

## ***Rolling Slabs: Platelet Grain Structure and Clay Memory***

Vince Pitelka, 2021

Slabs are easily rolled with a commercial slab roller, and various types are available. If you do a lot of work with slabs, a slab roller will pay for itself very quickly. I prefer models with rollers both above and below the slab, the upper one adjustable by knobs on either side, or in some cases by a single knob linked to both ends of the roller via a chain-drive. These models give infinite adjustments, rather than the few set adjustments with a shim system. Be kind to your slab roller by doing some of the work first. Thin down the lump of clay by slapping it down on a sturdy canvas-covered table or by pounding it with your fist or a mallet, (a standard Chinese slab mallet is best for this) to ease the strain on the slab-roller during the first pass, and then thin the slab in several adjustments of the slab-roller. When you slap down or pound out the lump of clay and place it on the slab roller bed, remember that the machine moves the clay in a linear direction and hardly widens the slab at all. With that in mind, shape the lump and place it cross-ways on the slab roller bed. On a slab-roller with a bed 20" wide, I take a 16" pug of clay 4" in diameter, pound it down part way, and place it cross-ways on the slab roller bed. In successive rolls, I take it down to a little thicker than what I ultimately want, and then cross-roll it with a rolling pin on a sturdy, flat table, checking the thickness with a needle tool. If I am aiming for a ¼" slab, after cross rolling to achieve the final thickness, I'll have a slab about 24" by 36".

Before running a slab through the slab roller a second or third time, always unstick the slab from both canvas sheets so that the slab can expand horizontally. Neglecting this step makes hard work for the slab roller and produces inferior slabs. Lift the top sheet of canvas, lay it back in place, grasp both sheets of canvas along the far side of the slab, lift and flip it towards you, lift off the other sheet, lay it back in place, and roll the slab again. This should become second nature.

Any sort of force applied to plastic clay creates a directional grain structure of platelets dependent on the type and direction of pressure applied. The clay retains memory of the compressive force and the resulting grain structure and will shrink accordingly during drying and firing. This is true with all forming methods but rarely a problem with thrown, pinch or coil construction. With all slab methods it can cause serious problems. Slabs rolled unidirectionally with a slab roller or rolling pin have a distinct linear grain structure in the direction the clay is stretched during rolling. As is the case with green (fresh, not dried) wood, shrinkage will be far greater across the grain than along its length. If you use such a slab to create a slumped form, the piece will likely warp badly in drying and firing. If assemble into a rectilinear form with conflicting grain direction in adjacent sides, the piece will likely pull itself apart in drying or firing, especially in midrange or highfired work. Unidirectional grain structure is the most common cause of drying and firing defects in slab-built work.

There are several ways to eliminate unidirectional grain structure. If the bed on your slab roller is sufficiently wide, work your way down to the desired thickness in several passes, turning the slab 90 degrees each time. If the bed-width does not allow this, cross roll with a rolling pin

after using the slab roller. If the slab is stuck to canvas on one side, it will not get thinner when you cross-roll with the rolling pin, but it will eliminate the grain structure. The slab cannot get thinner unless it can expand horizontally, and that won't happen if it's stuck to a sheet of canvas.

When hand-rolling slabs, change the rolling direction frequently. In either case this will equalize the compression and neutralize linear grain structure, minimizing subsequent problems. For most efficient elimination of grain structure, flip the slab over and roll in different directions on both sides. Even when using a narrow slab roller, you can roll the slab to exactly the thickness you want it and then get rid of the grain structure without thinning the slab any further. Roll the slab with canvas on both sides, and then with the canvas still stuck to both sides, roll in multiple directions with a rolling pin, flip the slab, and repeat. Again, the slab cannot get thinner unless it can expand horizontally, and the stuck canvas prevents that.

All slabs are subject to this problem, whether for geometric sculpture, slumped-slab tableware, or tiles. In all cases, clay memory resulting from improper rolling can ruin the finished piece.