

Soft Firing and Dust Free Cleaning

By Diane Arneson,, DDMEd.

In Chapter Two *Dolls Beautiful 2005-3* you pre-cleaned the *Li'l Kerstina* greenware pieces to prepare them for the next phase of the cleaning process: Dust Free Cleaning. Before we start on that, we need to fire the greenware to the soft-fired stage.

Soft Firing

Soft firing is a process in which greenware is fired hot enough to drive all water out of the clay particles, yet not high enough to produce fully matured hard bisque that is vitreous. When immersed in water the still porous soft-fired ware will absorb water but will not dissolve or fall apart, as would totally raw greenware.

Soft firing allows you to clean the pieces in water, thus completely eliminating the problem of porcelain dust. Some years ago, it was common practice for dollmakers to clean raw, unfired greenware. This cleaning method produced a cloud of porcelain dust that not only settled over everything in the studio, but was, more importantly, a major health hazard when inhaled. When you clean soft-fired ware in water, you will not produce a speck of dust. As an added bonus, soft-fired pieces are less fragile to handle and will have a longer shelf life.

Ready? Let's get started! The

first step is to load the kiln for soft firing. This is much easier than it sounds. Place the greenware pieces gently on a shelf in the kiln, making sure that they are at least one inch away from the heating elements on all sides. You do not need to worry whether any of the greenware pieces are touching each other, as they will not fuse together during soft firing.

Greenware matures to the soft-fired stage at a range of temperatures from cone 016–022; the higher the firing temperature the harder the soft-fired ware will be. In general, however, it is recommended that you soft fire greenware to cone 018 (1285°–1386°F, 697°–753°C), although shoulder plates can be fired one cone hotter (cone 017) to make them less likely to break during cleaning.

Place a junior cone 018 in the kiln sitter. To test whether the greenware reaches the proper firing temperature throughout the kiln, place a witness (self-supporting) cone 018 on each shelf. Set the kiln on Low and fire for one hour, leaving the peepholes open. Turn the temperature up to Medium. With peepholes still open, fire on Medium until the kiln shuts



off. It is important to fire the greenware slowly for maximum quality.

If you have a kiln with a digital controller, set the controller to increase in temperature at a rate of 500°F (260°C) per hour until it reaches 225°–275°F (107°–135°C). Hold for 1–2 hours, then increase temperature at a rate of 500°F per hour to 1300°–1450°F (704°–788°C).

Once the kiln shuts off, allow it to cool completely before opening the lid. The 018 witness cone should be well bent or touching the shelf. Gently remove the soft-fired pieces, and place them on a tray. You are ready to proceed with the final stage of cleaning.

Dust Free Cleaning

Now comes one of the most important steps in dollmaking: cleaning the soft-fired ware in preparation for bisque firing. An experienced dollmaker will tell you that it's virtually impossible to create a fine quality doll from poorly cleaned bisque, so you'll want to put some time and effort into this step and make sure the soft-fired pieces are as perfectly clean as you can get them! In this chapter "cleaning" means polishing the sur-

face of the soft-fired ware, smoothing away seams and imperfections and cutting open and beveling the eyes (if you plan to set in glass eyes, rather than painting them).

First, set up a work area for cleaning. If you don't have a studio or hobby room of your own, the kitchen table will do just as well, as long as the area is well lighted. Cover the table with newspaper or a waterproof tablecloth and assemble the supplies listed below. These are the basic tools needed for the Dust Free Cleaning Technique and can be used over and over in future projects. Because proper cleaning is so essential to the end result, it only makes sense to have the right tools for the job.

Supplies Needed:

Molds: M1028 Li'l Kerstina head mold
MALS1028 Shoulder plate, arms, legs mold set
Container filled with water (an ordinary plastic dishpan is ideal)
SKIT Stoneware and Porcelain Cleaning Kit:
SBR25A Round Taklon Brush
CMFYSCRB Comfy Scrub
DSCRUB #220 Grit Scrubber
FEAKN Featherknife
SPONGES Synthetic Sponge
ST05 Double Ball Stylus
ST03 Small Detail Carving Tool
HOLE1 Mini Hole Cleaner
SBR105 Multipurpose Blender/2 16 mm eye sizer
SRB18 and SSB18 Orton junior and witness cones 018



1. Gently place the soft-fired pieces into the water to soak for a few minutes. Don't be alarmed if you hear tiny hisses and see bubbles rising to the water's surface; this is just the air escaping as the water moves into the still-permeable soft bisque. Once the bubbling and hissing stop, the piece is thoroughly saturated, and you can begin cleaning it. For proper cleaning your tools should also be used wet. As you work, re-wet both the soft-fired ware and tools as needed.

