

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-16/0268
of 19 January 2022

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

"DG", "DG-SC", "DG-CR", "DG-CRF",
"DG-CR SK" and "DG-CR BS"

Product family
to which the construction product belongs

Intumescent products for fire sealing and fire stopping
purposes

Manufacturer

Flamro Brandschutz-Systeme GmbH
Am Sportplatz 2
56291 Leiningen
DEUTSCHLAND

Manufacturing plant

01

This European Technical Assessment
contains

7 pages including 1 annex which form an integral part of
this assessment

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

EAD 350005-00-1104

This version replaces

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Specific Part

1 Technical description of the product

Object of this European Technical Assessment (ETA) are the intumescent construction products "DG" and "DG-SC" as well as "DG-CR", "DG-CRF", "DG-CR SK" and "DG-CR BS".

In case of fire, exposed to high temperatures, these intumescent products expand and generate foam. This foam seals joints and gaps, closes voids and openings. Thus, the foam restricts the passage and the spread of heat, smoke, flames or any combination of these.

The intumescent product "DG" is produced as a liquid coating in the colour grades anthracite, black and red. As-delivered the product is easy to spread by brush or by sprayer.

The intumescent product "DG-SC" is a viscos, intumescent putty.

Both products essentially consist of intumescent substances and a binder. They harden when applied on a substrate and form flexible intumescent layers which react in case of fire.

The construction products "DG" and "DG-SC" are delivered in pails and containers of different capacity; the intumescent putty "DG-SC" is also delivered in cartridges.

The construction products "DG-CR", "DG-CR SK", "DG-CR BS" and "DG-CRF" are factory made flexible intumescent fabrics.

The construction products "DG-CR", "DG-CR SK", "DG-CR BS" and "DG-CRF" are tight and tear-proof, intumescent fabrics, which consist of a glass filament fabric¹ mechanically covered with the intumescent coating "DG" on at least one side.

The flexible intumescent fabric "DG-CR" is mechanically covered with "DG" on one side and on the other side it is covered with a coating of Polyurethan² pigmented optionally in the colour grades grey, red, black or white.

The flexible intumescent fabric "DG-CRF" is mechanically covered with "DG" and additionally reinforced with a fibre glass scrim¹ on one side. The other side is mechanically coated with a grey pigmented layer of Polyurethan².

The flexible intumescent fabric "DG-CR SK" is a glass filament fabric mechanically covered with "DG" on one side and equipped with an acrylic self-adhesive foil on the other side, on customers request on the same side.

The flexible intumescent fabric "DG-CR BS" a glass filament fabric¹ mechanically covered with "DG" on both sides.

The flexible intumescent fabrics "DG-CR", "DG-CRF", "DG-CR BS" and "DG-CR SK" are produced as endless rolls, cut at factory and delivered in the preferable length of 10 m or 20 m.

The products "DG-CR", "DG-CR SK", "DG-CR BS" and "DG-CRF" also may be delivered as intumescent strips, mats, cuts and stamps (bands, blocks, pads) of any dimension on request.

The technical characteristics relevant for fire sealing and fire stopping effects of the construction products are given in Annex 1.

¹ Type, manufacturer and characteristics deposited at DIBt.

² Required quantity and composition deposited at DIBt

2 Specification of the intended use in accordance with the applicable European Assessment Document (EAD)

The construction products "DG", "DG-SC", "DG-CR", "DG-CRF", "DG-CR SK" and "DG-CR BS" are assessed on the basis of EAD 350005-00-1104³ as intumescent products for fire sealing and fire stopping purposes without a defined final use (IU 1).

These construction products are intended to be used as essential components in construction products, construction elements, kits and special assemblies which need to meet requirements concerning the safety in case of fire.

In case of fire, the products delay the heat transfer through fire resistant construction products and construction elements by expanding under the impact of high temperatures and thus restricting the spread of fire.

The performance given in Section 3 is only valid if the construction products "DG", "DG-SC", "DG-CR", "DG-CRF", "DG-CR SK" and "DG-CR BS" are used in accordance with the instructions and the conditions stated in section 3.3.

