation of embrittling sigma phase is retarded.

RA 253 MA is welded using matching composition RA 253 MA AC/DC covered electrodes, fluxcored and bare wire. GMAW shielding gas may be 100% argon. Improved wetting and bead contour may be had with a mix of 80% minimum argon, 18% maximum helium and 2% maximum CO₂. For short circuiting arc transfer 68% Ar 30% He 2% CO₂ has been satisfactory.

Chemistry

	Cr	Ni	Mn	Si	C	N	Ce	S	P	Fe
Min	20.0	10.0	-	1.4	0.05	0.14	0.03	-	-	-
Max	22.0	12.0	0.80	2.0	0.10	0.20	0.08	0.03	0.04	bal

Specifications

UNS: S30815

W. Nr.: 1.4835

ASME: SA-240, SA-479, SA-312, SA-249

ASTM: A 240, A 276, A 312, A 358, A 409, A 473, A 479, A 813, A 814

Physical Properties

Density	0.282 lb/in ³
Melting Range	2500 - 2610°F
Poisson Ratio	0.31
Electrical Resistivity	34 μΩ • in
Coefficient of Thermal Expansion (68°F - 212°F)	9.06 μin/in • °F
Thermal Conductivity (212°F)	8.6 BTU/(hr•ft•°F)
Modulus of Elasticity (68°F)	2.9 • 10 ⁷ psi

Mechanical Properties

Representative Tensile Properties

Temperature, °F	Ultimate Tensile Strength, ksi	0.2% Yield Strength, ksi	Elongation, %
68	102.0	51.6	51.0
1400	45.0	22.0	44.0
1600	22.0	14.0	-
1800	11.5	7.0	-

Typical Creep-Rupture Properties

Temperature, °F	Minimum Creep 0.0001%/hour, ki	10,000 Hour Rupture Strength, ksi
1400	5.0	5.2
1600	2.3	2.5
1800	0.89	1.15
2000	0.25*	0.68

* Extrapolated

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Features

- Excellent oxidation resistance up to 2000°F
- High creep-rupture strength
- Excellent resistance to thermal shock
- Good weldability

Applications

- Pulverized coal burners in power boilers
- Recuperators
- Petrochemical, refinery and steam superheater tube hangers
- Radiant heating tubes for steel and aluminum annealing
- Thermal oxidizers
- Expansion bellows
- Furnace fans, dampers
- Fluidized bed combustor cyclones
- Rotary kilns and calciners

