[Emblem of the City of Vienna]

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MA 39 – VFA 2004-1949.01-.02

Vienna, December 9, 2004

[seal]

Duplicate

Inspection Report

regarding the impregnation system
"No. 21S Pores Filler and No. 20 Hot Impregnation"

Applicant:	Finalit Komplett Steinpflege GmbH
Date of application:	November 3, 2004
Bulk source:	FINALIT No. 21 – pores filler, 1 l – plastic bottle FINALIT No. 20 – hot impregnation, ½ l – tin can FINALIT No. 5 – coating remover, 1 l – tin can Samples from Posta sandstone
Bulk source received on:	November 3, 2004
Bulk source programme:	1. Capillary absorption 2. Water vapour permeability 3. Stain resistance 4. Removal of impregnation

The report comprises 4 pages and 1 enclosure (3 pages).

1 General

1.1 Order

The Municipal Department 39 – VFA was commissioned to check the impregnation system **FINALIT No. 21S – pores filler and FINALIT No. 20 – hot impregnation** regarding the capillary absorption, water vapour permeability, stain resistance and possibility to remove the coating. The products were applied on Posta sandstone.

1.2 Bulk Source

FINALIT No. 21S – pores filler is to be used in case of strongly absorbing materials.

According to the product description, **FINALIT No. 20 – hot impregnation** is a long-term, colourless protective impregnation for all materials.

FINALIT No. 5 – removal of impregnation is used to remove wax and acrylate coatings.

Posta sandstone.

2 Test Procedure

2.1 Capillary Absorption

For this test, 3 sandstone slabs with a thickness of approximately 2 cm and dimensions of 18 cm x 12 cm were coated with **FINALIT No. 21S** and **FINALIT No. 20** according to the instructions of the manufacturer. In order to apply the impregnating material, it was heated to approximately +70°C.

Subsequently, an uncoated slab and the slab coated with **FINALIT No. 21S** and **FINALIT No. 20** were immersed in water and the water absorption of the material was gravimetrically determined after different absorption times.

The values of the water absorption (kg/m^2) and water absorption coefficient ($kg/m^2\ h^{0.5}$) were recorded depending on the absorption time (chart and diagram: see enclosure) and compared with the respective values of the uncoated sample. The water permeability WP was determined according to the following relation:

$$WP\ (\%) = \frac{\text{Water absorption of the coated sample } (kg/m^2)}{\text{Water absorption of the uncoated sample } (kg/m^2)} \cdot 100$$

The test resulted in water permeability values of 4.01 %, 5.82 % and 3.79 % after an absorption time of 24 hours (see enclosure, page 1 to 3).

2.2 Determination of the Water Vapour Permeability

To measure the water vapour permeability, **FINALIT No. 21S** and **FINALIT No. 20** were applied to plates of the same Posta sandstone. Their diameter was 91 mm.

The coated plates were placed on flat containers to form their upper end and sealed to be impermeable to water vapour.

The water vapour permeability was measured according to ÖNORM B 6016, determination of the water vapour permeability of building and insulating materials, December 1, 1988.

The test was conducted at standard conditions B (23 – 50/100). The test temperature is approx. 23°C, the humidity 52% on one side and approx. 93% on the other side.

The individual water permeability values and the average are stated below. The influence of the sandstone was mathematically considered and is not included in the values anymore.

	1	2	3	Average	Average coating thickness µm
Water vapour permeability, $kg/m^2h\ Pa$	$0.75.10^{-5}$	$0.30.10^{-5}$	$0.75.10^{-5}$	$0.60.10^{-5}$	45

The measured values result in a diffusion-equivalent air layer thickness of µ.s = 0.17 m for the system.

2.3 Resistance against Staining

This test involved dripping a few drops of red wine onto an uncoated and coated slab. It was determined that the wine remained on the coating surface of the coated slab and did not infiltrate the material. After a contact time of approximately 20 minutes, the red wine was washed away with tap water. Subsequently, the impregnated surface did not show any stains resulting from the contact with the red wine. However, in case of the untreated slab, the red wine was completely absorbed by the sandstone and the resulting stain could not be removed afterwards.

2.4 Removal of the Existing Coating

It was attempted to remove the impregnation system from a coated slab using **FINALIT No. 5**. In order to determine the success, the “capillary absorption” as described in section 2.1 was tested on this slab. This test showed that the water absorption was somewhat higher than in case of the uncoated slab (see enclosure, page 4).

