

# ON LINE

Vol. 4, No. 1

Published by CH MurphylClark-Ullman, Inc.

Spring, 1995

Pressure Vessel &amp; Refractory Specialists

## HDPE Piping Job Requires Special Expertise

### *Plastic pipe is a growing trend*

High Density Polyethylene (HDPE) piping is becoming increasingly popular in industrial applications thanks to its durability and chemical resistance. At CH MurphylClark-Ullman, we've kept up with this trend. Recently, we used the piping for a job at the municipal waste treatment plant in Enumclaw, Wash.

The city wanted to replace existing carbon steel piping used to collect methane gas produced by two 45-ft.-diameter concrete digester tanks. Because the methane is corrosive and has a high moisture content, the steel piping was subject to relatively rapid deterioration. The city specified polyethylene piping due to its high corrosion resistance, to help keep future maintenance at a minimum.

Before starting the work, we sent three employees for specialized training in the fusion technique used to join HDPE piping. CHM|C-U technician Ron Baker and foreman Paul Barr, both of our Tacoma office, and Mike Bradley, a superintendent in our Portland office, attended training sessions at the Washougal, Wash. plant of Industrial Plastics, a supplier of the pipe.

Due to its unique properties, the plastic piping must be connected through a process called heat fusion, using a special piece of equipment. The procedure involves heating two surfaces to a specified temperature to soften the material, then joining them together by force.

"Like welding, the principle of heat fusion is really pretty simple," said Mike Dolan, CHM|C-U Tacoma manager. "But like the high quality welding we do, it involves critical steps that have to be performed right for the procedure to be successful."

The fusion procedure causes a flow of molten material on both surfaces. The material mixes and then fuses when pressure is applied. The pipe joints are allowed to cool, and the molecular structure of the plastic changes back to its solid form.

*"The joint actually becomes stronger than the pipe itself."*

"With the fusion, the joint area actually becomes stronger than the pipe itself," Mike said.

In addition to the heat fusion technique, the job involved the use of special adapters and techniques to create tie-ins between the plastic

and steel piping. Special-order valves unique to the waste treatment industry also required adapters to allow connection with the HDPE piping.

After CHM|C-U started the project, it was discovered that a second phase of work was required. The digester tanks have "floating" steel roofs, which were also found to have some corrosion. In order to make repairs, CHM|C-U rigged-off the 35,000-lb. roofs temporarily and erected supports and scaffolding. Sand-blasting was then performed by a subcontractor and CHM|C-U replaced the damaged steel.

As a result of the job, the waste treatment plant was successfully repaired, and CHM|C-U learned innovative new techniques which can be valuable to our customers in a variety of applications.



*When the fusion technique is used to join HDPE piping, the original interfaces disappear and the two separate pipes become one homogenous pipe.*

Steve Doolan



## Emergency Response Means Keeping Our Shelves Full

Our 24-hour emergency response capability is well known in the industry, and we're often asked to get a boiler back on line on short notice. That means we not only have to be ready to put a crew in the field quickly, we also need to have the right materials on hand. A recent job in Hood River, Oregon, was a case in point.

### **A 9 p.m. phone call**

CHM|C-U president Randy Lederbrand got a 9 p.m. emergency call from Dee Forest Products earlier this year, and we had people on-site at their Hood River hardboard plant first thing the next morning to survey the situation.

"They have a 40,000-lb./hr. Kipper hog fuel fired boiler that pretty much operates the whole plant, including providing steam for the presses," said Randy. "Due to a low-water condition, the boiler had overheated and they had to shut it down."

The survey showed that the roof tubes and front wall tubes were sagging, which had allowed refractories to fall out. The job called for removing and replacing all the casing and refractories, replacing all of the roof/front wall tubes and several sagging side-wall tubes, and then re-rolling all the tubes in the steam drum.

### **tubing and refractory needed**

"When we saw the magnitude of the problem we immediately geared up, had a swing shift put on and continued around the clock," said Randy. "We had enough 3 1/2 inch, 10-gauge tubing on the shelf to do the job, and the tubes were bent here locally. We also had all the refractory in stock that was required, from tile to plastic and castable."

Tiles were applied up the side walls behind the tubes, and then plastic and castable were used in the wall areas.

Dee Forest Products brought a rental boiler up from California so the plant could continue to operate while repairs were being made, and we increased our crew size to get the rental quickly installed.

### **Back on line**

Our crew arrived on a Tuesday and by Saturday the plant was back in operation with the rental unit. By the following Friday, the original boiler was back on line – just nine days after the plant had first called.

