

assessment report

Title:

Supplementary Comments to
WFRC Nos 135660 & 139273
Issue 2 - The Fire Resistance
Performance of 'Hilti CP648'
pipe wraps/collars & 'Hilti
CP 643N' Firestop Jackets

WF Assessment Report No:

163047

Prepared for:

**Hilti
Entwicklungsgesellschaft
mbH**

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Date:

19th April 2007

TABLE OF CONTENTS

SECTION	PAGE
<u>Executive Summary</u>	<u>3</u>
<u>Introduction</u>	<u>4</u>
<u>Assumptions</u>	<u>4</u>
<u>Proposals</u>	<u>4</u>
<u>Assessed Performance</u>	<u>5</u>
<u>Conclusions</u>	<u>6</u>
<u>Validity</u>	<u>6</u>
<u>Summary of Primary Supporting Data</u>	<u>6</u>
<u>Declaration by Hilti Entwicklungsgesellschaft mbH</u>	<u>8</u>
<u>Signatories</u>	<u>9</u>
<u>Annex</u>	<u>10</u>

Executive Summary

Objective	This report provides supplementary comments to the reports referenced WFRC Nos. 135660 & 139273 Issue 2, with regard the fire resistance performance of 'Hilti CP648' pipe wraps/collars & 'Hilti CP 643N' Firestop Jacket penetration sealing systems, where they are penetrated by small PVC pipes.
Report Sponsor	Hilti Entwicklungsgesellschaft mbH
Address	Hiltistr. 6 86916 Kaufering Germany
Summary of Conclusions	<p>Should the recommendations given in this report be followed, it can be concluded that 'Hilti CP648' pipe wraps/collars & 'Hilti CP 643N' Firestop Jackets, as detailed in this report should provide up to 240 minutes integrity and insulation performance with small PVC pipes, if subjected to a test utilising the general principles of BS EN 1363-1: 1999/BS 476: Part 20: 1987, in conjunction with guidelines from prEN 1366-3.</p> <p>A matrix of the seal performances and supporting constructions is included in the Annex to this report.</p>
Valid until	1 st May 2012

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Introduction

This report provides supplementary comments to the reports referenced WFRC Nos. 135660 & 139273 Issue 2, with regard the fire resistance performance of 'Hilti CP648' pipe wraps/collars & 'Hilti CP 643N' Firestop Jacket penetration sealing systems, where they are penetrated by small PVC pipes.

Walls and floors often incorporate apertures to accommodate the passage of services such as plastic pipes. The fire resistance of such elements is only as good as their weakest point and it is, therefore, important that these areas are adequately sealed, such that weaknesses are not created at the positions of the penetrations.

Historically there was no British Standard test procedure applicable to the evaluation of a method or a system designed to reinstate the fire resistance of a wall or floor where it has been provided with apertures to allow for its penetration by service items. Although such a standard now exists (BS EN 1366-3: 2004), the fire resistance of walls and floors is determined by tests utilising the general principles given in BS 476: Part 20: 1987 and BS EN 1363-1: 1999, and it would appear appropriate to use the principles of these Standards to evaluate the performance of penetration sealing systems.

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

Installation

It is assumed that the penetration sealing systems and services will be installed in a similar manner to that of the previously tested assemblies cited in the reports referenced WFRC Nos. 135660 & 139273 Issue 2, by competent installers.

Supporting construction

It is assumed that the supporting structure into which the elements are installed will have a proven fire resistance performance such that it is capable of effectively supporting the proposed constructions for at least the required period.

Sealing systems

It is assumed that the sealing systems will be identical to those detailed in the reports referenced WFRC Nos. 135660 & 139273 Issue 2, unless otherwise detailed within this report.

Proposals

It is proposed that 'Hilti CP648' pipe wraps/collars & 'Hilti CP 643N' Firestop Jacket will provide up to 240 minutes integrity and insulation performance when used to reinstate the performance of wall and floor constructions where they are penetrated by PVC pipes of minimum 20 mm diameter.

Assessed Performance

CP 648

The assessment report referenced WFRC No. 135660 positively appraises the performance of 'Hilti CP648' pipe wraps/collars when used to reinstate the performance of walls and floors where they are penetrated by various services. The report does not however consider the expected performance for PVC pipes of diameters below 32 mm.

Changes in pipe diameter can be critical to the performance of the separating element/penetration seal, however typically larger pipes are more difficult seal and thus require greater amounts of intumescent material and empirical evidence suggests that small PVC pipes tend to have an inherent resistance to fire and are far less dependant upon closure devices than larger pipes and pipes of alternative plastics materials.

While no amnesty from the use of a closure devices is proposed, it is considered highly unlikely that any reduction in performance from that already appraised for 32 mm diameter PVC pipes would occur, subject to a 'Hilti CP648' pipe wrap/collar being provided at the dimensions specified for 32 mm diameter pipes or above and on this basis PVC pipes of minimum 20 mm diameter are also positively appraised.

