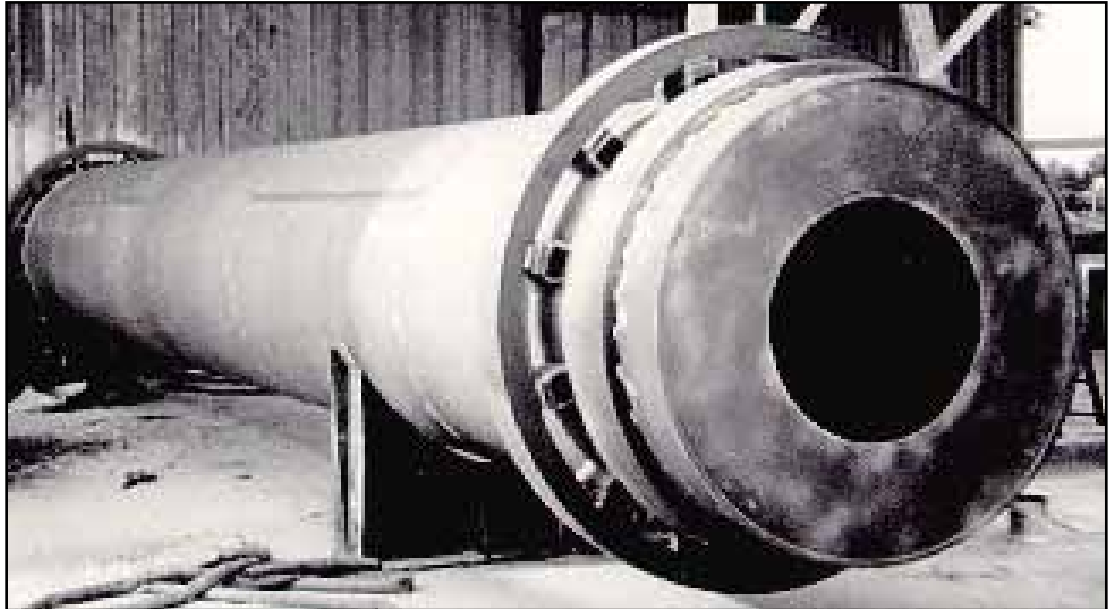


Bay Tank Fabricates RA333® Alloy Calcliner Units



Specifications

UNS: N06333 W. Nr./EN: 2.4608 AMS: 5593, 5717 ASTM: B 718, B 719, B 722, B 723, B 726

Chemical Composition, %

	Cr	Ni	Mn	Si	Mo	Co	W	P	S	C	Fe
MIN	24.0	44.0	—	0.75	2.5	2.5	2.5	—	—	—	—
MAX	27.0	47.0	2.0	1.5	4.0	4.0	4.0	0.03	0.03	0.08	balance

Case History

The catalyst for fluidized bed catalytic cracker units is made by calcining Kaolin clay. This thermal processing takes place at about 1650-1720°F, driving off water of hydration and oxidizing certain ingredients.

One major producer of cat cracker catalyst has selected RA333 as the standard alloy of construction of their calciner shells, at several locations in the U.S. and abroad. RA333 was chosen because of its excellent high temperature (to 2200°F) oxidation resistance, as well as strength and thermal fatigue resistance. This service is severe from both a strength and hot corrosion standpoint.

RA333 is the latest alloy upgrade, in this case over 601, for better resistance to hot corrosion from residual sulfates in the Kaolin feed stock. One 601 unit had holes eaten through the shell, attributed to sulfidation. After replacing the perforated 601 section with RA333 this shell has performed without incident.

These calciner shells were originally constructed of RA330. Over time, increases in duty cycle and operating temperature required an alloy with greater strength and fatigue resistance. Both RA333 and 601 were tried, and after a few years RA333 proved superior in service performance.

Case History, Continued

Bay Tank and Fabricating Company, Inc. of Panama City, FL is the ASME code shop which was selected to fabricate the three calciner units of RA333. Even though RA333 is not a common alloy of construction at Bay Tank, they maintained the proficiency needed to fabricate all high performance engineering alloys. They were able to handle the RA333 alloy fabrication in stride, using standard fabrication practices and equipment.

Bay Tank constructed these calciner units with a 5 ft. dia., 35-1/2 ft. long (1500 mm x 10800mm) shell of 3/8" (9.5 mm) RA333 plate. The shell seam was welded over an internal cage of RA333 square bar, using RA333-70-16 AC/DC titania electrodes. Bay Tank opted to use SMA welding (covered electrodes over the faster sub-arc process in order to keep heat input low. Although it was not required, Bay Tank elected to X-ray the welds after the cap pass was applied to assure full penetration, crack free welds. Shearing and rolling of the RA333 alloy was achieved with standard equipment without difficulty. To quote the Bay Tank spokesman, "The alloy formed and rolled like 304 stainless steel. We even rolled the square bar on our plate roller! The RA333 patterns and smaller pieces were cut with plasma."

RA333 alloy is a nickel based super alloy with outstanding resistance to high temperature oxidation and carburization. This grade has exceptional ability to withstand thermal cycling and shock and can withstand corrosive environments from room temperature to a white heat. This 45% nickel, 25% chromium alloy gets its name from its unique 3 % molybdenum, 3 % cobalt, 3 % tungsten addition.

Other applications include dampers, thermowells, flare tips, molten glass process equipment, radiant tubes, retorts, and various kilns. Visit rolledalloys.com for more information on RA333 or any other Rolled Alloys grades.



RA333 is a registered trademark of Rolled Alloys



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