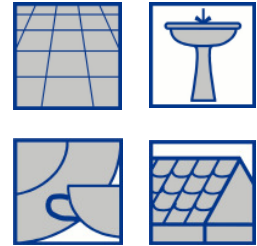


## Glaze / engobe binders



## OPTAPIX

### Application

On the one hand glaze binders are used to produce **internal adhesion** in the glaze/engobe. This inner adhesion brings about an improvement in mechanical strength of the surface, and hence leads to a better **touch-resistant finish**.

On the other hand a **better connection between the glaze and the ceramic piece** is obtained, which prevents cracking and crawling of the glaze surface and also at the edges of the piece.

Glaze binders can be used to adjust both the drying time of the slip, as well as the rheological properties. There are also products available which exhibit mainly binding properties, but only have a minimum influence on the drying time and the rheological characteristics.

In addition to glaze binders in powder form, liquid products can also be supplied. These are mainly used to correct the rheological properties of glazes/engobes, as well as the adhesive characteristics. On the basis of their composition, they can be added easily and homogeneously to the glaze slip during stirring (e.g. in the dipping container).

### Mode of action

In the glaze binders from Zschimmer & Schwarz, **synthetic organic polymers** are used, which besides their binding properties also bring advantages through the **regulation of drying time, levelling and viscosity**.

A special role here is fulfilled by **cellulose derivates**, especially high purity sodium carboxymethyl celluloses (sodium-CMCs), as unlike other types, these do not tend to foam.

Sodium-CMCs for use as glaze binders differ in their molecular weight, which is significant for the viscosity of the glaze solution, as well as their individual technical application properties.

The mode of action depends, like all temporary binders, on the **formation of an adhesive film between the raw material particles**, which remains effective after the removal of the physically bonded water. As a result of their solubility in water, the binders described can completely cover the raw material particles, leading to a highly adhesive surface.

Sodium CMC is a polyelectrolyte, and the low viscosity, i.e. short-chain types, have a deflocculating effect besides their binding property. As far as the sodium CMC types with a medium molecular weight are concerned their electrolytic effect is to a large extent compensated by their increased intrinsic viscosity; they, therefore, have a rather small effect on the viscosity of the glaze slip, at the usual addition quantities. Long-chain types have a strong thickening effect on the glaze slip.

In general the higher the molecular weight the higher the binding strength. On account of the stronger water retention characteristics of the higher molecular weight CMCs, the drying time of the slip is increased.

Glaze binders that do not influence the drying time encourage ceramic particles to stick together, through the formation of adhesive forces. As they do not swell, they possess no water retention properties.

Sodium CMCs from Zschimmer & Schwarz can be supplied for use in **powder or granulate form**. The advantage of granulates is their improved distribution property. As they do not tend to form clumps, either when stirred in with the slip, or prepared via a stock solution, they are more readily soluble.

In order to ensure the long term stability of the glaze/engobe slip, as well as the ready prepared CMC stock solution, a preservative is necessary, for example one of the NOVAL K types from Zschimmer & Schwarz.