

# Why Grout a Base-mounted Pump?

The procedure for installing a base-mounted pump in hydronic systems includes the following requirements:

- Prepare a suitable concrete foundation for the pump. Make sure it is tied into the building structure, not just resting on a floor. The weight of this foundation depends on the type and size of pump, so the manufacturer must include the minimum requirement in the installation instructions. Small pumps may need a foundation 2½ to three times the weight of the pump; larger pumps may require a foundation five to eight times the weight of the pump. The foundation also must be at least 2 inches larger in length and width than the pump base.
- Ensure that the pump base is level in all directions, using shims or wedges between the pump base and the concrete if necessary. The size and placement of these wedges ensures that the weight of the motor, pump, and base is supported uniformly on the concrete pad without sagging, hogging, or torsional stress on the base.
- Bolt the pump baseplate to this foundation using anchor bolts and washers that are strong enough to hold the pump against the dynamic forces that will act on the pump and the motor while in operation (see Figure 1).
- Use rough alignment procedures to ensure that the shaft-to-shaft alignment is reasonably close.
- Grout the baseplate to the foundation, and complete the rest of the installation.

HVAC contractors sometimes object to the last point because the grouting process is messy and expensive, and cement grout takes a long time to cure properly, which delays completion of the pump installation. They may say, "I've been installing pumps for a long time. I've never grouted the baseplate, and I've never had any trouble with the pump. What do you mean by 'grouting?' Why do you pump people insist on it?"

## WHAT IS GROUT AND WHY IS IT REQUIRED?

Grout is a mixture of non-shrinking cement, sand, and water that can be poured or troweled into a pump base, up to the top of the base rails. Epoxy grout is also available, but the purpose is the same in either case: to lock the pump base to the foundation. This makes the installation heavier and less likely to transmit vibration and noise to the building structure. It also helps maintain the shaft-to-shaft alignment, reducing bearing and coupler wear.

The standards for centrifugal pump installation are contained in ANSI/HI 1.4: *Centrifugal Operations*. Experts from the pumping industry developed this standard to apply to a large number of pumps from different manufacturers. The standard recog-

nized the importance of grout in strengthening and stiffening the pump base.

## HOW IS IT DONE?

The foundation surface must be clean and roughened for the grout to adhere. Rails should be clean and grease free as well. Cement grout needs water to cure to the proper strength, so the foundation should be soaked for at least 24 hours. Mix the grout to a consistency that can be poured and fill the entire pump base, making sure no bubbles are trapped in the grout. Manufactur-

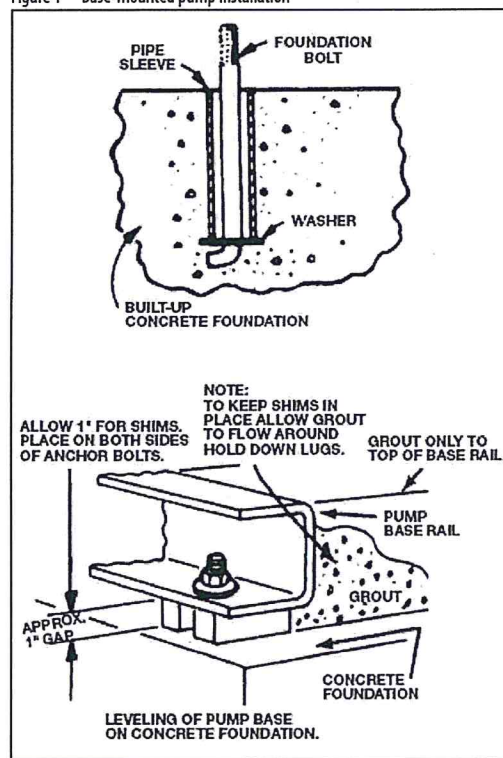
ers sometimes make their bases with welded ends and large access areas to make this process easier. If necessary, make a temporary form to hold the grout as it cures. Epoxy grouts cure much faster than cement grouts, and they adhere to the base rails much better. Temporary forms must be waxed to remove them after the grout cures, and cleanup of all tools must be done before the epoxy cures.

Line-mounted pumps do not have bases, so grouting them is not an issue. Some pump bases are made with thick steel and use welded gussets to provide more strength. In such a case, the manufacturer may not require grouting since the base is strong enough by itself. However, even with these pumps, it's always better to grout the base if possible.

Sometimes small pumps don't have alignment or bearing problems even though they aren't grouted in place. That's probably due to the fact that the base is pretty

strong by itself, and the rest of the installation just happens to be sound and stable. Proper installation will help avoid problems in spite of small changes as the building settles or pipe supports weaken or fail. Proper installation is also an advantage in the case of serious malfunction in the pump that would generate a warranty claim. **PSD**

Figure 1 Base-mounted pump installation



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