

assessment report

Title:

The Fire Resistance
Performance of 'Fomox' Fire
Stopping Materials

WF Report No:

145489

Prepared for:

**UGA System-Technik GmbH
& Co**

Heidenheimer Str. 80-82
D-89542 Herbrechtingen
Germany

Date:

4th March 2005

TABLE OF CONTENTS

| SECTION | PAGE |
|---|-------------|
| Executive Summary | 3 |
| Introduction | 4 |
| Assumptions | 4 |
| Proposals | 4 |
| Test Evidence..... | 4 |
| Conclusions..... | 7 |
| Validity..... | 7 |
| Summary of Primary Supporting Data | 7 |
| Declaration by UGA System-Technik GmbH & Co. | 8 |
| Signatories..... | 9 |
| Annex A..... | 10 |



Executive Summary

| | |
|-------------------------------|---|
| Objective | This report considers the expected fire resistance performance of fire stopping products referenced Fomox PA plugs, Fomox WMP mastic and Fomox PA system, when used to reinstate the performance of wall and floor constructions were they are penetrated by services. |
| Report Sponsor | UGA System-Technik GmbH & Co |
| Address | Heidenheimer Str. 80-82 D-89542 Herbrechtingen Germany |
| Summary of Conclusions | It can be concluded that fire stopping products as discussed in this report should be capable of providing the fire resistance performances given in Annex A, if subjected to a test utilising the general principles of BS 476: Part 20: 1987, in conjunction with guidelines from the draft document prEN 1366-3: 1993. |
| Valid until | 1 st April 2010 |

This report may only be reproduced in full. Extracts or abridgements of reports shall not be published without permission of warringtonfire.



Introduction

The reports referenced WARRES Nos. 63300 and 63301 detail tested conducted upon fire stopping products referenced Fomox PA plugs, Fomox WMP mastic and Fomox PA system, the results of which are compiled within this report.

FTSG

The data referred to in the supporting data section has been considered for the purpose of this appraisal which has been prepared in accordance with the Fire Test Study Group Resolution No. 82: 2001.

Assumptions

It is assumed that the supporting construction into which the services and seals are installed will be of a masonry/concrete construction and will have been shown via test or approval to have at least the required fire resistance period.

It is assumed that the fire stopping products will be installed by competent installers in a similar manner to the systems tested under the references WARRES Nos. 63300 and 63301.

Proposals

It is proposed that Fomox PA plugs, Fomox WMP mastic and Fomox PA system will reinstate the integrity and insulation performance of masonry/concrete wall and floor constructions, where they are penetrated by services, for the periods given in Annex A.

Test Evidence

WARRES No. 63300

The report referenced WARRES No. 63300 describes a test conducted utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines adopted from prEN 1366-3: 1993. The test was conducted to assess the ability of two specimens of proprietary penetration sealing systems to reinstate the integrity and insulation performance of 150 mm thick (200 mm including Supalux board fixed to each face) aerated concrete floor and wall constructions where each had been provided with a 600 mm square aperture to allow the penetration of various electric services.

The test demonstrated the ability of the sealing systems to provide the following performances:

| | Integrity | Insulation |
|---------------------------|------------------|-------------------|
| Floor mounted seal | 125 minutes | 125 minutes |
| Wall mounted seal | 125 minutes | 92 minutes |



Specification

The following service items penetrated the aperture in the wall and floor constructions:

- Cable rack comprising pre-shaped channel sections of mild steel 21 mm by 10 mm by 2 mm thick, at 300 mm centres.
- Cable rack comprising pre-shaped channel sections of mild steel 30 mm by 15 mm by 2 mm thick, at 300 mm centres.
- Cable tray of galvanised mild steel 500 mm wide by 65 mm by 0.9 mm thick.
- Cable tray of galvanised mild steel 500 mm wide by 65 mm by 1.5 mm thick.
- Cable tray of stainless steel 500 mm wide by 65 mm by 0.83 mm thick.
- Electric cable single multi copper core by 150 mm², rating of 10 kV and 30 mm overall diameter.
- Electric cable three with a copper and two with an aluminium core, each three core 185 mm²/95 mm², rating of 1 kV and 50 mm overall diameter.
- Electric cable three copper core by 185 mm², rating of 10 kV and 70 mm overall diameter.
- Electric cable four copper core by 10 mm², rating of 1 kV and 20 mm overall diameter. Protected on both faces for a distance of 100 mm from the barrier with 'Fomox WMP' mastic.
- Electric cable five copper core by 1.5 mm², three layer, rating of 1 kV and 10 mm overall diameter.
- Electric cable twenty copper core by 2 mm by 0.6 mm communication cables of 15 mm overall diameter.

