



SIMPLY. SMARTER. GREEN ROOFS.

Fire Combustibility Testing for Xero Flor Green Roof Materials

Performed by:

**Materials Testing Institute for Civil Engineering and Architecture
Institute for Building Materials, Massive Structures, and Fire Protection
IBMB, MPA Braunschweig, Germany**

**Analytical Report
No. 3364 / 9009-1b
Dated 24 Nov 1999**

Applicant:

**Xero Flor International, GmbH (Strodthoff & Behrens GmbH)
Annen No. 3
27243 Gross Ippener, Germany**

Content of the application

Tests to prove the resistance against spread of flame and radiant heat according to DIN 4102, Part 7 (July 1998 Edition)

Receipt of the material to be analyzed: 3 Aug 1999

Labeling: Roofing for extensive planting with substrate, designated as XF301 Sedum-Moss Mat without vegetation.

The test results refer exclusively to the aforementioned specimen which is described below.

1. Motive and Description of the Samples

The Material Testing Institute for Civil Engineering and Architecture in Braunschweig was commissioned by letter on 22 July 1999 to test a materials assembly for a roof planting, corresponding to German Institute for Building Technology (DIBT) Standard # 6/1989 (p. 200).

The build-up of the roof assembly (bottom to top):

XF 108 drainage filter mat, consisting of a polyester fleece covered with polyamide loops, of 390 g/m² basic weight and 15 mm thickness;

XF 154 fleece of mixed plastic fibers (800 g/m² basic weight and 8 mm thickness);

XF 301 Sedum Mat filled with ~15mm - 20mm XeroTerr II extensive greenroof substrate (approx. 20 l/m²) with 800 g/m² fleece (35 mm thickness);

Total thickness of the construction was approximately 60 mm. A wooden formwork was inclined at an angle of 15 degrees and surfaced with a polymeric seal (60 mm) and used as the support for the assembly. The component materials for the sample roof were stored in a dry room at approximately 20° C before being assembled.

2. Test Method

Testing Date: 8th September 1999

Ambient temperature in the test hall: 21° C.

The fire tests were carried out in accordance with the DIBT standards on the sample roof

Ignition Source (per DIN 4077): 600g woodwool consisting of 20 x 2 pine in a wire basket (300 mm x 300 mm x 200 mm) was placed on the sample roof and ignited from all four sides.

Number of burning points per roof inclination: four



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3. Test Results

Roof Inclination	Fire Test Position ¹	Largest Burned Area and Time of Occurrence		Combustion Duration	Burnt or Charred Surface Area ²	Burnt Surface Length ²
		mm	Min	min:s	m ²	mm
15 degrees	C	0	0	11.00	0.09	0
	C	0	0	9.30	0.09	0
	C	0	0	9.00	0.09	0
	C	0	0	8.30	0.09	0
	Center	0	0	9.30	0.09	0

¹ C = seamless surface on the roof inclination.

² Measured from the upper edge of the wire frame within 30 minutes of the test completion.

Observations:

Ignition of the roof surface inclined at 15 degrees: none

The roof parts (components) neither burned nor smoldered.

No flames or smoldering points occurred on the underside of the roof construction.

The sample roof remained fully sealed.

Except for the XF159 fleece of mixed plastic fibers, the tested materials used in the roof construction met the requirements of building material class B2.



Figure 1: Appearance of the sample roof (15 degrees inclination) during execution of the test.

4. Assessment

The tested roof materials met the requirements stated in of DIN 4102, Part 7, Section 4 (March 1987).

If the other pre-requisites according to the 'Fire Behavior of Planted Roofs' given on page 200 of standard No. 6 / 1989 issued by the German Institute for Building Technology in Berlin are met, then there is no technical, fire protective objection for planted roofs with the tested construction – even with vegetation – regarding the resistance against spread of flame and radiant heat.

5. Special Advice

5.1 The analytical report # 3364 / 9009-1b was recertified through 2009 (document available upon request).

5.2 This analytical report does not replace the general test certificate issued by the construction supervisory body.

Authorizing Testing Director:

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