Low-Fire Soda

BY JUSTIN ROTHSHANK
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Justin Rothshank's bowl, 7 in. (18 cm) in diameter, Standard Ceramic Supply's 710 clay, porcelain slip, decals applied to leather-hard clay, Darby Clear liner glaze, soda fired to cone 3, 2019.
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Wadding

Wadding is a refractory material that keeps the pieces from sticking to each other, to kiln shelves, or to the kiln post. I work with 2 types of wadding and mix both recipes roughly by volume using the unsophisticated “handful measuring” technique. This wadding is also used to make cone packs, and any excess is kept in a sealed container for use in future firings.

The Alumina Wadding/Kiln Wash, while more costly, provides a great barrier between the artwork and the kiln shelf. This wadding is highly effective, but its biggest drawback is that it can leave a distinct white mark on dark clay bodies. This mark can be quite distracting against the chocolate brown colors of atmospheric earthenware.

The Fireclay Wadding is less costly and can be a less effective barrier, especially in areas with high concentrations of soda spray. This can result in the need to spend more time cleaning and grinding fired wares. However, it leaves a darker mark and can be less distracting on darker clay bodies.

### ALUMINA WADDING/KILN WASH

| EPK Kaolin | 1 part |
| Alumina    | 1 part |

The same recipe for alumina wadding can be used for kiln wash by adding enough water to mix it into a cream consistency.

### FIRECLAY WADDING

| EPK Kaolin | 1 part |
| Fireclay   | 2 parts |
| Play Sand  | 2 parts |
| Sawdust    | 2 parts |

Wadding Strategies

Once pots are ready for the soda kiln, there are several more steps to prepare for the firing. Some artists apply kiln wash to the kiln posts or even the kiln shelves. I avoid kiln wash on all my shelves, as this prevents the option of flipping the shelves between firings to minimize warping. When a glaze runs, I use an angle grinder to clean it. This is a quick and easy process, and my glazes are formulated so glaze runs are minimal. I do kiln wash the tops and bottoms of each kiln post. This aids in separation of wads from posts after each firing, and keeps the posts level and free from wadding debris.

Each piece that will be fired needs to be prepared with wadding. When wadding pots, I prepare a bucket full of pre-rolled wads in different shapes and sizes (Figure 5.1). Sausage logs, jelly beans, marbles, and walnuts are my default sizes and shapes. I also make randomly shaped shields for deflecting ash and vapor in intentional patterns. These are thin slabs of wadding shaped in different ways to create interesting flashing patterns.
I prefer to glue the wads onto the pot using white Elmer’s® glue or some similar cheap white craft glue. The glue allows for potters to pre-wad their pieces before loading the kiln without fear of the wads falling off during the loading process. Glue will keep wads in place for several hours, days, or even weeks, until the pots are ready for loading. The glue burns off in the kiln.

Moistening the wads with only water will also work but the glue is more durable than water. Wads are placed intentionally, considering the pattern they will leave on the clay surface after the firing. During the firing, the glue burns away, and the wad is fired while it lifts the piece off the kiln shelf. Upon the completion of the firing, the wads are easily removed and discarded, or saved for possible use in future firings.

I have found that wads leave varying marks, depending, of course, on shape and size, but also on fired state. I keep some clean, fired wads for use in future firings. A wad applied as wet clay will form a tighter seal against the vessel’s surface, thus leaving a more defined mark. Applying a wad that has been previously fired will leave a more organic mark, as it does not conform exactly to the vessel surface.

Part of the glazing process of atmospheric firing, wadding pots and loading the kiln have an enormous impact on results. These are important decisions with lasting visual impact. Wherever you place a wad, you're placing a mark on your work. Stacking pots, using wads or bricks as shields, and deciding the placement on the kiln shelf are all opportunities to consider when planning your firing.

Noting where pots are placed within the kiln is important, too. Pots closer to the soda ports will get blasted with more soda. Pots closer to the burners may get hotter or display more reduction effects. Pots nearer to the center of the kiln may get less soda or have more oxidized surface effects.

Figure 5.1

1 Neil Celani preparing mugs for firing. Glue is used to hold wads onto mugs. 2 Notice the varying patterns used when applying wads.
Wadding and Placement

*By Neil Celani*

Loading the kiln is a fundamental part of firing with soda. I create dynamic effects on the pots with creative loading. I take an intuitive approach with the use of wadding and placement of the pots to encourage flashing and glaze patterns that are a unique record of that particular firing. Placing unglazed pots next to each other in direct contact yields a dry surface in those areas while allowing the soda to build up in the more exposed areas of the pots.

