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REFRATECHNIK

Processing instructions V 13.0
REFRAPROTECT F

Note: Please read the product information sheet first, to ensure that these are the right processing instructions for your product. This document describes the processing procedure for **REFRAPROTECT F** surface sealing / protective coating.
REFRAPROTECT F is used to protect and strengthen refractory fibre linings.

The instructions contained in this document must be complied with during processing and installation of the respective refractory concrete. Modification of or deviations from the processing instructions can lead to major problems during installation, and possibly to total failure of the installed refractory material. These instructions provide general guidelines for storage, processing, and installation of the specific refractory material. If, due to specific site conditions, it appears necessary to deviate from the procedures described here, please consult Refratechnik Steel GmbH before starting work.

Storage

- In general: Store under cool, dry, and frost-free conditions.
- The shelf life stated in the product information sheet is valid from the production date, and only if storage is in accordance with our recommendations. The production date is stated on the packaging label.
- Under certain circumstances, material that has been properly stored may still be usable even after expiry of the stated shelf life. In such a case, conduct a setting test with a sample before using the material. In case of doubt, the stored material can be checked by Refratechnik Steel GmbH.
- Incorrect storage can greatly reduce shelf life, and can impair product quality.
- The original pallet wrapping foil should be left intact for as long as possible to protect the product. However, the foil is not a substitute for storage under cover.
- Also standing water, e.g. due to inadequate drainage of the storage area, can damage the material.
- Stacking of the goods supplied by us (in sacks, Big Bags, etc.) is done under the sole responsibility of the shipping company or customer. Refratechnik Steel GmbH accepts no liability for possible consequential damage (damaged packaging, personal injury, etc.).

Health and safety

- Always wear suitable safety goggles, dust mask, protective clothing, and working gloves.
- Always wash thoroughly after working with the material.
- Observe the information in the safety data sheet.

General information

- This product serves to strengthen and protect the surfaces of fibre linings in furnaces and kilns.
  REFRAPROTECT F strengthens the surface and thus protects the fibre lining, e.g. in operating conditions with high flow rates.
  Depending on operating conditions, **REFRAPROTECT F** can also act as a protective layer in aggressive furnace atmospheres.
- **REFRAPROTECT F** is delivered dry in 25-kg sacks, and must be mixed with water on site before use.
- Always mix complete packaging units (1 sack). The use of partial quantities can lead to demixing and changed material properties.
- Only use clean drinking water, as otherwise the setting behaviour may be affected.
- **REFRAPROTECT F** is processed at room temperature (5…25 °C).
- Low temperatures can retard or even stop the setting process. Therefore, the temperature of material and mixing water must be at least 5 °C. It might be necessary to heat the installation site.

- On the other hand, the setting process may be significantly accelerated at temperatures above 25 °C.

- Before using the material for the first time, we recommend carrying out an individual suitability test in a representative test bay of the furnace, and subject it to the normal operating conditions to determine whether **REFRAPROTECT F** is suitable for the intended purpose.

- Please take the expansion of the refractory material for your specific furnace application into account. The reversible and irreversible expansion values and the respective material properties are given in the product information sheet. Depending on the furnace operating conditions and the specific characteristics of the refractory material, any arising stresses and pressures must be compensated by suitably designed expansion joints.

- During installation of the monolithic refractory material, please ensure correct anchoring to the existing furnace structure and/or to the existing or adjacent refractory material (e.g. with steel anchors, ceramic anchoring systems, etc.).

- Suitable measures must be taken to ensure that the water or water vapour generated during the drying & heat-up process is removed from the refractory lining without pressure build-up.

- With certain kiln structures and refractory linings, the drying process can cause the generated water or water vapour to diffuse outwards in the direction of the furnace shell instead of inwards to the hot side (kiln chamber). Therefore, suitable measures must be taken to ensure that the water or water vapour can escape to atmosphere. For this purpose, 10-mm holes drilled into the kiln's outer steel shell (at least 5 per m²) have proved to be successful.

- Regarding the build-up of water vapour pressure, attention must be given to the entire wall structure of the lining (wear lining/permanent lining/insulation). In the area behind the wear lining, it must also be ensured that only such materials are used, which provide an adequate (highest possible) permeability to the steel shell.

- If the permanent lining/insulating layers are used several times and only the wear lining is replaced, they can become clogged in the course of time due to moisture transport with dust contaminations, salts, etc., thereby also impeding moisture transport. Consequently, multiple use of such layers must be seen as counterproductive in terms of dewatering performance. It might even be safer also to replace the permanent lining, in order to ensure perfect flowthrough to the cold side.

- To ensure a continuous drying process, the complete kiln chamber must always be flushed with an adequate amount of fresh air during the entire drying and heat-up procedure. The air circulating in the kiln chamber may never be saturated with moisture.

Mixing

- Mixer, tools, conveying equipment, etc. must be clean and free from any form of contamination.

- Data on the maximum and minimum amounts of water to be added is given in the product information sheet or on the packaging label.

- The required amount of drinking water is filled into a suitable mixing container. A drilling machine fitted with an agitator is recommended for mixing. Slowly pour the dry material into the container while the agitator is running (pouring time: 1…2 minutes). Then continue agitating for 3 minutes. Next, allow the mixture to rest for about 5 minutes, then continue mixing for another 3 minutes. After preparing the **REFRAPROTECT F** mixture in this way, it is ready for processing.

- To prevent contamination of the mixed **REFRAPROTECT F**, we recommend that the lid of the mixing container is always kept closed.

- Under normal storage conditions, the prepared mixture can be processed for up to 5 days. We recommend that the mixture is agitated briefly (2 minutes) before processing.

Processing

- Special compressed air guns are used to apply the material. Air pressure and air quantity must be adjusted so that the fibre lining surface is not damaged.

- The distance between gun nozzle and fibre surface should be between 20 and max. 80 cm.

- **REFRAPROTECT F** can also be applied in a thin coat by means of a swab, brush or paint roll.

- The thickness of the applied layer should be as thin as possible, and not exceed 1,0 mm. The mixture should be applied as evenly as possible, and in a single coat.

Setting and curing

- **REFRAPROTECT F** is cured in 1 to 2 hours at room temperature, after which a protective layer is already formed on the fibre lining.

Drying and heating up

- Drying can be started 2 hours after the protective layer has been applied.

- There is no specific drying or heating up procedure for **REFRAPROTECT F**. Regarding the drying and heating up procedures of the respective base material (bricks, refractory concretes, etc.), the corresponding data sheets must be observed.

Physical data

Bulk density:	1,80 to 1,90 kg/l
Solids content:	Approx. 60% by weight
Storage time:	Dry mixture: 12 months; when mixed: up to 5 days
Max. temp.:	1400 °C, depending on the individual operating conditions
Amount of material required:	Depending on the substrate's condition (typical value: 0,75 to 1,50 kg/m^2)

General data

Storage conditions:	Free of frost
Application:	Gunning by means of suitable compressed air equipment, or with swab, brush or paint roll
Substrate:	Inorganic, mineral-based substrates (fibre materials)
Reaction time:	Depending on individual ambient temperature and surface quality (approx. 24 hours)

Caution: Before using the material for the first time, we recommend carrying out a suitability test in representative test bays and under operating conditions.