Wood Protection Association

in collaboration with

TIMBER DEVELOPMENT UK

INFORMATION

Issue 1: January 2023

Flame Retardant Treatments for Timber

An Overview

Flame Retardant (FR) chemical treatments for timber work by reducing its ignitability, slowing down the surface spread of flame and, as a result, reducing the heat released. This allows more time for escape in a fire situation.

These effects can improve the material's '**reaction to fire**' classification significantly.

Terminology and Performance Ratings

Further information on how flame retardants work and the crucial difference between **Reaction to Fire** and **Fire Resistance** classifications can be found in **Guidance Note** WPA FR1

Further information on **Reaction to Fire testing** and **Performance Classification** can be found in **Guidance Note** WPA FR2

Data obtained from 'reaction to fire' testing results in that material being given a **Euroclass** performance rating.

Untreated wood-based materials typically have Euroclass ratings of **D or E**. Flame retardant treatment can improve that to Euroclass **B or C** as required by the particular specification and end use.

All WPA Guidance Notes are available for free download HERE

Specification of flame retardant treatment

Specification of FR treated products must consider the end use **Service Environment**. This will have a direct bearing on the durability of the reaction to fire performance and hence, classification. Some treatments are suitable only for **internal** applications (**Class INT1**) whilst others may be used **outdoors** (eg. cladding), either **coated** (**Class INT2**) or **uncoated** (**Class EXT**).

Details of how to **Specify the Service Environment** of FR treated wood can be found in **Guidance Note** WPA FR3

The 'reaction to fire' classification of a product is uprated by flame retardant treatment. However, it should not be assumed that there is a reduced need for good design and installation practice as a result.

FR treatments are complementary to these standards – not a substitute for them.

It is vital that any FR treatment provides the required protection and is backed by independent verification. A checklist summarising all the essential factors of an effective and accurate specification is available from the WPA. The documentary evidence required to verify that the specification has been met is also explained.

The WPA **FR Specification Checklist** can be found in **Guidance Note** WPA FR6

Further explanation of how to read and interpret the performance results given in a **Reaction to Fire Test Classification Report** is given in **Guidance Note** WPA FR7

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Methods of applying flame retardants

The WPA operates independent quality schemes to underpin confidence in both the efficacy of a flame-retardant formulation and its application to the wood substrate.

Benchmark APPROVED TREATER WPA

Further details of the **WPA Benchmark FR schemes** can be found in **Guidance Note** WPA FR10 and a list of **APPROVED SUPPLIERS** and accredited products can be found on the WPA website's FR page: HERE

There are essentially three commercially available application technology groups:

a) **Vacuum Pressure Treatment:** An impregnation process applied in factory based, large scale autoclaves with full process control in place. Suitable for solid timber and specific grades of plywood. INT2 & EXT class treatment options are available in the UK, both capable of upgrading material to either a Euroclass B or C classification.

b) **Manufactured wood-based panels**: Products such as MDF, particleboard, flax board, OSB and plywood which incorporate FR chemicals as an integral part of manufacture where an enhanced reaction to fire rating is required. INT1 & INT2 options available, in either Class B or C (depending on product).

c) **Surface-applied products – Intumescent Coatings**: Intumescent technology is well established with a long track record. Such coatings react to fire by expanding and forming a barrier on the substrate surface. This slows down ignition and spread of flame. Contact the product manufacturer for end use performance details.
Factory application under strict process control is recommended by the WPA.

CAUTION: SITE APPLIED COATINGS AND LOW VISCOSITY LIQUIDS

The performance of surface applied coatings depend on correct application rates and/or film thicknesses being achieved. When low viscosity coatings are applied by brush or spray on site, it is not usually possible to sufficiently control the application. **For this reason, WPA will only consider applications for approval of such systems when applied under factory-controlled conditions.**

Characteristics of treated materials

The properties of an FR treated wood-based product will depend to a degree on the system used to treat the material and the specification to which it has been treated. It is important to obtain information from the supplier on the safe and effective use of the treated material. In particular, specifiers and users should ask for confirmation of the following:

- **The standard of treatment: Euroclass & Service Environment**
- **Wood species/substrate details**
- **How to fabricate the product after treatment**
- **Any post-treatment drying requirements**
- **Any effect of FR treatment on the mechanical and physical properties of the product**
- **Any effect of FR treatment on compatibility with fixings and fittings**
- **Service life guidance**
- **Any in-service maintenance requirements**
- **Any specific handling precautions**

All WPA Guidance Notes are available for free download HERE

For further guidance or information on any aspect of improving the reaction to fire properties of wood based materials please contact the WPA or visit the website (details below).

For further information or advice, please contact either :

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