The penetration seal was formed from foam slabs referenced 'Fomox PA system', each of dimensions 600 mm by 220 mm by 50-55 mm thick by 232 kg/m³ measured density such that the aperture was filled to full depth (200 mm). Any gaps left between the penetrations and foam slabs were filled with mastic referenced 'Fomox WMP'.

The cable trays and racks were supported via steel frames attached to the associated wall and floor constructions.

WARRES No. 63301

The report referenced WARRES No. 63301 describes a test conducted utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines adopted from prEN 1366-3: 1993. The test was conducted to assess the ability of specimens of proprietary penetration sealing systems to reinstate the integrity and insulation performance of 150 mm thick (200 mm including cape marine board fixed to each face) aerated concrete floor and wall constructions where each had been provided with a apertures to allow the penetration of various electric and pipe services.



The test demonstrated the ability of the sealing systems to provide the following performances:

| Specimen Reference | Integrity | Insulation |
|---------------------------|------------------|-------------------|
| V1 | 125 minutes | 102 minutes |
| V2 | 125 minutes | 125 minutes |
| V3 | 125 minutes | 125 minutes |
| V4 | 45 minutes | 39 minutes |
| H1 | 119 minutes | 111 minutes |
| H2 | 125 minutes | 125 minutes |
| H3 | 125 minutes | 125 minutes |
| H4 | 106 minutes | 106 minutes |

Specification

The following service items penetrated the aperture in the wall and floor constructions:

- Electric cable three copper core by 185 mm²/95 mm², rating of 1 kV and 50 mm overall diameter (specimens V1 & H1). The cable was coated on both faces from a distance of 100 mm from the plug with intumescent mastic referenced 'Fomox WMP' of 5 mm approximate thickness.
- Electric cable bunch comprising two copper core by 185 mm², rating of 10 kV and 20 mm overall diameter, two five copper core by 1.5 mm², three layer, rating of 1 kV and 10 mm overall diameter and two, twenty copper core by 2 mm by 0.6 mm communication cables of 15 mm overall diameter (specimens V2 & H2). The cables were coated with 'Fomox WMP' through the wall and floor only.
- Service pipe of polyvinyl chloride 160 mm diameter with a wall thickness of 5.8 mm (specimens V3 & H3).
- Service pipe of Polyethylene 160 mm diameter with a wall thickness of 5.1 mm (specimens V4 & H4).

The cables (specimens V1, V2, H1 and H2) passed through 200 mm diameter apertures filled with aperture sealing plugs of foam referenced 'Fomox PA-System', 200 mm diameter by 200 mm thick by 232 kg/m³ density. Any remaining gaps between the penetrations, plugs and floor/wall were filled with mastic referenced 'Fomox WMP'.

The plastic pipes (specimens V3, V4, H3 and H4) passed through 160 mm diameter apertures and were fitted with pipe collars referenced 'Fomox PA system' (one on each side of the wall and one on the soffit of the floor) with dimensions of 325 mm diameter (outside) by 105 mm deep.

The cables and pipes were supported via steel frames attached to the associated wall and floor constructions.



Conclusions

Fire stopping products as discussed in this report should be capable of providing the fire resistance performances given in Annex A, if subjected to a test utilising the general principles of BS 476: Part 20: 1987, in conjunction with guidelines from the draft document prEN 1366-3: 1993.

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 warringtonfire the assessment will be unconditionally withdrawn and UGA System-Technik GmbH & Co 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 2010, 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.

Summary of Primary Supporting Data

WARRES No. 63300

The report referenced WARRES No. 63300 describes a test conducted utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines adopted from prEN 1366-3: 1993.

The results of the test were as follows:

| | Integrity | Insulation |
|---------------------------|------------------|-------------------|
| Floor mounted seal | 125 minutes | 125 minutes |
| Wall mounted seal | 125 minutes | 92 minutes |

Test Date : 7th March 1995

Sponsor : The sponsor of the test does not wish to be identified in this report but has provided permission to use this data in the production of the report

WARRES No. 63301

The report referenced WARRES No. 63301 describes a test conducted utilising the general principles of BS 476: Part 20: 1987, in conjunction with additional guidelines adopted from prEN 1366-3: 1993.



