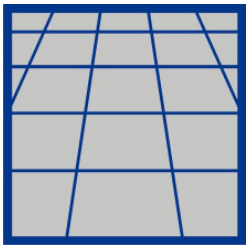
Deflocculants and dispersants



DOLAFLUX, DOLAPIX, GIESSFIX

Application

During the manufacture of ceramic products, energy costs represent a significant proportion of the total costs of the final product. If during the preparation process a slip phase occurs, **a high slip density must be the aim**. The **reduction of the water required within the slip or liquid phase** makes it possible to **lower the drying costs** by **energy cost savings**.
The amount of the energy to be saved shall be shown by an example for which the original data of a tile body have been used.

For the increase in output which may be achieved by using high-quality deflocculants available from Zschimmer & Schwarz, the following calculation has been made:

$$P = E \times [C_1 : (C_2 - C_1)]$$

Where:

P = body output
E = effective output of the spray tower in kg/h water evaporation
C_1 = solids content in the slip
C_2 = solids content in the spray granulate.

There is the following calculation for a tile spray body:

1) Actual situation

E = 1000 kg/h
C_1 = 58.8%
C_2 = 94.0%

$$P = 1000 \times [58.8 : (94 - 58.8)] = 1670.5 \text{ kg/h}$$

2) Increasing solids content of C_1 to = 62.5%

$$P = 1000 \times [62.5 : (94 - 62.5)] = 1984.1 \text{ kg/h}$$

This means an **increase in body output** of

$$[(1984.1 - 1670.5) : 1670.5] \times 100 = 18.8\%$$

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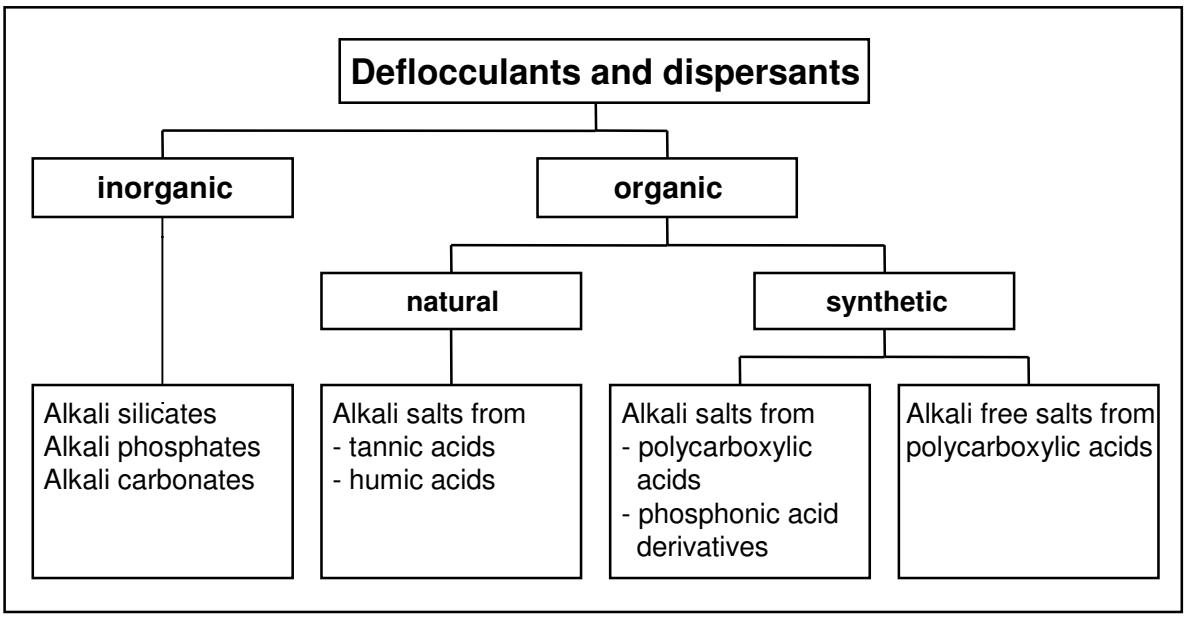
This percentage increase in body output is equivalent to the value of the energy cost savings. Through constant body demand, the running time of the spray drier is shorter; and with constant running time, with the same water evaporation the body output is increased.

Through the use of deflocculants and dispersants, the **rheology of a slip** (viscosity, thixotropy, structural viscosity, dilatancy, rheopexy and Newtonian flow) can be further **influenced in the desired manner**. Casting rates and green strengths may be increased, sedimentation phenomena and the formation of streaks may be prevented.

Mode of action

Inorganic as well as organic components are used in the deflocculants and dispersants available from Zschimmer & Schwarz, as set out in the following overview:



The mode of action of deflocculants and dispersants is based on their **definite composition**, which is directed towards an **optimum ion exchange** in connection with the deflocculated slip. Through this ion exchange, a **charge compensation** is achieved so that **attraction forces** are no longer effective **between the ceramic particles**.

The **effectiveness of the deflocculants and dispersants** is **not only dependent on** the solids content and the kind of raw material used, **but also on** various other parameters, such as for example

- water hardness
- particle shape
- particle size distribution
- clustering of particles

There are only a few cases where a general recommendation is possible, and as there is a wide variety of influencing factors, it is **necessary to adjust each slip to the required rheological values by means of separate deflocculation tests**.

A detailed description on how to determine the most suitable deflocculant and its optimal addition quantity for each individual application is given in our ***special information „Testing bodies for their deflocculation behaviour".***

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