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ASSESSMENT REPORT

The fire resistance performance of
Astro X Series Pillows and Astro Pillows installed within trunking

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1. Introduction

This report considers the expected fire resistance performance of Astro X Series Pillows and Astro Pillows (Astroflame Pillows) used to seal internally within trunking containing services, penetrating flexible, gypsum drywalls.

Astro X Series Pillows and Astro Pillows are available in the following sizes:

Astro X Series Sausage:	330 x 50 x 20mm	Astro Pillow Sausage:	300 x 50 x 40mm
Astro X Series Small:	330 x 200 x 25mm	Astro Pillow Small:	300 x 100 x 40mm
Astro X Series Large:	330 x 200 x 45mm	Astro Pillow Medium:	300 x 150 x 40mm
		Astro Pillow Large:	300 x 200 x 40mm

The data which forms the basis of this assessment was obtained from tests in accordance EN 1366-3: 2009.

The penetration seals discussed are required to provide up to 120 minutes integrity and 45 minutes insulation performance (E 120, EI 45) with respect to EN 1366-3: 2009, depending on configuration.

2. Assumptions

It is assumed that the walls which the seals will be installed to, will be proven to provide at least the integrity and insulation performance required of the penetration seals, when tested in accordance with EN 1364-1 or EN 1365-1 (as appropriate to the element). It is further assumed that the pillow based penetration seals will be as tested under the reference referenced WF No. 402946 except where detailed otherwise within this report.

It is assumed that the penetrations seals will be installed by competent installers in an equivalent manner to that tested.

3. Assessment – Performance to EN 1366-3

The test referenced WF No. 402946 was conducted on a number of pillow penetration seals installed within 75mm thick gypsum drywall. The test was conducted in accordance with EN 1366-3: 2009 and demonstrated the ability of the seals to provide 66 minutes integrity and insulation performance depending on the specification of the seal.

The following seals and performances are proposed based upon the available data:

Wall type	Trunking	Seal around trunking (both faces)	Seal within trunking	Services	Rating
75mm Plasterboard	225x225 mm galvanized steel	10mm deep Astro Intu Mastic Sealant, 1-10mm annular space	Astroflame Pillows min. 300 mm deep	Cables up to 80mm diameter	E 60
100mm Plasterboard	225x225 mm galvanized steel	25mm deep Astro Intu Mastic Sealant, 1-10mm annular space			E 120, EI 30
100mm Plasterboard	100x100 mm plastic	10mm deep Astro HPE Sealant with 10mm stonewool backing, 1-10mm annular space			E 60

Notes:

1. 75mm thick wall to comprise minimum 1 layer of 12.5 mm type F plasterboard per side and be classified minimum EI 60 and 100 mm thick walls to comprise minimum 2 layers of 12.5 mm type F plasterboard per side and classified minimum EI 60 for penetration seals rated E 60 or minimum EI 120 for penetrations seals rated E 120.
2. Astro Intu Mastic seal around trunking to reside within the opening where the annular space is practical to do so and to be squeezed into the annular space and beaded 10x10mm onto the surface where it is impractical to guarantee a 10 or 25 mm deep seal within the wall.
3. Astro HPE Sealant seal around trunking to reside within the opening and be backed with 10 mm stone wool material.
4. Pillows to be tightly packed within the trunking and around the service using appropriate pillow sizes.

75mm Flexible Wall System E 60

Seal B in the test referenced WF No. 402946 briefly comprised a 150 x 150 mm galvanized steel trunking installed within an 75mm thick gypsum wall. The 170 x 170 mm aperture was sealed with

Astro Intu Mastic sealant, 10 mm deep to both faces and internally the trunking was sealed with pillows 330 mm long.

Within the trunking was contained 1 x 'B', 1 x 'C1', 1 x 'G1' and 1 x 'G2' cables/wires.

The test demonstrated the ability of the penetration seal to provide 66 minutes integrity and 27 minutes insulation performance.

