# for the proof of fire behaviour according to DIN 4102-1

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PÜZ-Stelle (LBO): BRA09

TEST REPORT

**Reference:** FLT 3600816 (Translation of the German test report - no guarantee for translation of technical terms)

**Sponsor:** Texo Trade Services B.V.
Coenecoop 640
NL - 2741 PV Waddinxveen
The Netherlands

**Test order:** 2015-11-12 **Arrived:** 2015-11-12

**Description of samples:** Uncoated knit fabric made of polyester to be used for stage and exhibition constructions or for decorative purposes named: "**F205BX02**".
(for details see page 2)

**Delivered:** 2015-11-25

**Content of request:** Proof of flammability to classify building materials to class B1 "schwerentflammbar" according to DIN 4102-1

**Assessment:** The examined product meets the requirements of class B1 for "schwerentflammbare" (not easily flammable) building materials according to DIN 4102-1, if used suspended freely or with distance of >40 mm to the same or other plain materials.
(for details see page 5)

**Validity of test report:** 2020-11-30

**Sampling:** The sample was sent to the laboratory by the manufacturer.

Remark: If the above-mentioned building material is not used as product acc. to MBO § 2, Abs. 9, Ziffer 1, there
is no need for a general building supervisory test report.
This test report is not valid if the examined building material is used as product in the meaning of state building prescriptions (MBO § 17, Abs. 3).

This test report does not replace an eventually necessary proof of applicability concerning building supervisory or building laws in the meaning of state building prescriptions.
This has to be verified by:

- "allgemeine bauaufsichtliche Zulassung" (general building inspectorate approval) or by
- "allgemeines bauaufsichtliches Prüfzeugnis (general building inspectorate certificate) or by
- "Zustimmung im Einzelfall (exceptional approval).

This test report can serve as a basis for building supervisory procedures for:

- regulated building products for the pre scribed proofs of conformity
- non-regulated building products for the needed proofs of applicability.

This test report comprises 5 pages and 2 enclosures.

## 1 Description of test material

**1.1 Test material** (according to manufacturer)
The delivered material is an uncoated knit fabric made of flame retardant treated polyester yarn. The knit fabric is intended to be used indoor as advertising space or decorative purposes and was named with the trade name "F205BX02" by the sponsor.

**1.2 Description of the delivered material**
For the tests a sample of an uncoated knit fabric made of synthetic yarn with dimensions of app. 2,0 m in length and 1,55 m in width was received by laboratory from the sponsor. The material was marked with the article-no of the manufacturer and was named by the sponsor with the trade name "F205BX02".
Characteristic values: see chapter 4.1; photos: see enclosure.
Further details are not known to the laboratory, information about the manufacturer and a retain sample has been deposited.

## 2 Preparation of specimens

For the small burner ("Brennkasten") tests samples for edge exposure (dimensions 190 mm x 90 mm) and samples for surface exposure (dimensions 230 mm x 90 mm) have been cut in longitudinal and in cross direction of the material.

For the fire shaft (Brandschacht) test 2 specimens were assembled. The samples (1000 mm x 190 mm) for the test specimen A were cut in longitudinal direction, the samples for the test specimen B were cut in cross direction.

Afterwards all samples kept in a climate chamber acc. DIN 50014-23/50-2 until they reached constant weight.

## 3 Test procedure

The tests in the fire shaft ("Brandschacht") have been performed acc. DIN 4102-1 and -16 (building materials class B1), the small burner tests ("Brennkastenprüfungen") have been performed acc. DIN 4102-1, chapter 6.2.5 (building materials class B2).

All tests were carried out in single layer, freely suspended.

Examination period: December 2015

## 4 Results

- section 4.1 Material characteristics
- section 4.2.1 Test results class B2 (Brennkasten), enclosure 2
- section 4.2.2 Test results class B1 (Brandschacht)

### 4.1 Material characteristics

Table 1

| Trade name | Specifications given by the manufacturer | | Measured values | | |
|---|---|---|---|---|---|
| | Thickness [mm] | Weight per unit area [g/m²] | Thickness (m.v.) [mm] | s | Weight per unit area [g/m²] |
| F205BX02 | ./. | 115 | 0,31 | <0,002 | 111 |

m.v. mean value
s standard deviation
./. not received/not measured

### 4.2 Results of the fire behaviour

#### 4.2.1 Test results class B2 (Brennkasten)

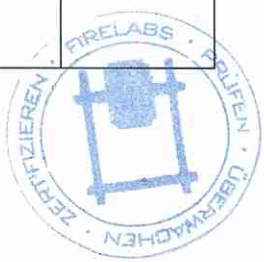
All building materials class B1 (not easily flammable) must also meet the requirements of materials class B2 (flammable). The material, tested in "Brennkasten" acc. DIN 50 050 meets the requirements class B2. The material did not show burning particles/droplets during these tests. (Results: see enclosure 2)

