

Certified Translation from the German Language

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**EVALUATION OF THE ELASTICITY AND OF THE ABILITY TO
COVER CRACKS ON THE SURFACE OF THE
UNDERCOATING OF THE FACADE PAINT WITH THE NUMBER 4
(POWER-SUNTHERM)**

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/Round seal with inscription:
"Technical University Brünn. Faculty of Architecture. Institute for Construction Engineering."/

1. SUBJECT OF EVALUATION

On behalf of Messrs. COLOR Plzen the elasticity of the facade paint furnished was tested and evaluated. The specimen furnished is marked with number 4.

Since up to now there has not been any uniform method to test the elasticity of a paint or its ability to bridge cracks, an experimental procedure by using specimens was applied. These specimens were applied on a floor pavement basis.

The paint was applied in the quantity prescribed on a wooden and gypsum board subsurface by using a roller. The actual strain was made by bending and monitoring the material reaction.

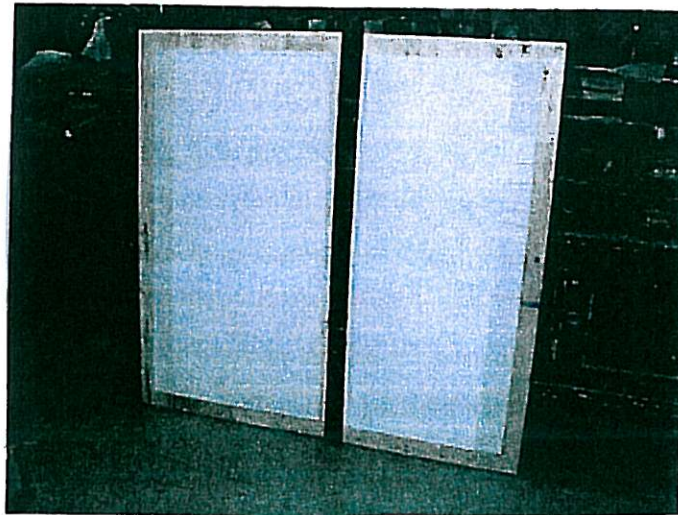


Fig. 1: View of the tested specimen of a press board with silicate floor pavement and with grooves placed before the experiment

2. SCOPE OF THE EXPERIMENTAL MEASUREMENT

For measuring the elasticity there are methods in practice which are based on the determination of the deformation of a tested specimen when compared to the status after a crack having occurred. Up to now there has however not been set down any norm for testing surface paints with regard to the elasticity and the ability to bridge cracks.

To test the elasticity a laboratory test was therefore carried out which comprised a controlled deformation/bending of the tested board body with applied paint. During that test the cracking or crack opening respectively was monitored. The results of this study are summarised in the following table.

2.1 LOCALISATION AND DETERMINATION OF CRACKS IN THE PAINT

During the test of the paint

- a) a specimen applied on a gypsum plaster board 600 x 500 m,
- b) a board specimen with artificially placed grooves representing the cracks in the undercoating were used.

Both specimens were strained on a test press in the laboratory of the Institute for Building Material and Constructional Elements up to the admissible deformation limit value without a break of material, and the strain on the respective position was measured and monitored. After that, a test was made by applying cyclical strain and strain relief with regard to the specimens during a series of 10 cycles.

