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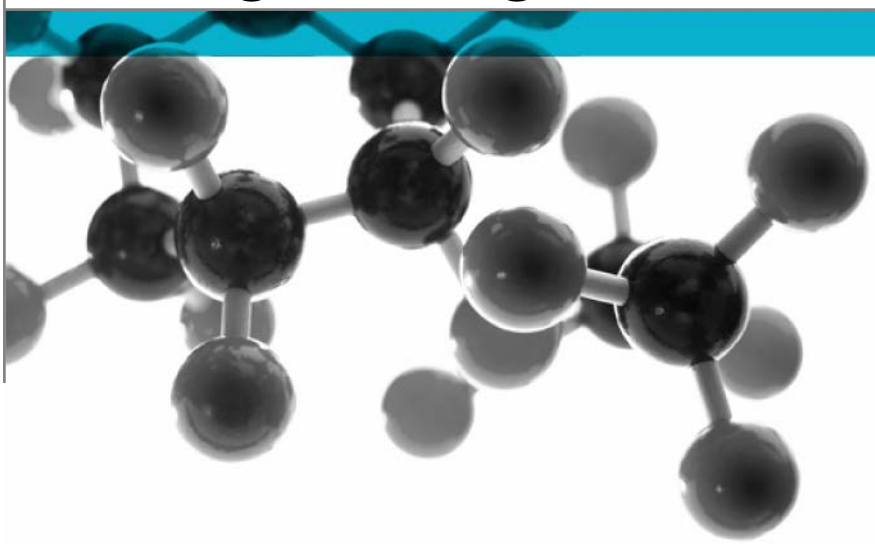
Ad-hoc investigation to determine the fire extinguishing properties of a “FIPRON P, FIPRON 15, FIPRON 25” fire extinguishing device



Ad-hoc investigation to determine the fire extinguishing properties of a “FIPRON P, FIPRON 15, FIPRON 25” fire extinguishing device

A Report To: FPN Yangın Koruma Sistemleri ve Üretim A.Ş

Document Reference: 410056

Date: 12th April 2019

Issue No.: 1

Executive Summary

Objective To demonstrate the capability of the following fire extinguishing device to extinguish a fire.

Generic Description		Product reference	Thickness	Weight per unit area
Fire extinguisher plate type with thermally activated microencapsulated active agents		"FIPRON P, FIPRON 15, FIPRON 25"	2 – 3mm	0.26 – 0.42g/cm²
Individual components used to manufacture composite:				
Composite sticker	Outer layer	"FIPRON Sticker"	2 – 3mm (full composite thickness)	0.26 – 0.42g/cm²
	Core	"Consisting of microcapsules containing fire extinguishing liquid and mixing and moulding of various chemicals"	Not applicable	0.70 – 0.99g/cm³
Adhesive		Unable to provide	0.05mm	0.1kg/m²
Please see pages 6, 7 & 8 of this test report for the full description of the product tested, the DB box and cylindrical wall socket				

Test Sponsor FPN Yangın Koruma Sistemleri ve Üretim A.Ş, Çayıryolu Cd. Ayplaza, No:2/1, 34752, Ataşehir / İstanbul / Türkiye

Test Results: **In the case of the "FIPRON P", "FIPRON 15" and "FIPRON 25" composite sticker, the tests have demonstrated the ability of the fire extinguishing device at a size of 30mm x 30mm, 85mm x 45mm and 110mm x 60mm respectively, to extinguish an internal fire when subjected to a Class A cotton wool ball fire source within a cylindrical wall socket (used for "FIPRON P") and a Class A cotton string fire source within a 15 litre distribution box (used for "FIPRON 15" and a 25 litre distribution box (used for "FIPRON 25").**

Date of Test 18th February 2019

Signatories

Responsible Officer T. Kinder * Senior Technical Officer	Authorised T. Mort * Senior Technical Officer

* For and on behalf of Warringtonfire.

Report Issued: 12th April 2019

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Test Details

Introduction

The sponsor approached Warringtonfire with a fire extinguisher plate and requested that a test be performed within a cylindrical wall socket, 15 litre distribution box and a 25 litre distribution box to demonstrate its capability to extinguish a fire.

As there is no specific standard or test procedure for this type of test, the sponsor and Warringtonfire agreed to the test procedure detailed in this report.

Purpose of test

Ad-hoc investigation to determine the fire extinguishing properties of a "FIPRON P, FIPRON 15, FIPRON 25" fire extinguishing device within a cylindrical wall socket, 15 litre distribution box and a 25 litre distribution box utilising cotton string fire source.

