



WOODSAFE

your expertise on fire retardant timber and plywood



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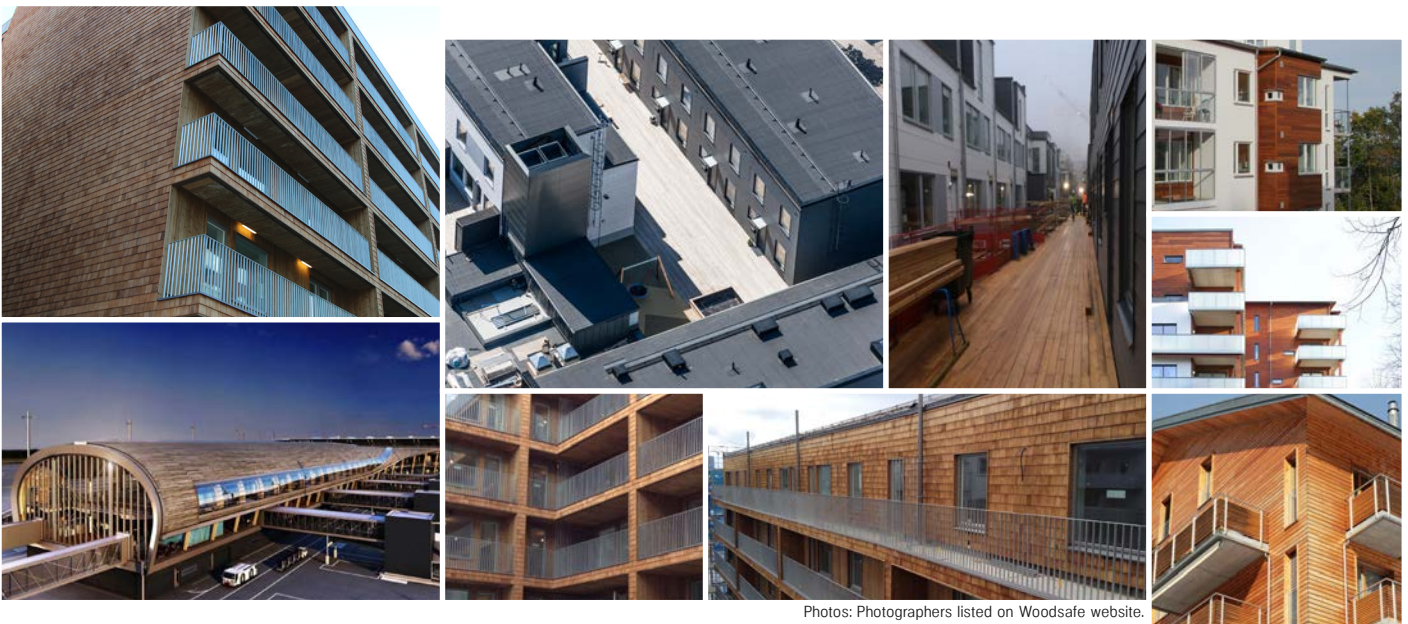
TECHNICAL DATA

01/2015

Woodsafe Exterior Fire-X

Woodsafe Timber Protection Exterior Fire-X

PROVEN SAFE - PROVEN STRONG - PROVEN ECONOMICAL



Photos: Photographers listed on Woodsafe website.

Woodsafe Exterior Fire-X. The No.1 fire-retardant treatment for exterior wood products.

Woodsafe Exterior Fire-X is the most versatile fire-retardant exterior wood product available on the market.

Our product provides architects with the opportunity to clad facades with wood products such as cedar, larch and heat-treated pine and to allow them to age naturally.

Woodsafe FRTW_(wood) FRTP_(plywood)

- Vacuum pressure FR-treated timber and plywood
- Third party certified by SP Technical Research Institute of Sweden (No.0402)
- Can be used outdoors or indoors
- Surface treatment not required when used outdoors
- Non-corrosive treatment process
- Decay resistant
- No halogens or sulphates
- Approved for use in nuclear power plants
- Kiln dried (KDAT)
- ISO 9001 Quality management systems
- ISO 14001 Environmental management

LUMBER & PLYWOOD FOR EXTERIORS & HIGH-HUMIDITIES

Natural maintenance structure and surface

Woodsafe Exterior Fire-X lumber and plywood are pressure impregnated, fire-retardant treated wood products (FRTW) that are designed to be used anywhere where wood is exposed to weather or high humidities. Indoors or outdoors. Exterior Fire-X has been proven to be safe, strong, effective and economical in both industry tests and in thousands of projects carried out around the world in the last 30 years.

Woodsafe Exterior Fire-X is an exterior grade, leach resistant (LR) fire-retardant which is applied to timber through a pressure impregnation process. Exterior Fire X is listed in the 2012 Wood Protection Association Flame Retardants Manual and meets the requirements set for HR (humidity resistant) treatment, DI (dry internal) and LR (leach resistant) products.

