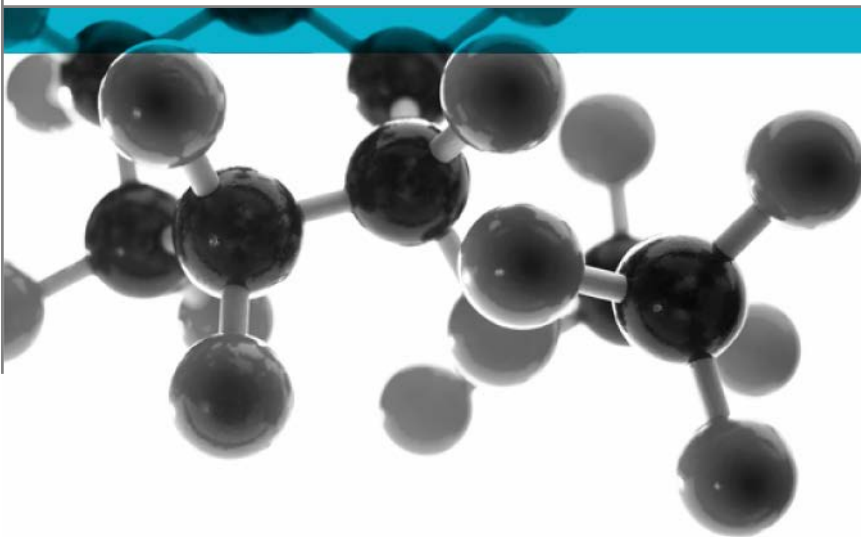


# Ad-hoc BS 5839-1: 2013 Section 26.2 e)



**Ad-hoc investigation to determine the fire performance of a cable junction box, using the principles of BS 5839-1: 2013 Section 26.2 e)**

A Report To: Abtech Limited

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Date: 26<sup>th</sup> August 2016

Issue No.: 1

Page 1

**Testing  
Advising  
Assuring**

## Executive Summary

**Objective** To determine the fire performance of a cable junction box, using the principles of BS 5839-1: 2013 Section 26.2 e)


Generic Description	Product reference	Thickness diameter	Density
Cable junction box	"SX6020"	2mm	Unable to provide
<b>Please see pages 6, 7 &amp; 8 of this test report for the full description of the product tested</b>			

**Test Sponsor** Abtech Limited, Newhall Road, Lower Don Valley, Sheffield, S9 2QJ


**Test Results:** When tested using the general principles of BS 5839-1 Section 26.2 e), the cable junction box maintained its integrity for the duration of the tests.

**Date of Test** 20<sup>th</sup> & 31<sup>st</sup> May 2016

## Signatories



Responsible Officer  
 C. Meachin \*  
 Technical Officer



Authorised  
 S. Deeming \*  
 Business Unit Head

\* For and on behalf of **Exova Warringtonfire**.

Report Issued: 26<sup>th</sup> August 2016

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## Test Details

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### Introduction

The sponsor, Abtech Limited, approached **Exova Warringtonfire** and requested that a series of tests be conducted to demonstrate that their cable junction box comply with the requirements of BS 5839-1: 2013.

Section 26.2 e) of BS 5839-1 states:-

“Methods of cable support should be such that circuit integrity will not be reduced below that afforded by the cable used, and should withstand a similar temperature and duration to that of the cable, while maintaining adequate support”.

In order to demonstrate that the cable junction box meets the above requirements, it was used in conjunction with standard fire resisting cables whilst they were exposed to the test conditions given in BS 5839-1: 2013 Section 26.2 e).

### Purpose of test

To determine the performance of cable junction box when it is subjected to the conditions of test specified in BS 5839-1: 2013, Section 26.2 e) and hence to demonstrate that they meet the requirements specified in Section 26.2 f). The purpose of the test methods are to determine whether a cable can maintain circuit integrity when it is exposed to the fire conditions described within the methods.

