

Executive Summary of the Research Report

„Studies on the emission potential of interior plasters with organic binders according to DIN EN 15824“

Wall coatings, in particular paints and interior plasters according to DIN EN 15824, are applied in lounge areas extensively. In comparison with paints, interior plasters according to DIN EN 15824 possess a greater mass per area and thus have a larger range of emitting compounds. Therefore it had to be experimentally clarified whether the release of free-emitting compounds from interior plasters into the indoor air has a relevant impact on the air quality in these rooms.

A previous research provided insufficient data on emission properties of plaster based on organic binders according to DIN EN 15824. The available test results derived from previous years showed a mixed picture of the VOC emission of these products.

In the context of the research project „Studies on the emission potential of interior plasters based on organic binders according to DIN EN 15824“, the emission properties of interior plasters were investigated and it was examined whether a) these products show a significant emission potential and if b) product groups with comparable emission properties can be established. The derived compound concentrations were evaluated qualitatively and quantitatively according to AgBB-scheme.

Evidence

For this study a total of 19 products (12 dispersion-, 4 silicate- and 3 silicone resin plasters, thereof 2 silicone resin plasters which only differ in grain size) from 12 manufacturers were used to evaluate their emission potentials. 18 plasters with grain size of 2 mm were investigated by means of thermal extraction on emissions of volatile organic compounds (VOC), all 19 plasters on their emissions of formaldehyde. Based on the results of the thermal extraction study 7 plasters were subject to the emission chamber experiment.

Conclusion

Only 1 plaster out of the 7 plasters tested in the emission chamber meets the requirement according to AgBB. 3 out of 7 products fail the R-value criteria (≤ 1). The TVOC ($\leq 1.0 \text{ mg/m}^3$) criteria level on day 28 is maintained by 6 out of 7 plasters. 3 out of 7 plasters exceed the sum concentration criteria limit of 0.1 mg/m^3 for unidentified substances on day 28. The chamber formaldehyde concentration on day 28 exceeds $120 \text{ } \mu\text{g/m}^3$ by 4 out of 7 plasters.

An emission pattern that may characterise a plaster type (dispersion/silicone resin/silicate) is not clearly distinctive. Manufacturer specific properties of the formulation also influence the emissions. The emission pattern therefore emerges from type-specific, manufacturer-specific and individual components. The found compounds give reason to conclude that a recipe adaption might reduce the emitting compounds. The examples of some interior plasters show that interior plasters based on organic binders are able to fulfil all AgBB-criteria. The study of a plaster with two different grain sizes indicates that a reformulation, adapting to the layer thickness, ensures grain size independent handling properties.