

Fire Protection for Wood - Specifiers Beware!

Timber protection specialists Arch explain the 'what and why' for fire retardant treatment for timbers used in construction.



If you are involved in the specification of building materials and you have chosen wood as part of the overall project - congratulations! An admirable choice for our most versatile, aesthetically pleasing and environmentally advanced construction product.

Just consider some of wood's key attributes and benefits.

- Wood has a natural warmth and beauty.
- Wood has a natural built-in strength yet can be easily worked and shaped.
- Wood products act as a carbon sink throughout their life, reducing the CO₂ in the atmosphere.
- Wood has the lowest energy consumption and the lowest CO₂ emission of any commonly used building material.
- Wood's thermal insulation properties mean timber frame houses use less energy.
- Wood is uniquely renewable and its future is cared for with responsible forest management schemes.
- Using wood products encourages forestry to expand, increasing the carbon sink effect.

However, in common with the Building Regulatory Authorities and insurance company loss adjusters, you may have a concern about its behaviour in a fire; after all wood has served as a fuel throughout the history of mankind.

Proven protection

Don't worry! Correct design specification and the correct use of modern fire retardant treatments can help to ensure that wood is a long lasting and safe choice of material. Also, wood in itself has excellent properties that help it to perform well in a fire situation over alternative building materials. It has a steady charring rate, low heat conduction and does not distort at high temperatures. Fire fighters prefer to enter a burning building made out of timber, because they have learned to estimate how long they can safely remain in the structure. In a fire wood carbonises from the outside in, leaving a core of structurally strong timber. That is why it is predictable - unlike masonry which cracks and spalls or steel, which buckles and twists.

Furthermore, the pressure treatment of timber with industrially applied fire retardant formulations delays and can even prevent ignition and spread of flame and reduces the rate of heat release. These factors help maintain the integrity of structures, enabling both compliance to Building Regulations in terms of escape and safety of life and restricting damage to the building fabric itself, to avoid huge insurance losses. A prime example was a recent project undertaken by Scarborough Borough Council - see panel opposite.

Which treatment should you specify?

Fire retardant treatments can be applied to timber and wood based substrates in a variety of ways. For instance, by vacuum pressure impregnation of new build timber components and plywood and also with in-situ brushing or spraying of coatings. For the specifier, the overwhelming consideration in making this choice is **COMPLIANCE**.

Scarborough Council had reconstructed the iconic and historic pagoda in the town's Peasholm Park after it had been burned down by vandals some years earlier. In the reconstruction DRICON pressure pre-treated fire retardant timber had been specified for much of the new structure and this proved to have a real justification when, once again, vandals tried to destroy the new building shortly before its re-opening.

On arrival at the site, contractors to Scarborough Borough Council found evidence to indicate that a bonfire was started deliberately on the lower deck of the pagoda using a mixture of non fire retardant treated timbers from the site, petrol from the concrete mixer and 16 ornate decorative timber brackets.

The spread of the fire was limited to just 25% of the lower deck flooring and supporting joists as a result of the DRICON fire retardant protection used.



FIRE RETARDANT TREATED TIMBER
FOR INTERIOR & WEATHER PROTECTED SITUATIONS



Graham Price, the Council's Head of Property Services said: "The main part of the structure was still intact, mainly because of the DRICON fire retardant treated timber used in its construction. If this material had not been used, the entire pagoda, with construction costs of over £250,000, would have been destroyed.

Thankfully, just the lower deck floor section needed to be replaced."

The replacement of the burnt timber and smoke damage was less than 1% of the original construction costs, which further reinforces the value of using a proven fire retardant treatment.

With a duty of care to make sure that the fire protection that is specified will be reliable and fit for purpose in these safety critical end uses, there are 3 main aspects in ensuring a suitable compliance and achieving peace of mind - **product application, product certification and product performance**.

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Product Application

If fire retardant treatments are to be made to new timbers going into a building then by far the most effective are pressure pre-treatments. Whilst flame retardant coatings can be very effective, their application and their maintenance can be open to variation and even misuse. Fire performance can only be assured when the application is carried out under an independent certification and accreditation scheme. Generally, coating products are not used this way and they should be used only to upgrade timbers that are already in situ within a building - in refurbishment, repair and improvement projects.