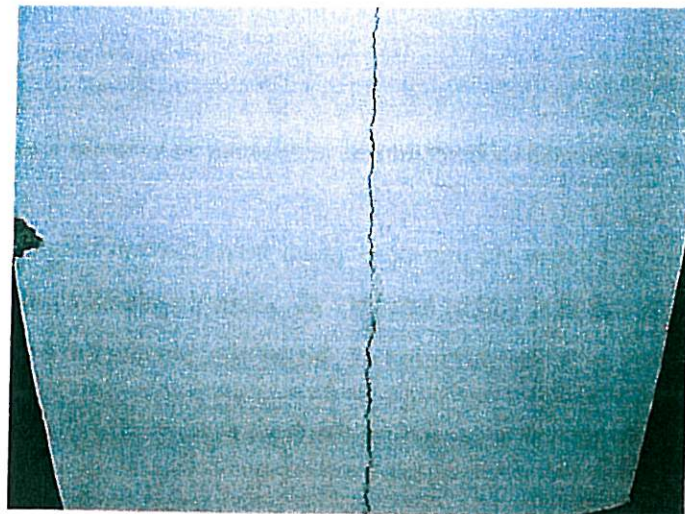


Fig. 2: View of the tested gypsum board specimen with paint applied using a roller before testing

Note: The crack occurred in connection with the experiment since the deformation of the gypsum plaster board enabled no comparison with the deformation of the specimen applied on the press board.

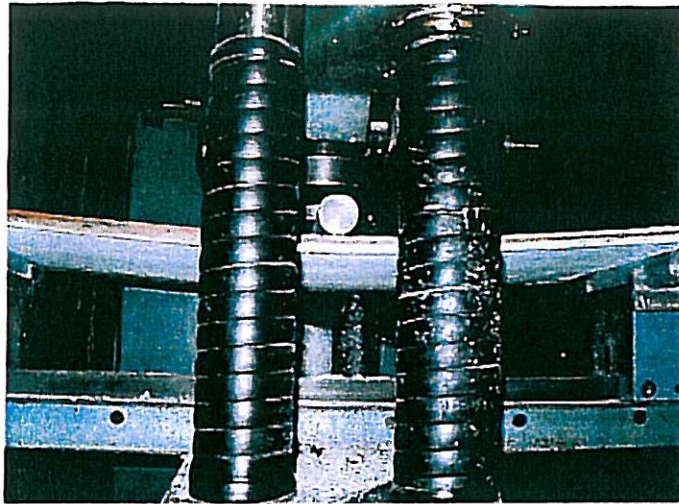


Fig. 3: Condition of the strained press board specimen with a paint applied using a roller during the carrying out of the experiment

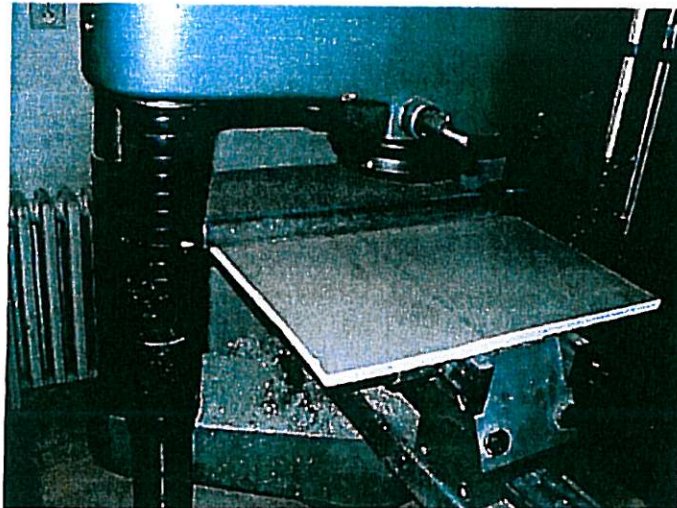


Fig. 4: Strain test of a gypsum board specimen on a test press

Due to a bending of the press board by 60 mm, the distance of the marginal supports being 900 mm, no visible cracks occurred. Cracks are deemed visible when having a minimum width of 0.1 mm. From the picture documentation can be seen that no capillary cracks, which could have been localised, occurred either.

