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ALLOYS**
The Better Metal People™

CASE HISTORY

RA 602 CA®

UNS N06025



RA 602 CA ALLOY TUBES SELECTED BY SYRACUSE HEAT TREAT FOR THEIR SUPER ALLCASE® FURNACE UPGRADE ARE APPROACHING 5 YEARS IN SERVICE

Syracuse Heat Treating Corporation, a commercial heat treater, located in Syracuse, NY, selected RA 602 CA alloy as the material of construction for two Trident® radiant tubes. These tubes replaced the original tubes constructed from type HU castings.

The tubes were installed in their Super Allcase furnace in November 2002. As of June 2007 these tubes were reported to be in excellent condition. Both tubes are still in service and show little distortion. One minor repair weld was required on one of the tubes during its lifetime, while the other tube has been maintenance free. Three additional RA 602 CA tubes were fabricated in 2005 to replace cast tubes in other furnaces. Typical operating temperatures in the furnace range from 1550-1650°F with a carbon potential of 0.95 to 1.0.

Cast HU tubes were originally used, but were not preferred due to the difficulties associated with their installation and removal. The thicker walled castings (1/4 inch) are much heavier than wrought tubes made of 11 gage (0.120 in.) sheet material. A typical RA 602 CA fabricated tube weighs roughly 165 pounds compared to 350 to 400 lbs for a 1/4 inch cast tube.

The added weight of the cast tubes requires an extra maintenance worker to assist during installation. Because of the limited space inside the furnace, the added person makes the process even more cumbersome and time consuming.

An additional benefit of the thinner RA 602 CA tubes is fuel efficiency. Because heat resistant alloys are relatively poor conductors of heat, the burners in the thick cast tube must fire hotter to maintain the same temperature on the outer tube surface as a thinner tube. The added weight of a cast tube also means an additional 350 pounds of material must be heated and maintained at temperature.

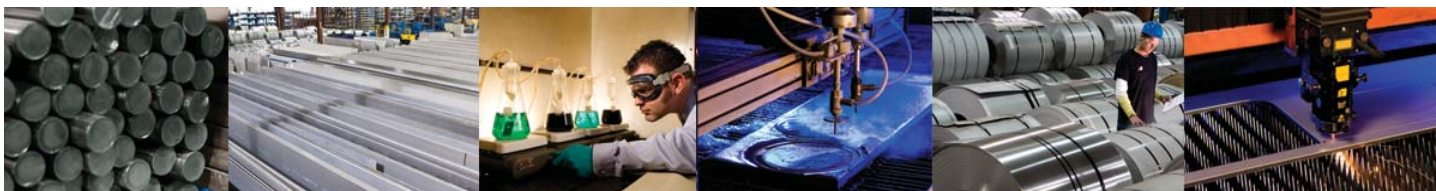
RA 602 CA was selected because of its high strength and excellent resistance to carburization and oxidation. RA 602 CA is a nickel-based alloy with a nominal composition of 63% nickel, 25% chromium, and 2.2% aluminum with additions of yttrium, zirconium, and titanium. The result is an alloy with superior oxidation, hot corrosion, and creep resistance compared to other commercially available heat resistant alloys.

The 6" diameter tubes were rolled and welded out of the 0.120 inch RA 602 CA sheet material using similar setups as other nickel based heat resistant alloys. All seam welds were made using matching 0.045" diameter RA 602 CA spooled MIG wire, also supplied by Rolled Alloys. The return bends were press formed from 0.120 inch RA 602 CA sheet.

For more information on the RA 602 CA alloy contact Rolled Alloys and ask for bulletins 1027 and 1602.

602 CA is a registered trademark of ThyssenKrupp VDM Technologies

Super Allcase and Trident are registered trademarks of Surface Combustion



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