



Here's what to consider:

First, determine if the machine requires anchoring.

Before designing a foundation for a particular machine tool, two questions must be answered:

- 1) Does the machine require support from its foundation to maintain alignments between machine elements?
- 2) Will shock and vibration isolation be required to assure the desired levels of finish quality and accuracy?

An excellent example of a machine that requires a large amount of support to operate properly is the above illustrated horizontal-boring mill. In this application, the only connection between the machine column and work table (and hence spindle and work piece) is the floor or foundation.

In designing the foundation for an alignment-critical machine, these factors are important:

- 1) Foundation thickness. The stiffness of a foundation varies with the cube of its thickness. The stiffer the required support, the more concrete required.
- 2) All machine elements should be mounted on the same foundation block.
- 3) Local soil conditions must be taken into account to assure that the foundation will be stable on the soil on which it is placed.

Second, use correct foundation reinforcing designs and adequate methods of anchoring for the equipment being installed.

In order for the foundation to become an integral part of the machine tool structure, a connection of adequate rigidity must be provided. In many types of machinery, a means of adjusting the relationship of the machine base to the foundation is also necessary.

Several approaches may be followed:

1. Anchor Bolts and Shims: (generally inadequate where alignment requirements are critical.)

2. Leveling Screws: provide for faster adjustment than the shimming methods, but there is a tendency for machines to "creep" under load and for adjustments to be difficult and time consuming.

3. Anchor Bolts and Grout: provide strong, continuous rigid support between the machine and the foundation. Grouting is used to assure that the voids between the machine base and the foundation surface are completely filled, and to spread concentrated loads over a larger area.

4. Leveling Wedges: provide a more rigid support than does the leveling screw. The most elementary of these is a two-piece wedge. Three-piece wedges provide greater mechanical advantage and permit more precise alignment. The UNISORB LEV-L-INE for general purpose installation and FIXATOR SYSTEM for high precision requirements are excellent choices.

Third, isolate support critical machines.

The first step involves carefully evaluating the environment into which the machine is to be placed.

For support critical machines (and for non-support critical machines when high amplitude and low frequency vibrations are involved) an isolated inertia block foundation is the best solution. The concrete foundation is isolated from the rest of the environment. Limiting the transmission of shock and vibration from the environment to the machine or, in the case of a source machine, from the machine to the environment is the goal.

Either IB-500 isolation material or rubber GK Blocks may be used.

The IB-500 isolation material approach can be carried out using normal construction practices and is substantially less involved. The GK Block approach is used for natural frequency requirements in the 4hz range. Using either method, an isolation efficiency of over 90% is usually attainable.

Fourth, be sure the machine that is non-support critical is mounted properly.

If you determine a machine is non-support critical, it is still desirable to provide some sort of mounting device to comply with OSHA requirements, to permit the machine to be leveled easily, prevent "walking," and isolate from shock and vibration. This can usually be accomplished by the use of a free standing mount, such as UNISORB LR Series.

CONCLUSION

Correct installation is second in importance only to the proper selection of the machine tool itself in guaranteeing optimum performance from a piece of equipment, and a proper return on invested capital.

When you realize that correctly installing a machine tool rarely costs more than one percent of the total value of the machine, it's false economy not to spend the time and money necessary to make the proper installation.

By taking advantage of UNISORB's products and engineering, you can be sure that your machine will be correctly installed.

For a more complete discussion of machinery installation, request UNISORB'S BULLETIN: "Preventing Machine Installation Problems," along with information on a free seminar in your plant.