I. Technical Information

I.1 Description

Dolit HES is a halogen and fluoride-free water glass mortar that only has to be admixed with water to apply and then cures in a chemical reaction. Bonding agents and hardeners are already contained within the mortar powder. Dolit HES is a product from a series of special CRS protective construction materials.

I.2 Properties and Application

With the exception of hydrofluoric acid, Dolit HES is resistant to all acids as well as to oxidising agents, greases and oils, but not to alkalis. Dolit HES is primarily used as a caulking mortar to insert interior chamotte (fireclay) pipes in house chimneys. It also serves as a full and hollow-joint bedding mortar for bricks, tiles and moulded components for floors and tank masonry. Dolit HES has relatively good resistance to water and rinsing that even allows for acidic rinsing over several weeks, though not on a permanent basis. If a high level of resistance to rinsing or wear-and-tear is required, joints should be made using synthetic resin bonded Dolit mortars.

I.3 Physical Data

Density:	g/cm^3	2,0
Compressive strength:	N/mm^2	25
Flexural strength:	N/mm^2	10
Shore D Hardness		>30
Modulus of elasticity:	N/mm^2	1.1×10^4
Linear heat expansion coefficient:	K^{-1}	12×10^{-6}
Heat conductivity:	$W/m \times K$	1.2
Maximum application temperature:	°C	900
Adhesion strength to		
Ceramic:	N/mm^2	2.5
Steel:	N/mm^2	1.5

I.4 Important Chemical Resistances

• Mineral oil	+
• Otto motor fuel oil	+
• Toluene/Xylene	+
• Methanol/Ethanol	+
• Isopropyl alcohol	+
• Ethyl acetate	+
• Acetone	+
• Methyl isobutyl ketone	+
• Trichloroethylene	+
• Aldehydes	+
• Hydrochloric acid 37%	+
• Phosphoric acid 85%	+
• Chromic acid 20% CrO_3	+
• Hydrofluoric acid	-
• Sulphuric acid 90% at 100°C	+
• Nitric acid 65%	+
• Acetic acid 100%	+
• Oleic acid	+
• Caustic soda, caustic potash solution 50%	-
• Chlorine bleach 13%	-
• Ammonia 25%	+
• Hydrogen peroxide 30%	+

\+ = resistant (at 20 °C)
o = briefly resistant
– = non-resistant

Our materials are subject to constant testing and improvement so that changes may not yet have been taken account of at time of printing. We would therefore ask you to review the basic technical specifications with your contact at our company prior to application.

All details given in this Technical Information Sheet are accurate to the best of our knowledge at time of printing, however we reserve the right to make changes. No liability on our part can be inferred or accepted on the basis of the information given here.

We would like to point out that the materials we offer are specialist products that require expert knowledge and confidence in application by the user.

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II. Preparation and Application

II.1 Requirements for Application

Steel substrates have to be treated by sandblasting (e.g. using corundum) until they shine metallic. To prevent immediate rusting, a thin layer of mortar laitance made of Dolit HES and water (mixing ratio: 4 : 1) must be applied over the surface at once after sandblasting. The amount required to cover 1 m²: 0.8 kg Dolit HES powder: 0.2 kg water. All water glass mortars naturally display a certain amount of porosity that allows liquids to penetrate into the mortar. Cement substrates should therefore be provided with a liquid-blocking membrane in conformity with the basic rules of surface protection engineering. This resulting surface should be made in such a way that the water glass mortar applied to it can adhere properly.

⇒ Bedding and layer joint thickness from 4 to max. 10 mm
⇒ Joint width for bedding with hollow joints 5 to 8 mm
⇒ Joint depth for bedding with hollow joints min. 15 mm
⇒ The temperatures for the space, the substrate and the mortar material should remain between 10°C und 30°C during application.

II.2 Components

	Art. No.	Appearance	Package	Storage conditions	Shelf life
Dolit HES Powder	94010025	Grey powder	S	dry	2 years

S = Sack

Safety information: Please observe the corresponding Safety Data Sheets for information on handling, storing and transporting the materials!

