

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. 309 is somewhat better in this respect. 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 shortcircuiting arc transfer 68% Ar 30% He 2% CO₂ has been satisfactory.

Specifications

UNS: S30815 W. Nr./EN: 1.4893, 1.4835 ASTM: A 240, A 276, A 312, A 358, A 409, A 473, A 479, A 813, A 814
ASME: SA-240, SA-479, SA-312, SA-249

Chemical Composition, %

	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	0.030	0.040	balance

Features

- Excellent oxidation resistance through 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

Physical Properties

Density: 0.282 lb/in³ Melting Range: 2500-2610°F

Temperature, °F	70	1400	1600	1800
Coefficient of Thermal Expansion* in/in°F x 10 ⁴	—	10.5	10.6	10.8
Thermal Conductivity Btu • ft/ft ² • hr • °F	8.6	14.3	15.4	16.5
Modulus of Elasticity, Dynamic psi x 10 ⁶	29.0	20.0	18.7	17.6

* 70°F to indicated temperature. Note: Modulus for information only. Elastic behavior ceases above about 1000°F

Mechanical Properties

Representative Tensile Properties

Temperature, °F	68	1292	1562	1832
Ultimate Tensile Strength, ksi	102	56.4	24.8	10.8
0.2% Yield Strength, ksi	51.6	23	14.6	6.2
Elongation, Percent	51	44	–	–

Typical Creep-Rupture Properties

Temperature, °F	1400	1600	1800	2000
Minimum Creep 0.0001%/Hour, ksi	5.0	2.3	0.9	–
10,000 Hour Rupture Strength, ksi	5.2	2.5	1.2	0.7



**INTERNATIONAL
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