



CASE STUDY

No: 13
Date: May 2008

Interconnecting large-bore steam line tubing in a refinery

Market: Oil & Gas - Refineries
Product: Phastite



Value Summary:

- > **Faster:** 50% faster by eliminating orbital welding
- > **Smarter:** No Hot Work Permits required
- > **Safer:** Reducing risk and safety issues by avoiding welding on a working refinery

Customer:

BP's Whiting plant in northwest Indiana is the fourth-largest refinery in the USA, and the second-largest of BP refineries worldwide. It has the capability to process more than 400,000 barrels of crude oil/day. BP is investing \$3.8 billion to upgrade and modernize Whiting, in order to refine more heavy crude oil from Canada and to increase motor fuels production. More than \$1.4 billion of the current modernization program is allocated for environmental improvements.

Problem:

A project on a vapor recovery unit called for the installation of eight new, 100-foot long, one-inch diameter steam lines, mounted vertically. Conventionally, this would require a lot of complex orbital welding, which in turn would necessitate Hot Work Permits — highly undesirable in a working refinery.

Solution:

During a visit of Parker's exhibition trailer into BP Whiting, hosted by distributor Instrument Associates of Chicago, BP's lead mechanical engineer was given a demonstration of the new Phastite fluid connector. The engineer realized that this system would greatly simplify the steam line project currently being planned, which would otherwise require some 50 orbital welded joints on one inch carbon steel tubing.

Instrument Associates obtained the larger sizes of Phastite that were about to become available, and provided BP's installers with the 50 components needed, plus a rented bench-mounted assembly tool, and a one hour training session to demonstrate the application of the connection system.

The contractor decided the best way to fabricate the steam lines was to assemble lengths on the ground,

and then raise them into place using a 'cherry picker' hoist. BP reported to Instrument Associates that they "completed the job for about half the labor cost for a welded system".

The installation also did not require any Hot Work Permits, greatly simplifying the risk and operator safety issues. BP's engineer noted that "Phastite is the way to go" for future steam and other applications.

Benefits:

Phastite connections eliminated the need for time consuming orbital welding, speeding the job by around 50%.

Phastite eliminated the need for Hot Work Permits, greatly reducing the risk and safety issues associated with welding on a working refinery.



Phastite is a new type of fluid connection providing permanent connections for fluid systems operating at up to 20,000 PSI / 1,379 bar. For permanent connections, and these elevated pressures, system builders would typically use either welded or 'cone and thread' style fittings, which are time consuming and expensive to install. Compared with these products, Phastite connectors can reduce installation costs by a factor of 90% or more. Phastite employs a compression assembly principle using a novel form of toothed profile, which makes the seal. The connectors are supplied as one-piece components. To make a joint, all that's required is to insert the tube, and then push the collar along the connector body until it reaches a dead stop. This operation is performed by a



simple hydraulic tool (the tool is handheld for smaller joints - up to 1/2 inch / 12 mm), and takes a few seconds. The tool requires no skill to use, and assures users of right-first-time connections. This assembly approach contrasts with the requirement to perform a 360-degree weld around the circumference of a tube, an operation requiring skill, consumables, expensive equipment, and up to 10 minutes of time. Or, the coning and threading of a tube end to prepare it for use in a special screw-together fitting, operations that again require skill, and time - in this case up to 30 minutes or more. For many applications, the quality of the weld is also tested by means of dye penetration, or x-ray inspection, adding further substantial costs.

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