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Certification of a Qualifying Test for Cables
KBS Foamcoat Z-19.11-1165 (used in U 97065)

Datum: 17. Juni 2014
JZE-OR i1097

We hereby certify that in the procedure for qualification of cables, on the basis of which tests and evaluations for the intumescent coating KBS Foamcoat (former name Grünau Foamcoat KBS) have been developed for cables that are described in the test report U 97065 from 30.05.1997, no changes have been made up to now.

A summary of the test report U 97065 is at the end of this document.

It can be also derived a fire protection technical suitability according to the statements contained in the test report when using the same recipe of the coating and cables, as in the test report U 97065 described.

The cable coating described in the test report U 97065 is in their recipe unchanged since their initial general technical approval Z - 19.11- 1165. The recipe has filed at the DIBt. According to our information, the successor of Grünau Illertissen is BASF Personal Care and Nutrition.

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Dr.-Ing. Olaf Riese

Summary U 97065

Qualifying Test of Intumescent Coating GRÜNAU KBS Foamcoat Concerning Reduction of Fire Risks of Trays Fitted with PVC Cables

Braunschweig, im September 1997

OBJECTIVE OF QUALIFYING TESTS

The intumescent coating GRÜNAU KBS Foamcoat produced by Grünau Illertissen GmbH at Illertissen/Germany is officially approved by Deutsches Institut für Bautechnik (German Institute for Building and Construction Technology). However, up to now a proof of protective efficiency to cable trays fitted with PVC cables has been missing. During extensive basic research since 1994 using laboratory as well as full-scale tests the fire protective effect of intumescent coatings applied on PVC cables was investigated and a qualifying method for this kind of protective system has been developed. The intumescent coating GRÜNAU KBS Foamcoat was tested in 1997 using the corresponding test parameters in order to prove the fire protective effect compared to uncoated cables qualitatively as well as quantitatively. All these tests were conducted at the Institute for Building Materials, Solid Constructions and Fire Protection (iBMB) of Braunschweig University of Technology, guided by Prof. Dr.-Ing. D. Hosser and Dipl.-Phys. J. Will.

BASIC TEST SET-UP

The cables themselves may be the source of fire, if combustible plastic material catches fire by short circuiting or overheating. On the other hand the cables may be preheated by a fire of external origin and start burning after contact to flames. To cover all risks of ignition the heat development of a „primary fire load“ was simulated by preheating the test chamber according to the so-called smoldering fire curve (according to DIN EN 1363-1 Draft April 1994) up to a fixed temperature level. The direct flame application was achieved with a separate gas burner. The thermal output of the gas burner (50 kW) corresponds to the fire of a waste paper basket. This proceeding is an expansion to the methods of DIN 4102-1 and IEC 332-3 (DIN VDE 0472 Part 804), which include only a local flame application to coated cables without preheating. In addition to the large-scale tests coated cables were tested in the Cone Calorimeter following ISO 5660 at a heat flux of 50 kW/m². This heat flux is in accordance with the effects of a fully developed fire in vicinity of the cables.

The cable trays used in large-scale tests were equipped with a standard set of frequently used PVC-jacketed power and control cables. Two tests were done with horizontal trays, one with a vertical tray. In all cases the cables on the trays were coated with GRÜNAU KBS Foamcoat with 1.5 kg/m² wet respectively 1.0 kg/m² dry coverage. This corresponds to a dry thickness of 0.75 mm at minimum, 1.0 mm on average. For Cone Calorimeter tests control cables with equal coating thickness were used.

TEST RESULTS

After a 20 minute preheating period at 200 °C and subsequent direct flame application the cables of an unprotected horizontal tray are ignited after 3 to 4 minutes, then fire spreads with velocity of 3 - 5 cm/min. A preheating temperature of 350 °C reduces ignition time to less than one minute and increases flame spread to 110 - 120 cm/min along the horizontal and 360 - 480 cm/min along the vertical tray. If an unprotected piece of cable is exposed to a heat flux of 50 kW/m² in the Cone Calorimeter, ignition occurs after 22 seconds, heat release rate is 12.4 kW/m at maximum respectively 7.0 kW/m on average.

A cable tray, coated with GRÜNAU KBS Foamcoat will not be ignited before 30 minutes at a temperature of above 400 °C. In case of a horizontal tray flame spread occurs only after 45 minutes. Testing a vertical tray flame propagation follows immediately after ignition i. e. after 30 minutes, if no supplementary measures in the cable mounting areas were taken. Using GRÜNAU KBS Foamcoat and supplementary measures in the cable mounting areas on vertical trays same results as on horizontal trays could be observed. Coating cables with GRÜNAU KBS Foamcoat yields a reduction of heat release rate to less than one third of uncoated cables together with significantly delayed ignition (575 seconds at 50 kW/m²).

SUMMARY

If a cable tray with PVC cables is protected with the intumescent coating GRÜNAU KBS Foamcoat according to producer's recommendations ignition will be reliably prevented for at least 30 minutes at ambient temperature up to 400 °C and direct flame application with the intensity of a waste paper basket fire. Flame propagation along horizontal trays will be prevented for at least 40 to 45 minutes. After ignition the heat release of the cable insulation will be reduced to less than one third compared to uncoated cables. The same results will also be achieved with vertical trays if qualified supplementary measures in the cable mounting areas will be taken.