RA330® Chosen for Muffle Sintering Stage in Powdered Metals

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

Application

A rectangular muffle was designed for the sintering stage of a powdered metal application. The operating temperature needed to be capable of handling temperatures in excess of 2000°F with excursions up to 2050°F. This muffle was specifically used for sintering iron with some usage sintering cuperous alloys in the 1600°F range. This application used a gas fire furnace with an endothermic atmosphere inside the muffle. The furnace was stated to be in continuous operation 24 hours per day and 7 days per week.

Problem

Typical muffle failures in this furnace were due to of creep issues. Usually the top of the muffle would collapse inward causing the muffle to not allow the powdered metal to travel through the furnace without obstruction. Previous muffle were made from a 75% Ni – 15% Cr alloy. This was a significantly more expensive alloy due to the high nickel content.

Bill of Materials

Materials for this muffle consisted of plate and welding consumables. All sides of the muffle were made from 3/8 inch RA330 plate and were welded together using RA330-04 electrodes.

Conclusion

This muffle outlasted any of the previous muffles that had been in service prior to its installation. The muffle finally had to be taken out of service after 17 months of continuous service with no atmosphere leaks or repairs having been made. This muffle lasted longer than any previous muffle that was placed in this furnace.

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