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Laboratory for Fire Safety

Resistance to smoke passage between spaces in analogy with NEN 6075:2020 and EN 1634-3:2004 + C1:2007

Generic assessment report linear joint seals with 4tecx Fire Retardant PU Foam

Report number CB 2028-1E-RA-001 dated 9 January 2024

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Generic assessment report linear joint seals with 4tecx Fire Retardant PU Foam

Client	4tecx
Report number	CB 2028-1E-RA-001
Date	9 January 2024
Reference	HL/RO//CB 2028-1E-RA-001 (renaming of report C 2028-2E-RA-001 dated April 1, 2021)
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1 Introduction

On behalf of 4tecx in Oosterhout (further referenced as 4tecx) a test was performed to measure the smoke leakage (resistance to smoke passage) of two linear joints sealed with PU foam. In the Dutch standard NEN 6075:2020 (further referenced as NEN 6075) a method is presented by which the rate of smoke leakage of a construction can be assessed. This is done by measuring the air leakage of a construction. The Dutch standard NEN 6075:2020 redirects to the test standard EN 1634-3 for the test method. Although the NEN-EN 1634-3:2004 + C1:2007 (further referenced as EN 1634-3) basically is intended to test the smoke leakage of doorsets, is affiliated with the relevant passages in this testing standard.

The test performed consisted of a determination of the resistance to smoke passage between spaces in accordance with EN 1634-3 causes by the linear joint seals. For this, a total of two linear joints were tested. 4tecx Fire Retardant PU Foam was applied to wood and aerated concrete.

The question cannot be answered using the field of direct or extended application ('exap') as defined in the relevant European standards. This report therefore concerns an Assessment or Expert Judgement. The assessment described in this report concerns an equivalent solution. The equivalent solution described must be agreed with the competent authority in good time.

This assessment has been drawn up in accordance with the guideline "Requirements for drawing up assessments or collective reports – 2019-03." as can be found on our website (in Dutch).

This report is valid for 3 years. At the end of this period, the validity period can be extended if it is demonstrated that the composition of the materials and the construction have not changed, the direct and extended field of application as described in the relevant standards have not been limited and no test results have become available that require adjustment of the conclusions in this report.

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2 Determination of smoke leakage

2.1 Requirements

The standard NEN 6075 describes the resistance to smoke passage between spaces with the criteria S_a or S_{200}. The test method is based on the EN 1634-3.

The classification S_a stands for "cold" smoke (the $_a$ means ambient, 20 °C). S_{200} stand for "medium temperature" smoke (the $_{200}$ means 200 °C).

The air leakage requirement for linear joint seals is less than 0.1 m^3/hm over the length of the linear joint and 3 m^3 over the surface of the linear joint.

The relevant pressure for the tests is 10 Pa, 25 Pa and 50 Pa. In consultation with the client it was decided to test all specimens with this three different pressures.

In summary, the criteria S_a and S_{200} are met when above leakage is not exceeded at 10, 25 and 50 Pa, both at 20 °C and 200 °C.

2.2 Reports used and test configuration

Several reports have been made available by Bostik for the purpose of this assessment, see table 2.1 below.

t2.1 Documents made available

Laboratory	Client	Number and date of report	Content report
Peutz BV	4tecx	Y 2089-4E-RA-001 dated April 1, 2021	Test report of nine linear joint seals in analogy with EN 1634-3:2004 + C1:2007

A brief description with details of the specimens is given in table 2.2. A more detailed description of the test configuration can be found in the test report.

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t2.2 Specifications specimens

Specimen	Type system	Width (mm)	Surface	Type	Depth (mm)
4	Linear joint	30	Aerated concrete (G4/600)	FP404 Fire Retardant PU Foam	100
8	Linear joint	20	Pine wood (approx. 500 kg/m^3)	FP404 Fire Retardant PU Foam	100

The length of all specimens was 2.5 meter.

2.3 Summary testing results and measured leakage

All test results are summarised in table 2.3, with a correction of the measured values to standard test conditions (temperature 20 °C, pressure 101325 Pa). The values are rounded to tenths of a decimal.

t2.3 Summary test results

Specimen	Type seal	Short description	Total leakage over the length of the tested seal [m^3/h/m], S_a at pressure difference of			Total leakage over the length of the tested seal [m^3/h/m], S_{200} at pressure difference of		
			10 Pa	25 Pa	50 Pa	10 Pa	25 Pa	50 Pa
4	Linear seal	Aerated concrete	0.0	0.0	0.0	0.0	0.0	0.1
8	Linear seal	Wood	0.0	0.0	0.0	0.0	0.0	0.1

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3 Conclusion

3.1 Smoke leakage S_a en S_{200}

On behalf of 4tecx in Oosterhout (further: 4tecx) a test was performed to measure the smoke leakage (resistance to smoke passage) in accordance with NEN 6075 and EN 1634-3. Based on the test results it can be stated that linear joints sealed with 4tecx Fire Retardant PU Foam do meet the requirements for classification S_a and S_{200}.

3.2 Field of application linear seals

The following conditions apply:
- the classifications are valid for a linear joint seal in a wall and allowed in every orientation;
- the classifications are valid in both directions;
- the depth of the sealant is at least 10 mm. The surfaces of the material on which the 4tecx Fire Retardant PU Foam is applied are thoroughly cleaned;
- the linear joint seals may connect to any type of construction of aerated concrete, metal, wood or gypsum;
- the width of a linear joint connected to a construction of aerated concrete is 5 mm to 30 mm in case of 4tecx Fire Retardant PU Foam;
- the width of a linear joint connected to a wooden construction is 5 mm to 20 mm for 4tecx Fire Retardant PU Foam.

Haps,

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This report contains 7 pages.

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