AQUIMAX FLAMESHIELD INFORMATION

Aquimax - Fire Retardant system

Classification report: N°430005 - AQUIMAX FIRE RATED

TEST REPORTS TO ACHIEVE N°430005 - AQUIMAX FIRE RATED:

1. Test Report N°430001 - EN11925 reaction to fire test with single-flame source test
2. Test Report N°430002 - EN13823 SBI - reaction to fire test with thermal attack by a single burning item

Particleboard, not fire retardant treated, thickness 10 mm and density 650 kg/m3 have been tested to obtain the right to use "transparent Water Base acrylic paint named "ULTRIMAX FIRE RATED 1"" **on wooden material of density ≥ 487,50 kg/m3 or any material of reaction to fire class A2-s1,d0 or A1**

THE REPORT SHOWS GRAPHS AND PICTURES OF THE TEST PERFORMED:

3. Test Report N°430003 - EN13823 SBI - reaction to fire test with thermal attack by a single burning item –

MDF named DecoBoard MDF.MR "reaction to fire class D-s2,d0", thickness 18 mm and density 650 kg/m3, coated on both sides with oak veneer of thickness 0.6 mm and density 780 kg/m2 undertaken under the SBI test gives the right to use "transparent Water Base acrylic paint named "ULTRIMAX FIRE RATED 1"" **ONLY ON MDF thickness 18 mm and density ≥ 650 kg/m³ coated with oak veneer of thickness 0.6 mm.**

THE REPORT SHOWS GRAPHS AND PICTURES OF THE TEST PERFORMED

EN11925

The EN 11925 standard refers to the European norm that governs the fire ignition testing of construction materials under direct flame exposure. Its full title is:

"EN 11925-2:2010 - Reaction to fire of building products – Part 2: Ignitability when subjected to direct impingement of flame."

This standard outlines a testing method used to evaluate the ignitability and surface flammability of building materials when exposed to a small flame. It applies to products used in construction systems such as wall panels, ceiling coverings, insulation materials, etc.

EN13823 SBI

"EN 13823:2020 - Reaction to fire tests for building products – Building products excluding floorings exposed to the thermal attack by a single burning item"

is a **European fire test method** used to evaluate the reaction to fire performance of construction products (excluding flooring materials). It is commonly known as the SBI test (Single Burning Item test).

PURPOSE OF THE EN 13823 STANDARD

EN 13823 assesses how construction products contribute to the development of a fire when exposed to a small fire in a room corner, simulating the effects of a **burning wastepaper basket.**

Ultrimax Coatings Ltd
Shaw Lane Industrial Estate
Ogden Road
Doncaster DN2 4SE

T.01302 856666 **E.**
sales@ultrimaxcoatings.co.uk
www.ultrimaxstore.com

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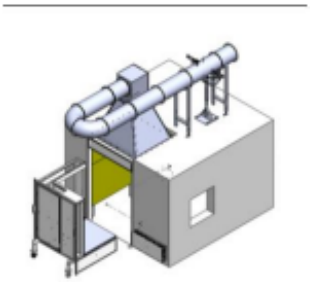
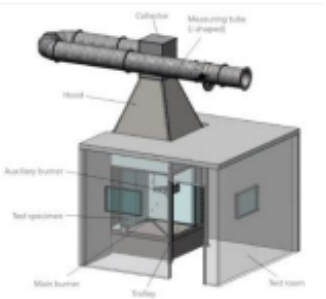
This test is **mandatory** for classification under the **Euroclass system (EN 13501-1)**, which is the European framework for fire classification of building products.

HOW THE SBI TEST WORKS

TEST SETUP AND PROCEDURE (SCHEMATIC EXPLANATION)

The EN 13823 (SBI) test simulates how a construction product reacts to a small fire in a **room corner scenario** (e.g., a burning wastebasket).



