

ON LINE

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Pressure Vessel & Refractory Specialists

Innovative Refuse-Fueled Plant Features Advanced Refractory Tile System

As space for landfills grows increasingly scarce, more and more municipalities are turning to incinerator systems that burn solid waste (garbage) as fuel. These systems are often used to generate power for local use or for sale, and can recover materials for recycling.

One of the firms building and operating innovative plants of this type is Ogden-Martin Waste Energy Systems, and CH Murphy/Clark-Ullman has handled maintenance and repair work for some of their facilities on the west coast. Earlier this year, we helped change the Ogden-Martin/Marion County plant in Brooks, Oregon over to a new, advanced refractory system that may soon be installed in similar plants around the country.

Built in the early 1980s, the Marion plant is equipped with two 66,000 lb./hr. Zurn refuse-fired boilers. Fuel is supplied to each boiler via a chute which drops the refuse onto a feed table. A large pusher plate then moves the material forward for incineration.

As it burns, the refuse separates. Lighter materials ignite quickly, and the gasses are recovered. Heavier materials fall through a system of grates. After passing through a water quencher for cooling, they move out onto shakers. There the vibration causes larger, unburned objects of refuse such as concrete chunks to fall to the side. Round objects — most often including coins and, in one instance, an 8-lb. shotput —

roll out and are recovered. Other metals fall into a bin for recycling.

"With the unusual variety of objects that go through these boilers, the refractory on the lower walls is subject to major abuse, especially in the



Silicon carbide tile.

area near the pusher plate," said CHM/C-U refractory specialist Dan Dean.

Previously, the waterwall tubes were studded for protection from

abrasive objects, and gunnite was applied over the studs for heat transfer and protection. Instead, the plant has now converted to a system of high-tech refractory tiles made of silicon carbide.

"It's expected to provide better

heat transfer and greater abrasion resistance," said Dan. "Silicon carbide is a very hard material. Also, the tiles

install easily. Hopefully,

maintenance will be easier too."

An engineering firm designed the system, and CHM/C-U worked closely with another refractory company on the project.

Before installation of the tiles could take place, the existing 1/2-

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New Steam Kilns Shorten Drying Time

While much of our work in the wood products industry involves large boilers, mills typically have a variety of steam-related equipment, and over the years we've worked on most of it. This winter, we helped the Weyerhaeuser mill in Snoqualmie, Wash. convert to a new steam kiln configuration that's shortening their drying cycles while ensuring a consistent lumber product.

The mill was unhappy with drying times they were getting with the species they're cutting

today, and the existing kilns had also developed some hot spots. A new design was created by an engineering firm, and CH Murphy/Clark-Ullman was called in to install it in one of the units on a trial basis. Modifications were made by CHM/C-U as part of the process.

Once the new design proved successful, CHM/C-U was contracted to convert all of the kilns. The mill has 18 single-track and double-track kilns ranging in size from 1500 to 3000 square feet. The job required tearing out the

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Refractory System

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Metal bolts are welded directly to the metal membrane of the water-walls as a first step in installing the new tile refractory system. Mortar is then applied as the tiles are set in place.

inch protective studs had to be removed from the tubes and the old refractory was torn out. Stud guns were used to weld new 2-inch steel bolts onto the tubes to hold the tiles.

Each 8-inch square tile is held in place by one nut and bolt through the center. During installation, mortar is applied behind the tile, and the nut is tightened down with a torque wrench to the

New Steam Kilns

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old kiln piping, and fabricating and installing new steam coil panels. The panels consist of finned piping running from header to header.

With each kiln holding 12 panels, over 200 of the 15-foot-long by 50-inch units were built and installed. Working four ten-hour shifts a week, our crews met a tight schedule for a portion of the work that had to be completed before the first of the year, then finished the rest of the job ahead of schedule.

customer's specifications.

"In the past, the gunnite needed a lot of maintenance every year," said Dan. "The tiles should hold up better, and if they do need replacement, you can just remove individual ones. Hopefully, it will only be a few a year. Most of the tiles should be on there for a long time."

Another benefit of the new refractory is that the silicon carbide is more resistant to slag that forms when the refuse burns.

"We were back in the plant and had a look at the new refractory about three weeks after it was put in," Dan said. "From what we could see, it was completely free of slag so far."

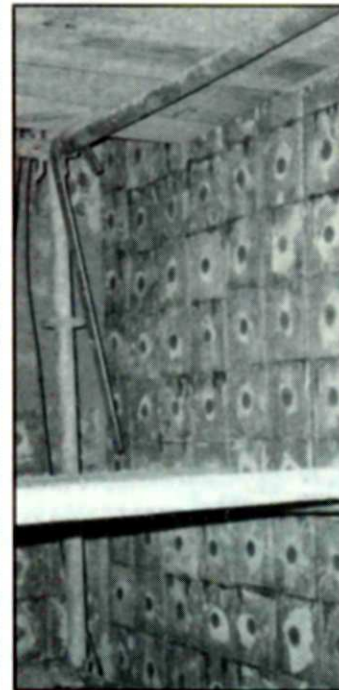
CHM/C-U has done a variety of other work at the Marion plant since it was built, from sectioning ruptured tubes and resurfacing the drum manway seats, to installation of sight ports and casing seal modifications. We've also done much of the plant's regularly scheduled maintenance.

Special projects by CHM/C-U have resulted in improved refractory performance. For example, we redesigned the ignition table

to improve air flow and remove voids where gasses had been collecting and corroding the refractory. We then installed a low cement gunning refractory that has lasted significantly longer than the previous material.

Another project involved refractory changes on the ash hoppers. Previously, an insulating castable and a hard castable had both been used, but separation problems developed between the two layers. CHM/C-U built a form and poured the refractory all at once using a single castable. The area is no longer eroding as it had been.

Plants like Ogden-Martin/Marion will be increasingly important as part of the solution to solid waste problems, and CHM/C-U is glad to be making a contribution to helping them work effectively.



Each 8-inch silicon carbide tile is secured by a single bolt, making the tiles exceptionally easy to replace during maintenance.

