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# Using Polyurethane (PU) Foams



## 1 Purpose statement

The purpose of this document is to provide advice on the correct and safe use of polyurethane (PU) foams in fire seal applications.

## 2 Audience

This Information Bulletin is intended for:

- (i) FPA Australia members;
- (ii) Building owners;
- (iii) Builders and trades service contractors undertaking electrical, plumbing, cabling, ventilation and air-conditioning and other service works that commonly penetrate fire-resisting building elements.

## 3 Background

PU foams are used in control joint or service penetration applications.

A number of PU foams are available in the market supplied in pressurised cans for hand held or gun application.

PU foams are normally expelled from pressurised cans through long nozzles as a sticky liquid that quickly expands (typically by 40 times its original volume) to form a rigid foam.

PU foams are not structural materials and hence should not be used in areas subject to foot traffic where such traffic is likely to pass over the seal and transfer load to the seal material.

## 4 Fire resistance

Fire resistance, in the context of PU foams, is the ability of the wall or floor it is applied within to maintain fire separation so that fire does not spread from one compartment to another.

PU foams that are to be used in control joint or service penetration applications must have their fire performance determined by testing to the appropriate

fire resistance test standards as either a "control joint" or "penetration" in accordance with AS 1530.4 and assessed in accordance with AS 4072.1.

Once tested to the required standard(s), it is important that the scope of application of the test results is supported by documentation that meets the "Evidence of suitability" requirements of Clauses A5.2, A5.4 and Schedule 5 of the National Construction Code (NCC).

For example, PU foams tested as a control joint cannot be used to seal pipe or cable penetrations unless they have been tested in that end-use application, see Figures 1 and 2, below.

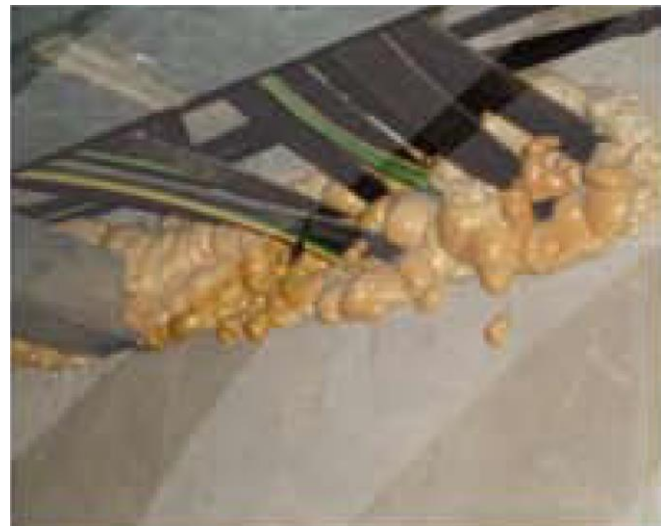


Figure 1 - Incorrectly installed PU foam

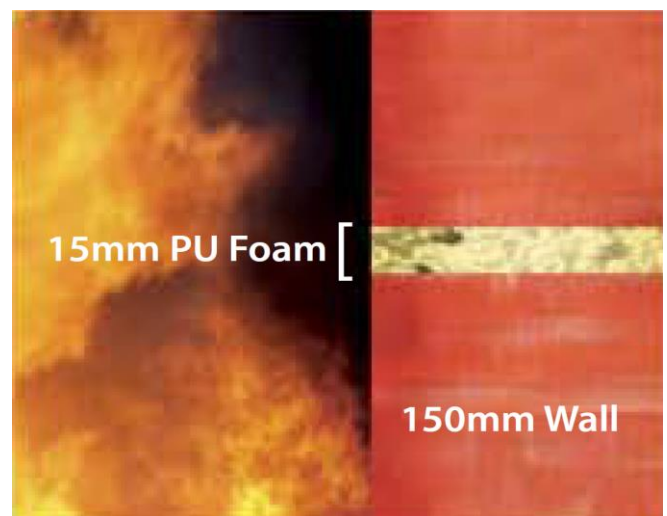


Figure 2 - Correctly installed PU foam

## 5 Guidance on their use

PU foams are combustible and hence the rate at which combustion occurs under standard heating conditions will be dependent upon such factors as the available oxygen and the presence of conductors capable of transferring heat into the seal. With respect to the former, the aspect ratio (gap/opening width/seal depth) will be a key factor in determining fire performance. In the case of heat transfer, the presence of penetrating metallic pipes or cables with large metallic conductors will have a detrimental effect on fire performance and should be seen to be within the scope of the assessed applications.

Plastic pipes may also be sealed by the use of intumescent wrap systems designed to expand under fire conditions crushing the softened pipe and sealing the opening. Such systems require external restraint in order that the intumescent expansion is directed inwards. Hence, if PU foam is to be used to seal an opening around such a device, evidence of suitability must be available which demonstrates the required fire performance under test.

Finally, care should be taken where the bonding properties of the foam under fire conditions may be critical to the performance of another element—for example, if the foam were to be used to bond the frame of a fire resistant door into a structural opening without the use of additional mechanical fixings. In such a case the erosion of the foam as it burns is likely to significantly weaken the stability of the frame to the point where it has a detrimental effect on the fire performance of the door assembly. Hence, as with intumescent pipe wrap, proof of performance in the intended application must be available before use.

## 6 References

- AS 1530.4-2014, *Methods for fire tests on building materials, components and structures—Fire resistance tests for elements of construction* – Published by Standards Australia International Ltd, Sydney.
- AS 4072.1-2005 (+A1), *Components for the protection of openings in fire-resistant*

*separating elements—Service penetrations and control joints* – Published by Standards Australia International Ltd, Sydney.

- *Using Polyurethane Foams*, Advisory Note – Published by Association for Specialist Fire protection (ASFP), Coventry, UK.

## 7 Acknowledgements

FPA Australia would like to acknowledge and thank the Association for Specialist Fire Protection (ASFP), UK, for permission to use their Advisory Notice “Using Polyurethane Foams” as the base document for the development of this FPA Australia Information Bulletin.

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