

Reaction to fire test report

Issuing laboratory: WFRGENT NV

Test standard: EN ISO 11925-2: 2020

Test sponsor(s): FLAMEOFF COATINGS INC.

Product(s): FR Clear

Report number: 23328A

Version: 1

WFRGENT NV , accredited for compliance with ISO/IEC 17025:2017 – Testing

Quality management

Version	Summary of amendments including reasons	
1	Description	Initial issue
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*Signed for and on behalf of WFRGENT NV		

The authenticity of the electronic signatures is assured by Belgium Root CA.

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1. Introduction

This report documents the findings of the reaction to fire test of "FR Clear" in accordance with EN ISO 11925-2: 2020.

WFRGENT NV (Warringtonfire) performed the test on 21 February 2023 at the request of the test sponsor listed in Table 1.

Table 1 Test sponsor details

Entity	Address
Test sponsor	
FLAMEOFF COATINGS INC.	3915 Beryl Rd, Suite 130, Raleigh, NC 27607 United States
Supplier	
FLAMEOFF COATINGS INC.	3915 Beryl Rd, Suite 130, Raleigh, NC 27607 United States

2. Test specimens

The description of the test specimens is detailed in Table 2. Unless otherwise specified:

- The information including measurements was provided by the test sponsor.
- All measurements taken by Warringtonfire are clearly identified.

Warringtonfire was commissioned to modify the test specimens so they met the geometric requirements of the test standard.

Table 2 Test specimen description

FR Clear	Nominal values (1)	Measured values (2)
Type of product	Fire Inhibitor on water and phosphate basis. The fire inhibitor was delivered to the lab as a bottle of liquid. The lab applied the fire inhibitor onto a particle board substrate.	
Manufacturer	(4)	
Appearance	Liquid	Liquid
Density (kg/m ³ ;wet)	1223	(3)
Solid content (weight %)	40	(3)
End-use application (prepared by the lab)		
<i>Application method</i>	Sprayed	
<i>Wet applied amount per layer</i>	0,15 l/m ²	0,15 l/m ² (applied by the lab onto the substrate)
<i>Dried weight (g/m²;dry)</i>	183	(3)
Use of fire retardants	Yes	
Amounts of fire retardants (m/m %)	40	(3)
Colour	Transparent	Transparent

(1) Based on the information given by the sponsor

(2) Values verified by the laboratory

(3) Unverifiable by the laboratory

(4) Known by the laboratory

3. Test procedure

Table 3 details the test procedure for this reaction to fire test.

Table 3 Test procedure

Item	Detail
Test standard	The test was performed in accordance with EN ISO 11925-2: 2020.
Supplementary standard	EN 13501-1: 2018
Deviations from the test standard	None
Product standard and/or EAD	According to the information provided by the sponsor, there was no product standard for CE marking available at the time the test report for the tested material/product was drafted. When such a product standard is published, this report may be submitted again to the laboratory to evaluate the adequacy of the report for product certification.
EGOLF agreements and/or recommendations	None
Pre-test conditioning	Test specimens were received on 09/01/2024 (2 bottles of FR Clear). Before testing, the test specimens were conditioned in accordance with the requirements of EN 13238: 2010 at a temperature of 23 ± 2 °C and a relative humidity of $50 \pm 5\%$ for a minimum period of 48 hours, until constant mass was achieved.
Sampling / test specimen selection	The test specimens were supplied by the test sponsor. Warringtonfire was not involved in any selection or sampling procedure. Production place: Windsor ON Production line: FR Clear line Production date: not known by the test sponsor ID within the quality system: not known by the test sponsor
Composite bonded by	Warringtonfire
Supplier of the substrate	Warringtonfire
Substrate	The lab sprayed the FR Clear fire inhibitor onto the particle board standard substrate (12 mm, 743 kg/m ³) in a wet application rate of 0,15 l/m ² (total amount of 4 grams was added by the lab over the full surface of 250 mm x 90 mm particle board substrate)
Test face	The fire-retardant treated side of the particle board substrate was exposed to the heating conditions of the test when the test specimens were mounted in the test position.
Number of replicate tests	Six specimens were tested, each of which were subjected to surface exposure to flame with the fire-retardant treated side of the particle board substrate exposed. Six specimens were tested, each of which were subjected to edge exposure to flame with the fire-retardant treated side of the particle board substrate exposed.
Flame application time	30 s
Test duration	60 s
Intended application	Fire inhibitor for wood applications
Condition of specimen edges	Layered product (coating + particle board standard substrate), coating was applied on the front side and also onto the edges.