Instruction to test

The test was conducted on the 18th February 2019 at the request of FPN Yangın Koruma Sistemleri ve Üretim A.Ş, the sponsor of the test.

Provision of test specimens

The specimen was supplied by the sponsor of the test on the 12th February 2019. Warringtonfire was not involved in any selection or sampling procedure.

Test procedure

As there is no specific standard or test procedure for testing this type of product, the sponsor and Warringtonfire agreed that the following test procedure was considered to best demonstrate the ability of a fire extinguishing device to extinguish an internal fire within a cylindrical wall socket, 15 litre distribution box and a 25 litre distribution box.

- A cylindrical wall socket, 15 litre distribution box and a 25 litre distribution box were used as the test enclosures.
- For Specimens 1, 2 & 3 a Class A fire source comprising a 10mm cotton wool ball (for "FIPRON P") faintly sprayed with methylated spirits was used for the cylindrical wall socket, 15 litre distribution box and a 25 litre distribution box respectively was placed centrally hanging from the top of the of the distribution boxes and placed at the bottom of the cylindrical wall socket.
- For Specimens 4, 5 & 6 a Class A fire source comprising a cotton string (for "FIPRON 15") at a length of 100mm, faintly sprayed with methylated spirits was used for the 15 litre distribution box and placed centrally hanging from the top of the of the distribution box.
- For Specimens 7, 8 & 9 a Class A fire source comprising a cotton string (for "FIPRON 25") at a length of 160mm, faintly sprayed with methylated spirits was used for the 25 litre distribution box and placed centrally hanging from the top of the of the distribution box.

- The cotton was ignited and observations were made to determine if the fire source was extinguished within 2 minutes from the start of the test.
- The test was discontinued after extinguishment.
- Still photographs and a video recording were taken of the tests.

Description of Test Specimen, Distribution Box & Cylindrical Wall Socket

The descriptions of the specimens, distribution box & cylindrical wall socket given below have been prepared from information provided by the sponsor of the test. All values quoted are nominal, unless tolerances are given.

Test Specimen

General description		Fire Extinguisher plate type with thermally activated microencapsulated active agents
Product reference		"FIPRON P, FIPRON 15, FIPRON 25"
Overall thickness		2 – 3mm (stated by sponsor) 2.31mm (determined by Warringtonfire)
Overall weight per unit area		0.26 – 0.42g/cm² (stated by sponsor) 0.26 – 0.34g/cm² (determined by Warringtonfire)
Product configuration		Plate type fire extinguisher, consisting of microcapsules containing fire extinguishing liquid and mixing and moulding of various chemicals. "FIPRON P" type for wall sockets, protect up to 0.2 litre "FIPRON 15" type for electric cabinets protect up to 15 litre "FIPRON 25" type for electric cabinets protect up to 25 litre
Face	Product reference	"FIPRON Stıcker"
	Generic type	Polyacrylic polymer with mineral particles
	Name of manufacturer	FPN Yangın Koruma Sistemleri ve Uretim A.S. Gerede Bolu / TURKEY
	Weight per unit area	0.26 – 0.42g/cm²
	Thickness	2 – 3mm
	Colour	"Orange / yellow"
	Trade name of flame retardant	"FK-5-1-12"
	Generic type of flame retardant	Fluoroketone
	Amount of flame retardant	50% of total product weight
Core	Product reference	"Consisting of microcapsules containing fire extinguishing liquid and mixing and moulding of various chemicals"
	Generic type	Microcapsules 10-90 microns in diameter, covering the extinguishing liquid with polymeric shell
	Name of manufacturer	FPN Yangın Koruma Sistemleri ve Uretim A.S. Gerede Bolu / TURKEY
	Composition details	90% extinguishing fluid, 10% polymeric shell
	Application method	Nanotechnology
	Density	0.70 – 0.99g/cm³
	Trade name of flame retardant	"FK-5-1-12"
	Generic type of flame retardant	Fluoroketone
	Amount of flame retardant	50% of total product weight

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Adhesive	Product reference	**See Note 1 below**
	Generic type	Glue
	Name of manufacturer	TESA
	Thickness	0.05mm
	Weight per unit area	0.1kg/m²
	Flame retardant details	**See Note 2 below**
Brief description of manufacturing process		Liquid-containing microcapsules having a fire extinguisher are mixed with different chemicals in order to bring the silicone structure to dough consistency and it is molded with moulds of certain dimensions. The products which are dried from the dough to the dried plate are laminated with self-adhesive double-sided tape. "FIPRON Stıcker" should be installed in the middle or directly over contact group in the top of object with an active layer downwards.

