Pigments and Engobes for Crystalline Glazes

1

CATERINA ROMA EXPLAINS A TECHNIQUE DEVELOPED BY JOSEP MARISCAL.

With a family tree with deep roots in the pottery trade, Josep Mariscal was taught by his father from the age of seven to master the rolling of clay. When he grew up, and after working as a potter in many factories in the traditional ceramic village of La Bisbal d'Empordà (Catalonia, Spain), Mariscal set up his own studio and kept researching to perfect the techniques that would best express his artistic interests, mainly terra sigillata, raku, and crystalline glazes. A self-made artist from head to toe, today he's a great master without ever having attended a ceramics class.

With such a long practice in throwing, and strong arms, Mariscal builds large pieces with smooth surfaces – the perfect background to grow large crystals, floating in deep and shining glazes. His research has allowed him to achieve the brilliant finish of porcelain in large-scale pieces born on the throwing wheel, and to discover new colours that are different from those you would get if using classic combinations of oxides.

The technique is not new – Mariscal just uses engobes and pigments – but there are hurdles at every step. He has standardised the process in a way that, if you stick to it, will allow you to take a step forward with your crystalline glazes colour range.

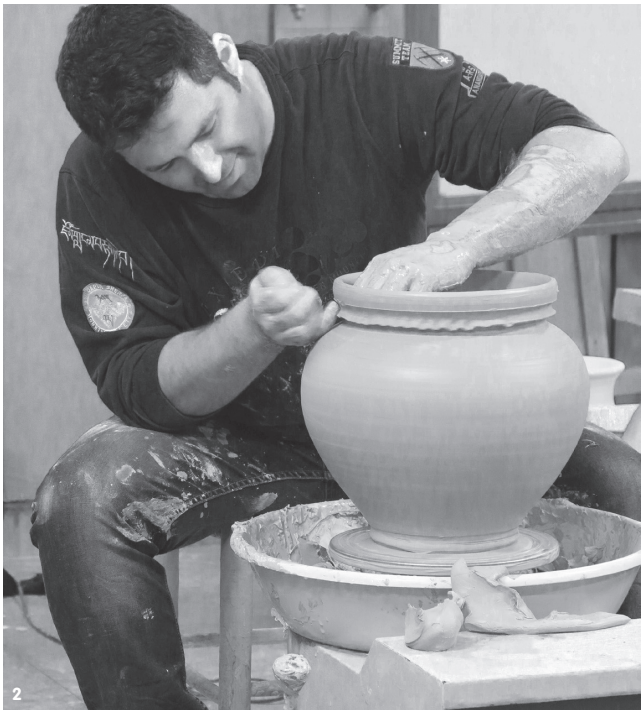
ENGOBES The basic technique consists of using a porcelain engobe to cover a stoneware piece, a clay that is far better to throw but one on which crystals do not generally develop so well. For the porcelain to correctly adhere to the stoneware body, Mariscal covers the piece with a deflocculated slip when the clay is leatherhard, and he does it slowly and steadily in order to achieve a homogeneous thickness of about 2-3mm. If the piece is thin or too wet, it needs to be immediately dried with a torch to avoid collapse. Once dry, it is ready to bisque fire.

If you want your piece to have a white background to show the colour of the crystals, nothing else needs to be done; do some tests with the clays you have available to check if they work well together. But if you want to experiment with new colours, there are some factors that have to be taken into consideration.

LOSS OF COLOUR If you have ever tried to mix pigments into a crystalline glaze, you know that most of the time the colour mysteriously disappears during the firing. This can happen because of the breaking down of the particles through excessive milling, or due to the chemical attack by alkali fluxes or glazes. To overcome this first setback, simply mill the glaze for under thirty minutes.

1 *Crystals with engobes*, stoneware with white and coloured porcelain engobe, 2013, H65cm max **2** Josep Mariscal throwing at the *International Crystalline Glaze Convention*, La Bisbal d'Empordà, April 2013 **3** *Crystals on coloured engobe*, stoneware with coloured porcelain engobe, 2013, H65cm **4** *Bottle with red engobe*, stoneware with coloured porcelain engobe and crystalline glaze, 2013, H45cm
Photography Caterina Roma

Email ceramics@caterinaroma.com
Web www.caterinaroma.com
Caterina Roma is a ceramist who graduated in Literary Theory and Comparative Literature, and studied Literary Translation and Publishing at postgraduate level. She is a passionate researcher of ceramic techniques and traditions



2

4

3

However, the second factor presents more difficulties, because crystalline glazes have a high alkali nature, and there are only some metal oxides whose colours will 'survive' it. That's why the colour disappears if you mix it into the glaze. The oxides that work are lead, calcium, magnesium, boron, and zircon. The neutrals are zinc, barium, and alumina. And the ones that work against it are sodium, potassium, lithium, and fluorine.

WORKING WITH SLIP The first ingredient of the glaze that melts when the temperature rises in the kiln is the frit. The most common frits for crystalline glazes, 3110 or 90208, create a particularly unfriendly environment for the pigments, but all crystalline glaze frits do. When zinc oxide dissolves in the frit, on a later stage of the firing, it is too late to protect the pigment. That's why the only possibility of saving the colour is to mix the pigment in the porcelain slip, which works as a protection from the alkalis. You can always try to make your own frit so it will be more suitable for this purpose, but that would be another (long) story.

The key point is to find the balance between the glaze composition and temperature, to ensure that the pigment 'survives' and shows its original colour.

Mariscal recommends trying 10% to 30% pigment in the porcelain slip, depending on the colour. Once the piece is bisque fired, you can glaze it with your usual recipe. If it still doesn't work, you can try adding some zinc oxide or zircon silicate to the slip, from 5% to 20%.

With this simple but challenging technique, Mariscal glazes his pieces using his crystalline glaze recipes with added oxides over tinted engobes. The results are rare but fascinating combinations of different colours for the backgrounds and crystals.

You can find more information about crystalline glazes, recipes, and techniques at www.ceramicasjosemariscal.blogspot.com (Spanish only). And don't miss the macro-crystalline zinc-silicate glaze discussion group www.s3.excoboard.com/crystal, where you can learn and share with experienced potters. CR