

# RA CASE HISTORY

# RA330® Alloy (UNS N08330, ASTM B 536)

## ***RA330 grids chosen to replace cast HT grids and extend fixture life in a wire annealing operation***



Another heat treat facility has discovered the benefits of using wrought RA330 heat resistant fixtures over castings. Ajax Metal Processing of Warren, Michigan provides spheroidized, normalized, and annealing services to the manufacturing industry. Ajax has used the traditional cast HT alloy grid in their annealing process. Their process involves the heating of steel rod coils in a nitrogen atmosphere to approximately 1500°F followed by a controlled cooling.

Cast grids typically provided a lifetime of 18 to 24 months until major repairs were required, with cracking becoming visible after about a year of service. At that point, cracks in the castings can lead to segments breaking away from the trays (see photo on opposite page). Cast heat resistant alloys are highly susceptible to brittle fracture from thermal cycling and/or from rough handling.

A leading heat resistant alloy fabricator noted the cracking problems associated with the cast trays and proposed a new fabricated design using RA330 alloy to improve performance.

Wrought RA330, in contrast to cast HT, has a carbon content of 0.05%. RA330 is also manufactured to control its grain size, which greatly enhances resistance to cracking from thermal cycling. RA330 is immune to sigma phase formation. As a result, even after long-term exposure at 1500°F, RA330 alloy retains its ductility. This allows for life extension through restraightening and/or weld repair. After seven months in service, the RA330 grids are still performing well and show no sagging from creep deformation or cracking from the thermal cycling.



RA330 is a 35% nickel, 19% chromium, 1.25% silicon alloy. The excellent resistance of RA330 to thermal shock and carburization has made it the workhorse alloy of the heat-treating industry. Rolled Alloys maintains an extensive stock of RA330 product forms, which includes flat products, pipe, bar, threaded bar, structural shapes, hex nuts, washers, and expanded metal.

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