II.3 Mixing ratios and pot life

Material	Components	Measuring container L	= Kg	Kg per L	Litre weight = kg	Pot life at 20°C	1 mixing cont. = L
Dolit HES mortar	Dolit HES Powder	4.950	5.250	1.75	2.0	1.5 hours	3,0
	Water	0.750	0.750	0.25			

After filling the amount of water into the mixing container, add the proper amount of Dolit HES Powder and mix thoroughly until a homogeneous mixture is obtained. Use a forced (Rotex) mixer to stir larger amounts. It is characteristic for Dolit HES in such cases to make a mixture that at first appears too dry. A mortar that is easy and proper to apply usually only results after the material has been stirred sufficiently (arr. 5 minutes). The mixing process can be accelerated at low temperatures by using preheated water (+ 30°C to + 60°C).
It is imperative to keep to the prescribed mixing ratio. Only in exceptional cases it can be varied up to + 10% depending on the prevailing circumstances. Note when doing so, however, that the mortar is thicker and more solid when mixed with less water than it is when mixed with more. Thin-mixed mortar is also less resistant to water and displays less strength.

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II.4 Application

Later admixture of water to the mortar material that is already curing is not permitted. The mortar cures in arr. 24 hours at +20° C and may not be disturbed while it is in the process of curing. At temperatures from +10 to +15°C, the creep stability of the mortar in the joints can be improved by using warm water when mixing the material. Furthermore, it is recommendable to preheat the mortar powder and, if possible, the brick and tile as well using dry air heated to arr. +25°C (brick and tile must not be warmer than the mortar). Water glass mortar must not be applied at temperatures below +10°C. If this minimum temperature is not maintained for a protracted period, i.e. for several hours, the quality of the mortar will be negatively impacted. Freshly applied mortar surfaces have to be protected from frost until they are fully cured.

Tools: Measuring container, mixing container, drill with stirrer, (on large work sites: Rotex mixer), trowel, jointer, brush mortar smoothing agent ("Dolit Universalreiniger"), work site safety signs

II.5 Post-treatment

Masonry and surfaces made using Dolit HES will be waterproof after 10 days at +20°C even without an acid treatment. At lower temperatures, the surface will not become waterproof for longer time. If bricks or tiles are hollow-jointed in Dolit HES using a phenol or furan resin mortar, these joints should be acid-treated after curing and drying of the mortar, but at the earliest three days after installation. This should be repeated up to a total of three times at intervals of several hours. Suitable acidification agents include alcoholic hydrochloric acid (mixture of 70 parts per weight isopropyl alcohol or methylated spirits + 30 parts per weight of 30% hydrochloric acid), or 20% alcoholic sulphuric acid, (mixture of 20 parts per weight of water + 20 parts per weight of 96% sulphuric acid + 60 parts per weight isopropyl alcohol). Wear protective eyewear when mixing these agents! Stir the components together in the order given here.

II.6 Commissioning

Masonry and surfaces made using Dolit HES can be commissioned five days at the earliest after completion of work, in case of exposure to liquids at temperatures above +150°C at least 8 to 10 days. Tanks or plant equipment with masonry applied using Dolit HES should be initially started up using dilute mineral acids. If a longer period of time elapses between completion and commissioning, or for longer standstill periods, it is helpful to fill the tanks or equipment first up to a third with weakly acidic water. Cover open tanks.

II.7 Safety and Handling

Classification of products in accordance with the German Hazardous Goods Act and transport legislation and the recommendations such rules entail for handling and dispatching such products can change rapidly. To find the latest information on this, please refer to the most recent version of the Safety Data Sheet which we would be pleased to send to you on request.

Safety precautions:

- Operating instructions acc. to Sec. 20 of the German Hazardous Goods Act (abbreviated GefahrstoffV)
- Safety Data Sheets
- Accident prevention regulations of relevant accident insurers
- Fire prohibition / Smoking prohibition
- Sufficient ventilation and air removal
- Avoid contact of the materials with skin
- Clean hands with protective hand soap (no solvents)

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