TEST SETUP OVERVIEW:

1) The sample is mounted in the shape of an L-shaped corner, made up of:
   - **Main wing:** 1500 mm (H) x 1000 mm (L)
   - **Secondary wing:** 1500 mm (H) x 500 mm (L)
2) A **30 kW propane gas burner** is placed at the base corner of the sample.
3) The burner is turned on for **20 minutes.**
4) The entire setup is placed in a **sealed test room** with:
   - Controlled airflow and ventilation
   - A **hood system** that measures heat, smoke, and combustion gases
5) Sensors measure:

a. Oxygen (O_2)
b. Carbon dioxide (CO_2)
c. Optical density (for smoke)
d. Temperature rise (for fire growth)

THE TEST MEASURES:

Parameter	Meaning
FIGRA (Fire Growth Rate Index)	Rate at which the fire grows (W/s)
$THR_{600}s$ (Total Heat Release)	Total energy released in the first 10 minutes (MJ)
SMOGRA	Smoke Growth Rate Index
$TSP_{600}s$	Total Smoke Production in 600 seconds
Lateral Flame Spread	How far flames spread across the surface
Flaming Droplets/Particles	Number and duration of burning droplets

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EURO-CLASS CLASSIFICATION BASED ON EN 13823

N 13823 is used together with EN 11925-2 to classify materials into **Euro-classes:**

Class	Fire Behaviour	Typical Tests
A1	Non-combustible	EN 13823 not needed
A2	Very limited combustibility	EN 13823 + EN 11925-2
B	Very limited fire contribution	EN 13823 + EN 11925-2
C	Limited fire contribution	EN 13823 + EN 11925-2
D	Acceptable fire contribution	EN 13823 + EN 11925-2
E	Easily ignitable	EN 11925-2 only
F	No performance determined	Not tested or fails

WITH ADDITIONAL CODES:

- s1, s2, s3 → Smoke production (s1 = low smoke, s3 = high)
- d0, d1, d2 → Flaming droplets/particles (d0 = none)

EXAMPLE:

B-S1, D0 MEANS:

- Class B: very limited contribution to fire
- s1: very low smoke production
- d0: no flaming droplets or particles

KEY APPLICATIONS

The EN 13823 standard is applicable to:

- Wall and ceiling linings
- Composite panels
- Insulation materials
- Claddings and facades (non-flooring)

AQUIMAX FLAMESHIELD - SYSTEM

BARRIER COAT			APPLICATION WEIGHT
AFS3600	Barrier Coat	**RATTIO 1:1**	80 g/sqm
AFS3600CAT	Barrier Hardener		
SEALER			
AFS3500	Clear Basecoat		150 g/sqm x2 coats
TOPCOAT			
AFS3400	Clear Lacquer	**RATIO 1:5**	80 g/sqm
AFS3400CAT	Hardener for Topcoat		

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SYSTEM AFTER TESTING:

The painting system is an intumescent paint that works by undergoing a chemical reaction when heated to form an expanded, thermally insulating layer that can help protect against heat loss. This expansion creates a thick, spongy layer that acts as insulation, protecting the underlying material from fire.

This system is indicated for increasing the fire resistance of structures thanks to the thermal insulation power of the foam which is generated by the chemical process triggered by the rise in temperature. Intumescent paint is mainly used as a protective barrier for:

- Supporting structures: beams, pillars and wooden floors, steel, reinforced concrete and prestressed reinforced concrete.
- Non-bearing structures: prefabricated walls panels, brick and/or concreate blocks.

FIREPROOF PAINT

The fire-retardant paint contains fire retardant or flame-retardant additives capable of significantly reducing the combustion capacity of the wooden support on which it is applied. Fire-retardant paints adopt chemical reactions to extinguish flames and limit their spread. The application of fire-retardant paints therefore serves to modify the reaction of the material in contact with fire.

NEW INSTRUCTIONS ON AQUIMAX FLAMESHIELD SYSTEM:

1. Keep from freezing: do not store at temperatures below 15° C
2. During application and flash-off, both the substrate and environment shall be kept at a temperature not lower than 15°C