The results of the test were as follows:

| Specimen Reference | Integrity | Insulation |
|---------------------------|------------------|-------------------|
| V1 | 125 minutes | 102 minutes |
| V2 | 125 minutes | 125 minutes |
| V3 | 125 minutes | 125 minutes |
| V4 | 45 minutes | 39 minutes |
| H1 | 119 minutes | 111 minutes |
| H2 | 125 minutes | 125 minutes |
| H3 | 125 minutes | 125 minutes |
| H4 | 106 minutes | 106 minutes |

Test Date : 14th March 1995

Sponsor : The sponsor of the test does not wish to be identified in this report but has provided permission to use this data in the production of the report

Declaration by UGA System-Technik GmbH & Co.

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 warringtonfire to withdraw the assessment.

Signed:

For and on behalf of:



Signatories

| |
|---|
|  |
| Responsible Officer |
| C. Johnson* - Technical Officer |

| |
|---|
|  |
| Approved |
| D Hankinson* - Technical Consultant |

* For and on behalf of warringtonfire.

| |
|---|
| Report Issued: 28 th February 2005 |
|---|

The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

This copy has been produced from a .pdf format electronic file that has been provided by warringtonfire to the sponsor of the report and must only be reproduced in full. Extracts or abridgements of reports must not be published without permission of warringtonfire. The original signed paper version of this report, which also includes a silvered logo, is the sole authentic version. Only original paper versions of this report bear authentic signatures of the responsible warringtonfire staff.



Annex A

Penetrations through concrete floors (200 mm thick) sealed with 'Fomox PA' pre-formed blocks and 'Fomox WMP' mastic

| Service | Dimensions | Integrity | Insulation |
|----------------|--|-------------|-------------|
| Cable rack | 21 mm by 10 mm by 2 mm thick, mild steel | 125 minutes | 125 minutes |
| Cable rack | 30 mm by 15 mm by 2 mm thick, mild steel | 125 minutes | 125 minutes |
| Cable tray | 500 mm by 65 mm by 0.9 mm thick, mild steel | 125 minutes | 125 minutes |
| Cable tray | 500 mm by 65 mm by 1.5 mm thick, mild steel | 125 minutes | 125 minutes |
| Cable tray | 500 mm by 65 mm by 0.84 mm thick, stainless steel | 125 minutes | 125 minutes |
| Electric cable | Electric cable single multi copper core by 150 mm ² , rating of 10 kV and 30 mm overall diameter. | 125 minutes | 125 minutes |
| Electric cable | Electric cable with three copper core, 185 mm ² , rating of 1 kV and 50 mm overall diameter. | 125 minutes | 125 minutes |
| Electric cable | Electric cable three with three aluminium core, 95 mm ² , rating of 1 kV and 50 mm overall diameter. | 125 minutes | 125 minutes |
| Electric cable | Electric cable three copper core by 185 mm ² , rating of 10 kV and 70 mm overall diameter. | 125 minutes | 125 minutes |
| Electric cable | Electric cable four copper core by 10 mm ² , rating of 1 kV and 20 mm overall diameter. Protected on both faces for a distance of 100 mm from the barrier with 'Fomox WMP' mastic | 125 minutes | 125 minutes |
| Electric cable | Electric cable five copper core by 1.5 mm ² , three layer, rating of 1 kV and 10 mm overall diameter | 125 minutes | 125 minutes |
| Electric cable | Electric cable twenty copper core by 2 mm by 0.6 mm communication cables of 15 mm overall diameter | 125 minutes | 125 minutes |

Penetrations through concrete/masonry walls (200 mm thick) sealed with 'Fomox PA' pre-formed blocks and 'Fomox WMP' mastic

| Service | Dimensions | Integrity | Insulation |
|----------------|--|-------------|------------|
| Cable rack | 21 mm by 10 mm by 2 mm thick, mild steel | 125 minutes | 92 minutes |
| Cable rack | 30 mm by 15 mm by 2 mm thick, mild steel | 125 minutes | 92 minutes |
| Cable tray | 500 mm by 65 mm by 0.9 mm thick, mild steel | 125 minutes | 92 minutes |
| Cable tray | 500 mm by 65 mm by 1.5 mm thick, mild steel | 125 minutes | 92 minutes |
| Cable tray | 500 mm by 65 mm by 0.84 mm thick, stainless steel | 125 minutes | 92 minutes |
| Electric cable | Electric cable single multi copper core by 150 mm ² , rating of 10 kV and 30 mm overall diameter. | 125 minutes | 92 minutes |
| Electric cable | Electric cable with three copper core, 185 mm ² , rating of 1 kV and 50 mm overall diameter. | 125 minutes | 92 minutes |
| Electric cable | Electric cable three with three aluminium core, 95 mm ² , rating of 1 kV and 50 mm overall diameter. | 125 minutes | 92 minutes |
| Electric cable | Electric cable three copper core by 185 mm ² , rating of 10 kV and 70 mm overall diameter. | 125 minutes | 92 minutes |
| Electric cable | Electric cable four copper core by 10 mm ² , rating of 1 kV and 20 mm overall diameter. Protected on both faces for a distance of 100 mm from the barrier with 'Fomox WMP' mastic | 125 minutes | 92 minutes |
| Electric cable | Electric cable five copper core by 1.5 mm ² , three layer, rating of 1 kV and 10 mm overall diameter | 125 minutes | 92 minutes |
| Electric cable | Electric cable twenty copper core by 2 mm by 0.6 mm communication cables of 15 mm overall diameter | 125 minutes | 92 minutes |