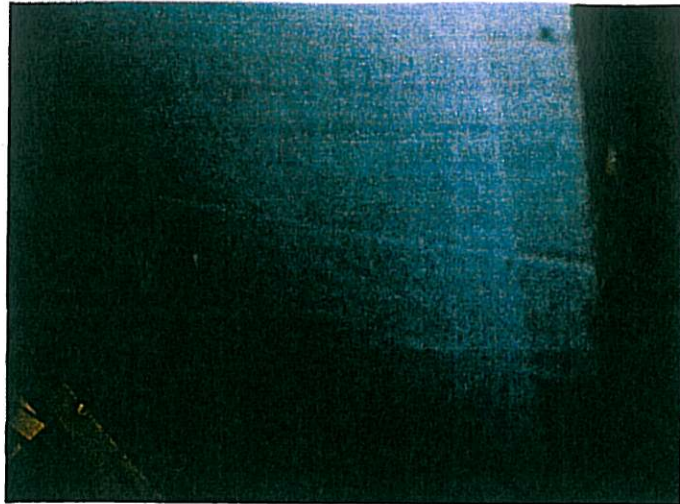


Fig. 5: Display of the surface with artificially placed grooves during the strain test in the test press on a press board specimen with silicate floor pavement and the paint tested.

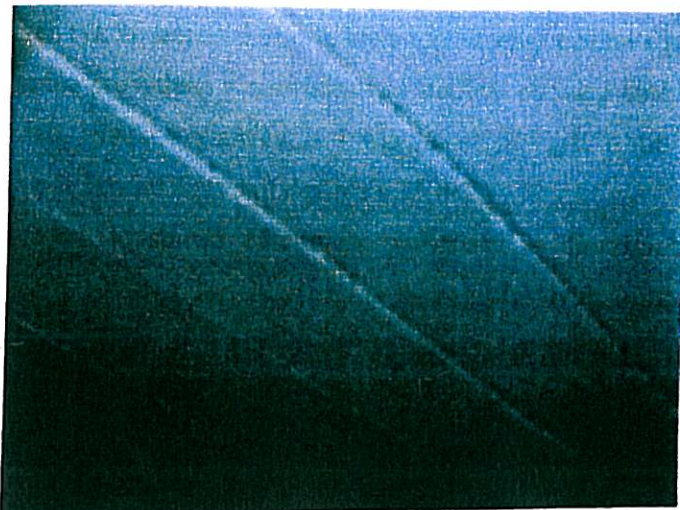


Fig. 6: Detailed view of the surface with artificially placed grooves during the strain test in the test press on a press board specimen with silicate floor pavement and the paint tested.

3. SUMMARY OF FINDINGS

The present difficulties of cracking in the facade paint with the number 4 (Power-SunTherm) have up to now not yet been normalised. The experimental test of the elasticity and the ability to cover cracks was made with the aid of a flake board with silicate floor pavement and a gypsum plaster board on a test press under normal climatic conditions, namely in paints which were applied on the test surface in a way prescribed by the manufacturer and which were exposed to a ripening process of prescribed duration. In addition, the press board with silicate floor pavement had artificially placed grooves by which cracks in the undercoating were imitated.

During the test it was discovered that in the case of a proportionally large bending of 60 mm in the middle of the board, which was strained and supported by two beams in a distance of 900 mm, no visible separation of the paint layer occurred in the form of cracks. This result holds also true for the grooves placed into the floor pavement layer, which represent cracks in the undercoating.

Experimental operations carried out in connection with the study of the behaviour of the paint bearing the number 4 (Power-SunTherm) show a high elasticity and ability to bridge cracks during several cyclical strain and strain relief procedures of the board specimen with paint.

The research of surface properties of the paint material is of significance for the durability of the structural design on which it is applied, since possible cracks represent a hazard of penetrating moisture into the structural design. These findings are important both for an effective carrying out of constructions and for their protection against climatic influences during their entire durability.

Lecturer RNDr. Ing. Stanislav Šťastník, CSc.
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12 June 2008

In my capacity as a translator of the Czech, German and English languages sworn in by the President of the Regional Court Munich 1 I herewith certify that the above translation of the original document written in the German language is in every respect correct and complete.

L. Santiago de la Cruz

19. JUNI 2008