"Our policy is to always have enough refractory on hand at our Portland warehouse to do an entire boiler if necessary," said Randy. "And we keep an extensive tube inventory, some of which would have to come from the midwest or east coast if we didn't have it here. Our people are what make us a great emergency response company, but without the inventory, they couldn't do their job."

## Fast Times At Cascade Steel

### ***This fast-track refractory maintenance job included a burner wall re-design and steel curtain fabrication***

A refractory repair at Cascade Steel Mills over the last Christmas/New Year's holiday is another example of CHM|C-U's ability to accomplish a lot in a short period of time.

The plant's annual shutdown provided an opportunity to renew the refractory in one of the plant's furnaces. The existing refractory had performed well, exceeding its life expectancy, but that also meant we had more than the usual amount of maintenance

to catch up on over the holiday.

"Basically, we did about 8 days worth of work in six days," said Dan Dean, CHM|C-U refractory specialist.

"We removed and replaced the entire hearth, including renewing the lower burner wall for better performance," he said.

*"We did about eight days worth of work in six."*

"When the hearth expands, it pushes the burner wall out, and in the past that had caused cracks in the refractory which tended to fill with slag. We redesigned the

refractory and anchoring system so the expansion is much more controlled now."

CHM|C-U also built and installed a unique set of steel curtains for the furnace, used to keep heat from escaping when steel billets enter the hearth during the production process.

Made of stainless steel mesh surrounding a ceramic fiber core, the curtains were custom fabricated in our Portland shop.

Next on the agenda: the plant is in the process of expanding with a new re-heat furnace, and we'll be installing the refractory in it this summer.



## Shop Talk

### Heat Exchangers for Georgia-Pacific

We retubed these two heat exchangers for the Georgia-Pacific pulp and paper mill in Bellingham, Washington. One is a freon condenser (left) containing over 350 3/4-inch diameter copper tubes. The other is an acid cooler, which has 294 3/4-inch diameter tubes made of carbon steel.

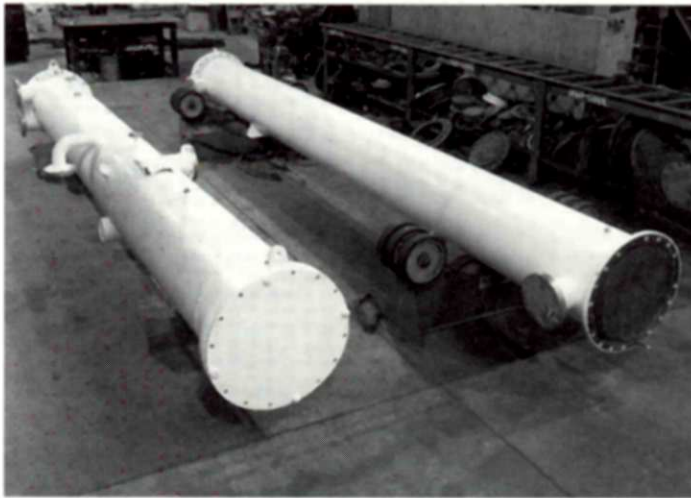


Photo Courtesy



### Bag House Air Manifolds

These air manifolds are among a dozen that we fabricated for a dust collection system being installed at a manufacturing facility in Ulysses, Kansas. Designed with approximately 20 nozzles each, the 12-foot long by 12-inch diameter manifolds met all ASME codes and were built to customer specifications using carbon steel construction.

## Forty Days In Ulsan

While in the past we've been doing dry dock repairs for the American Presidents Line in Hong Kong, this year's trip was to Korea. A crew of five flew from Portland to San Francisco to Seoul, and then to the industrial port city of Ulsan earlier this year to perform scheduled maintenance on the

APL President Grant and the APL President Jefferson. Our people completed work on the two break bulk cargo ships over a 40-day period, repairing hand-holes, making refractory repairs and testing the boilers for tube leaks.

Other marine work so far this year has included boiler

and refractory repairs on a Military Sealift Command ship, the SS. Chesapeake, in preparation for the ship's activation. Equipped with its own barge and an extensive array of piping, the Chesapeake is designed to pump oil to a beachhead or other land location from a position just offshore.

## Frank Keeney New Safety Director

CHMIC-U marine specialist Frank Keeney will also be serving as our new safety director, filling the slot vacated by Dwayne Shepard in February. Dwayne, who had been Vice President and General Manager at CHMIC-U since 1988,

moved back to his home town of Phoenix, Arizona to be closer to his family and spend more time with his grandchildren.

Frank is currently reviewing our customers' latest safety policies, including some that are specific

to particular plants, and updating our own policies to integrate with them. He's also attending a variety of safety training seminars, and will be doing some in-house training of our employees.