Before I begin loading the work, I come up with a rough plan of placement and create clusters and stacks of pots to load together on a shelf (Figure 5.2). I play with variations for each piece, considering what position or angle to wad it in. It should be noted that the placement of the wad can have a dramatic affect on the pot as wads leave markings and can direct and divert the flame’s path. This can and should be exploited and used as a decorative element to enhance the piece.

With this in mind, I take cues from the individual pots to determine how many wads to use and where to place them on the piece (Figure 5.3). Cups and bowls tend to get three to five wads unless there is an element of a pot that would suggest a particular wad pattern. For example, if the pot has seven sides, I might use seven wads to follow the piece’s design.

If a pot has no glaze, the options are wide open as to how the piece gets loaded in the kiln: I can wad the pot upside down on a post or place it at an angle on a large wad. Small bowls and cups can be placed in large bowls or on top of plates (Figure 5.4). Stacks of various forms wadded together can create dynamic surfaces that highlight the range of surfaces achieved in the soda-firing process.

For a typical firing, I wad a selection of work beforehand and leave the rest unwadded with the intention of filling in open gaps or creating blocks by determining how a piece is wadded right before it is loaded. One of the beautiful things about low-fire soda is that wadding is not always needed between stacks of pots. I have discovered amazing results by dry stacking pots together, though this only works with slipped or raw clay surfaces.

Because soda at these temperatures does not flux as much and accumulates less than at high-fire temperatures, dry stacking and butting pots right up against one another is possible. I have seen remarkable flash marks from dry stacking and use the technique in most of my firings. Wadding can also be used as a decorating device by placing wads in, on top of, or next to pots to create vapor blocks, which promote flashing and can create interesting and dynamic designs and markings. By experimenting and taking notes, a multiplicity of effects and surfaces can be achieved with the use of thoughtful loading and wadding strategies.
To prepare a plate for firing, apply glue where wads will be attached. Press the wads into the glue. Flip the plate over and lightly press to stabilize on the wads. To add a second plate to the stack, wad it in a similar fashion to the first plate. Then stack to leave a flashing mark and maximize kiln space. Add a cup to the stacked plates with wads. All pieces are wadded to ensure the pieces don’t become glazed to each other during the firing process. Each stacked piece will leave a mark on the piece below it. Kiln post, brick shim, bowl, and plate ready for wadding. Invert a bowl on a post using a large ball of wadding. Use a brick shim with wads on top and bottom between a bowl and plate to provide separation during the firing process.
Getting Ready to Fire

1 Cup with ball of wadding. 2 Press the cup into the ball of wadding at an angle. 3 Cup wadded and ready for the kiln. 4, 5 Mug and tumbler arranged together to encourage flashing. The close proximity will discourage soda vapor from landing in shielded areas. This will leave marks that disrupt the surface design continuity and display evidence of the atmospheric firing process. 6 Build clusters of vessels, considering how the atmospheric effects will interact with each piece. 7 Each piece is carefully arranged with shape and size considered to encourage flashing for deliberate results.

Figure 5.3

1 Plate with wads glued on awaiting loading. 2 Plate and bowl wadded and stacked. Wads are placed intentionally to elevate the bowl above the surface of the plate. This allows airspace between pieces, enabling soda vapor and flame to travel between the pieces. 3 Fired plate with wad still in place. 4 Fired plate with wadding removed, illustrating mark making potential with wadding size and placement.

Figure 5.4
After years of experimenting with earthenware in wood, soda, and salt kilns, Justin Rothshank has compiled all his know-how into this helpful guide. *Low-Fire Soda* is a start-to-finish resource that outlines everything from the different types of clay bodies to use, to decorating and glazing techniques, wadding and loading strategies, firing tips, post-firing ideas, and much more. Whether you’re interested in learning about faster, more economical atmospheric firings, or you’re intrigued by the expanded color palette of low-fire clay materials, *Low-Fire Soda* has the information you need to start exploring low-temperature atmospheric firings. Justin also covers health and safety, recipes, and kiln firing strategies. Four articles contributed by guest authors, along with helpful insights from practicing artists round out the book. *Low-Fire Soda* has a wealth of information for ceramic artists interested in learning more about the potential of soda at low temperatures.

About the Author

Prior to moving back to his hometown of Goshen, Indiana, in 2009, to become a full-time studio potter, Justin Rothshank co-founded the Union Project, a nonprofit arts organization located in Pittsburgh, Pennsylvania. Justin’s ceramic work has been exhibited and published nationally and internationally, including articles in *Pottery Making Illustrated, Ceramics Monthly, American Craft, Studio Potter, The Log Book,* and *Neue Keramik.* Justin was recognized by *Ceramics Monthly* as an Emerging Artist in 2007, and in 2009, he was presented with an Award of Excellence by the American Craft Council. He has also been a presenter, panelist, visiting artist, and artist-in-residence at numerous universities, schools, conferences, and art centers throughout the United States and abroad.