

# HYDROSIL HT20E

Hybrid binder

## Chemical Description

**HYDROSIL HT20E** is a hybrid binder containing a mixture of silica derived from prehydrolysed tetraethylorthosilicate and another form of high purity amorphous silica.

## Typical Physical Properties

	Method Reference	Typical value
Appearance .....	Visual	Milky white liquid
Silica content, % weight .....	Gravimetry	19.5 – 20.5 %
Viscosity at 20°C, cPs .....	Brookfield	3.0 – 4.5
Specific gravity at 20°C, g/ml .....	NF-T 60.101	0.90 – 0.93
Flash point, °C .....	ATM D-92	< 13
Acidity, % weight of H <sub>2</sub> SO <sub>4</sub> .....	Titrimetry	0.08 – 0.15
Gel time at 20°C after 24h, minutes .....	Internal*	3 - 10

\* Accelerator: 10% (volume) of 10% piperidine in alcohol (volume/volume).

## Applications

**HYDROSIL HT20E** is fully proven in production and established in use in investments foundries, both in mechanical and manual moulding systems. It has a number of advantages over binder formulations of similar silica concentration:

- Increased stability in store. The change in viscosity during the first 6 months is minimal.
- Increased stability in the slurry mix. This enables close control of viscosity and density, and prolongs the useful life of the slurry.
- More filler is taken up in the slurry mix for the same viscosity.
- Bonding strength from the available silica is higher.
- Mould coats air dry quicker.

The principal application is as a binder in the ceramic shell process:

- ❖ In air dried only techniques where a minimum drying time of 1 hour is required per coat, or up to 2 hours for larger or more complicated shapes.
- ❖ In partly air dried systems with ammonia check, where a minimum period of 15 minutes air drying time of each coat is required before assembly enters the ammonia containing atmosphere, which should be approximately 0.5% concentration.

## Dilution

**HYDROSIL HT20E** may be diluted by additions of ethyl or isopropyl alcohol. The alcohol must be water free otherwise the stability of the binder will be adversely affected.

This technical data sheet corresponds to our knowledge of today. Its purpose is to provide information on our products. It is therefore not intended to guarantee all characteristics or applications.



**Control of slurry**

For optimum stability the pH of slurries should be maintained at 1.0-1.5 by adding 10% weight/volume of sulphuric acid in alcohol, and the slurry temperature should be maintained at  $20^{\circ}\text{C}\pm 1^{\circ}\text{C}$ . Viscosity and density should be checked twice daily. Binder and filler should preferably be pre-mixed in a separate tank for topping up the main tank. Losses of volume due to evaporation of solvent should be made up by adding alcohol. The tanks should be left covered when not in use.

**Packaging**

The product is available in high density polypropylene drums at 180 kg (net weight) and container at 900 kg in PEHD natural.

**Storage**

The product can be stored in a cool warehouse for at least 1 year, but for optimum reproducibility it is advisable to use it within 9 months of the date of manufacture.

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