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## **EBOLIT FF**

### **TECHNICAL DATA SHEET**

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#### **Product characteristics**

**EBOLIT FF** is a modified phenol-furaldehyde resin suitable for preparation of chemically resistant linings and floors that are exposed to oxidizing acids.

#### **Applications**

Mixing **EBOLIT FF** resin with a powdered FILLER FF yields a self-hardening putty (denoted as PUTTY FF hereafter). It is used as a bonding agent of ceramic tiles and shaped blocks used for chemical protection of buildings and technological complexes.

#### **Product Features**

Brown-black coloured liquid with a characteristic smell.

**EBOLIT FF** must comply with the following quality characteristics:

Quality characteristic	Value	Methodology of assessment
Consistency at 20 °C (s)	70 to 150	ČSN EN ISO 2431
pH of an aqueous leach	6.5 to 7.5	PN-ZM 151/2001

#### ***Physical properties of the hardened putty***

Compressive strength (MPa)	minimally 30
Tensile strength (MPa)	minimally 3
Bending strength (MPa)	minimally 7
Contraction during hardening (%)	approx. 0.3

#### **Hardening agent FILLER FF**

To harden **EBOLIT FF** resin, it is mixed with a hardening agent FILLER FF in the ratio of 27 to 30 units of mass of the powdered filler to 10 units of mass of **EBOLIT FF**.

#### **Directions for Use**

##### ***Application of the PUTTY FF as a lining putty***

We mix the measured quantity of the resin into the measured quantity of the hardening filler. The obtained paste-like putty is processed immediately. We mix only such quantity of the putty which we are able to process for the given working time, but no more than 3 kg.

The working time of the putty is up to 0.5 hour at 20 °C. After this period, the putty solidifies. In case the workability of the putty is shorter, which can be caused by e.g. faster reaction of older resin **EBOLIT FF**, a new putty in which a portion of the FILLER FF is replaced by a FILLER 0 (which does not contain a hardening catalyst) should be prepared. At higher temperatures, its viscosity lowers. As a result, it is possible to add higher quantity of the filler to the putty to achieve the common density. This way, more hardening catalyst is added to the putty. This accelerates the process of solidification which might even go through extremely fast at higher temperatures for this type of a product. Consequently, it is necessary to adhere to the specified temperature and to avoid mixing a high quantity of the putty at once as the hardening is a strongly exothermic reaction. It is the other way

around at lower temperatures - at 5 °C, the hardening process stops. It is forbidden to add water to the putty as it significantly deteriorates all its chemical and physical properties.

It is convenient to mix the putty in polyethylene containers that are easily cleaned of its leftovers. The prepared putty hardens to a rubber-like state in 10 to 12 hours and to a solid state in 24 hours at 20 °C. The putty gains its full firmness in joints after around 10 days.

#### ***Usage of the PUTTY FF for preparation of 1 m<sup>2</sup> of a floor***

when chinking	1.1 kg
when laying a bedding for a pavement	5.6 kg

#### ***PUTTY FF application conditions for chemical linings:***

**a)** Concrete or brick beddings with cement plaster selected for chemical lining must be completely dry and well isolated from water and exterior humidity. The latter is usually achieved by utilising high-quality asphalt isolation. It is important especially in presence of aggressive water. Beddings must be of sufficient static dimensions for their corresponding load.

**b)** We recommend to provide the concrete or brick beddings with cement plaster selected for chemical lining with a chemically resistant membrane. This is usually achieved through use of asphalt isolation or a sheet made of PVC, natural rubber, oppanol or polyethylene. This step serves as precaution against damage or destruction of e.g. a concrete bedding caused by a corrosive medium (acids) in case of mechanical breaching of the performed chemical lining in joints bonded by the putty.

**c)** The PUTTY FF has low adhesiveness to smooth glazed surfaces. Consequently, we recommend to abrade these surfaces with carborundum prior to chinking.

