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Testing. Advising. Assuring.

Title:

The Fire Resistance
Performance of Lightweight
Partition Walls Incorporating
Electrical Sockets

WF Assessment Report No:

390551

Prepared for:

VJ Technology

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Date:

16th October 2006

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Executive Summary

Objective This report presents an appraisal of the fire resistance performance of previously tested lightweight partition walls when incorporating electrical sockets, if tested in accordance with BS 476: Part 22: 1987.

Report Sponsor **VJ Technology**

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Summary of Conclusions Should the recommendations given in this report be followed, it can be concluded that plastic and metallic electrical sockets when protected with 'VJT Putty Pads' self-adhesive mastic pads, as discussed in this report, should reinstate the 60 minutes & 120 minutes integrity performance of previously proven lightweight partition systems, if tested in accordance with BS 476: Part 22: 1987.

Valid until 1st November 2022

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Introduction

This report presents an appraisal of the fire resistance performance of previously tested lightweight partition systems when incorporating electrical sockets protected by 'VJT Putty Pads' self-adhesive mastic pads.

The proposed 'VJT Putty Pads' self-adhesive mastic pads are required to reinstate the integrity performance of the partition assembly where it is penetrated by plastic and metallic electrical sockets for up to 60 minutes and 120 minutes depending upon the construction, if subjected to a test in accordance with BS 476: Part 22: 1987.

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

Partition assembly

It is assumed that the partition assembly into which the electrical sockets are to be fitted will be twin skinned (at least one layer of boards on each side of the studs) and will have provided at least 60 minutes or 120 minutes integrity performance when tested in accordance with BS 476: Part 22: 1987 by a UKAS accredited laboratory (or assessed by warringtonfire).

Installation

It is assumed that the sockets will not be installed juxtaposed, so at least one face of the partition assembly remains intact.

Proposals

It is proposed that 'VJT Putty Pads' self-adhesive mastic pads will reinstate the integrity performance of previously proven partition assemblies where they are penetrated by electrical sockets, for up to 60 minutes & 120 minutes depending upon the construction, if subjected to a test in accordance with BS 476: Part 22: 1987.

Basic Test Evidence

Report No. WF 156432

The report referenced WF No. 156432 and briefly described in the supporting data section of this report, describes a test conducted utilising the general principles of BS 476; Part 20: 1987, to evaluate the ability of specimens of electrical wall sockets protected by a putty pad, to reinstate the integrity and insulation performance of a section of 'standard flexible wall construction', as detailed in EN 1366-3: 2004.

The test demonstrated the ability of all eight socket configurations tested to provide in excess of 150 minutes integrity performance.

Assessed Performance

Wall construction

As detailed above, the test referenced WF No. 156432 was conducted on a small section of lightweight partition system, into which eight plastic electrical sockets were installed, four to each face.

Tests utilised to evaluate the inclusion penetrations and penetration sealing systems in lightweight partition walls are normally conducted on full size specimens (3 metres high by 2 metres wide as detailed in BS EN 1366-3), so that the influence of the movement of the partition, in conjunction with the penetration may be evaluated. However in this case, it considered that this movement will be less critical to the performance for the following reasons:

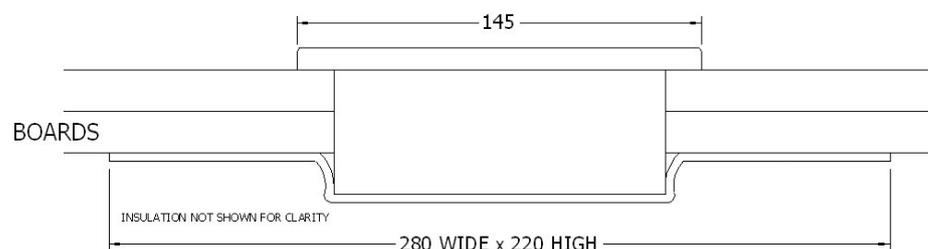
- The sockets are not independently restrained as a continuous pipe or cable penetration would be and are therefore likely to move in sympathy with the partition assembly.
- The sockets penetrate only one skin of the partition leaving the other skin fully intact.

This provides confidence in the ability of the of plastic sockets in conjunction with 'VJT Putty Pads' self-adhesive pads to reinstate the integrity performance of full size partitions for the required periods, however it is also necessary to consider the nature of the proposed wall assembly.