The tests were performed using the general principles of the procedures specified in BS 5839-1: 2013 Section 26.2 e), BS EN 50200: 2006 and BS 8434-2: 2003 + A2 2009 and this report should be read in conjunction with those standards.

### Scope of test

Section 26.2 e) of BS 5839-1 describes two methods of test for standard fire resisting cables :-

a) The cable should meet the PH 120 classification when tested in accordance with BS EN 50200.

The PH 120 classification for the continuity of power supply is defined in the Interpretative Document No. 2 of the Construction Products Directive. Two results in which the measured duration of survival equals or exceeds the stated classification (i.e. 120 minutes) are needed to obtain the classification.

And

b) The cable should maintain circuit integrity when exposed to the following test:

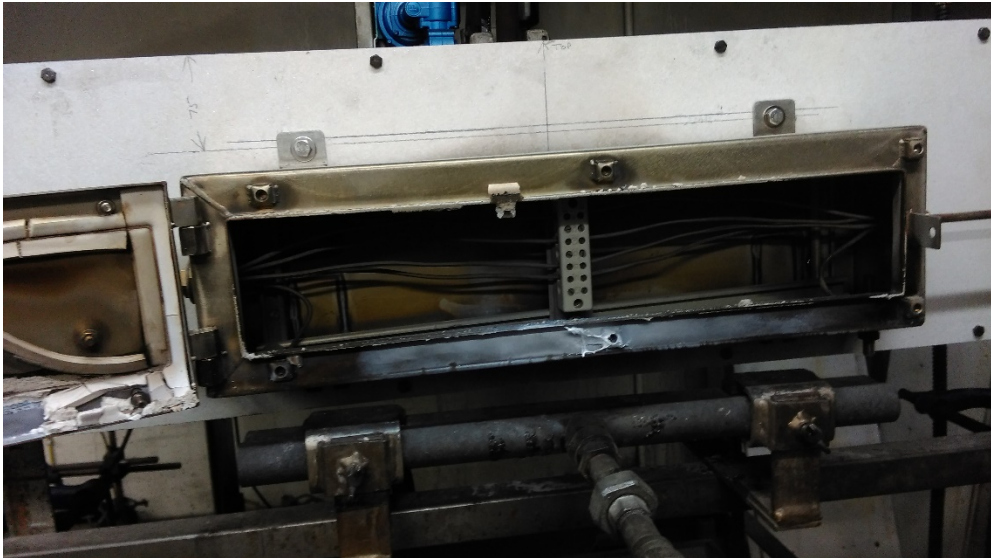
‘A sample of the cable is simultaneously exposed to a flame at a temperature of 930 (+40 -0°C) and mechanical shock for 60 minutes, followed by simultaneous exposure to water spray and mechanical shock for a further 60 minutes.’ At the specific request of the sponsor, the cable junction box was then exposed to fire alone for 1 further hour.

Compliance with this requirement is demonstrated using the test method described in BS 8434-2: 2003 + A2 2009.

<b>Fire test study group/EGOLF</b>	Certain aspects of some fire test specifications are open to different interpretations. The Fire Test Study Group and EGOLF have identified a number of such areas and have agreed Resolutions which define common agreement of interpretations between fire test laboratories which are members of the Groups. Where such Resolutions are applicable to this test they have been followed.
<b>Instruction to test</b>	The tests were conducted on the 20 <sup>th</sup> & 31 <sup>st</sup> May 2016 at the request of Abtech Limited, the sponsor of the test.
<b>Provision of test specimens</b>	The specimens were supplied by the sponsor of the test. <b>Exova Warringtonfire</b> was not involved in any selection or sampling procedure.
<b>Conditioning of specimens</b>	<p>The specimens were received on the 6<sup>th</sup> May 2016.</p> <p>Prior to the test the specimens were conditioned for at least 16 hours in an atmosphere having a temperature of <math>23 \pm 2^{\circ}\text{C}</math> and a relative humidity of <math>50 \pm 5\%</math>.</p>
<b>Form in which the specimens were tested</b>	The cable junction box was mounted to a nominally 10mm thick calcium silicate backing board and used the standard cable supplied and described below. The entry point of the cable to the junction box was sealed using standard brass flanges and stoppers.