Always hold each soft-fired piece in your hands during the cleaning process, rather than resting it on the table; otherwise, you're liable to press down too hard and break or chip the piece. The time you need to spend cleaning each piece of soft-fired ware will depend on how well you pre-cleaned the greenware in the leather hard stage.

2. If you can feel a ridge or bump along the seam remove it with the Comfy Scrub in the Stoneware and Porcelain Cleaning Kit. Rub first with the rough side then with the spongy side, using a circular motion to avoid accidental dents or gouges. If you completely removed the

seam in the leather hard stage all you need to do now is polish the area smooth with the spongy side of the Comfy Scrub. Sometimes the seam will be smooth to the touch but will appear to be a slightly different color from the rest of the piece. This has to do with the way the porcelain ingredients settle during the casting and is not significant.

3. Next use a Comfy Scrub to smooth rough spots and irregularities along any area where you cut or trimmed the leather hard greenware. This includes the edge of the shoulder plate where you trimmed the spare and cut out the arm openings; the top rim of each limb; the stringing holes in the neck and the opening you cut out in the top of the head to make it easier to clean the eye openings and set the glass eyes. Again, there won't be much work to do in this step if you pre-cleaned properly.

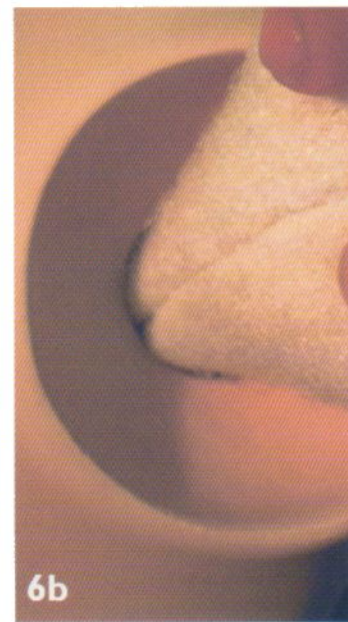
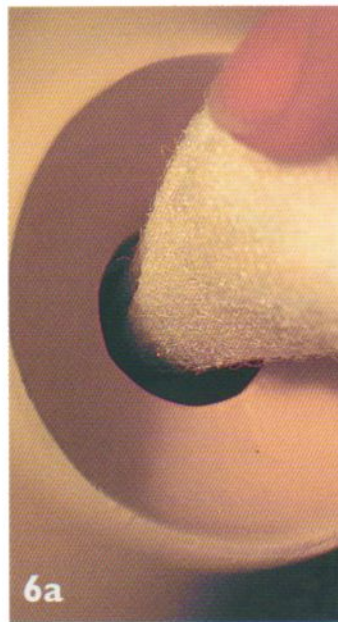
4. Use the soft bristled Round Taklon Brush in the Cleaning Kit to remove from between the fingers and toes any seams or webbing not removed during pre-cleaning.



5 Use the same Round Taklon Brush to smooth inside crevices such as the mouth and ears.



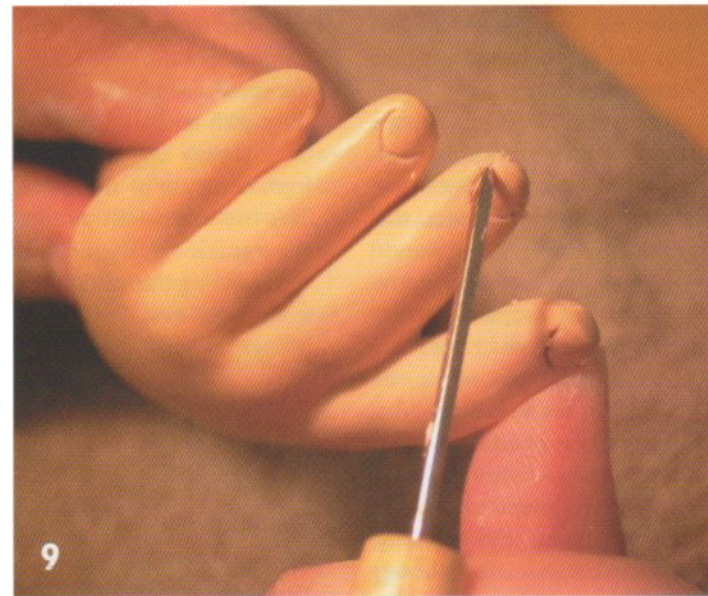
6 Smooth and round out the neck opening in the head and the stringing and sew holes in the shoulder plate with a few turns of a Mini Hole Cleaner. Finish smoothing the edges with the Round Taklon Brush.



7 As you clean the pieces you might encounter tiny pinholes, which are caused by air bubbles trapped in the porcelain slip. Chapter Two, Pre-Cleaning, covered repair of pinholes discovered in the leather hard greenware. Pinholes that appear in soft-fired ware must be dealt with differently. In most cases, tiny pinholes will disappear when you polish over them with the Comfy Scrub. The repair techniques for large pinholes are covered below.