The Standard wall construction specified in BS EN 1366-3 for periods of 60 minutes fire resistance performance is relatively 'robust', which may infer a slightly positive result for the penetration sealing system, relative to alternative partition systems which are proven to provide 120 minutes integrity performance. However based upon the observed ability of the sockets protected by 'VJT Putty Pads' self-adhesive mastic pads to show no signs which would indicate integrity failure in a formal test, for significantly in excess of the required 120 minute period, this provides confidence in the repeatability of this performance in alternative partition systems for at least the required 60 & 120 minute periods. The following details are however considered essential to this fire resistance performance:

- The partition assembly into which the electrical sockets are to be fitted will be twin skinned (at least one layer of boards on each side of the studs) and will have provided at least 60 or 120 minutes integrity performance (depending upon the performance required) when tested in accordance with BS 476: Part 22: 1987 by a UKAS accredited laboratory (or assessed by warringtonfire).
- The sockets will be installed within the bottom 1000 mm of the assembly.
- The sockets will not be fitted juxtaposed so that one skin of the partition remains intact.
- The sockets will be tightly fitted into the face of the partition with a 'VJT Putty Pads' self-adhesive mastic pad fitted over the back face of the socket box, as shown in Figure 1 below.

Figure 1



Metallic sockets

All of the sockets included within the test referenced WF No. 156432 were of a plastic face and body construction, with some metallic components. It is however proposed that the 'VJT Putty Pads' self-adhesive mastic pads may also be utilised with sockets with metallic faces and bodies, typically steel, brass or aluminium.

The observations recorded in the test referenced WF No. 156432 indicated that all of the plastic socket faces installed on the exposed side of the wall section had fallen away during the first 17 minutes of testing and had therefore offered only a minor contribution to the integrity performance of the wall. Sockets constructed of metallic components with relatively low melting points, such as aluminium would be expected to remain in place for a similar period, while materials such as brass or steel would be expected remain in place for significantly longer.

This provides confidence that the substitution of sockets of metals with relatively low melting points, would not be expected to significantly affect the integrity performance of the wall construction and that the substitution of sockets constructed from metals with higher melting points would be likely to have a slightly beneficial affect upon the performance of the wall construction.

Conclusions

Plastic and metallic electrical sockets when protected with 'VJT Putty Pads' self-adhesive mastic pads, as discussed in this report, should reinstate the 60 minutes & 120 minutes integrity performance of previously proven lightweight partition systems, if tested in accordance with BS 476: Part 22: 1987.

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 Exova warringtonfire the assessment will be unconditionally withdrawn and VJ Technology 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, valid initially for a period of five years, has been returned for re-appraisal and revalidated for a further five year period i.e. until 1st November 2022, 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

Report No. WF 156432

A test conducted utilising the general principles of BS 476; Part 20: 1987, to evaluate the ability of specimens of electrical wall sockets protected by a putty pad, to reinstate the integrity and insulation performance of a section of 'standard flexible wall construction', as detailed in EN 1366-3: 2004. The performance the section of wall incorporating the electrical sockets was assessed, with respect to the integrity and insulation (maximum temperature rise only) performance criteria, as defined in BS 476: Part 20: 1987.

For the purpose of the test the electrical sockets were referenced Specimens A to H.

The assembly had overall nominal dimensions of 1000 mm high by 1000 mm wide by 105 mm thick and an internal perimeter frame and central vertical stud of steel partitioning members. Four apertures were cut through each face of the 'British Gypsum' 'Fireline' plasterboard at staggered heights, such that the sockets were not positioned juxtaposed to each other. One electrical socket complete with its rear box was installed into each aperture.

Specimens A to D were installed on the unexposed face of the partition and Specimens E to H were installed on the exposed face of the partition. Each specimen was protected by the same self-adhesive mastic pad, which was installed within the partition wall. The results of the test were as follows:

| Test Results | Spec A | Spec B | Spec C | Spec D | Spec E | Spec F | Spec G | Spec H |
|---------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| Integrity | 158 mins | 152 mins | 176 mins | 150 mins | 179 mins | 179 mins | 179 mins | 179 mins |
| Insulation | 153 mins | 151 mins | 154 mins | 141 mins | 161 mins | 172 mins | 163 mins | 166 mins |

Test Date : 11th August 2006

Sponsor : The sponsor has provided permission to allow the use of this data

Declaration by VJ Technology

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 Exova warringtonfire to withdraw the assessment.

Signed:

For and on behalf of:

Signatories

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|  |
| Responsible Officer |
| C. Johnson* - Principal Certification Engineer |

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|  |
| Approved |
| A. Kearns* - Technical Manager |

* For and on behalf of Exova warringtonfire.

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| Report Issued: 16 th October 2006 |
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The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

Issue 2 – Correction of typographical errors (26th October 2006)

Issue 3 – Review and revalidation until 1st March 2017 (27th February 2012)

Issue 4 - Review and revalidation until 1st November 2022 (16th October 2017)