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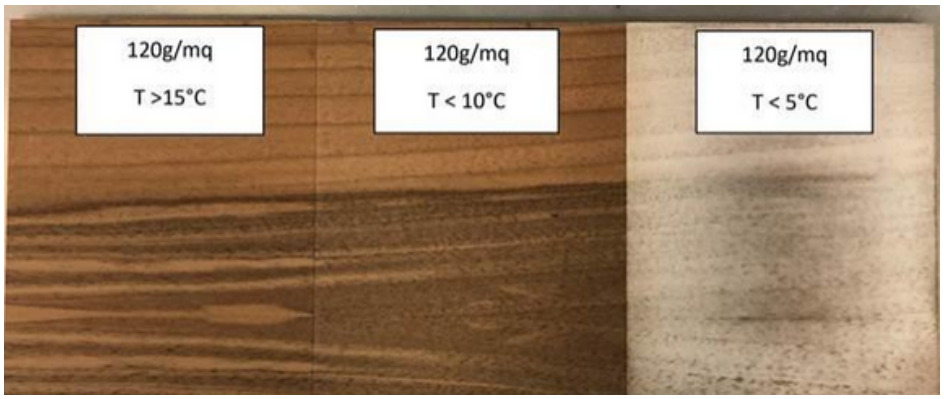

3. AFS3500 cannot be stacked. THE DRYING MUST BE ON TROLLEY.
4. Stacking and packaging is possible after 48 hours and only if AFS3500 is protected with the proper AFS3400 topcoat.
5. AFS3500 intumescent coat is clear and remains clear if used with the right working temperature. The product cannot be used as a topcoat because it is sensitive to humidity and must always be protected by a really thin layer of AFS3400 2 pack topcoat. If the intumescent is not protected the coat will turn whitish in time.

Ultrimax obtains by the system AQUIMAX FLAMESHIELD the upgrade from D-s2,d0 to Bs1,d0. D-s2,d0 classification includes all types of wooden surface. Our painting's system helps manufactured customers items to achieve B-s2,d0 or B-s1,d0 once the substrate of use has the right precautions

SUBSTRATE REQUIREMENTS UNDER EN13501-1

Type of substrate 1 (non-veneered)	**Particleboard, not fire retardant treated, thickness 10 mm and density 650 kg/m^3 (standard substrate - UNI EN 13238:2010) - wooden material of density ≥ 487,50 kg/m3 or any material of reaction to fire class A2-s1,d0 or A1**
Type of substrate 2 (veneered)	**MDF named DecoBoard MDF.MR of reaction to fire class D-s2,d0, thickness 18 mm and density 650 kg/m3, coated on both sides with oak veneer of thickness 0,6 mm and density 780 kg/m**

IN CASE OF A DIFFERENT VENEER NATURE, THE STANDARD ALWAYS REQUIRE NEW SBI TEST.
MOREOVER, IF THE MDF THICKNESS WOULD CHANGE, THE STANDARD ALWAYS REQUIRE NEW SBI TEST.

HOW ULTRIMAX APPROACH THE APPLICATION OF "AQUIMAX FLAMESHIELD" ON VENEER SUBSTRATE BEFORE AN SBI TEST:

Our official test reports, in case of veneered MDF requires the following prescriptions:

- 18 mm MDF 650 kg/m3 density
- Thermosetting glue or ureic glue.
- Veneer → ≥ 0.6 thickness (higher thickness better reaction to a fire test)

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IN CASE OF DIFFERENT PARAMETERS FROM THE ONE DESCRIVED ABOVE ULTRIMAX FR SYSTEM MUST BE EVALUATED FROM THE FIRE-RETARDANT DEPARTMENT.

STANDARD EN13501-1, IMPORTANT REMARKS:

- TO FINALIZE THE PERFORMANCE OF A SYSTEM IT IS ALWAYS REQUIRED AN SBI TEST
- DO NOT ALLOWED TO USE THE REPORT FROM THE PAINT PRODUCER (it is also related to architects/constructor responsibility)
- ANY PROJECT FOLLOWED BY A COMPANY SHOULD BE TESTED UNDER THE SBI TEST BEFORE THE PRODUCTION OF THE PROJECT
- LEADTIME SBI TEST 2 MONTHS.

POSSIBLE TESTS OVER AN INDIPENDENT TEST HOUSE

The indicative test will tell you if the specimens (board + paint) burned will may pass or not based on 1 set of specimens tested. In this case we would have a report that would roughly predict the requirements of the B-s2,d0 standard. The issued report would not be a Certification for proceeding to production.

The full test will be performed on the test taken over the 3 set of specimens tested. In case of a good performance of the SBI test matching the B-s2,d0 requirements, the test house would issue a Certificate allowing the starting of the production of the new project

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