



WOODSAFE® EXTERIOR WFX
Durable Fire Protection

**POLYMERIC FIRE RETARDANT
TREATED WOOD**



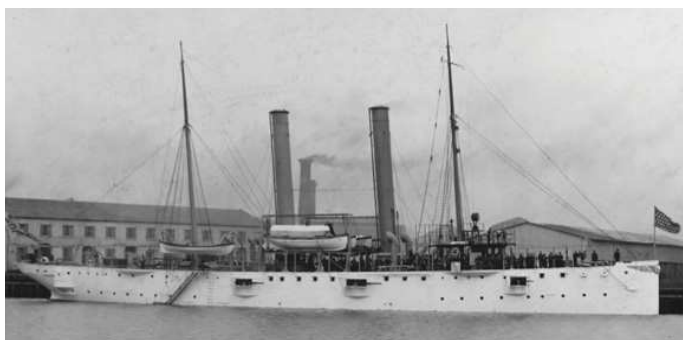
Proven Durable Fire Protection

When fire takes hold, time is everything. Precious minutes can mean the difference between life and death. The REACH approved and durable ingredients in **WOODSAFE** Polymeric Exterior WFX fire retardant treated timber dramatically reduce the surface spread of flame, heat and smoke release during of fire, giving you the time you need to get out safely.

Introduction to Fire retardant treated wood. It all started in the US

During World War II, over 55 million board feet of fire-retardant-treated lumber and plywood were used to build 17 blimp hangars, identical to this 1072-foot long, 192-foot tall, 296-foot wide hangar. Several still stand today. In 1955, a fire at one of the hangars demonstrated the effectiveness of FRTW in preventing spread of fire and was the impetus for establishing FRTW code provisions.

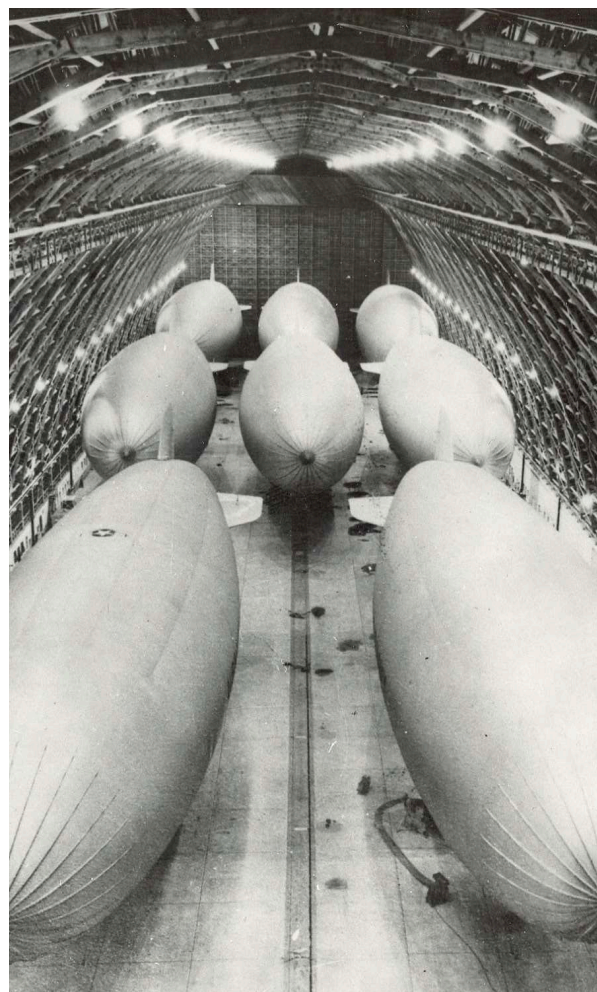
Fire retardant treatment of wood by pressure impregnation was commercialized by the Electric Fire Proofing Company in 1895. The first important demands for FRTW came from the building industry in New York City and from the U.S. Navy for use in ship construction.



The U.S.S. Nashville was the first U.S. warship to use FRTW. Its FRTW decking provided protection from hot embers.

The tremendous military demands for FRTW in the early 1940s caused the industry to expand nationwide. Its principal uses were for the construction of blimp hangars, ship scaffolding, and other wartime structures. In the 1960s, the model building codes published the first provisions for FRTW as a structural alternative to noncombustible materials (e.g., steel and concrete).

