

# Finishing- Tool Primer

## Tips for choosing and using the basic hand tools for flatwork finishing

By Kim Basham

**A**re power trowels making hand tools obsolete? Not by a long shot! Even on large slabs, where power trowels are used for their speed and efficiency to finish vast areas, hand tools are still required for slab edges, steps, and other tight areas where power trowels can't maneuver. And hand tools are still the best way to finish smaller slabs, such as residential flatwork.

Without a doubt, the need for hand tools and skilled finishers to use them still exists for slabs both small and large. But in order for these tools

to work their magic, finishers must choose the right tool for the job, know how to use it properly, and understand the importance of timing.

Following are descriptions of the basic finishing tools needed by most flatwork contractors and tips for using them properly.

### **Bull floats and darbies**

Bull floats and darbies level ridges and fill voids left by striking off the concrete with a straightedge. They also increase the amount of mortar paste on the surface by slightly embedding the coarse aggregate.

Both bull floats and darbies are flat, rectangular tools made of wood, aluminum, magnesium, or composite materials. Designed to float large slab areas, bull floats measure 4 to 8 inches wide and 3 to 10 feet long, and attach to handles up to 20 feet in length. Darbies are smaller, hand-held tools designed to float small or restricted slab areas. They measure 3 to 4 inches wide and 2 to 4 feet in length.

Begin bull floating and darbying immediately after screeding, and complete the operation before bleedwater or excess moisture appears on the surface. Any finishing operation perform-



**Above:** When using a bull float, keep the leading edge of the blade slightly inclined above the slab surface. **Right:** To create a neat, rounded edge, run the edger back and forth with the leading edge slightly raised.



ed while bleedwater is on the surface can result in dusting or scaling of the concrete after it hardens. However, you also must be careful not to seal the surface, trapping bleedwater and air just beneath it. This creates a plane of weakness that can cause blistering, delamination, or surface scaling.

When floating or darbying, keep the blade as flat as possible to avoid sealing the surface and to avoid pushing the concrete around, which can destroy the surface plane left by screeding. When using a bull float, keep the leading edge of the blade just slightly inclined above the slab surface, and always float at right angles to the strikeoff direction. Lower the float handle while pushing it away, and raise the handle while pulling it back. Special double-action brackets or gear-boxes are available that let finishers control blade pitch by simply turning the bull-float handle.

**Tips:** When finishing air-entrained concrete, which doesn't bleed as much and can be sticky, use bull floats and darbies made of magnesium or aluminum. Wood floats can tear the surface of lightweight or air-entrained concrete, but they work well on non-air-entrained, normal-weight concrete because they're less likely to seal the surface.

### Edgers

Edging consolidates the concrete and produces neat, rounded slab edges

that are less likely to chip or spall after form removal. Hand edgers range from 3 to 6 inches wide and 6 to 10 inches long and come in various radius sizes. They are available in bronze and stainless or blue steel. Bronze edgers are heavier, last longer, and produce a smoother, denser edge than do steel edgers. If you prefer to stand while edging, walking edgers are available that attach to long handles.

Start edging after bleedwater has disappeared from the concrete surface. During strikeoff, the straightedge may drag concrete away from the form edge and leave a high spot a few inches away. So before edging, use a short 2x4 or the edge of a hand float in a fanning motion to cut any high spots and move concrete to the edge so it's flush with the top of the form. Sometimes you may have to add a little more concrete with a shovel to ensure that the surface doesn't slope down at the edge. Also before edging, use a margin trowel in a vertical sawing motion to dislodge aggregate particles near the edge forms so the side of the edger won't hang up, dig into the concrete, or leave a bumpy surface.

When edging, tilt the leading edge of the tool up slightly to keep it from digging into the surface. Also, avoid pushing too hard on the radiused edge. You should see only a slight mark on the con-

crete surface at the outside edge of the blade.

For the first edging pass, use a wide edger, and apply light pressure to avoid sealing the surface and depressing the slab edge. Don't lift the edger off the concrete unless the tool is in motion. Use a narrower edger for the final pass.

**Tips:** Always edge sidewalks, patios, driveways, and steps, but don't edge floor slabs that will be covered with tile. When edging slabs subject to vehicular traffic, use a 1/8-inch-radius edger because edges with larger radii are less durable. Don't start edging at a slab corner. Start a few feet away from the corner and work back to avoid depressing the corner edges.

