

Glazing

A guide to using Cromartie's dipping glazes.

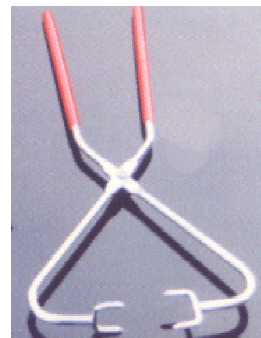
We supply several clear transparent dipping glazes for use over underglaze colours on our bisqueware ranges, for details please see our Duncan and Gare catalogues. These glazes are easy to use but require a little skill and experience to get it right; this guide is designed to help. Duncan and Gare glazes are designed for use on their own bisque ranges and may be suitable on other Paint a Pot bisque however it is important to test that they are compatible with other clays before using in your business.

Your choice of dipping glaze

From Duncan we offer GL612D and CN2000D and from Gare we have GG1700D and NTG9000D. GL612D and GG1700 are both dinnerware safe, lead-containing glazes giving very bright colours. Leaded glazes are more forgiving and less prone to firing problems but cost a little more. For information on lead glazes please see the health and safety section on our website. CN2000D and NTG9000 are lead-free glazes which tend to be a little whiter over the bisque. Lead-free glazes must be fired more carefully ensuring that the correct heatwork is achieved.

Equipment required:

1. Glaze container
The container should hold about six gallons of glaze with room for displacement when dipping.
2. Mixer
Use a wooden spoon, large catering whisk or toilet brush.
Glaze tongs
3. Viscosity cup
4. Stopwatch or watch with second hand.



Method

1. Shake the gallon bottle of glaze thoroughly and tip about half into your glazing container. This will enable you to shake the remainder more effectively before pouring into the container. Repeat the process with more glaze until you have the enough depth to dip your bisque.
2. Now mix the glaze thoroughly, it should be the consistency of whole milk and completely smooth. Take care using electric mixers that might create too much movement and put air bubbles into the glaze.
3. When the glaze is mixed, test the thickness with a DuPont M-50 cup Viscosity cup as supplied by Cromartie. This measures the thickness, (viscosity) of the glaze; too thick and you will put too much glaze on the piece, too runny and the

glaze will not cover the bisque. Immerse the cup in glaze so that it fills with glaze. Lift the cup out of the glaze and start timing. When the steady stream of glaze starts to break stop timing. A time of 18 – 25 seconds will give the desired consistency.

4. Now you are ready to dip. Hold the piece firmly in the glaze tongs, for larger or awkward shapes you may have to use your hands. Be careful not to touch any colour with wet hands as this will smudge it. Dip the bisque in a smooth action, straight in and out, carefully shake off excess glaze and place on a drying mat. Larger pieces will need to be dipped in two parts, immerse half or three quarters of the piece and leave to dry until it is safe to touch without smudging. Dip the other half overlapping the glaze by about $\frac{1}{4}$ ".
5. Imperfections on the glaze such as finger or tong marks can be touched up using a soft fan brush when the glaze has dried. If the glaze is not dry you risk smudging the colour. Small runs, lumps etc on the glaze surface will smooth out in the firing, larger imperfections can be smoothed by "finger sanding", rubbing gently with the fingers.
6. When thoroughly dry, fire in the kiln to a program that ensures witness cone 06 is put down. A typical firing would be as follows: 150°C per hour to 600°C full power to 1020°C soak for 15 minutes; however please note the top temperature required will vary widely with different makes of kiln. Please call us for advice on firing programs.
7. Allow the kiln to cool to below 200°C before removing side bungs or cracking open the kiln lid. Wait till a safe temperature is reached, well below 100°C, before unloading.

Health & Safety

1. Dust. Avoid creating dust and clean up daily. Finger sanding causes glaze dust so this should be kept to a minimum; most lumps and bumps are smoothed out in firing anyway. Always "wet clean"; wipe up with a damp cloth, clean floors with mop and bucket.
2. Leaded glazes. Lead in leaded glazes is rendered safe by being combined with glass, please read our information on the website [www.bisqueware.co.uk/Health & Safety](http://www.bisqueware.co.uk/Health%20&Safety).
3. Wash with soap. Although our glazes are safe to handle, (there are no bio-available toxins present), it is always advisable to wash hands thoroughly with plenty of soap.
4. Health & Safety Data sheets. Health & Safety Data sheets, (MSDS, COSHH information) is available for download from our website www.bisqueware.co.uk