## Description of Test Specimens

The description of the specimens given below has been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

General description		Cable junction box		
Junction box	Product reference		"SX6020"	
	Name of manufacturer		ABTECH	
	Terminals	Product reference		"ATB7"
		Detailed description / composition details		Ceramic terminals with 316 stainless steel conductive parts
		Name of manufacturer		ABTECH
	Steel	Generic type		Stainless steel EN1.4404 (AISI 316L)
		Product reference		"SX Range, size 600mm x 200mm x 140mm"
		Thickness		2mm
		Density		<b>See Note 1 below</b>
	Flame retardant details		This component is inherently flame retardant	
Dimension of cable junction box (diagram)				
				
Brief description of manufacturing process		<b>See Note 1 below</b>		
<b>The junction box was fitted to a calcium silicate backing board using stainless steel screws</b>				

Continued on next page

Cable	General description	MI
	Product reference	"Pyrotenax"
	Name of manufacturer	Pentair Thermal Management
	Diameter	<b>See Note 1 below</b>
	Weight per unit length	<b>See Note 1 below</b>
	Cable marking	<b>See Note 1 below</b>
	Cable function	<b>See Note 1 below</b>
	Colour	<b>See Note 1 below</b>
	Number of cores x core size	4 core 2.5mm <sup>2</sup>
	Voltage rating	600V
	Cable configuration	<b>See Note 1 below</b>
	Photograph of cable	<b>See Note 1 below</b>
	The sponsor was unable to provide any further information regarding the cable	
Brief description of manufacturing process	<b>See Note 1 below</b>	

**Note 1: The sponsor was unable to provide this information.**

## Photographs of Test Specimens

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Before test



After test





## Test Results

### Results

#### BS EN 50200: 2006 (Resistance to fire with mechanical shock)

When two specimens of the cable junction box utilising the MI cable supplied with the entry point of the cable to the junction box being sealed utilising standard brass flanges and stoppers, were tested using the principles of the procedure specified in BS EN 50200: 2006, for a period of 120 minutes at a temperature of 830 (+40 –0) °C and a rated voltage of 600V-rms, both the cable specimens and junction boxes maintained their circuit integrity.

#### BS 8434-2: 2003 + A2 2009 (Resistance to fire with mechanical shock and water spray)

When a specimen of the cable junction box utilising the MI cable supplied with the entry point of the cable to the junction box being sealed utilising standard brass flanges and stoppers, was tested using the principles of the procedure specified in BS 8434-2: 2003 + A2 2009, at a temperature of 930 (+40 –0) °C and a rated voltage of 600V-rms, for period of 120 minutes, both the cable specimens and junction boxes maintained their circuit integrity

### Conclusion

**When tested using the general principles of BS 5839-1 Section 26.2 e), the cable junction box maintained its integrity for the duration of the tests.**

### Applicability of test result

The test results relate only to the behaviour of the test specimens of the product under the particular conditions of test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use.

The test results relate only to the specimens of the product in the form in which they were tested. Small differences in the composition or thickness of the product may significantly affect the performance during the test and may therefore invalidate the test results. Care should be taken to ensure that any product which is supplied or used is fully represented by the specimens which were tested.

### Validity

The specification and interpretation of fire test methods are the subject of ongoing development and refinement. Changes in associated legislation may also occur. For these reasons it is recommended that the relevance of test reports over five years old should be considered by the user. The laboratory that issued the report will be able to offer, on behalf of the legal owner, a review of the procedures adopted for a particular test to ensure that they are consistent with current practices, and if required may endorse the test report.

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## Revision History

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Revised By:	Approved By:
Reason for Revision:	

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