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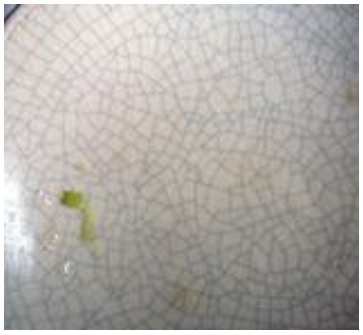
Glaze Faults and Remedies

A quick guide to the most common glaze faults.

Crazing



Crazing is the network of small cracks that appear in the glaze surface but do not penetrate through to the clay. Crazing is caused by a mismatch between the clay body and the glaze. The glaze has a thermal expansion greater than the clay so that when it cools down after firing the glaze has a smaller surface area than the clay and it is being stretched by the clay creating stress which cracks the glaze. This often occurs when the clay has not been fired high enough in the biscuit firing. Clays must be fired to their maturing range as specified by the manufacture; a common mistake is to fire the biscuit too low. Changes may be made in glaze recipes to prevent crazing include increasing silica, decreasing feldspar, increasing boron and increasing lead. Delayed crazing can occur especially in earthenware because the clay absorbs moisture and expands, stretching the glaze.

Shivering or Shelling

Shivering is when the glaze peels off the pot like eggshell, hence shelling. It usually occurs on the rims or handles of pots. The cause is the opposite of crazing; the glaze has a lower thermal expansion than the clay making the glaze surface too large for the clay. This is a particularly serious fault as sharp slivers of glaze can drop into food or drink. To correct the problem change the clay or glaze to ones that are compatible. Alter the glaze recipe to decrease silica, increase feldspar, especially sodium feldspar, nephaline syenite or other alkaline materials. Shivering can also be the result of over-sponging the edges and rims of pots; this can remove the smaller clay particles leaving more sandy material giving less adhesion to the glaze. Very thick application of underglaze to rims can also cause this problem.

Crawling

Crawling is where the glaze detaches from the clay and rolls up revealing a bare patch of biscuit. It occurs when the glaze does not adhere to the biscuit; this is frequently caused by grease or dust on the surface of the biscuit preventing the initial bond of wet glaze to the pot. Glazes with a high surface tension and high viscosity such as zircon opacified whites and matt glazes are prone to crawling. Glazes applied too thickly and when a glaze is applied over another can crawl because of moisture trapped in the glaze boiling during the firing. Small additions of flux to the glaze will help, but most importantly, ensure the biscuit is clean.

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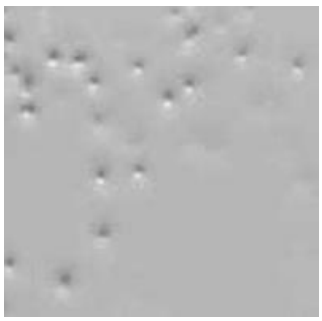
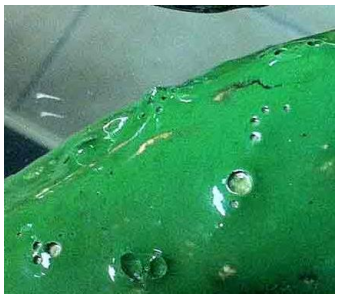
Pinholes



Pinholes are small indentations in the glaze surface, they are caused by bubbles of gas formed in the glaze or clay as it is fired rising through the glaze surface; the glaze does not having enough heat or time to heal over leaving a small hole. Sometimes caused by underfired biscuit where the clay has not been matured and gases are still being generated within the clay. This is often a symptom of an under-fired glaze. Small particles of dust or pencil marks on the biscuit can also cause pinholes which are really tiny areas of crawling – see above. Increasing the temperature and/or extending the soak will help, try applying the glaze less thickly, additions of fluxes to the glaze will also help. Pinholing is more prevalent on "stiffer" glazes that flow less in the firing.

Blistering



Blistering, craters on the glaze surface are usually a sign of an over-fired glaze; gases are generated in the glaze – it could be said to be boiling. The gases burst at the glaze surface leaving jagged edged craters. Reduce the firing temperature. Paradoxically, an underfired glaze can also blister; craters often form in glazes as the glaze melts, as the firing progresses they heal over and the glaze surface becomes smooth. A very thickly applied glaze can also contribute to this problem.

Oolites Not illustrated.

Oolites are small spherical crystals of calcium carbonate that contaminate the glaze and after firing appear like small hard grains of sand standing proud of the glaze surface. Under magnification they are perfect spheres which differentiate them from other contamination such as kiln dust. Oolites are precipitated in lime rich glazes particularly where stored for long periods in a warm atmosphere. Once they start forming they will continue to do so; sieving before glazing may help to reduce the impact.

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