### Groovers

Groovers, also called jointers, are used to cut contraction joints in fresh concrete. They're made of bronze or stainless steel and range in width from 2 to 5 inches and in length from 3 to 9 inches. On the bottom of the tool is a metal "V," or bit, that cuts the joint and creates a weakened section. As the concrete shrinks, the slab will crack at the joint instead of cracking randomly. But to create the plane of weakness, you must use a bit depth at least one-



**Above:** Darbies serve the same purpose as bull floats except they are used on smaller areas and are moved across the concrete surface in a sawing arc instead of a back-and-forth motion. **Right:** If you prefer to stand while edging, use a walking edger that attaches to a long handle. One type of handle bracket allows you to flip-flop the handle to either side of the edger. Another type (shown here) locks the handle in a set position.





**Above: Groovers are used to control cracking by cutting joints to a depth of at least one-fourth the slab thickness. To form straight joints, use a straightedge or chalkline as a guide.**



**Below: Hold a hand float as flat as possible and at arm's length while moving it in a wide semicircular motion until the surface is smooth. Use a large float for the first pass and then a smaller float for the final pass.**



fourth the slab thickness. Groovers are available with bit depths of  $\frac{3}{16}$  inch to 2 inches.

As with edging, begin grooving or jointing after the bleedwater has disappeared or when the concrete begins to stiffen but the coarse aggregate can still be pushed aside by the bit. Push the groover into the concrete, and then move it forward while applying pressure to the back of the tool. After cutting the joint, turn the groover around and run it back over the cut joint to create a smooth finish. For stand-up use, walking groovers are available with features similar to those of walking edgers.

**Tips:** Don't start grooving too late. If the concrete stiffens too much, you'll dislodge coarse aggregate at the surface and spend too much time trying to pound the particles back in or patch holes left by their removal.

### Hand floats

Hand floating removes imperfections from earlier finishing operations, compacts the slab surface, and brings paste to the surface for troweling. Finishers can also use floats to achieve

the final finish when a finely textured surface is desired for an outdoor slab, such as a sidewalk, patio, or driveway.

Floats usually are made of wood or magnesium and range in width from 3 to 4 inches and in length from 12 to 24 inches. Begin floating after the edging and jointing operations are complete and the bleedwater sheen is gone. Floating while free water is on the surface is likely to cause dusting, scaling, or crazing of the hardened concrete. Hold the float as flat as possible to avoid sealing the surface and creating ridges or valleys.

**Tips:** Begin floating when the bleedwater has disappeared and you can leave about a  $\frac{1}{4}$ -inch-deep footprint in the slab. If the footprint is deeper than  $\frac{1}{4}$  inch, it's too early to float and you should extend the wait period. As with bull floats and darbies, avoid using wood hand floats on air-entrained concrete because they can tear the surface.

### Steel trowels

Used after floating, steel trowels produce a smooth, hard, dense slab surface. The blades are made of blue,



**Use a large steel trowel for the first finishing pass and a smaller trowel for each subsequent pass. Switching to shorter, narrower trowels increases compaction pressure, so the more you trowel, the smoother and harder the finish will be. Tipping the trowel to a greater angle will also increase compaction pressure.**

stainless, or high-carbon steel and are thinner than hand-float blades. Sizes range from 3 to 5 inches wide by 10 to 24 inches long.

Hold the trowel at a slight tilt at arm's length and move it in a semicircular motion, overlapping each pass by one-half until the surface is smooth. Keep the blade as flat as possible during the first troweling. Too much tilt or pitch will produce a washboard or chattered surface. On subsequent trowel passes, you can tilt the trowel more to increase the degree of compaction. Also switch to shorter, nar-

**Trowels are less likely to gouge the surface after they're broken in.**

rower trowels for each subsequent trowel pass to increase compaction pressure and produce a smoother, harder finish.

Two variations of the standard steel floor trowel are pool and fresno trowels. A pool trowel has rounded blade ends designed for finishing the vertical sides of curved swimming pools. The tool also is excellent for finishing small surface areas and around floor pipes and drains. When using a pool trowel, however, you can't apply as much pressure to the surface

because the blade is wider and more flexible than that of a floor trowel.

Fresno trowels are designed for rapid work over large areas and are fitted with bull-float handles so finishers don't have to walk on the slab. Fresnos can produce a smooth, flat finish, but they can't achieve the same degree of compaction possible with hand trowels. That can be an advantage when finishers must trowel slabs early for decorative work because they can create a smooth finish without densifying the surface.

*Tips:* Trowels are less likely to gouge the surface after they're broken in because the blades become slightly curved, the edges beveled, and the corners rounded. To break in a new trowel quickly, use a metal file, holding it at a 10-degree angle, to slightly bevel the blade edges and corners. Also, place the blade on hardened concrete and carefully lean on it with both hands to shape it. Another option is to purchase a new trowel that has already been broken in at the manufacturing plant. ■

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