### 4.2.2 Test results class B1 (Brandschacht)

Table 3

| Test results (part 1) | | | | | | |
|---|---|---|---|---|---|---|
| line no. | | Specimen | | | | require-ments |
| | | A | B | C | D | |
| 1 | Number of specimen arrangement acc. DIN 4102 –15 Table 1 | 1 | 1 | - | - | |
| 2 | Maximal flame height above bottom edge ..... cm | 20 | 20 | - | - | |
| 3 | Time [1] ..... min | 1 | 1 | - | - | *) |
| 4 | Burning / melting through Time [1] .....min | 1 | 1 | - | - | |
| 5 | Back side of the specimens: Flames / glowing Time [1] ..... min | ./. | ./. | - | - | |
| 6 | Discolouring Time [1] ..... min | | | | | |
| 7 | Falling of burning droplets Begin 1)..... min | No | No | - | - | |
| 8 | Extend: Sporadic falling of burning droplets | | | | | |
| 9 | Continuous falling of burning droplets | | | | | |
| 10 | Falling of burning parts Begin [1]..... min | No | No | - | - | |
| 11 | Extend: Sporadic falling of burning parts | | | | | |
| 12 | Continuous falling of burning parts | | | | | |
| 13 | Afterflame time at the bottom of the sieve (max.). min:s | ./. | ./. | - | - | |
| 14 | Impairment of the burner flames by dropping or falling Material Time [1] ..... min:s | ./. | ./. | - | - | |
| 15 | Premature end of test Final occurrence of burning at the specimen [1].....min | 2 | 2 | - | - | |
| 16 | Time of eventually end of test [1] ..... min:s | ./. | ./. | - | - | |

[1] Indication of time: from the beginning of testing procedure
- Not tested
. /. Not occurred
*) No cause for complaint



| Test results (part 2) | | | | | | |
|---|---|---|---|---|---|---|
| line no. | | Specimen | | | | require-ments |
| | | A | B | C | D | |
| | Afterflame after end of test | No | No | - | - | |
| 17 | Time .....min:s | | | | | |
| 18 | Number of specimen | | | | | |
| 19 | Front side of specimen | | | | | |
| 20 | Back side of specimen | | | | | |
| 21 | Flame length .....cm | | | | | |
| | Afterglow after end of test | No | No | - | - | |
| 22 | Time .....min:s | | | | | |
| 23 | Number of specimen | | | | | |
| | Place of appearance: | | | | | |
| 24 | Lower half of specimen | | | | | |
| 25 | Upper half of specimen | | | | | |
| 26 | Front side of specimen | | | | | |
| 27 | Back side of specimen | | | | | |
| | Smoke density | | | | | |
| 28 | ≤ 400 % min | 0,15 | 0,23 | - | - | |
| 29 | ≥ 400 % min (very strong smoke density) | ./. | ./. | - | - | |
| 30 | Diagram fig. no. | 1 | 3 | - | - | |
| | Residual length | | | | | |
| 31 | Individual value .....cm | 70<br>69<br>69<br>68 | 75<br>78<br>73<br>76 | -<br>-<br>-<br>- | -<br>-<br>-<br>- | > 0 |
| 32 | Average value .....cm | **69** | **75** | - | - | ≥ 15 |
| 33 | Photo of test specimen fig. no. | 2 | 4 | - | - | |
| | Flue gas temperature | | | | | |
| 34 | Maximum of average value...°C | 112 | 121 | - | - | ≤ 200 |
| 35 | Time [1] .....min:s | 8:14 | 9:54 | - | - | |
| 36 | Diagram fig. no. | 1 | 3 | - | - | |
| 37 | Remarks: line 32: There were no additional tests proceeded because of the residual length of > 45 cm (DIN 4102-16: 2015-09, 5.2 b)). (diagrams and photos see appendix 1) | | | | | |

[1] indication of time: from the beginning of testing procedure
- not tested
. /. not occurred
*) no cause for complaint

| Specimen | Test-no.: | Trade name | Orientation of samples |
|---|---|---|---|
| A | 563815-001 | F205BX02 | longitudinal |
| B | 563815-002 | | transversal |

## 5 Assessment

According to the test results in section 4.2 the material, described in section 1 and 4.1, fulfils the requirements of building materials class B1 according to DIN 4102-1 if the material is used suspended freely with a distance of > 40 mm to the same or other plain materials.

