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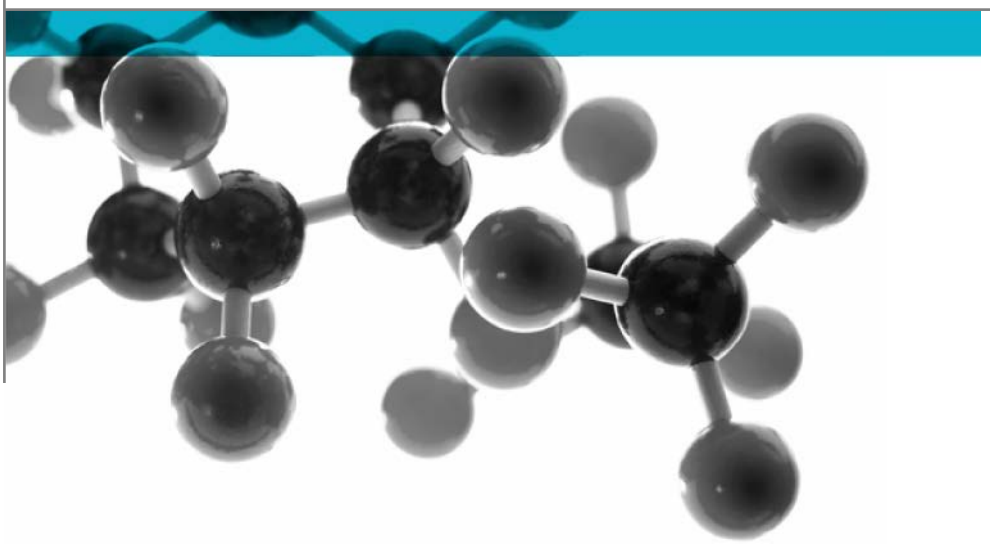
Ad-hoc investigation to determine the fire extinguishing properties of a “FIPRON CORD 1” fire extinguishing device



Ad-hoc investigation to determine the fire extinguishing properties of a “FIPRON CORD 1” fire extinguishing device

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

Document Reference: 410057

Date: 24th 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 / length
Fire extinguisher type-cord with thermally activated microencapsulated active agents		"FIPRON CORD 1"	3 ±0.2mm	27 ±1g/m
Individual components used to manufacture composite:				
Composite cord	Outer layer	"FIPRON CORD 1"	3 ±0.2mm	27 ±1g/m
	Core	"Consisting of microcapsules containing fire extinguishing liquid and mixing and moulding of various chemicals"	Not applicable	0.70 – 0.99g/cm³
Please see pages 5, 6 & 7 of this test report for the full description of the product tested and the DB box				

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 CORD 1" composite cord, the test has demonstrated the ability of the fire extinguishing device at a length of 1000mm, to extinguish an internal fire when subjected to a Class A cotton string fire source within a 50 litre distribution box.**

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: 24th April 2019

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Test Details

Introduction

The sponsor approached Warringtonfire with a fire extinguisher cord and requested that a test be performed within a 50 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 CORD 1" fire extinguishing device within a 50 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 50 litre distribution box.

- A 50 litre distribution box was used as the test enclosure.
- A Class A fire source comprising a cotton string at a length of 160mm, faintly sprayed with methylated spirits was 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 5 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

The descriptions of the specimens & distribution box 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 type-cord with thermally activated microencapsulated active agents
Product reference		"FIPRON CORD 1"
Overall thickness		3 ±0.2mm (stated by sponsor) 3.12mm (determined by Warringtonfire)
Overall weight per unit length		27 ±1g/m (stated by sponsor) 26.78 ±1g/m (determined by Warringtonfire)
Product configuration		Cord type fire extinguisher, which is formed by covering the microcapsules containing fire extinguishing liquid with various chemical substances and coated with special textile mesh to increase the efficiency
Face	Product reference	"FIPRON CORD 1"
	Generic type	Polyacrylic polymer with mineral particles
	Name of manufacturer	FPN Yangın Koruma Sistemleri ve Uretim A.S. Gerede Bolu / TURKEY
	Weight per unit length	27 ±1g/m
	Thickness	3 ±0.2mm
	Colour	"White and Red strip"
	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

Continued on next page

Brief description of manufacturing process	Liquid-containing microcapsules with fire extinguishing properties are mixed with different chemicals in order to form a polymeric dough and molded in suitable moulds. The products that become dried cord from dough are knitted with high temperature resistant glass fiber rope and red textile rope. The purpose of this braid; 1) To protect the product from external influences, to ensure the integrity and to keep the solids in the product, 2) Red rope is burned, the microcapsules in the extinguisher of the extinguisher agent, the pressure is to spread to the environment

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		500mm (high) x 500mm (wide) x 205mm (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**

Continued on next page

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.

Photograph of specimen

"FIPRON CORD 1"

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 10.

Discussion of results

In the case of the “FIPRON CORD 1” composite cord, the test has demonstrated the ability of the fire extinguishing device at a length of 1000mm, to extinguish an internal fire when subjected to a Class A cotton string fire source within a 50 litre distribution box.

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.

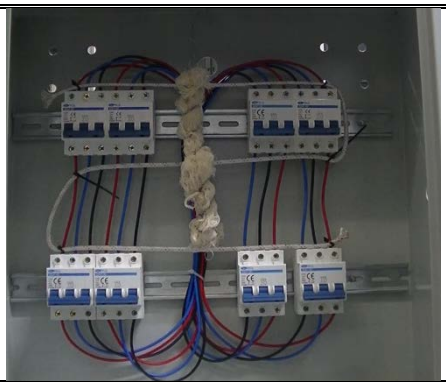
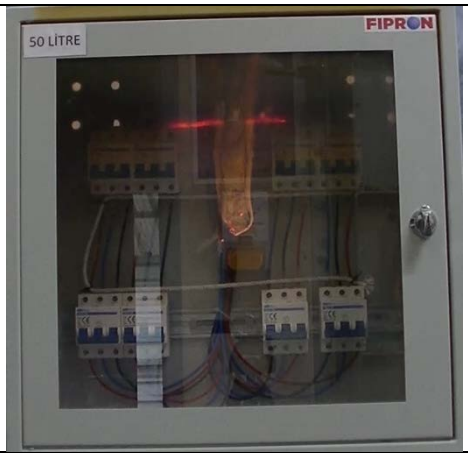
Validity

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 CORD 1”	00:32	Pass	00:22	Pass	00:29	Pass

Photographs

“FIPRON CORD 1”

Photograph before a test
 
Photographs during a test

Photograph after a test

Revision History

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

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