**d)** In case of possible danger of local attack of acid-resistant lining made of **EBOLITU FF** by strongly aggressive substances such as concentrated sulphuric acid, oleum, nitric acid at higher concentration (these disturb the putty), the lining is usually laid into a layer of a putty made of water glass that is resistant to these substances. Chinking itself is then performed by EBOLIT based putties. In this case, it is very important to lightly wipe the joints with the putty (to neutralise them) with 10% alcoholic hydrochloric acid. The process of chinking with the EBOLIT based putties should not be performed sooner than 24 hours after the acid in the joints dries. This is necessary due to strong alkaline character of water glass putties which would make it impossible for any EBOLIT putty (AB, FA, FF or FAL resins) to become hardened.

**e)** Prior to bonding, joints of linings must be completely dry and void of dust and grease. During processes of bonding and putty hardening, the work must be protected against steam and water effects. Width of joints is usually chosen in range from 6 to 10 mm. Finished joints should be re-coated with **EBOLIT FF** resin after 24 hours (20 °C). Once the putty is hardened, this step will considerably improve both its waterproofness and its wear resistance in these joints.

**f)** For the PUTTY FF preparation, it is necessary to use clean and dry containers and tools. Soiling by cement, lime or other substances of alkaline character is utterly undesirable.

**g)** Finished chemical linings must not be exposed to corrosive effects before the putties in their joints are completely hardened.

**h)** Non-hardened **EBOLIT FF** resin as well as the corresponding PUTTY are very soluble in acetone or ethyl acetate - consequently, these substances are suitable for cleaning areas stained by the putty. Once hardened, the putty is no longer soluble.

#### **Chemical resistivity of the hardened PUTTY FF**

Hardened **EBOLIT FF resists** organic and inorganic acids, their acidic and normal salts and certain solvents. Unlike other types of putties such as phenol-formaldehyde, furfuryl alcohol or furan aldol based ones (EBOLIT AB, FA, FAL), **EBOLIT FF** based putty exhibits enhanced resistivity to oxidizing substances, namely acids, such as nitric and chromic acid at concentration to c. 20 % (at lower temperatures).

**EBOLIT FF** is damaged by and does not **withstand** concentrated sulphuric acid at concentrations above 80 %, oleum and chlorosulphonic acid. In these cases, only water glass putties should be used and are recommended.

**The putty exhibits low resistivity to** strong alkalis such as sodium or potassium hydroxide at concentrations ranging between 12 to 20 %. However, it resists well solutions of soda, ammonia and calcium hydroxide.

Solvent resistivity: It resists well hydrocarbons such as petroleum, diesel, petrol, toluene, tetrachlorethane and trichloroethylene.

**It has low resistivity to** alcohols such as ethanol, butanol and ketones in which it swells. Apart from that, it is more rapidly disturbed by phenols, pyridine bases and aniline. In these cases, it is suitable to use the PUTTY FAL. In any case and especially with more complex chemical agents, we recommend to perform a laboratory examination of a sample of the hardened PUTTY FF in corresponding environment prior to its application.

#### **Packaging & Storage**

**EBOLIT FF** is delivered in 200 l metallic barrels. Alternatively, it can be delivered in different containers that were discussed and agreed on in advance.

Store it in a sealed container in places protected from direct climatic influences. Recommended storage temperature is between +5 to +30 °C. Must not be stored in the sun or near heat sources. Storing at temperatures below 0 °C does not affect product's application properties.

#### **Transport**

**EBOLIT FF** is transported by covered vehicles. It is not subject to ADR/RID Regulations.

#### **Warranty**

Provided the product is transported and stored in accordance with the above written conditions, its warranty is 6 months from the date it was delivered from a warehouse.

#### **Note**

Data about the product characteristics and its processing were obtained by laboratory measurements and application tests. This technical data sheet can provide solely legal advice without any engagements. Use of the product should be always adjusted to specific conditions.