8 Another important part of the cleaning step is defining details. Some molds produce castings that require more definition than others. Fortunately for us, Li'l Kerstina is very well molded, and requires very little extra work.



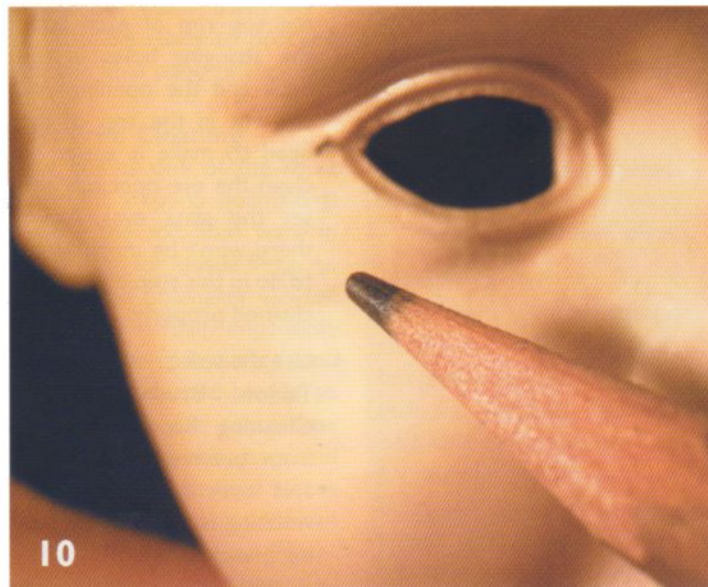
Along the top of each arm and leg is a groove where the cloth body will be attached later on during assembly. Gently deepen this groove with a Double Ball Stylus so it is uniform in depth.

9. Use the Small Detail Carving tool to deepen the groove around each nail.

10. Now you need to start cleaning and sizing the eye openings to prepare them for the eyes you will set in the head later. Wet the

head thoroughly. Use a pencil to make a dot in each of the eye corners, lining up the dots in a straight horizontal line. These dots will guide you in keeping the corners lined up properly. If you wish, you can also draw a light line all around each eye just inside the sculpted rim. This line will guide you in cutting out the proper eye shape.

11. Since you already opened the eyes during the leather hard greenware





eyes by following the sculpted eye ridges. Keeping the precise eye shape will make a big difference in the appearance of the completed doll. When you have finished cutting, you should have two well-shaped eye openings, symmetrical in size with well-defined corners. Don't forget to dip the head in the water every few minutes as you work; if the porcelain is allowed to dry out, it will become harder to cut and could result in chipping or cracking. You will also need to rinse away the porcelain crumbs that collect as you cut.

alog or worksheet for the doll, if one is available, to determine the recommended size of the glass or acrylic eyes you will set in the finished doll. According to the catalog *Li'l Kerstina* needs 14mm eyes. Because porcelain shrinks when it is bisque fired you will need to clean the eyes with a sizer that is one size larger than the eyes. For *Li'l Kerstina* this will be a 16mm eye sizer.

Wet the eye sizer and insert it into the opening in the top of the head. Place the ball of the eye

too deeply set, thus detracting from the beauty of the doll. If you bevel until the lids are paper thin, they're more likely to chip, forcing you to clean too much of the eye rim away and making the doll end up with a startled expression. To avoid chipping, take your time and wet the head and sizer frequently.

You will know you're finished when both eyes are the same size and shape, the corners are neatly trimmed and angled, and the sizer fits as snugly into the eye socket as a human eyeball would.



stage, this next step will be quicker and easier than if you had to chip away at the soft fired porcelain to do it. While holding the head gently in one hand, use a new, sharp Feather-knife to trim away the excess porcelain in the eye area, a little bit at a time, until you've cleared it almost to the eye rim. This can be a slow process, but trying to rush it could result in cracked porcelain, or too large an opening.

As you work, take care to preserve the corners of the

- For the next step in cleaning the eye openings you will need to use an eye sizer, which is a tool with a round wooden ball on one end. Some eye sizers, such as those made by Master Eye Beveler, have a rough sandpaper type surface that is perfect for grinding away at the soft-fired porcelain. Sizers without this rough surface need to be wrapped with a piece of tulle or a nylon stocking held in place with a rubber band.