The fire retardant agent Woodsafe Timber Protection uses via license under the trade name **WOODSAFE** EXTERIOR WFX entered the US market in the early 1960s and is the world's largest polymeric fire retardant protective agent.



Let's talk about Woodsafe Timber Protection AB

In business since 1990, Woodsafe Timber Protection AB ("Woodsafe") is Europe's largest service provider of vacuum pressure impregnation of fire retardant treatment for wood. Our manufacturing is located in Västerås, Sweden with distribution all over Europe and parts of the world. Our facility is custom built and completely designed for optimal efficiency with as low a climate footprint as possible where for example our electricity comes from our solar energy plant that covers our entire annual consumption and heat source from wood pellets, which makes our production carbon dioxide neutral. Our approach to documentation and certification is that everything we say reflects documented characteristics verified and certified by third party notified bodies and institutes with the necessary accreditation for their professional role.

Below, we clarify some of our values and obviousness to live up to in the role of market-leading service provider to the wood and construction industry for sustainable construction with wooden products

We are proud to inform you that we are:

- **Woodsafe** was the first CE certified manufacturer of fire retardant wood according to CPD 89/106, which in 2013 was replaced by CPR 305/2011. The certification covers harmonized standards EN14915 and EN13986, Annex ZA system 1.
- **Woodsafe** holds a national type approval certificate confirming national approval facade requirements SP-Fire 105 and long-lasting properties EN16755 INT1, INT2 and EXT.
- **Woodsafe's** quality and management system is certified according to ISO 9001:2015.
- **Woodsafe's** continuous environmental management system is certified according to ISO 14001:2015.
- **Woodsafe** quality, production and control is certified according to the Wood Protection Association quality manual, approved FR-treater.
- **Woodsafe's** quality system, production, work environment are monitored by continuous production control by notified body RISE.
- **Woodsafe's** financial stability places itself at the top of Swedish companies with a triple AAA credit rating.

Our offer to you backed by efficient resources and more than 60 years of knowledge

Woodsafe's business model is based on a long-term collaboration with the best manufacturers of fire retardant chemicals and the wood industry, where our offer creates the right conditions that create safe and sustainable communities in healthy living environments surrounded by wood.

Woodsafe's resources include, among other things:

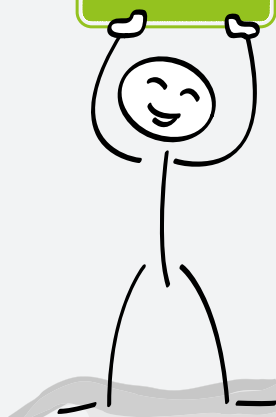
- **Woodsafe Research and Development**
A department within the Woodsafe Group with full-scale product development, impregnation, fire testing and analysis
- **Woodsafe Exterior WFX**
Unique durable polymeric fire retardant treated wood through a 2.5x8m custom-built autoclave with lots of custom-built functions.
- **Woodsafe KDAT** (kiln dry after treatment)
In collaboration with world-leading kiln manufacture, specially adapted curing kilns.





Let's talk

about why WOODSAFE® Durable Exterior WFX is the best choice of fire retardant treated cladding



- Unique polymeric leach resistance fire retardant
- Approved for exterior use, without surface treatment
- Tried, Tested and Trusted worldwide for more than 60 years
- The only FR-system approved and classified according to EN16755 INT1, INT2, EXT without surface treatment
- Manufacturing according to ISO 9001
- Environmental responsibility according to ISO 14001
- Manufacturing control by credible notified body
- Nationally type-approved product and manufacturing

Ask yourself the questions.

Is others FR-product **equivalent** to Woodsafe Exterior WFX?



