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Consider pregrouted pump baseplates and new grout systems

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Conventional grouting methods for nonfilled pump baseplates are, by their very nature, labor- and time-intensive. Using a pregrouted baseplate with conventional grouting methods helps to minimize some of the cost, but the last pour still requires a full grout crew, skilled carpentry work and good logistics.

To further minimize the costs associated with baseplate installations, a new field grouting method has been developed for pregrouted baseplates. This new method uses a low-viscosity, high-strength epoxy grout system that greatly reduces foundation preparation, grout form construction, crew size and the amount of epoxy grout used for the final pour.

While other low-viscosity, high-strength epoxy grout systems may be available, the discussion and techniques that follow are based on flow and pour characteristics of Escoweld 7560. This type of low-viscosity grout system can be poured to depths from 1 in. to 2 in. (13 to 50 mm), has the viscosity of thin pancake batter, and is packaged and mixed in a liquid container. This material can be mixed and poured with a two-man crew.

Concrete foundation preparation. Irrespective of baseplate style, i.e., pregrouted (see also “HP In Reliability,” November 2003) or traditional unfilled, correct preparation of the top of the concrete foundation will have long-term reliability implications and is important. The laitance on the concrete surface must be removed for proper bonding, regardless of grouting method and material selected. Traditional grouting methods require plenty of room to properly place the grout, and this requires chipping all the way to the shoulder of the foundation. However, using a low-viscosity epoxy grout system will greatly reduce the amount of concrete chipping required to achieve a long-term satisfactory installation.

New grout forming technique. With the smooth concrete shoulder of the foundation still intact, a very simple 2 in. ? 4 in. grout form can be used (Figs. 1 and 2). One side of the simple grout form is waxed, and the entire grout form is sealed and held in place with caulk. While the caulk is setting up, a simple head box can be constructed out of dux seal. Due to the favorable flow characteristics of the low-viscosity epoxy grout, this head box does not need to be very large or very tall.

The low-viscosity epoxy grout is mixed with a hand drill, and all the grout is poured through the head box to prevent trapping air under the baseplate.

This new installation method has been used for both ANSI and API-style baseplates with excellent results. With this technique, field experience has shown that a pregrouted baseplate can be routinely leveled, formed and poured with a two-man crew in three to four hours. Here, then, is the proof:

Field installation cost comparison. The benefits of using a pregrouted baseplate with the new installation method can be clearly seen when field installation costs are compared. This comparison applies realistic labor costs. It does not take credit for eliminating repair costs associated with field installation problems, such as void repair and field machining.

Industry experience shows that eight men are typically involved in the average size conventional grouting job. An actual labor cost of $45 per man-hour must be used in US installations when employee benefits and overhead charges are included.

A cost comparison can be developed, based on installing a typical API baseplate using epoxy grout for the conventional two-pour procedure and a pre-grouted baseplate using the new installation method. The following conditions apply:

- Base plate dimensions: 72 in. ? 36 in. ? 6 in. (1.8 ? 0.9 ? 0.15 m)
- Foundation dimensions: 76 in. ? 40 in. ? 2 in. (1.93 ? 1.0 ? 0.05 m) (grout depth)

FIG. 1 Simple frame prepared for grouting a prefilled pump base plate (source: Stay-Tru, Houston, Texas).

FIG. 2 Foundation and prefilled baseplate ready for grouting (source: Stay-Tru, Houston, Texas).
In 2003, a baseplate with the listed dimensions could be pregrouted for $2,969. This would include surface preparation, epoxy grout, surface grinding and a guaranteed inspection. The total installed cost for a conventional two-pour installation was $6,259, whereas the total installed cost for a pregrouted baseplate, installed with the new installation method, amounted to $4,194. Aside from the very obvious cost savings, the reliability impact of this void-free and fully coplanar installation is of great importance to reliability-focused pump users.

The author is HP’s Equipment/Reliability Editor. A practicing engineer with over 40 years of applicable experience, he advises process plants worldwide on reliability improvement and maintenance cost avoidance topics. See Bloch/Budris Pump User’s Handbook, ISBN 0-88173-452-7, for more information on the topic.