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

Note 2. The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

Distribution Box

General description		General purpose model DB (distribution board) box
Dimensions		For "FIPRON 15" sticker: 300mm (high) x 300mm (wide) x 170mm (deep) For "FIPRON 25" sticker: 353mm (high) x 355mm (wide) x 208mm (deep)
Coating	Product reference	**See Note 1 below**
	Generic type	Stainless paint
	Name of manufacturer	**See Note 1 below**
	Weight per unit area / density	**See Note 1 below**
	Thickness	0.05mm
	Colour	Grey
	Flame retardant details	**See Note 2 below**
Steel	Product reference	"EMEK PANO"
	Generic type	Steel
	Name of manufacturer	Emek Is Elektrik Bolu / TURKEY
	Application rate	**See Note 1 below**
	Application method	**See Note 1 below**
	Specific gravity / density	**See Note 1 below**
	Flame retardant details	**See Note 2 below**

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Window	Product reference	**See Note 1 below**
	Generic type	Glass
	Name of manufacturer	**See Note 1 below**
	Thickness	4.5mm
	Weight per unit area / density	**See Note 1 below**
	Flame retardant details	**See Note 2 below**
Brief description of manufacturing process		**See Note 1 below**

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

Note 2. The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

Cylindrical Wall Socket

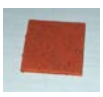
General description		Standard cylindrical wall socket
Dimensions		65mm (diameter) x 70mm (deep)
Coating	Product reference	**See Note 1 below**
	Generic type	Stainless paint
	Name of manufacturer	**See Note 1 below**
	Weight per unit area / density	**See Note 1 below**
	Thickness	0.05mm
	Colour	Grey
	Flame retardant details	**See Note 2 below**
Steel	Product reference	"EMEK PANO"
	Generic type	Steel
	Name of manufacturer	Emek Is Elektrik Bolu / TURKEY
	Application rate	**See Note 1 below**
	Application method	**See Note 1 below**
	Specific gravity / density	**See Note 1 below**
	Flame retardant details	**See Note 2 below**
Window	Product reference	**See Note 1 below**
	General description	Plastic
	Name of manufacturer	**See Note 1 below**
	Thickness	4.5mm
	Weight per unit area / density	**See Note 1 below**
	Flame retardant details	**See Note 2 below**
Brief description of manufacturing process		**See Note 1 below**

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

Note 2. The sponsor of the test has confirmed that no flame retardant additives were utilised in the production of the component.

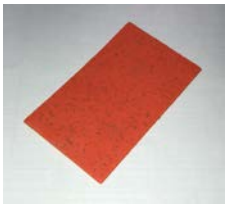
Photograph of specimens

"FIPRON P"



"FIPRON 15"

"FIPRON 25"



Test Results

Observations

The visual observations taken during the tests are shown in Appendix 1.

Photographs taken at intervals during the test are shown on page 11.

Discussion of results

In the case of the “FIPRON P”, “FIPRON 15” and “FIPRON 25” composite sticker, the tests have demonstrated the ability of the fire extinguishing device at a size of 30mm x 30mm, 85mm x 45mm and 110mm x 60mm respectively, to extinguish an internal fire when subjected to a Class A cotton wool ball fire source within a cylindrical wall socket (used for “FIPRON P”) and a Class A cotton string fire source within a 15 litre distribution box (used for “FIPRON 15” and a 25 litre distribution box (used for “FIPRON 25”).

Applicability of test results

The test results relate only to the behaviour of the test specimen of the product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the performance of the product in its end use.

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.

Appendix 1 - Observations

Product reference	Specimen 1		Specimen 2		Specimen 3	
	Time Extinguished	Pass/Fail	Time Extinguished	Pass/Fail	Time Extinguished	Pass/Fail
“FIPRON P”	00:08	Pass	00:08	Pass	00:08	Pass
“FIPRON 15”	00:32	Pass	00:30	Pass	00:28	Pass
“FIPRON 25”	01:01	Pass	01:00	Pass	00:49	Pass

Photographs

“FIPRON P”	“FIPRON 15”	“FIPRON 25”
		
Photograph before a test		
		
Photograph during a test		
		
Photograph after a test		

Revision History

Issue No :	Issue Date:
Revised By:	Approved By:
Reason for Revision:	

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