With pressure pre-treatments both solid timbers and board materials can be given a measured, controlled, highly effective and permanent protection that is applied to all faces of the timber and will require no maintenance.

Fire has the highest level of attestation in European standards and a supplier of fire retardant pressure pre-treated timbers must have an independently audited factory production control system in place, in accordance with ISO 9001, the international standard for quality management systems. Also, for a supplier to be listed in the UK Wood Protection Association quality scheme for fire retardant treatments suppliers again require ISO 9001 accreditation. Arch Timber Protection has both ISO 9001 and ISO 14001 (international standard for environmental management systems) accreditation for its fire retardant treatment facility.

Product Certification

With regard to certification against relevant standards, currently there is a transitional stage between traditional British Standards and new European classifications. Eventually, over the next few years, the European classifications, referred to as Euroclasses, will become mandatory for materials used for permanent constructions. To support a Euroclass performance, classification reports from a notified body according to BS EN 13501-1 are a definite requirement.



Arch's fire retardant treatment centre - the only one of its type in the UK, operating with ISO 9001 and ISO 14001 accreditations. Treatments involve high pressure impregnation followed by careful kiln drying/heat curing.

Simple fire test reports are insufficient. The description of the product given in the classification report has to be comparable with the specification of the timber components to be used in the project.

For example, if a classification report refers to Euroclass B, s1, d0 being achieved on 25mm thick spruce boards tested without an air gap on plasterboard, then the product cannot be assumed to confer the same reaction-to-fire performance for:

- Timbers less than 25mm
- Alternative species
- With an air gap
- Other backing materials deemed to be of higher risk

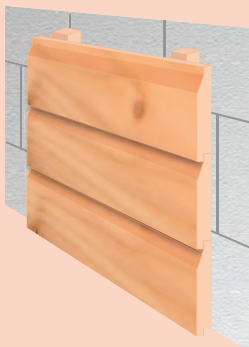
The priority is to check with your supplier if they have a relevant classification report to match your particular requirement. Arch has invested in classification reports to match a wide range of species, sizes and end uses.

Product Performance

Finally, when specifying you need to be assured that the fire retardant performance of the treated timbers will last. Here compliance with the draft European standard on durability is a must - prEn 15912 highlights the durability classes of reaction to fire performance of fire-retardant wood-based products in both interior and exterior end use applications. Meeting this classification will not only ensure that a product is fit for purpose but will also prevent staining, decay, poor paint adhesion, migration and exuding of chemicals, moisture at the high humidities and corrosion of metal fasteners.

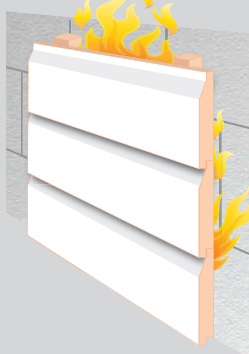
Both DRICON and NON-COM Exterior treated timbers meet this important standard. Also results of an independent 21 year exposure study with DRICON fire retardant treated timber have recently been published and they confirm that the initial fire performance characteristics of the timbers have been maintained over this period. These results are very positive and demonstrate that the fire retardant treatment will still be protecting projects such as Scarborough's pagoda to the same standard for at least another two decades.

The ultimate peace of mind for such an important specification has to be third party quality assurance and using products and suppliers with a proven track record. Both DRICON and NON-COM Exterior fire retardants from Arch have over 25 years of proven commercial use around the world and DRICON treatment remains the only BBA Certified fire retardant treatment for timber available today.



Fire Retardant Impregnation Treatments

- Permanent protection - no maintenance required.
- Controlled treatment process - consistent and assured results.
- Deep penetration of treatment on all faces - front, back and edges.
- Leaves natural finish to the timber.



Fire Retardant Coating Protection

- Coating will need future maintenance to keep fire protection.
- Brush/spray applications - inconsistent results.
- Reverse of boards may be uncoated and unprotected. If coated, maintenance is impossible.
- Coatings cover the natural beauty of the timber.



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