WOODSAFE
TG0263-08



WOODSAFE
0402-CPR-SC0260-15

Let's talk about how WOODSAFE® Exterior WFX works

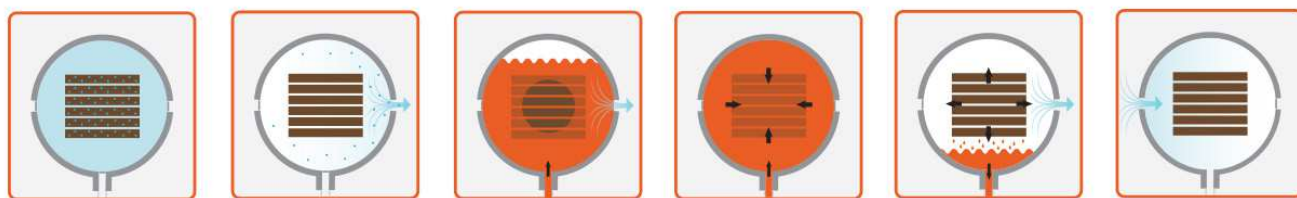
Impregnation of wood with fire-retardant chemicals reduces the combustible properties of wood by greatly reducing the amount of volatiles released during the initial stages of combustion. The surface manifests only a slight glow, and that portion directly exposed to flame checks and chars. The yield of char is increased by slow dehydration of the wood substances and is reduced to a clinker-like charred condition, not to ordinary ash. In addition to decreasing the rate of flame spread, FRTW is self-extinguishing and ignition resistant, resulting in no flaming, glowing, or smoldering combustion after the primary source of external fuel is exhausted.

In other words, in order for FRTW to burn, it must be exposed to a persistently applied, external fuel source, without which FRTW cannot ignite and sustain combustion. Impregnation by pressure process is used for solid wood products, such as lumber and plywood. "Other means during manufacture" addresses the treatment of certain wood fiber-based products, such as acoustical tile, and fiberboard roofing insulation and wall sheathing.

In this method, chemicals are added to the wet pulp stage of the manufacturing process, resulting in an even distribution of the chemicals throughout the entire mass of the finished product. Methods of applying fire-retardants to the surface of the wood, such as by painting and coating, do not provide the intimate mixing of chemicals and wood necessary for changing the base material's properties.

In Europe, with Euroclasses as the basis for the fire-technical property of the wood product's behavior, different materials are considered equivalent if the fire class is achieved, i.e. function-based.

Worth mentioning is that in the US, which is the world's largest market for FRTW, fire-painted wood products are not accepted as fire protection for structures. Therefore, the International Building Codes (IBC) does not recognize painted or coated wood products as FRTW.



WOODSAFE® Durable fire protection manufacturing is covered by continuous third-party factory and manufacturing control by RISE (No.Body 0402)

Since 2008, Woodsafe's services have been certified according to Boverket – the Swedish National Board of Housing, Building and Planning codes and the Planning and Building Act, PBL (SFS2010:900). In addition, Woodsafe is a holder of CE certificate since 2009, CPR 305/2011, EN14915, Annex ZA AVCP system 1.

Reference: TG0263-08, 0402-CPR-SC0260-15





REACH and WOODSAFE® EXTERIOR WFX

Under REACH, some chemicals are classified as substances of very high concern or SVHCs. These chemicals are designated SVHCs due to meeting certain criteria according to both CLP (Classification, Labelling and Packaging) regulation and REACH Annex XIII. Products that contain SVHC's are still compliant under REACH and are authorised for use and sale throughout the EU member states.

It is not uncommon for rumors to circulate that various players' fire retardants are toxic and that those who say so claim that theirs are bio-based, green technology and completely harmless. Such claims are dubious claims because it is forbidden to sell toxic products within the EU.

Here follows some background to the debate on brominated and toxic substances and what applies today within the EU.

There are several hundred different fire retardants, some of which are hazardous to the environment and health. Some are also mistaken for endocrine disruptors and the spread to the environment is considered extensive. Of these fire retardants, about 70 contain bromine and all forms of brominated substances are difficult to break down, but the toxicity (toxicity) and how easily they accumulate in living beings varies. Leakage into nature in all its forms can occur throughout the entire life cycle – from manufacturing, during use and when scrapped or incinerated.

PBDEs (polybrominated diphenyl ethers) are a collective term for a number of the most widely used flame retardants widely distributed in the environment, for example BDE 47 mentioned below. These are found in sediments from the Baltic Sea as well as in several investigated animal species, for example seals, porpoises, herring, lake fish, reindeer, moose, osprey and humans. PBDEs containing 4, 5, 6 and 7 bromine are on the Stockholm Convention's list of persistent organic compounds (POPs) and are prohibited from production and use.

HBB (hexabromobiphenyl) is mainly used as a flame retardant in plastics and cables. The substance is persistent, bioaccumulative and toxic. The presence of the substance in arctic areas suggests that it can spread far into the atmosphere. HBB is banned in Sweden and since 2009 has been on the Stockholm Convention's list.

