

Kuraray Poval / Mowiol® - Ceramic compounds

Mowiol is outstandingly suitable as a temporary binder and plasticizer for ceramic compounds. It breaks down almost entirely into water and carbon dioxide when a ceramic molding is fired.

The possible applications depend essentially on the nature of the ceramic compound and the molding process. The quantities used vary considerably, depending on the technology applied, in the range 0.1 – 5 %, relative to the dry mix. Mowiol is particularly effective as a temporary binder in *special ceramics (technical ceramics)*. In this sector moldings of high green strength are made by cold compression of ceramic powder produced beforehand by spray drying.

In special ceramics it is important to have both high green strength in the molding and the lowest viscosity in the aqueous ceramic slip, the necessary shear-dependent viscosity being achieved by addition of Mowiol. If the slip needs to be further liquefied for particular uses, this can be done by adding Mowilith Ct 5 A approx. 50 % in solution, sodium hexametaphosphate and/or other dispersants.

In the case of low-viscosity compounds it should be noted that foaming may occur during vigorous mixing. To prevent this, additions of 0.02 – 0.3 % defoamer, relative to Mowiol solid, are recommended.

Mowiol 3-85, 8-88, 18-88 and especially 4-88, though also fully hydrolyzed grades such as Mowiol 10-98, have proved useful in the ceramics sector. These products are applied either alone or with an addition of up to 10 % plasticizer (relative to Mowiol) such as glycerin, trimethylol propane, neopentyl glycol or poly-glycol (up to a molar mass of 400).

During development work on suitable formulations, consideration may be given to additions of paraffin emulsions or solutions of poly-glycols with higher molar masses, the choice depending on the process technology.

The combination of Mowiol with cellulose ethers (Tylose) in ceramic slips gives improved processability, e.g. in the plasticizing of extrusion compounds.

Advantages of using Mowiol as a temporary binder in the ceramics sector:

- Low viscosity of the aqueous slip before drying and hence less water to evaporate
- Low binder requirement
- Low ash content (electro-ceramics)
- Little waste through breaking (re-usable)
- Smooth burn-out-profile
- Low shrinkage during firing
- No clogging of screens, filters and moulds

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