The tests and assessment methods on which this European Technical Assessment is based, lead to the assumption of working life of the intumescent construction products "DG", "DG-SC", "DG-CR", "DG-CRF", "DG-CR SK" and "DG-CR BS" in final use of at least 10 years⁴.

The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for this assessment

3.1 Safety in case of fire (BWR 2)

3.1.1 Reaction to fire

| Essential characteristic | Performance |
|--|---|
| "DG" for layers of a thickness of 1 mm to 2 mm on metal substrates (melting point > 1000 °C) and on classified substrates of class A1 | Class B-s1,d0 in accordance with EN 13501-1 |
| "DG-CR" free standing, on mineral substrates (density ≥ 800 kg/m ³) and on classified substrates of class A1 | Class C-s1,d0 in accordance with EN 13501-1 |
| "DG" (layers <1 mm), "DG-SC", "DG-CRF", "DG-CR SK", "DG-CR BS" | Class E in accordance with EN 13501-1 |

The intumescent construction products "DG", "DG-SC", "DG-CRF", "DG-CR SK" and "DG-CR BS" meet the reaction to fire requirements of class E in accordance with EN 13501-1⁵.

The intumescent construction product "DG" (coating) with a thickness of the dried layer between 1 mm and 2 mm meets the reaction to fire requirements of class B-s1,d0 in accordance with EN 13501-1⁵ on metal substrates (melting point > 1000 °C) and on classified substrates of class A1.

³ Official Journal of the EU N° C 378/02 of 13/11/2015

⁴ results of long-term aging of "DG" (historical data) are available (natural-aging for 10 years)

⁵ EN 13501-1 Fire classification of construction products and building elements, Part 1 and A1:2009 Classification using test data from reaction to fire tests

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The intumescent fabric "DG-CR" meets the reaction to fire requirements of class C-s1,d0 in accordance with DIN EN 13501-1⁵ for nominal thicknesses between 0,6 mm and 2,2 mm free standing, on mineral substrates (density $\geq 800 \text{ kg/m}^3$) and on classified substrates of class A1.

3.1.2 Resistance to fire

The performance "resistance to fire" shall be determined separately for every final use and shall be classified, if required.

3.2 Hygiene, health and the environment (BWR 3)

| Essential characteristic | Performance |
|---|-------------------------|
| Content and release of dangerous substances | No dangerous substances |

The detailed chemical composition of the intumescent construction products "DG", "DG-SC", "DG-CR", "DG-CRF", "DG-CR SK" and "DG-CR BS" was assessed by DIBt and is deposited with DIBt.

3.3 General aspects

Durability testing shall be an integral part of assessing the basic works and performance requirements. The following specific provisions shall be complied with to ensure the durability of the performance for the intended use.

The testing and the assessment of the product performance were carried out for environmental conditions of type X – product intended for use at conditions exposed to weathering (rain, UV, frost) - in accordance with EAD N° 350005-00-1104³

Result:

The intumescent construction products "DG" and "DG-SC", "DG-CR", "DG-CRF", "DG-CR SK" and "DG-CR BS" and cuts can be used under use conditions of type X (out-door use), without having to fear essential changes in the relevant fire sealing and fire stopping properties and the resulting performance. This assessment includes the in-door use under use conditions of type Y₁, Y₂, Z₁ and Z₂.

Supplementary the product was tested under specific conditions according to EOTA TR 024, section 4.3⁶

- Exposure to a constant temperature of 80 °C for 40 days,
- Exposure to solvents (tested with Butylacetat, Butanol, solvent naphtha and fuel)
- Subsequent over-painting (tested with coatings on the basis of acryl dispersion, alkyd resin, polyurethanacryl and epoxide resin,
- Exposure to permanent wetness (water immersion and permanent condensation) for 4 weeks
- Exposure to intimate contact to plastics (PVC, PE).

The characteristics "expansion ratio" and "expansion pressure" did not change essentially due to these specific exposures.