Full details of the positively appraised pipes, seals and separating elements based upon scope already appraised in WFRC No. 135660, are detailed in the Annex to this report.

CP 643N

The assessment report referenced WFRC No. 139273 Issue 2 positively appraises the performance of 'Hilti CP643N' Firestop Jackets when used to reinstate the performance of walls and floors where they are penetrated by various services. The report does not however consider the expected performance for PVC pipes of diameters below 40 mm.

Changes in pipe diameter can be critical to the performance of the separating element/penetration seal, however typically larger pipes are more difficult seal and thus require greater amounts of intumescent material and empirical evidence suggests that small PVC pipes tend to have an inherent resistance to fire and are far less dependant upon closure devices than larger pipes and pipes of alternative plastics materials.

While no amnesty from the use of a closure devices is proposed, it is considered highly unlikely that any reduction in performance from that already appraised for 40 mm diameter PVC pipes would occur, subject to a 'Hilti CP643N' Firestop Jacket being provided at the intumescent ratios specified for 40 mm diameter pipes or above and on this basis PVC pipes of minimum 20 mm diameter are also positively appraised.

Full details of the positively appraised pipes, seals and separating elements based upon scope already appraised in WFRC No. 139273 Issue 2, are detailed in the Annex to this report.

Conclusions

Should the recommendations given in this report be followed, it can be concluded that 'Hilti CP648' pipe wraps/collars & 'Hilti CP 643N' Firestop Jackets, as detailed in this report should provide up to 240 minutes integrity and insulation performance with small PVC pipes, if subjected to a test utilising the general principles of BS EN 1363-1: 1999/BS 476: Part 20: 1987, in conjunction with guidelines from prEN 1366-3.

A matrix of the appraised seal performance is included in the Annex to this report.

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 Bodycote **warringtonfire** the assessment will be unconditionally withdrawn and Hilti Entwicklungsgesellschaft mbH 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 May 2012, 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

WFRC No. 135660 An appraisal of the expected fire resistance performance of horizontal or vertical elements of building construction penetrated by various services protected via CP648 pipe wraps/collars, should they be tested utilising the general principles of BS 476: Part 20: 1987 in conjunction with additional guidelines adopted from prEN 1366-3.

The report concluded that the penetrating elements discussed, comprising a range of pipe diameters and materials protected via CP648 wraps, if tested utilising the general principles of BS 476; Part 20: 1987, in conjunction with additional guidelines adopted from prEN 1366-3, would be as per the tables included within Section 6 of the assessment.

Report date : 12th November 2003

Test sponsor : Hilti Entwicklungsgesellschaft mbH

WFRC No. 139273 An appraisal of the fire resistance performance of 'CP 643N Firestop Jacket' pipe penetration seals when used where plastic pipes penetrate wall and floor assemblies.
Issue 2

The report concluded that 'CP 643N Firestop Jacket' pipe penetration seals when used where plastic pipes penetrate walls and floors, as detailed in this report should provide up to 240 minutes integrity and insulation performance (as shown in Tables 1 to 3) if subjected to a test utilising the general principles of BS EN 1363-1: 1999/BS 476: Part 20: 1987, in conjunction with guidelines from prEN 1366-3.BS 476: Part 20: 1987.

Report date : 19th May 2004

Test sponsor : Hilti Entwicklungsgesellschaft mbH

Declaration by Hilti Entwicklungsgesellschaft mbH

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 Bodycote **warringtonfire** to withdraw the assessment.

Signed:

For and on behalf of:

Signatories


Responsible Officer
C Johnson* - Technical Consultant


Approved
A Kearns* - Technical Manager

* For and on behalf of Bodycote **warringtonfire**.

Report Issued: 19 th April 2007
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The assessment report is not valid unless it incorporates the declaration duly signed by the applicant.

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Annex

Table 1 – CP 648 with PVC pipes 20 - 32 mm diameter

Separating element	Maximum Pipe Wall Thickness mm	Intumescent Thickness mm	Integrity mins	Insulation mins
Blockwork/Masonry Walls	2.1	4.5	240	223
Aerated Concrete Floors	3.9	4.5	240	240

For full details of appropriate separating elements refer to WFRC No. 135660

Table 2 – CP 643N with PVC pipes 20 - 50 mm diameter

Separating element	Maximum Pipe Wall Thickness mm	Ratio of Pipe Area to Intumescent Surface Area	Integrity mins	Insulation mins
Blockwork/Masonry Walls	4.7	1.45:1	245	245
Concrete Floors (recessed)	4.7	2.52:1	245	245
Concrete Floors (face fixed)	4.7	2.52:1	245	245
Drywalls (face fixed)	11.9	1.12:1	135	135

For full details of appropriate separating elements refer to WFRC No. 139273 Issue 2.



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