

## RA 253 MA® Chosen For Furnace Heat Treatment Trays



### Specifications

UNS: S30815 W. Nr./EN: 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	Fe
MIN	20.0	10.0	—	1.4	0.05	0.14	0.03	—
MAX	22.0	12.0	0.8	2.0	0.1	0.2	0.08	balance

### Operating Conditions

- **Temperature:** 1800°F
- **Cycles per day:** 2
- **Length of furnace cycle:** 4-8 hours
- **Typical life of tray:** 350 cycles (5-6 months)
- **Average weight of loads:** 2,500 pounds
- **Type of parts being heat treated:** Castings with some sulfur content
- **Type of quench:** Water
- **Repair:** During the 6 month life cycle the trays are routinely repaired from distortion. The empty trays are heated and pressed flat.
- **Method of failure:** Cracks form in the bars adjacent to the spot welded sections. Over time, enough cracks form that the center of the tray breaks loose. Once the tray breaks apart, the trays are replaced.

### Case History

A heat treat company in Dallas, TX is currently using RA 253 MA heat treat trays made by Wirco Inc. in Avilla, IN. The RA 253 MA trays are replacing RA330® trays with similar life and lower cost. Trays are run individually through a furnace on rollers. Depending on the parts being treated, the trays and parts will either be water quenched or air cooled.

The RA 253 MA trays provide approximately \$100-200 savings over the RA330 trays. With similar or slightly longer life than the RA330 trays, the heat treat company has already begun replacing all the water quenched trays with RA 253 MA material. With a higher minimum creep rate, the RA 253 MA may show less distortion and therefore fewer repairs between cycles. Each tray measures 4 feet across and uses approximately 160 feet of 5/8" diameter round bar.



**Case History, Continued**

RA 253 MA is a lean austenitic heat resistant alloy that offers an excellent combination of high creep strength along with excellent resistance to oxidation, sulfidation, and erosion at high temperatures in an alloy containing just 11% nickel. Because of its lean chemistry, RA 253 MA is very economical compared to most heat resistant alloys. RA 253 MA obtains its heat resistant properties by tight control of micro alloy additions. The use of cerium in combination with silicon results in superior oxidation resistance to 2000°F. Nitrogen, carbon, and cerium combine to provide creep rupture strength that is double that of type RA330 stainless at 1800°F.

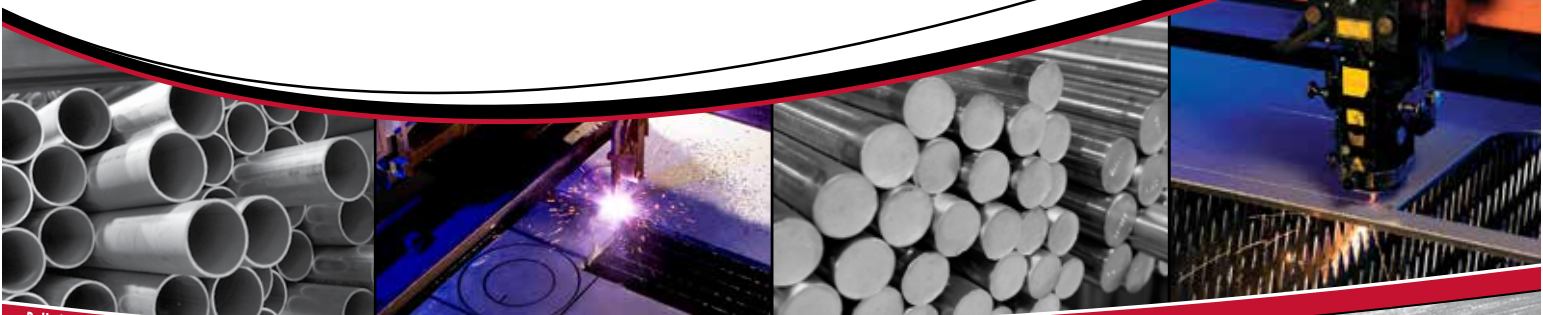
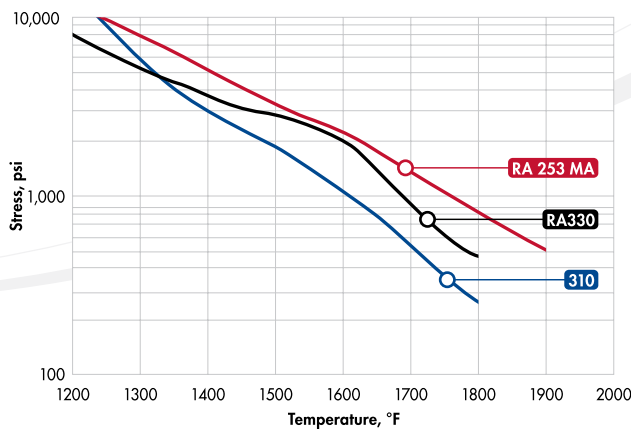
RA 253 MA is stocked in sheet (16-10ga), plate (3/16-1 1/2"), bar (1/2-4"), pipe (1/2-3" sch40), and weld filler (GMAW, GTAW, SMAW, SAW, FCAW)

**Sulfidation Resistance**

Alloy	RA 253 MA	RA333®	309 Stainless	310 Stainless	RA330®
Depth of Attack, mils	8	8	18	20	24

*Test samples exposed to an atmosphere containing 13.6% SO<sub>2</sub> at 1850°F for 1860 hours exhibited above intergranular oxidation and sulfidation*

**Minimum Creep-Rate**  
0.0001% per hour



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