Troubleshooting

- Problem:** Glaze thin at edges giving a rough, dry look.
Cause: The glaze mix is too thin and runs off the edges of pieces.
Solution: Check the viscosity with your viscosity cup. If the glaze is too thin leave uncovered to allow it to
- Problem:** Uneven “orange peel” surface to glaze, milky in places.
Cause: Glaze too thick. See also *underfired*.
Solution: Check glaze viscosity, add water if required. Distilled water should be used.
- Problem:** Blisters and sharp craters in glaze.
Cause: Over-fired; the glaze is “boiling”. Seriously overfired pieces can have a very dry, matt texture.
Solution: Check firing temperature with cones, do not exceed cone 06.
- Problem:** Dull colours, matt or orange peel surface.
Cause: Under fired
Solution: Check firing temperature with cones, ensure cone 06 is down.
- Problem:** Smudged Colour
Cause: Glaze applied before colour has dried, handled before glaze has dried.
Solution: Ensure colour and glaze are completely dry before handling.
- Problem:** Colour bleeding and spreading in a halo effect, moving downward on vertical surfaces, especially with blue colours.
Cause: Temperature too high and/or soak too long. Cobalt used in blues is a very strong flux and will cause the glaze to melt more readily if over applied.
Solution: Check firing temperature with cones, ensure cone 06 is down correctly. Avoid using colour too heavily.
- Problem:** Glaze rough and dry in texture only over certain colours.
Cause: Too much colour; not enough glaze. As above, colours which have more active fluxing characteristics melt the glaze and can sometimes dissolve silica out of the glaze giving it a starved look with rough dry surface.
Solution: Reduce colour thickness if possible; apply more glaze where colour application is heavy. Re-firing with added glaze to the faulty area might restore the piece.
- Problem:** Crazeing, a network of small hairline cracks over the glaze surface.
Cause: The glaze is too small for the bisque when it contracts after firing and is under tension causing it to crack. The glaze does not “fit” the bisque. Underfired bisque can cause crazeing; some clays and glazes are not compatible whatever the temperature.
Solution: Check firing temperature; underfired glaze can sometimes cause crazeing. In general as bisque is fired higher than glaze, re-firing at higher temperatures will not correct the problem.

- Problem:** Bare patches of bisque where the glaze has moved in firing.
Cause: Crawling, colour and glaze has not adhered to the bisque surface because of dust or grease on the bisque.
Solution: Wipe bisque with a damp cloth to remove dust; ensure no grease or sticky fingers touch the bisque.
- Problem:** Glaze falling of the ware after firing leaving bare bisque.
Cause: Shelling, glaze has not adhered to the bisque. Usually a mismatch of glaze to bisque; the glaze being too big for the bisque. Shelling is the opposite of crazing.
Solution: Ware cannot be repaired, contact you bisque supplier.
- Problem:** Small hard round grains or grit in the fired glaze.
Cause: Oolites, crystal growth of limestone in the glaze cause by adding tap water to glaze. Characterised by the very even round shape of the particles.
Solution: Although larger particles can be sieved, once the impurity is in the glaze the crystals will keep growing so the glaze may have to be discarded. Always top up with distilled water. Ware can be repaired by grinding down the crystals and re-firing.
- Problem:** Small sharp pieces of grit in the fired glaze.
Cause: Debris falling on the ware from kiln bricks or kiln shelves. Batt wash can cause this problem if it has been applied to the underside of the shelf.
Solution: Hoover the kiln regularly especially the top edge to remove loose brick dust, check edges of shelves for damage that could fall off. Ware can be repaired by grinding down the particles and re-firing. Store kiln shelves on edge on a wood board, concrete will damage the edges and drop fragments into the kiln.
- Problem:** Pinholes in the glaze
Cause: Underfired glaze, dust on the bisque, pencil marks on bisque, underfired bisque.
Solution: Re-fire, check the kiln temperature. Ensure ware is wiped with a clean damp cloth/sponge before painting.
- Problem:** Cracked ware: glaze covering the edge of the break or running into the crack.
Cause: Firing too fast up to 600°C. Hairline crack before firing. The break occurred in the heating cycle as the molten glaze has run into the crack.
Solution: Reduce the first heating ramp to no more than 150°C per hour slower for bigger items. Check for cracks before decorating by “ringing” the piece.
- Problem:** Cracked ware: glaze very sharp at break.
Cause: The break occurred in the cooling phase after the glaze had cooled.
Solution: Cooling too fast, especially around 220°C.
Solution: Avoid opening the kiln until at least 100°C, support the foot ring of large plates etc on pins to avoid contact with kiln shelves allowing movement of air under the piece.