MUNARI

SOLUTIONS FOR THE TREATMENT
OF MICRO-SHRINKAGE

IMPREX

PRODUCT IDENTIFICATION: Formulation based on polysiloxanes and sodium salts of polysilicic acid.
USES: Impregnating porous materials so as to reduce permeability and increase mechanical resistance.
ACTION MECHANISM: The IMPREX product penetrates the porosity and following a chemical reaction converts into a product which is elastic, insoluble in water or other solvents, anchoring itself to the walls of the porosity in the impregnated material, by means of interfacing chemical reactions. Following heating three cases may result:

1. When the coefficient of thermal expansion is equal for the IMPREX product and its impregnated support.
2. When the coefficient of thermal expansion for the IMPREX product is less than that for the support.
3. When the coefficient of thermal expansion for the IMPREX product is more than that for the support.

RELEASE OF SUBSTANCES: From specially carried out analyses, covering the release of harmful substances, subsequent to impregnation, on small boilers for coffee machines (Gaggia), the analytical results were:

Global Migration (test at 80°C)	Global Migration (test at 120°C)
Less than 0.5 mg/dm≤	Less than 0.5 mg/dm≤

Based on the test for global migration carried out according to the procedures specified in the Ministerial Decree dated 21st March 1973 and with regard to the values obtained, the sample proved to be suitable for the proposed application.

CHEMICAL - PHYSICAL CHARACTERISTICS

APPEARANCE: Thick, odourless, oily liquid, green in colour and almost limpid. Stable for an indefinite period of time when kept in a closed container.
MIXING WITH WATER: In all ratios.
CONTENT OF SOLIDS:: approx. 470 g/l.
pH: 10.8 - 12 t.q. solution.
BOILING POINT: 102 - 104°C.
VISCOSITY AT 20°C: approx. 200 - 400 MpA x S.
OPERATING TEMPERATURE RANGE: - 60°C + 700°C after impregnation.
RESISTANCE TO PRESSURE: Up to the breaking of the treated support.
CARBONIZATION TEMPERATURE: It does not carbonize, it is inert, inorganic.
RESISTANCE TO SOLVENTS: It resists all solvents, hydraulic fluids, antifreezes, motor oils, petrochemical products, brine, water, steam, etc.
RESISTANCE TO ACIDS: Acids render it insoluble: It is only attacked by hydrofluoric acid.
WORKABILITY: The support can be worked after impregnation treatment without any problems whatsoever regarding tightness.
THERMAL EXPANSION: 2.76 x 10 (raised to -4)/°C. Remember (see Action Mechanism) that even if the impregnating material has an expansion coefficient different from that for the impregnated material, no detachment between the two takes place, thanks to the high elasticity of the former, which always remains well anchored to the walls of the support.
THERMAL CONDUCTIVITY: After hardening the impregnating material has, by itself, a low thermal conductivity. Everything changes if this comes into contact with a different support. In the specific case of a support with high thermal conductivity it is necessary to consider the behaviour of the impregnating material in two situations:

1. **POROSITY:** Since the support has a high thermal conductivity, this remains unchanged, thanks to the extensive contact surface between this and the impregnating material: thermal balance is reached in every point in a very short time.

2. **SURFACE:** The quantity of heat transmitted between two surfaces is given by the formula

$$Q = K \times S \times \frac{\Delta T}{s}$$

where K = thermal conductivity, S = surface extension, ΔT = temperature differential between the two surfaces, s = surface thickness. Since in our case s practically = 0 we will have:

$Q = K \times S \times \Delta T$ but mathematically $\frac{\Delta T}{0} = \infty$ therefore $Q = K \times S \times \infty$ $\quad Q = \infty$

which means that the infinitesimal film we may have on the support does not alter its conductivity.

DISINTEGRATION: Disintegration of the porosity does not occur. It can take place on a flat surface only if it dries completely in the total absence of water, at temperatures near to 100°C (for two hours).

INFORMATION ON THE DANGER OF FIRE AND EXPLOSION

FLASH POINT: N.A.

FLASH LIMIT: N.A.

MEANS OF EXTINGUISHMENT: Not necessary.

SPECIAL PROCEDURES AGAINST FIRE: Compatible with all procedures.

DANGER OF FIRE AND EXPLOSION: None.

DATA ON CHEMICAL REACTIVITY

STABILITY: Reacts with acid substances. Cannot be mixed with organic solvents.

CONDITIONS TO BE AVOIDED: Changes in the pH and contact with strong concentrated acids.

MATERIALS TO BE AVOIDED FOR STORAGE: Copper, aluminium, zinc, tin, lead and alloys.

CLASSIFICATION OF DANGER

DANGER: The product is classified as irritant.

RISK PHRASES: R 36/38 (irritating for eyes and skin).

SAFETY PHRASES: S2 - S26 - S27 - S37 - S39 (Explanatory note for the safety phrases: • Keep out of reach of children • If contact with the eyes occurs, wash immediately and thoroughly with water and consult a doctor • If contact with the skin occurs, wash immediately and thoroughly with water • Use suitable gloves • Protect eyes and face • If swallowed do not cause vomit. Wash the mouth immediately and thoroughly with water and make sure a large quantity of water is drunk • In serious cases consult a doctor • The product is not considered dangerous).

TRANSPORT: N. 256 according to ADR - RID - IMCO - IATA standards: N.A.

HANDLING: Protect eyes with suitable goggles • Protect hands with rubber gloves • Use suitable footwear to avoid slipping.

SPILLAGE: Small quantities of product can be eliminated using strong dilutions in water. Insoluble residue can be collected mechanically. Substantial leakages must be absorbed using inert material (earth or sand) and removed by suitable suction appliances.

DISPOSAL AS WASTE: Watery solutions containing IMPREX with a pH between 5.5 and 9.5 can be disposed of directly into the sewers. Waste containing IMPREX is to be considered as special and disposable with a pH between 5.5 and 9.5 in category 2B dumps.

INFORMATION SOURCES: Directions for safety and hygiene at work.

SANITARY LAWS: RD 1265/34 - L 388/78.

STANDARDS OF GENERAL NATURE: DPR 547/55 - DPR 303/56 - DPR 1124/65 - DPR 482/75.

STANDARDS FOR THE CLASSIFICATION OF DANGEROUS SUBSTANCES: RD 147/27 - L 185/64 - L 256/74.

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