The requirements of building materials class B2 are also fulfilled; no falling of burning parts or droplets occurred during these tests.

The verification

- for outdoor usage (ageing behaviour by outdoor weathering)
- after washing or cleaning with chemicals

has not been proved.

## 6 Special remarks

This report is only valid for the material as described under paragraph 1. In combination with other materials or with additional coatings or surfaces etc. the burning behaviour may differ.

This test report is not valid, as soon as the product is used as a building product in the sense of the "Landesbauordnungen" (state building requirements, MBO § 17, par. 3).

This test report is no substitute for a General Building Inspectorate Certificate. This test report is granted without prejudice to the rights of third parties, or particular private proprietary rights.

In General Building Inspectorates procedures this test report can serve for

- regulated building materials for the required proof of accordance
- for not regulated building materials for the required proof of applicability.

The explanations given in DIN 4102-1 app. D, especially concerning an external production control has to be considered.

This test report is valid until 2020-11-30 provided that the test methods, the classification rules and the technology do not change during this period.

Borkheide, 26th of October 2016

Head of the test laboratory
Dipl.-Ing. (FH) Uwe Kühnast

*This translation was issued on 26th of October 2016.*

Test specimen A

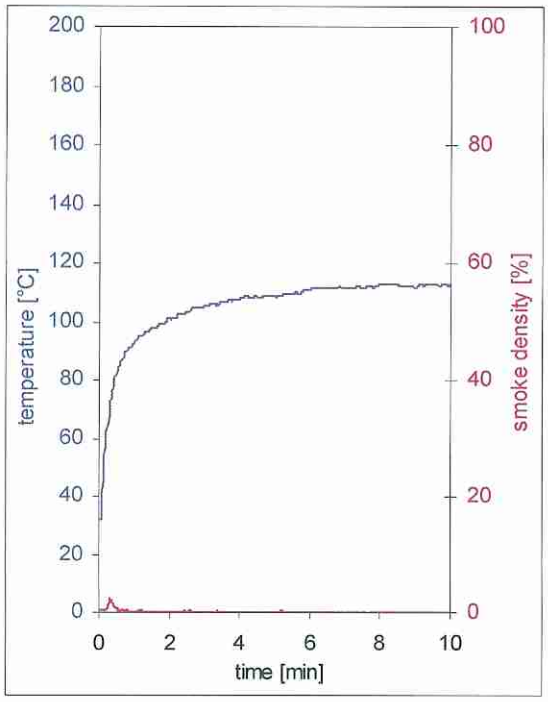



fig. 1
Graphs of the flue gas temperature and the smoke density

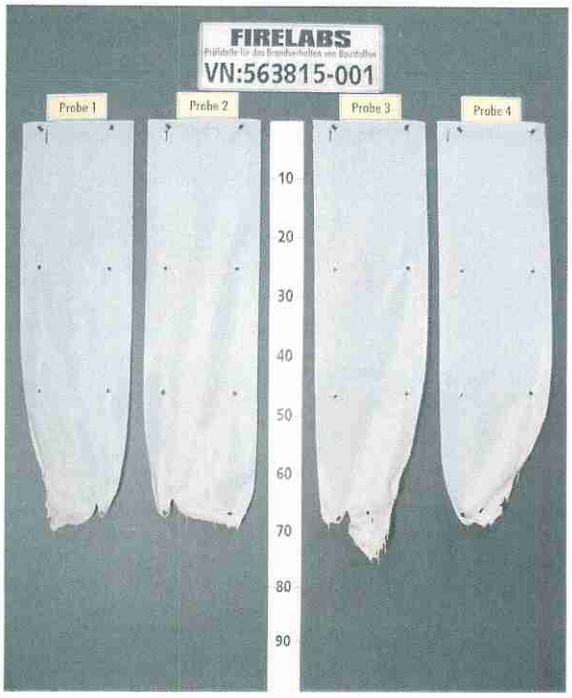



fig. 2
Photo of the test specimen after the test

Test specimen B

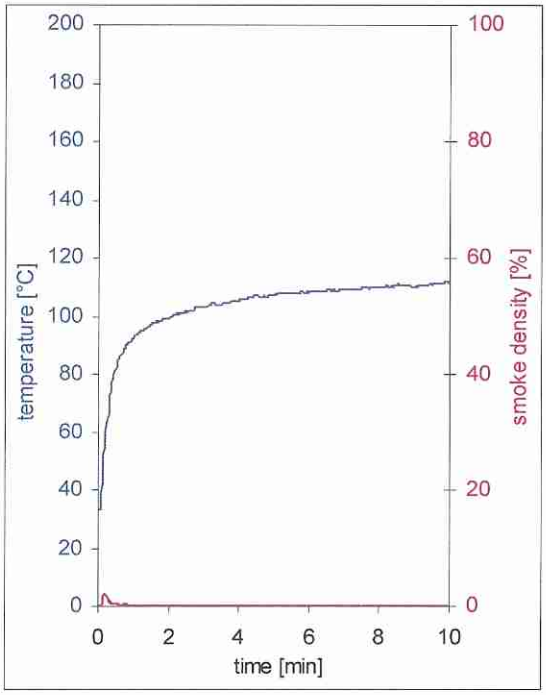



fig. 3
Graphs of the flue gas temperature and the smoke density