BDE-47 (tetrabrominated diphenyl ether-47) is a commonly used brominated flame retardant. From the early 1970s, levels of BDE-47 increased sharply, with a peak in the mid-1980s. After that, the

levels have clearly decreased and they are now down to roughly the same levels as in the early 1970s. In 2004, a ban was introduced within the EU against the use of an environmentally hazardous and health-damaging mixture of BDEs, which includes BDE-47.

HBCDD (Hexabromocyclododecane) is a commonly used brominated flame retardant. The levels in herring porpoise eggs have increased for a long period by approximately three percent per year, and it is only in the last decade that a clear reduction has taken place. HBCDD is still manufactured, but not in Sweden. According to a risk assessment carried out by the EU, HBCDD is highly toxic to aquatic organisms. HBCDD is on the Stockholm Conventions list.

WOODSAFE Exterior WFX are in compliance with both REACH Regulation (EC) 1907/2006 and the Biocidal Products Regulation (EU) 528/2012. Exterior WFX does not contain any prohibited chemicals according to REACH. Some substances may be on the SVHC list according to CLP regulations, but as a final product and using fire retardant treated wood, Exterior WFX is not classified as hazardous to health or the environment and has an approved emission value for indoor use.



Are you seeking any of these standards? Then you can stop looking. **You have the solution in front of you!**

Woodsafe EXTERIOR WFX is approved and certified according to several different standards, here are some examples of what we can help you with:

NATIONAL	DESCRIPTION
SP-FIRE 105	Facade cladding multi-storey building

EUROPEAN	DESCRIPTION
EN 13823	Reaction to fire, Euroclass
EN 14135	Determination of fire protection ability
EN 16755	Durability of Reaction to Fire Performance

INTERNATIONAL	DESCRIPTION
ASTM D2898	Standard Rain Test
ASTM D3201	Hygroscopic Properties
ASTM D5664	Effects of Fire-Retardant Treatments and Elevated Temperatures on Strength Properties of Fire-Retardant Treated Lumber.
ASTM D6841	Calculating Design Value Treatment Adjustment Factors for Fire-Retardant Treated Lumber
ASTM E160	Combustible Properties of Treated Wood by the Crib Test
ASTM E69	Combustible Properties of Treated Wood by the Fire-Tube Apparatus
UL 723	Surface Burning Characteristics of Building Materials
MIL-L- 19140E	Military Specification: Lumber and Plywood, Fire-Retardant Treated



WOODSAFE® EXTERIOR WFX Durable Fire Protection Possibilities and End uses

Thanks to the unique and advanced formula, Woodsafe Exterior WFX is the most suitable durable fire-retardant treated wood product on the market for exposure in damp exterior environments without any surface treatment requirements. Approved and classified according to EN16755 EXT.

The specifier and/or end user is responsible to review the fact sheets and instructions on Exterior WFX fire retardant treated wood to determine if it is acceptable for the intended end use.

- Facade cladding, not surface treated
- Facade cladding, colored surface
- Roof shingle
- Wood shavings
- Decoration
- Balcony
- Ceiling extent
- Eaves
- Screen roof
- Sound barrier
- Packaging
- Furnishing in a humid environment
- Scaffold boards
- And more





WOODSAFE® EXTERIOR WFX Durable Fire Protection

Range of fire-rated wooden panels and multi-storey cladding

Depending on fire class requirements, there are several different types of wood to choose from. It is fundamental that all types of wood mentioned are CE marked and meet the requirements according to Euroclass B. The additional index for smoke production is described in a separate performance declaration for each product. Extended access to this product line-up is available from our partners' own tests, which are also separately certified

Euroclass B (some examples)

- Heat modified Pine
- Heat modified Spruce
- Heat modified Poplar
- Heat modified Ayous
- Western Red Cedar & shingle
- Spruce
- Pine
- Oak
- Accoya
- Nobelwood
- Larch
- Board in spruce, 3-layer

SP-Fire 105

- Heat modified Pine
- Heat modified Spruce
- Western Red Cedar
- Western Red Cedar shingle
- Spruceboard, 3-layer

*SP-Fire 105

Several different system solutions including coloring, mounting conditions, insulation and substrate are available via partners. Contact customer service for more information helpdesk@woodsafetimer.com





WOODSAFE[®] EXTERIOR WFX Durable Fire Protection

Lifespan expectancy factors in particular

Internationally there are several studies done over the last decades that clearly illustrate the supremacy of polymeric fire retardants when it comes to durability and lifespan expectancy for fire retardant treated wood.