⁶ EOTA TR 024

Characterisation, Aspects of Durability and Factory Production Control for Reactive Materials, Components and products; amended version July 2009

For the intumescent fabrics "DG-CR" and "DG-CRF" the tear strength and the elongation at rupture were determined according to EN ISO 10319⁷:

| "DG-CR" | | | |
|--------------------------------------|--------------|------------|------------|
| Thickness of the fabric | | ca. 1,6 mm | ca. 0,6 mm |
| Ultimate elongation in % | longitudinal | 3,6 | 4,2 |
| | transverse | 4,4 | 4,5 |
| Ultimate tensile strength in kN/m | longitudinal | 56,0 | 60,7 |
| | transverse | 34,5 | 41,4 |
| "DG-CRF" | | | |
| Thickness of the fabric | | ca. 1,6 mm | |
| Ultimate elongation in % | longitudinal | 7,2 | |
| | transverse | 7,7 | |
| Ultimate tensile strength in kN/m | longitudinal | 141,8 | |
| | transverse | 48,8 | |

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with the Decision of the commission N° 1999/454/EC of 22 June 1999 (OJ of the EU L 178 of 14 July 1999, p 42), amended by EC Decision 2001/596/EC of 8 January 2001(OJ of the EU L 209 of 2 August 2001, p 33) system 1 applies for the assessment and verification of consistency of performance (AVCP).

See Annex V in conjunction with Article 65 (2) of the Regulation (EU) N° 305/2011 and the following table:

| Product | Intended use | characteristic | System |
|---|---|---|--------|
| "DG", "DG-CR", "DG-SC", "DG-CRF", "DG-CR SK", "DG-CR BS" | Components effective in view of safety in case of fire (BWR 2) used in construction products, construction elements, kits and specific assemblies | reaction to fire, properties relevant for the fire sealing and fire stopping effect | 1 |

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable EAD

The technical details necessary for the implementation of the system for Assessment and Verification of Consistency of Performance are laid down in the confidential part of the control plan deposited with Deutsches Institut für Bautechnik.

Issued in Berlin on 19 January 2022 by Deutsches Institut für Bautechnik

Otto Fechner
Head of Section

beglaubigt:
Dr.-Ing. Dierke

"DG", "DG-SC", "DG-CR", "DG-CRF",
"DG-CR SK" and "DG-CR BS"

ANNEX 1

CHARACTERISTICS RELEVANT FOR THE FIRE SEALING AND FIRE STOPPING EFFECT OF THE CONSTRUCTION PRODUCTS "DG", "DG-SC", "DG-CR", "DG-CRF", "DG-CR SK" AND "DG-CR BS"

| Characteristic | Range and tolerance | Test method |
|--|--|------------------|
| "DG" (coating), "DG-SC" (putty) | | |
| density | Coating: 1200 kg/m ³ ± 10 % Putty: 1300 kg/m ³ ± 10 % | see control plan |
| Expansion ratio | Thickness 2 mm 15 to 26,5 | |
| Expansion pressure | Thickness 2 mm 1,00 N/mm ² to 1,90 N/mm ² | |
| Coated fabrics | | |
| "DG-CR" | | |
| Expansion ratio | Thickness 2 mm 15,5 to 22,0 | see control plan |
| Expansion pressure | Thickness 2 mm 1,00 N/mm ² to 1,65 N/mm ² | |
| "DG-CRF" | | |
| Expansion ratio | Thickness 1,6 mm 12,5 to 16,0 | see control plan |
| Expansion pressure | 1,30 N/mm ² to 1,80 N/mm ² | |
| "DG-CR SK" | | |
| Expansion ratio | Thickness 1,6 mm 15,5 bis 22,0 | see control plan |
| Expansion pressure | 1,00 N/mm ² to 1,65 N/mm ² | |
| "DG-CR BS" | | |
| Expansion ratio | Thickness 1,4 mm 16,5 bis 24,0 | see control plan |
| Expansion pressure | 1,50 N/mm ² bis 2,00 N/mm ² | |