3 Evaluation

When priming and impregnating with **FINALIT No. 21S** and **FINALIT No. 20**, the water absorption of sandstone is considerably reduced.

With regard to the determined water vapour permeability, a system with **FINALIT No. 21S** and **FINALIT No. 20** is suitable as impregnation.

When using the **FINALIT No. 21S** and **FINALIT No. 20** system, red wine does not leave any stains on the sandstone.

The **FINALIT No. 21S** and **FINALIT No. 20** system can be completely removed with **FINALIT No. 5**.

Person responsible:
[signature]
E. Koselsky (engineer)

Head of the laboratory:
[signature]
A. Tichy (graduate engineer)

[seal]
Head of the Institute for Testing and Research:
[signature]
W. Fleck (graduate engineer)
Senate Council

Capillary Absorption

Material: Finalit primer + impregnation

Absorbing surface uncoated sample: 261 cm^2
Absorbing surface coated sample: 216 cm^2

		Water absorption (g)		Water absorption (kg/m^2)		Water absorption coefficient	
Time (min)	Time (h)	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated
0	0	1258.40	1117.90	0.00	0.00		
10	0.2	1312.40	1118.40	2.07	0.019	5.02	0.046
30	0.5	1316.00	1118.50	2.21	0.024	3.12	0.034
60	1	1316.40	1118.60	2.22	0.028	2.22	0.028
120	2	1316.50	1118.60	2.23	0.028	1.57	0.020
180	3	1316.70	1118.70	2.23	0.033	1.29	0.019
240	4	1316.70	1118.70	2.23	0.033	1.12	0.017
300	5	1316.70	1118.80	2.23	0.038	1.00	0.017
360	6	1316.80	1118.80	2.24	0.038	0.91	0.015
420	7	1316.80	1119.00	2.24	0.047	0.85	0.018
11440	24	1316.90	1120.00	2.32	0.093	0.47	0.019

[Diagram]

Capillary Absorption

Water absorption (kg/m^2)

- - - uncoated
––– coated

Time (h)

Capillary Absorption

Material: Finalit primer + impregnation

Absorbing surface uncoated sample: 261 cm^2
Absorbing surface coated sample: 216 cm^2

		Water absorption (g)		Water absorption (kg/m^2)		Water absorption coefficient	
Time (min)	Time (h)	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated
0	0	1258.40	1073.10	0.00	0.00		
10	0.2	1312.40	1073.60	2.07	0.019	5.02	0.046
30	0.5	1316.00	1073.70	2.21	0.024	3.12	0.034
60	1	1316.40	1073.80	2.22	0.028	2.22	0.028
120	2	1316.50	1073.80	2.23	0.028	1.57	0.020
180	3	1316.70	1074.10	2.23	0.042	1.29	0.024
240	4	1316.70	1074.20	2.23	0.047	1.12	0.023
300	5	1316.70	1074.30	2.23	0.052	1.00	0.023
360	6	1316.80	1074.50	2.24	0.061	0.91	0.025
420	7	1316.80	1074.70	2.24	0.070	0.85	0.026
11440	24	1316.90	1076.10	2.32	0.135	0.47	0.028

[Diagram]

Capillary Absorption

Water absorption (kg/m^2)

- - - uncoated
––– coated

Time (h)

Capillary Absorption

Material: Finalit primer + impregnation

Absorbing surface uncoated sample: 261 cm^2
Absorbing surface coated sample: 216 cm^2

		Water absorption (g)		Water absorption (kg/m^2)		Water absorption coefficient	
Time (min)	Time (h)	Uncoated	Coated	Uncoated	Coated	Uncoated	Coated
0	0	1258.40	1109.40	0.00	0.00		
10	0.2	1312.40	1110.00	2.07	0.023	5.02	0.056
30	0.5	1316.00	1110.10	2.21	0.028	3.12	0.039
60	1	1316.40	1110.10	2.22	0.028	2.22	0.028
120	2	1316.50	1110.20	2.23	0.032	1.57	0.023
180	3	1316.70	1110.20	2.23	0.032	1.29	0.019
240	4	1316.70	1110.30	2.23	0.037	1.12	0.018
300	5	1316.70	1110.40	2.23	0.042	1.00	0.019
360	6	1316.80	1110.40	2.24	0.042	0.91	0.017
420	7	1316.80	1110.40	2.24	0.042	0.85	0.016
11440	24	1316.90	1111.40	2.32	0.088	0.47	0.018

[Diagram]

Capillary Absorption

Water absorption (kg/m^2)

- - - uncoated
––– coated

Time (h)