This seal is generally similar to the proposed seal for 75 mm gypsum walls and provided in excess of the required 60 minutes integrity only (E 60) performance, however, differences between the tested and proposed specification must be considered:

Difference	Anticipated affect upon proposed performance
Proposed trunking is larger than tested at 225 x 225 mm vs 150 x 150 mm.	Negligible – The trunking is tightly packed with pillows and services and the seal remains effectively the same, so this is not expected to have a significant affect upon integrity performance. Insulation performance is not claimed.
Annular seal space range of 1-10mm relative to the tested 10 mm.	Negligible – Reduced annular space, provided it is adequately sealed will provide less area for the passage of flames and hot gases and is therefore expected to perform at least as well as tested in terms of integrity performance. Insulation performance is not claimed.
All electrical cables up to 80 mm diameter are proposed relative to the smaller selection tested.	The Astroflame Pillows are additionally certificated (UL-EU-00840-A1) for much larger penetration seals incorporating cables up to 80 mm diameter for up to E 120, the ability of the pillows to seal around such cables is therefore adequately proven.

Based upon the above comparison of differences to the tested seal it can be confidently predicted that the proposed seal would be capable of provided 60 minutes integrity performance (E 60) in a 75 mm thick gypsum wall.

100mm Flexible Wall System E 120, EI 30

Seal B in the test referenced WF No. 402946 is again cited in support of this specification and, in addition, the UL-EU certificate UL-EU-00838-A1 is also cited for the performance of the Astro Intu Mastic sealant used to seal around the trunking.

Specifically, this document certificates the 120 minutes integrity performance (E 120) with both copper and steel pipes ranging from 15-159mm diameter, which would be expected to represent the same or slight more onerous situation, since the trunking, unlike the pipes, will be tightly packed with Astroflame Pillows inside.

The seals discussed above are generally similar to the proposed seal for 75 mm gypsum walls and support the required 120 minutes integrity and 30 minutes insulation (E 120, EI 30) performance, however, differences between the tested and proposed specification must be considered:

Difference	Anticipated affect upon proposed performance
Proposed trunking is larger than tested at 225 x 225 mm vs 150 x 150 mm.	Negligible – The trunking is tightly packed with pillows and services and the seal remains effectively the same, so this is not expected to have a significant affect upon integrity performance. Insulation performance is not claimed.
Annular seal space range of 1-10mm relative to the tested 10 mm.	Negligible – Reduced annular space, provided it is adequately sealed will provide less area for the passage of flames and hot gases and is therefore expected to perform at least as well as tested in terms of integrity performance. Insulation performance is not claimed.
All electrical cables up to 80 mm diameter are proposed relative to the smaller selection tested.	The Astroflame Pillows are additionally certificated (UL-EU-00840-A1) for much larger penetration seals incorporating cables up to 80 mm diameter for up to E 120 and EI 90, the ability of the pillows to seal around such cables is therefore adequately proven.
E 120 performance.	As already discussed, based on the certificated performance of UL-EU-00838-A1-CPR.
EI 30 performance	Seal B in the test referenced WF No. 402946 provided 27 minutes insulation performance in a 75 mm wall and with 10 mm thick Sealant, the additional 3 minutes performance can be anticipated based upon the significantly thicker wall and penetration seal (outer).

Based upon the above comparison of differences to the tested seal it can be confidently predicted that the proposed seal would be capable of provided 120 minutes integrity performance (E 120) and 30 minutes insulation performance (EI 30) in a 100 mm thick gypsum wall.

100mm Flexible Wall System E 60

Seal B in the test referenced WF No. 402946 is again cited in support of this specification and in addition the UL-EU certificate UL-EU-00837-A1 is also cited for the performance of the Astro HPE Sealant used to seal around the trunking.

Specifically, this document certificates the 60 minutes integrity and insulation performance (EI 60) with both PVC and HDPE pipes ranging from 40-125mm diameter, which would be expected to represent a significantly more onerous situation, since the trunking, unlike the pipes, will be tightly packed with Astroflame Pillows inside and thus will require little or no actual closure pressure.

The seals discussed above are generally similar to the proposed seal for 100 mm gypsum walls and support the required 60 minutes integrity only (E 60) performance, however, differences between the tested and proposed specification must be considered:

Difference	Anticipated affect upon proposed performance
Annular seal space range of 1-10mm relative to the tested 10 mm.	Negligible – Reduced annular space, provided it is adequately sealed will provide less area for the passage of flames and hot gases and is therefore expected to perform at least as well as tested in terms of integrity performance. Insulation performance is not claimed.
All electrical cables up to 80 mm diameter are proposed relative to the smaller selection tested.	The Astroflame Pillows are additionally certificated (UL-EU-00840-A1) for much larger penetration seals incorporating cables up to 80 mm diameter for up to E 120 and EI 90, the ability of the pillows to seal around such cables is therefore adequately proven.
Astro HPE Sealant	The use of the sealant is discussed above and is beneficial to the performance of plastic services.
Sealant depth	UL-EU-00837-A1 specifies 25 mm sealant depth (and various seal annulus), however this is to close an open pipe, for the intended purpose of the seal around the trunking, the proposed sealant dimensions are considered adequate.

