

RA330® Tube-Supports are used for methane reformer.



Specifications

UNS: N08330 W. Nr./EN: 1.4886, 10095 AMS: 5592, 5716 ASTM: B 536, B 511, B 512, B 535, B 546, B 710, B 739
 ASME: SB-536, SB-511, SB-535, SB-710

Chemical Composition, %

	Cr	Ni	Mn	Si	Cu	P	S	C	Fe
MIN	18.0	34.0	–	1.0	–	–	–	0.04	–
MAX	20.0	37.0	2.0	1.5	1.0	0.03	0.03	0.08	balance

Case History

When molecular hydrocarbon chains are processed or “reformed” by removing hydrogen from long chain molecules, the gas streams are heated in tubes or pipes, to around 1675°F, in direct-fired furnace heaters.

Typically, direct-fired heaters, depending upon the fuel being burned and the chemistry of combustion, have high potential for carburization, sulfidation and oxidation of exposed metal parts and furnace components. The selection of alloy for furnace tubes, tube separators, hangers and supports is very important.

Recently, a major gulf coast petroleum refinery and chemical plant specified RA330 alloy for all of the tube supports in one of their direct fired, methane reformer, furnaces. RA330 was selected because it had performed well in other applications at this same refinery, and because RA330 has long been recognized as having superior resistance not only to carburization and sulfidation, but to embrittlement from sigma phase formation. In fact, RA330 does not form the brittle, chromium-ion compound which is known by metallurgists as “sigma phase”.

In such reformer service as this, the leaner heat resistant grades simply do not have enough oxidation, carburization and sulfidation resistance. In many cases, they also do not have enough time-at-temperature strength i.e., creep strength and high temperature fatigue strength. In this application, RA330 was selected to replace the high performance cast alloy, HK-40.



Case History, Continued

The refinery selected RA330 because the available stock of plate could be promptly fabricated into the tube supports needed for their quick turn around. In addition, the cast supports had often failed in the past due to the presence of casting voids which caused premature cracking and embrittlement. In the future, this refinery will order only wrought RA330 alloy for this particular service. The plate was quickly plasma burned to shape and GMA welded into the final functional form.

RA330 alloy is a high nickel (35%), medium chromium (19%), silicon enriched (1.25%) austenitic alloy which exhibits excellent carburization and oxidation resistance up to 2100°F and good general elevated temperature corrosion resistance.

Rolled Alloys® stocks RA330 in every popular form including bar, sheet, plate, pipe, sheet coil, rod coil, squares, hexagons, flats, threaded nuts, threaded bar (all thread), washers, expanded metal, foil perforated metal and structural shapes including channels, "I" beams, angles and tees.



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