4. Test results and observations

4.1 Test results

Table 4 shows a summary of the results for the test specimens. A fully detailed overview of the measurements is given in the laboratory record sheet (see Appendix).

Table 4 Test results

Exposure condition	Did flame front exceed 150mm above the flame application point?	Were flaming droplets/particles produced that ignited the filter paper?
Surface	No	No
Edge	No	No

4.2 Test observations

Observations of any significant behaviour of the specimen during the tests are summarised in Table 5 below.

Table 5 Test observations

Observations during test
Surface exposure to flame
Carbonisation
Edge exposure to flame
Carbonisation

5. Application of test results

5.1 Validity

This document is the original version of this test report and is written in English. In case of doubt the original version prevails over a translation.

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The test results relate to the behaviour of the test specimens of a product under the particular conditions of the test; they are not intended to be the sole criterion for assessing the potential fire hazard of the product in use, nor can the results be extrapolated and applied to other products.

Test reports are statements of fact prepared in accordance with the referenced version of the standards stated in Section 3 of this report. Test reports are based upon the information provided to Warringtonfire. Warringtonfire takes no responsibility for the accuracy or completeness of such information.

The results stated in this report apply to the sample as received. Any differences in composition, production process, thickness, density or colour of the product may significantly affect the performance and will therefore invalidate the application of the test results to the variant product. It is recommended that any proposed variation to the tested configuration or product should be referred to the test sponsor. The test sponsor should then obtain appropriate documentary evidence of compliance from Warringtonfire or another notified testing authority. The supplier of the product is responsible for ensuring that the product which is supplied for use is identical to the test sample as received.

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5.2 Uncertainty of measurement

The uncertainty of test results for this test is described in Annex A of the test standard. The evaluation is based on an interlaboratory trial involving 10 laboratories and 12 products. For all times measured, the absolute reproducibility was within 5 s.

For the yes/no answers the degree of uncertainty was generally a function of the product itself, rather than of the method.

Appendix A Test data

A.1 Laboratory record sheet – Surface Application

Centre line of the specimen, 40 mm above the bottom edge (see figure 11 of the standard).

Specimen number	Test date	Ignition	Time from start of test for flame to reach 150 mm	Extent of flame spread	Flaming droplets / particles that ignite filter paper	Test direction
(-)	(-)	(-)	(s)	(mm)	(-)	(-)
Specimen 1	21/02/2023	No	Did not ignite	Did not ignite	Did not ignite	-
Specimen 2	21/02/2023	No	Did not ignite	Did not ignite	Did not ignite	-
Specimen 3	21/02/2023	No	Did not ignite	Did not ignite	Did not ignite	-
Specimen 4	21/02/2023	No	Did not ignite	Did not ignite	Did not ignite	-
Specimen 5	21/02/2023	No	Did not ignite	Did not ignite	Did not ignite	-
Specimen 6	21/02/2023	No	Did not ignite	Did not ignite	Did not ignite	-

A.2 Laboratory record sheet – Edge Application

Centre of the width of the bottom edge of the test specimen 1,5 mm behind the surface (see figure 8b of the standard).

Specimen number	Test date	Ignition	Time from start of test for flame to reach 150 mm	Extent of flame spread	Flaming droplets / particles that ignite filter paper	Test direction
(-)	(-)	(-)	(s)	(mm)	(-)	(-)
Specimen 1	21/02/2023	Yes	Did not reach	30	Filter paper not ignited	-
Specimen 2	21/02/2023	Yes	Did not reach	25	Filter paper not ignited	-
Specimen 3	21/02/2023	Yes	Did not reach	25	Filter paper not ignited	-
Specimen 4	21/02/2023	Yes	Did not reach	25	Filter paper not ignited	-
Specimen 5	21/02/2023	Yes	Did not reach	20	Filter paper not ignited	-
Specimen 6	21/02/2023	Yes	Did not reach	25	Filter paper not ignited	-



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