The flame retardant manual from Wood Protection Association (WPA) in the UK classifies Exterior WFX as a Leach Resistant (Type EXT) product which means that treated wood and board products can be used in all interior and exterior applications with no requirement to apply top coating such as paints. All wood species are included in the approval.

Literature review

Internationally there are several studies done over the last decades that clearly illustrate the supremacy of polymeric flame retardants when it comes to durability and lifespan expectancy for flame retardant treated wood. Russel et al. states that the only flame retardants currently approved for exterior use, are those based on heat-cured polymeric systems.

Timber treated with these systems is not considered to be preservative treated, although it has been shown that this timber is more durable than if it were untreated. Consequently, the Wood Protection Association (WPA) in the UK has acknowledged this fact in their Specification – Service Environment and Treatment Types, states how the WPA recommended treatment for unprotected exterior cladding, Type EXT, is obtained: “Leach resistance is brought about by high temperature curing of the complex chemical system in the treated wood following impregnation and re-drying”.

WPA and EN16755 Type EXT is suitable for EN1995 Service Class 3 applications, the most severe category.

Our statement is also based on the experience of more than 50 years of manufacturing of the heat-curing polymeric system with distribution worldwide where more than 10 million cubic meters have been used in North America only and supporting approved test results according to ASTM D2898, EN16755, American Society for Testing and Materials (ASTM) test method E-84 (commonly known as the Steiner tunnel test), ASTM E108-20a, ASTM E1354, ISO 5660-1, EN13823 and EN927:6.

Finally, as there is no harmonized standard for verifying lifespan expectancy in number of years, Woodsafe Timber Protection disclaims formal or legal responsibility for the lifespan expectancy estimation given in this document.

Benchmark
APPROVED TREATER



Let's talk about our Durable Production

ISO 14001:2015, ISO 9001:2015, ISO 26000, ISO 45001:2018, WELL BUILDING, ECOVADIS, UL-GREENGUARD



Fire protection through sun's rays

Your durable choice of fire retardant treated wood from Woodsafe is produced 100% by solar energy from our own solar power plant



The production is carbon dioxide neutral

Your durable choice of fire retardant treated wood from Woodsafe is surrounded by heat from 100% biofuel, no fossil fuels occur.



Drying without negative carbon dioxide emissions

Your durable choice of fire retardant treated wood from Woodsafe is dried with 100% wood pellets.



All handling is electrified

Your choice of fire retardant treated wood from Woodsafe handled by 100 % electrified forklifts and our large wheel loaders use renewable HVO100 fuel.



Sorting and recycling

Waste management from your durable choice of fire retardant treated wood is certified according to ISO 14001 environmental management.

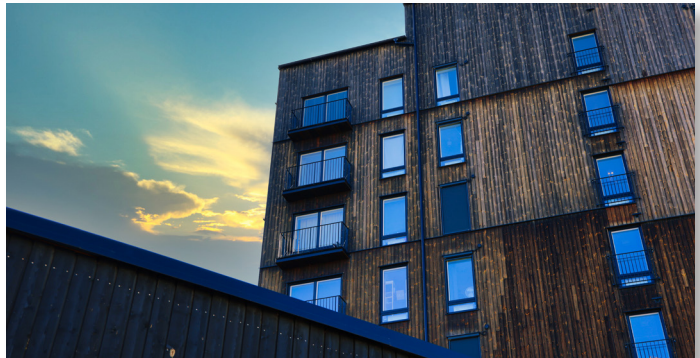


High efficiency in all areas

Your choice of fire retardant treated wood from Woodsafe is managed by energy efficient methods, sustainable working environment for employees health and leisure.



Let's be inspired
by WOODSAFE® Durable fire
protected heatmodified wooden products





Let's be inspired

by **WOODSAFE**[®] Durable fire
protected natural wooden products





Let's take some notes

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Phone	+46 10 206 72 30
Support	helpdesk@woodsafes.com
Webpage	www.woodsafes.com
Visit	Woodsafe Timber Protection Fågelbacken, Tillbergaleden SE-72595 Västerås, Sweden.

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