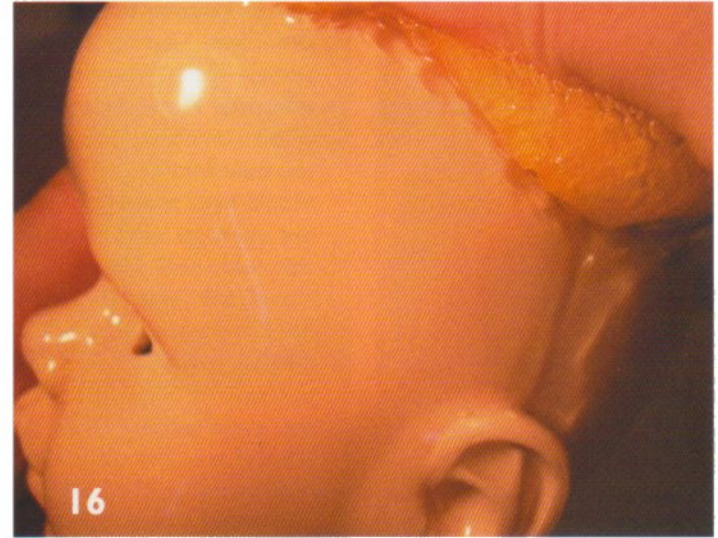
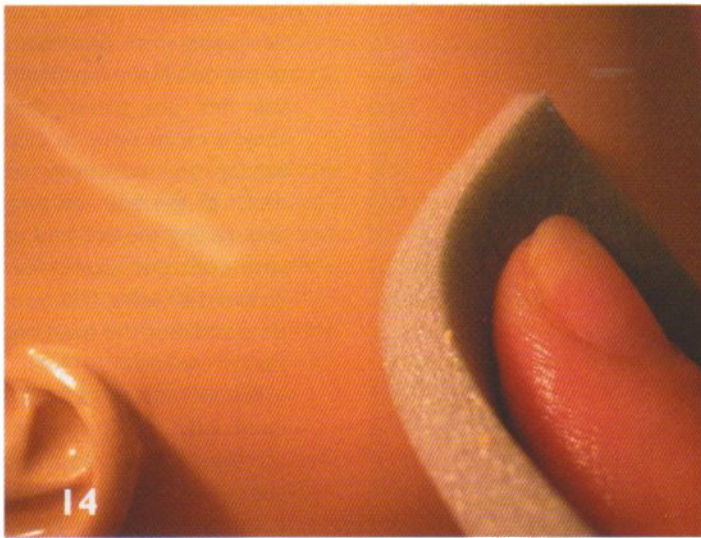
Refer to the Seeley's cat-

sizer into one of the eye sockets and rotate the sizer gently to bevel and thin the porcelain behind the eyelids. The idea is to create a spherical area in the eye socket in which the glass or acrylic eye should fit snugly, without large gaps. Beveling will also thin the eyelids just enough to create a natural, lifelike look.

It takes a bit of practice to learn just how far to bevel to achieve a proper eye fit. If you don't bevel far enough, the eyes will be

Before you bisque fire the head you can also check the eye fit with a 16mm eye. Place the eye gently in the socket to avoid chipping.

- For the final step in cleaning the eyes, moisten a Multi-purpose Blender/2 and gently slide it along the surface of the eye rim to finish smoothing the cut edge and remove any stray crumbs.
- When you're finished with all the cleaning steps above, gently polish the



entire surface of each piece with a circular motion of the spongy side of a wet Comfy Scrub. This will ensure the fired bisque has a smooth, satiny finish.

15. Use a Double Ball Stylus to carve your name, or initials, and the date into the back of the doll's neck. The signature and date should be low enough on the neck to still be visible after the wig is glued on. Some dollmakers like to inscribe a tiny logo, or even a message if the doll is to be a special gift for someone. This is fine, but optional.

If your pieces are to be fired in a kiln with those of other students you will need to identify each of

your pieces by incising your initials in an inconspicuous spot such as the rim of an arm or leg or the underside of the shoulder plate.

16. Rinse each piece under the running tap to remove all the greenware paste and particles. While you are rinsing, gently brush the piece with the Synthetic Sponge in the Cleaning Kit.

Set the rinsed pieces on a towel to dry until the watery sheen is gone. Make a final inspection of each piece under a bright light to make sure you did not miss any tiny scratches, dents or pinholes. A magnifier is also helpful. Wet the piece again and re-clean any spots you

missed with a moist Comfy Scrub or Round Taklon Brush.

17. Repair of large pinholes should be saved until after the final rinsing of the piece. Use a Featherknife to scrape a bit of porcelain off the edge of one of the pieces such as the rim of an arm or leg. Use the Featherknife to gently push some of the scrapings into the pinhole, patting the area with the side of the blade to pack the hole firmly and smoothly. Use a wet Synthetic Sponge to wipe away any stray porcelain crumbs around the patched hole. After you have patched a pinhole, the piece should not be placed

back into the water or rinsed because the filling will dissolve.

Once you're satisfied that you've done the very best job possible, your cleaned pieces are ready for bisque firing, which will be covered in the next chapter.

All molds, brushes and other dollmaking tools and supplies available from Seeley's.

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