Based upon the above comparison of differences to the tested seal it can be confidently predicted that the proposed seal would be capable of provided 60 minutes integrity only (E 60) in a 100 mm thick gypsum wall.

4. Limits of Applicability

The conclusions of this report only apply to Astroflame Pillow penetration seals as previously tested under the reference WF No. 402946.

This assessment does not constitute product certification by UL and should not be used to demonstrate compliance where the project requires product certification.

5. Conclusions

It can be concluded that Astroflame Pillows used to seal internally within trunking containing services, penetrating flexible, gypsum drywalls, will provide up to 120 minutes integrity and up to 30 minute insulation performance, subject to specification, as discussed earlier in this report, if subjected to a test in accordance with EN 1366-3: 2009.

6. Validity

This assessment is issued on the basis of test data and information available at the time of issue.

If contradictory evidence becomes available to UL International (UK) Ltd the assessment will be unconditionally withdrawn and ASTROFLAME FIRESEALS LIMITED will be notified in writing. Similarly the assessment is invalidated if the assessed construction is subsequently tested because actual test data is deemed to take precedence over an expressed opinion.

The assessment is valid initially for a period of five years i.e. until 1st April 2026, after which time it is recommended that it be returned for re-appraisal.

The appraisal is only valid provided that no other modifications are made to the tested construction other than those described in this report.

7. Declaration by ASTROFLAME FIRESEALS LIMITED

We the undersigned confirm that we have read and complied with the obligations placed on us by the UK Fire Test Study Group Resolution No. 82: 2001.

We confirm that the component or element of structure, which is the subject of this assessment, has not to our knowledge been subjected to a fire test to the Standard against which the assessment is being made.

We agree to withdraw this assessment from circulation should the component or element of structure be the subject of a fire test to the Standard against which this assessment is being made.

We are not aware of any information that could adversely affect the conclusions of this assessment.

If we subsequently become aware of any such information, we agree to cease using the assessment and ask UL International (UK) Ltd to withdraw the assessment.

Signed:

For and on behalf of:

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8. Signatories

Report by:



Chris Johnson*
Staff Engineer
Building and Life Safety Technologies

Reviewed by:



Danny Forshaw*
Senior Project Engineer
Building and Life Safety Technologies

*For and on behalf of UL International (UK) Ltd

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant. This is included in Section 7 to this report.

REPORT ISSUED: 14th April 2021

Appendix 1: Summary of Primary Supporting Evidence

WF No. 402946

A fire resistance test in accordance with EN 1366-3: 2009 on thirteen specimens of penetration seal installed within 75mm thick flexible walls. Specimens A & B included steel trunking sealed externally with sealant and internally with fire pillows. Specimen A incorporated a 50x50mm trunking within a 70x70mm aperture and 1x A1, A2 & A3 cables. Specimen B incorporated a 150x150mm trunking within a 170x170mm aperture and 1x B, C1, G1 & A3 cables.

The results of the test were as follows:

Specimen	Integrity (mins)	Insulation (mins)
A	66	48
B	66	27

Report Sponsor : Held on confidential file (permission provided)
Report Date : 20th September 2019

UL-EU-00837-A1

A third party certification of Astro HPE Sealant against the requirements of ETAG 026-2, EN 13501-2 and EN 1366-3. The certificate can be viewed at: https://database.ul.com/certs/UL-EU-00837.pdf

Certificate Sponsor : ASTROFLAME FIRESEALS LIMITED
Certificate Date : 9th September 2015

UL-EU-00840-A1

A third party certification of X Series Pillows against the requirements of ETAG 026-2, EN 13501-2 and EN 1366-3. The certificate can be viewed at: https://database.ul.com/certs/UL-EU-00840.pdf

Certificate Sponsor : ASTROFLAME FIRESEALS LIMITED
Certificate Date : 9th September 2015

UL-EU-00838-A1

A third party certification of Astro Intu Mastic against the requirements of ETAG 026-2, EN 13501-2 and EN 1366-3. The certificate can be viewed at: https://database.ul.com/certs/UL-EU-00838.pdf

Certificate Sponsor : ASTROFLAME FIRESEALS LIMITED
Certificate Date : 9th September 2015