Penetrations through concrete floors (200 mm thick) sealed with 'Fomox PA system plugs' and 'Fomox WMP' mastic

| Service | Dimensions | Integrity | Insulation |
|----------------|---|-------------|-------------|
| Electric cable | Electric cable three copper core by 185 mm ² /95 mm ² , rating of 1 kV and 50 mm overall diameter. Cable to be coated on both faces for a distance of 100 mm from the plug with intumescent mastic referenced 'Fomox WMP' of 5 mm approximate thickness.. | 119 minutes | 111 minutes |
| Electric cable | Electric cable two copper core by 185 mm ² , rating of 10 kV and 20 mm overall diameter. Cables coated with 'Fomox WMP' through the wall and floor only. | 125 minutes | 125 minutes |
| Electric cable | Electric cable two five copper core by 1.5 mm ² , three layer, rating of 1 kV and 10 mm overall diameter. Cables coated with 'Fomox WMP' through the wall and floor only | 125 minutes | 125 minutes |
| Electric cable | Electric cable copper core by 2 mm by 0.6 mm communication cables of 15 mm overall diameter. Cables coated with 'Fomox WMP' through the wall and floor only. | 125 minutes | 125 minutes |

Penetrations through concrete/masonry walls (200 mm thick) sealed with 'Fomox PA system plugs' and 'Fomox WMP' mastic

| Service | Dimensions | Integrity | Insulation |
|----------------|---|-------------|-------------|
| Electric cable | Electric cable three copper core by 185 mm ² /95 mm ² , rating of 1 kV and 50 mm overall diameter. Cable to be coated on both faces for a distance of 100 mm from the plug with intumescent mastic referenced 'Fomox WMP' of 5 mm approximate thickness.. | 125 minutes | 102 minutes |
| Electric cable | Electric cable two copper core by 185 mm ² , rating of 10 kV and 20 mm overall diameter. Cables coated with 'Fomox WMP' through the wall and floor only. | 125 minutes | 125 minutes |
| Electric cable | Electric cable two five copper core by 1.5 mm ² , three layer, rating of 1 kV and 10 mm overall diameter. Cables coated with 'Fomox WMP' through the wall and floor only | 125 minutes | 125 minutes |
| Electric cable | Electric cable copper core by 2 mm by 0.6 mm communication cables of 15 mm overall diameter. Cables coated with 'Fomox WMP' through the wall and floor only. | 125 minutes | 125 minutes |



Penetrations through concrete floors (200 mm thick) sealed with 'Fomox PA system collars'

| Service | Dimensions | Integrity | Insulation |
|----------------|---|------------------|-------------------|
| PVC Pipe | 160 mm diameter with a wall thickness of 5.8 mm. Collar to fitted to soffit of floor | 125 minutes | 125 minutes |
| PE Pipe | 160 mm diameter with a wall thickness of 5.1 mm. Collar to fitted to soffit of floor | 106 minutes | 106 minutes |

Penetrations through concrete/masonry walls (200 mm thick) sealed with 'Fomox PA system collars'

| Service | Dimensions | Integrity | Insulation |
|----------------|--|------------------|-------------------|
| PVC Pipe | 160 mm diameter with a wall thickness of 5.8 mm. Collar to fitted to both sides of wall | 125 minutes | 125 minutes |
| PE Pipe | 160 mm diameter with a wall thickness of 5.1 mm. Collar to fitted to both sides of wall | 45 minutes | 39 minutes |





Warrington Fire Research Centre Ltd - Holmesfield Road - Warrington - Cheshire - UK - WA1 2DS
t: +44 (0) 1925 655116 - f: +44 (0) 1925 655419 - w: warringtonfire.net