



Best Practices in Glass Recycling

A Simple Vibratory Compaction Table

Material: Recycled Glass

Issue: *Thixotropic or slurried castable materials often need to be vibrated after they are poured into molds to get the particles to level and to pack in the most efficient manner. Variable speed, variable displacement vibrating tables are available through equipment manufacturers for the casting industry. However, OEM equipment may be too expensive for small shops or labs experimenting with castables.*

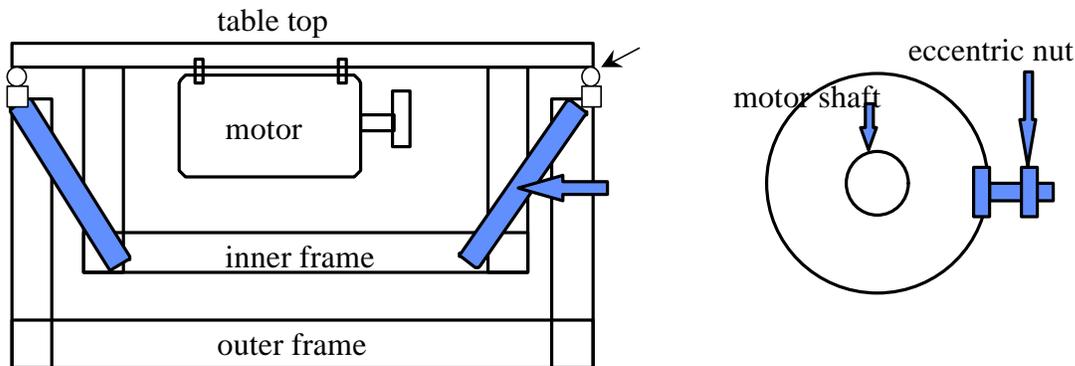
Best Practice: A simple, inexpensive, and effective vibratory compaction table can be built from materials available at any hardware store. The design is self-leveling so that the castable maintains uniform thickness. It also can be made to have a relatively large displacement at relatively slow speeds. The frequency suggested for vibratory compaction of concrete is 3000 rpm.

The following equipment is necessary to build the compaction table:

- A fractional (1/3-1/2) horsepower motor (variable speed if possible) with a pulley.
 - One short (1 to 1 1/2") machine bolt as heavy as possible, but thin enough to mount through a hole drilled in the motor pulley, along with several spare nuts and washers.
 - Four heavy springs such as those used in door closures. The springs should be six to ten inches long with connection loops on each end and be designed for extension rather than compression. If total weight of the table, motor, and expected load will be 40 pounds, the springs should each extend about one-half inch with a load of 10 pounds.
 - Eight lag wood bolts at least three inches long.
 - Table top material, preferably with a cleanable surface like Formica, and a thickness and density great enough to firmly anchor the motor beneath.
 - Wood for the frame, possibly 2x4's.
1. Drill a hole in the motor pulley and mount the machine bolt through it. This gives an eccentric weight to the pulley. Check the eccentric by plugging in the motor while holding it in the hands. The eccentric should cause the motor to shake. Add washers and nuts to increase the eccentric.
 2. Mount the motor on the bottom of the tabletop. The bolt on the pulley must turn freely, clear of obstructions. The center of gravity of the motor and pulley should coincide with the center of the table.
 3. Build a frame around the motor, mounted to the bottom of the tabletop. This will be the inner frame. Remember, there will be two frames, an inner frame and an outer frame. Ideally, the outside of the outer frame should be inside the outer edge of the table. That way, any liquids running off the table will run directly onto the floor rather than onto the frame.
 4. Build the inner frame. This frame will support the unit on the bench or floor. There should be at least 1" clearance between the inner and outer frames on the sides to allow room for the lag bolt heads and spring bodies. Clearance on the ends should be at least 1/2".

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5. Mount four lag bolts on the sides toward the bottom of the inside of the outer frame and four more toward the top of the outside of the inner frame. Some experimentation will determine mounting points where the table with the motor mounted to it hangs by the springs from the outside of the outer frame without touching any side.
6. Hang the inner table on the outer frame with the springs.
7. Test the table by running the motor. The spring tension should be such that the table hangs with only slight spring extension with no load, and does not bottom out on the outer frame under maximum load. The table should be always be fully suspended by the springs.
8. The whole assembly can be placed on a counter. If properly isolated, no “walking” should occur during operation.



Because the table is mounted on springs, it will be somewhat self-leveling. However, it is useful to mount a leveling eye on the tabletop so the tabletop can be kept both level and centered.

Since this description was written, it has been discovered that ball bearing “Glides” can be purchased at woodworker supply stores. The glides, mounted under each corner, can be a great aid to prevent tipping.

The displacement can be adjusted by adding eccentric weight to the pulley. If a variable speed motor is being used, the frequency changes with motor speed.

Implementation: Before building the vibratory compactor, estimate as closely as possible the size and weight of casting to be compacted. That judgment will inform the size of the table, strength of the springs, and power of the motor.

Benefits: This compaction table can be made inexpensively from used or new hardware materials and is a necessary piece of equipment for experimentation with castables.

Application Sites: Small shops or laboratories experimenting with thixotropic or slurried castables.

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