



# **TECHNICAL SHEET**

## **DESALINATING PASTE**

**Revision No. 1 Revision date 30/05/2017**

# Table of Contents

Table of contents.....	2
1. INTRODUCTION AND GENERAL PRINCIPLES .....	3
2. TECHNICAL SPECIFICATIONS .....	4
2.1. Composition of paste .....	4
2.2. Areas of application .....	4
2.3. Efficacy of product.....	4
2.4. Reference standards.....	5
3. APPLICATION MODES .....	5
3.1. Preparation of paste.....	5
3.2. Preparation of treatment surfaces.....	6
3.3. Application of product on surfaces for treatment.....	6
3.4. Protection of the paste .....	6
3.5. Application times for paste .....	6
3.6. Removal of paste .....	7
3.7. Possible subsequent applications .....	7

## 1. INTRODUCTION AND GENERAL PRINCIPLES

Masonry subject to contamination by soluble salts can be treated through extraction by means of a paste, a process that guarantees an effective desalinating action on the surface and to a varying depth depending on the porosity and the nature of the substrate.

The principle is based on the use of deionized water to promote dissolving and the movement to the surface of soluble salts through prolonged contact (favoured by the high capacity of the product to store and retain the solvent, which is water in this case) with the material for treatment.

The product used for the paste contains natural materials, such as high-purity cellulose pulp, that guarantee that the technique can be used on different types of natural and artificial stone substrates.

The treatment surface must be mechanically cleaned beforehand with a brush so as to remove the surface deposits of crystal salts and pre-consolidated depending on the state of conservation and the level of material cohesion.

The paste is applied manually or by spraying on the treatment surface to a thickness of around 2cm. If environmental conditions are not favourable (due to high temperatures and very low relative air humidity), the product should be protected with materials such as polyethylene films that prevent vaporisation of the deionized water.

The application time can be determined via preliminary in situ tests, so as to optimize the cleaning process, using conductivity analysis on pulp samples taken at pre-fixed intervals (extraction procedures according to UNI 11087 norm) to determine the treatment efficiency curve. Times generally vary from 24-48 hours.

The paste is removed manually, taking care not to damage the treated surface. Pulp residue can be removed with a damp and non-abrasive sponge.

## 2. TECHNICAL SPECIFICATIONS

### 2.1. Composition of paste

Mix of various ingredients including pure cellulose fiber, quartz flour, bentonite (montmorillonite marl), etc.

Fossil filtration adjuvant the paste does not contain water-soluble materials or chemical products that could damage the treatment materials. This is also easily removable from the surface after extraction and does not leave residue that cannot be eliminated via delicate brushing.

### 2.2. Areas of application

The product is suitable for the extraction of soluble salts from natural and artificial porous stone materials (natural stone, plaster, brick, mortar, concrete). The effectiveness of the product and the depth of desalinization action depends on the type of substrate and the porosimetrical distribution of the material for treatment. The product cannot be used on surfaces that have layers of water-repellent or waterproofing material that impede the exchange principle which is at the base of extraction.

### 2.3. Efficacy of product

The product is effective on all natural and artificial porous stone materials and acts on a wide range of soluble salts. The efficiency of the extraction depends on various factors, including:

- the porosimetrical distribution of the material for treatment
- type and quantity of the salts to be removed
- environmental conditions during application
- duration of the application and number of application cycles
- presence of factors that inhibit the extraction process (water-repellent and waterproofing agents on the surface).

The depth of the reclaimable layer for extraction depends on the chemical/physical features of the material and can be determined via the specific lab analysis of transverse sections of material, taking samples from the surface.