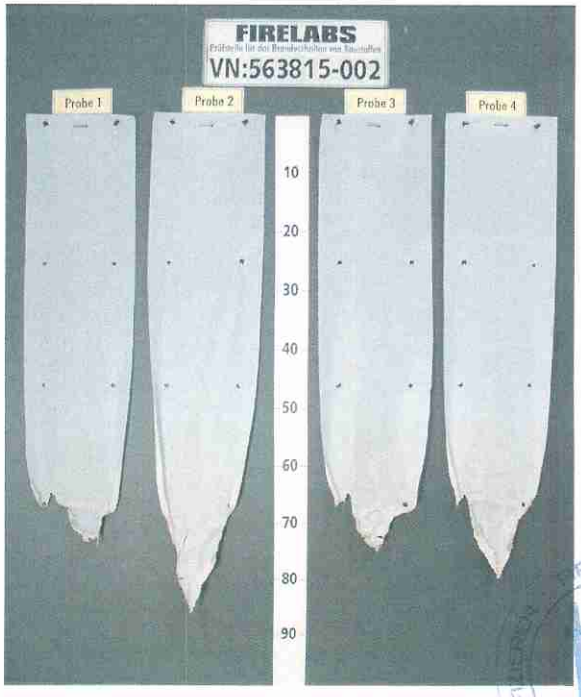



fig. 4
Photo of the test specimen after the test

Test results small burner test (Brennkasten)

Table 2

| | longitudinal direction | | | | | | | cross direction | | | | | | | dim. | require-ments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Sample-No. | 1 | 2 | 3 | 4 | 5 | 6 | - | 1 | 2 | 3 | 4 | 5 | 6 | - | - | - |
| Ignition of the sample | 1 | 1 | 1 | 1 | 1 | 2 | - | 1 | 1 | 1 | 1 | 1 | 2 | - | s | - |
| Maximum flame height | 6 | 7 | 5 | 10 | 4 | 3 | - | 2 | 2 | 1 | 2 | 2 | 2 | - | cm | - |
| Time of the maximum | 5 | 7 | 4 | 9 | 4 | 4 | - | 2 | 2 | 2 | 3 | 2 | 3 | | s | - |
| Flame tip reached the 150 mm test mark | ./. | ./. | ./. | ./. | ./. | ./. | - | ./. | ./. | ./. | ./. | ./. | ./. | - | s | ≥ 20 |
| Flame has extinguished before reaching the test mark | 9 | 12 | 4 | 13 | 5 | 5 | - | 3 | 3 | 3 | 3 | 2 | 3 | - | s | - |
| Ignition of filter paper | ./. | ./. | ./. | ./. | ./. | ./. | - | ./. | ./. | ./. | ./. | ./. | ./. | - | s | [1] |
| Smoke density (visual) | very low | | | | | | | very low | | | | | | | - | - |
| Afterburning time | ./. | ./. | ./. | ./. | ./. | ./. | - | ./. | ./. | ./. | ./. | ./. | ./. | - | ./. | - |
| Flames have been extinguished | ./. | ./. | ./. | ./. | ./. | ./. | - | ./. | ./. | ./. | ./. | ./. | ./. | - | ./. | - |
| View of the samples after the test (20 seconds after exposure of the flame): The samples were destroyed at flame impingement area up to max. 9 cm in height and 2 cm in width, above slightly sooted. | | | | | | | | | | | | | | | | |

Samples 1-5: edge flame exposure
Samples 6: surface flame exposure

[1] No ignition within 20 seconds
./. Not occurred
dim. Dimension
Indication of time: from the beginning of testing procedure
Indication of measurements: from reference line of the flame