## 2.4. Reference standards

### ANALYTICAL METHODOLOGY FOR THE DETERMINATION OF THE CONTENT OF SOLUBLE SALTS:

- UNI EN 16455:2014 Conservation of cultural heritage - Extraction and determination of soluble salts in natural stone and related materials used in and from cultural heritage
- UNI EN 772-5:2016 Methods of test for masonry units. Determination of the active soluble salts content of clay masonry units ANALYTICAL METHODOLOGIES TO IDENTIFY THE WATER ABSORPTION PROPERTIES OF THE TREATMENT SURFACE
- UNI EN 16302:2013 Conservation of cultural heritage - Test methods - Measurement of water absorption by pipe method
- UNI 11432:2011 Cultural Heritage - Natural and artificial stone - Determination of the water absorption by contact sponge
- UNI EN 15801:2010 Conservation of cultural property - Test methods - Determination of water absorption by capillarity
- UNI EN 1925:2000 Natural Stone Test Methods - Determination Of Water Absorption Coefficient By Capillarity
- UNI EN 1015-18:2004 Methods Of Test For Mortar For Masonry - Determination Of Water Absorption Coefficient Due To Capillary Action Of Hardened Mortar

## 3. APPLICATION MODES

### 3.1. Preparation of paste

Pre-mix the compound with deionized water around 8 hours before application (max conductivity 5 S/cm) in the following proportions:

- 1 part (weight) of powdered mix
- 1 – 1.2 parts (weight) deionized water (the quantity of water depends on the climatic conditions and the workability of the mixture) - e.g. 1 kg of powder + 1.2 litres of deionized water

Mix until the product is completely hydrated with a thorough manual action or using an electrical mixer.

At the end of the process, seal the container with the cover and leave to hydrate for 8 hours. Before application add a further 1/4 or 1/2 part (weight) of deionized water relative to the dry powder mass and mix the compound that is now ready for use. (E.g. for the previous pre-mixed compound add a further 0.25 – 0.5 litres of water).

### 3.2. Preparation of treatment surfaces

Remove all surface deposits with manual brushing with a soft bristled brush. In particular, eliminate salt efflorescence and powder deposits so that the surface is prepared for the extraction of soluble salts.

**NOTE: carry out diagnostic tests to ensure that the surfaces do not have water-repellent layers that impede or limit the action of the extractor (e.g. wax residue, polymer-based protective substances, film-forming paint or similar materials).**

The product action can be improved by spraying with deionized water, waiting around 15 minutes until the water penetrates into the pores of the material before applying the compound.

### 3.3. Application of product on surfaces for treatment

The product can be applied on the surface in the following ways:

- **MANUAL SPREADING:** Apply the product manually using a spatula, to create a uniform layer (1.5-2.5 cm) on the surface for treatment
- **MECHANICAL SPREADING VIA SPRAY:** You can apply the product with a standard-type compressor gun for plaster, verifying the adhesion characteristics of the surface beforehand. After application smooth the surface with a spatula to achieve a uniform thickness (1.5-2.5 cm). **Average consumption is approx. 6.5 kg of powdered material per square meter.**

### 3.4. Protection of the paste

In unfavourable environmental conditions (high temperatures, presence of strong winds and dry air) you can improve the effectiveness of the product by spreading a protective layer that limits the evaporation speed of the water such as a polyethylene film (or similar material). This protection guarantees that the action time of the deionized water is maintained at a sufficiently high level for complete extraction of the salts from the pores of the material.

### 3.5. Application times for paste

The application time is typically 48 hours but can vary depending on the type of substrate and the level of contamination of the material. To optimize the application time we suggest that you conduct preliminary tests on the surface by spreading the paste and checking the efficiency curve of the product with conductimetric measures on the saline solution extracted from paste samples taken at fixed intervals. **This analysis can be carried out using the extraction method described in the following**

**standard: UNI EN 16455:2014 Conservation of cultural heritage - Extraction and determination of soluble salts in natural stone and related materials used in and from cultural heritage.**

### 3.6. Removal of paste

After the extraction process is concluded, the dry paste containing the extracted salts can be manually removed with a spatula. You can use a soft bristled brush or soft dampened sponge to clean residue from the surface.

### 3.7. Possible subsequent applications

If the level of contamination of the substrate (determined via the specific norms listed in paragraph 2.4 of this document) is too high after the first application cycle, you can repeat application to improve efficiency.