The information provided here supplements information provided on the certified properties of the product. The product is treated with the fire-retardant Fire-X, which is a product that has been used worldwide and therefore complies with almost all international standards.

► Technical features & performance.

► Published: 2 March 2015

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Woodsafe Timber Protection AB

CEO

Woodsafe Timber Protection AB continuously develops new products.
If you cannot find the wood or plywood product you are looking for in table 1, then please contact us.

WOODSAFE EXTERIOR FIRE-X

(This table was last updated in April 2014. For the latest table please go to <http://woodsafese.se/en/content/exterior-fire-x>)

Exterior requirement	Complies with	Woodsafe Exterior Fire-X
Facade cladding (SE) External wood cladding for multi-storey buildings.	SP-Fire 105	Yes. Approved in accordance with SP-Fire 105
Facade cladding (NO) External wood cladding for multi-storey buildings.	B-s3,d0	Yes. Approved in accordance with SS EN13501-1.
Facade cladding (DK) External wood cladding for multi-storey buildings.	B-s1,d0	Yes. Approved in accordance with SS EN13501-1.
Facade cladding Complies with Euroclass B, fire resistance $K_{2,10}^{(NO)}$ and $K_{1,10}^{(DK)}$	$K_{1,10}/B-s1,d0^{DK}$ $K_{2,10}/B-s1,d0^{NO}$	Yes. CWFT
Denmark national regulations. Class A material (B-s1,d0)	Class A-material	Yes. Approved in accordance with SS EN13501-1.
Denmark national regulations. Class 1 covering ($K_{1,10}/B-s1,d0$ and cross-section)	Class 1-covering	No See comment:
Durability of reaction to fire performance	CEN/TS 15912 or ASTM D 2898	Yes. ASTM D 2898 CEN/TS 15912:2012 will be replaced by EN16755. ASTM D2898 is equivalent to testing stipulated in CEN / TS 15912: 2012 DRF INT1, INT2, EXT
Comment on Class 1 covering (Denmark)	Woodsafe Exterior Fire-X is designed for wood to which no coating is applied and that is allowed to age naturally. Larch, cedar and oak are the wood types that are most commonly treated with Exterior Fire-X. These woods have, however, natural properties that prevent them meeting Class 1 covering requirements. SP-105 Fire combined with ASTM D2898 can, in such cases, be used as alternatives. Always contact your local authority where products deviate from specified standards and to request compliance with SP-105 Fire combined with ASTM D2898 accelerated weather testing.	



Loading Woodsafe for dispatch. Exterior Fire-X, RWC SP-Fire 105. 1 of 2 autoclaves at treatment plant. KDAT 1 of 6 kilns.

Additional Information - Exterior Fire-X

Accelerated weathering of fire retardant treated wood.
The accelerated weather resistant properties of Exterior Fire-X are tested on wood to which no other coating has been applied. The test is of the fire retardant properties and the result is therefore not wood species dependent. Reaction to fire B-s1, d0 must therefore be verified for each wood used. The result of B-s1, d0 for larch cannot, for example, be applied to other types of wood such as cedar and oak.

1. Fields of application

1.1 Woodsafe Exterior Fire-X (FRTW) wood products can be used in above ground interior or exterior applications where building regulations permit the use of wood products or fire-retardant wood products. Uses include cladding, shingles, playground equipment, sheathing and joists.
The designer and/or end user is required to review the test data for Exterior Fire-X FRTW products to ensure that they are suitable for the end use. Exterior Fire-X treated timber performs well in standard fire-retardant tests such as EN 13823, SP Fire 105 and ASTM E84 and has been classified in accordance with SS EN13501-1 and SS EN13501-2 (CWFT)

2. Woodsafe Exterior Fire-X performance and European and national standards

2.1 Reaction to Fire, SS EN13823.

Fire-retardant treated wood products (FRTW) treated with Exterior Fire-X have been tested in accordance with SS EN 13823. These tests are referred to as 'reaction to fire tests' and are frequently referred to in building and transport sector regulations. The flammability classes are A1, A2, B, C, D, E, F.
IMPORTANT: B-s1, d0 properties relate to all sides of the material for open designs where wood is fitted at a distance from the underlying surface. All four sides must therefore be painted if fire-retardant paint systems are used. Impregnation however always treats all four sides of the wood

2.2. Determination of fire protection ability, SS EN14135.

Fire-retardant treated wood products (FRTW) treated with Exterior Fire-X have been CWFT in accordance with SS EN14135. This standard relates to the performance of wood which does not have any other layers (often mistakenly considered to be the surface coating on the wood surface)

2.3. Facade coverings and external walls are tested in accordance with the SP Fire 105 test method (RWC Shingles), which simulates a room fire.

Fire-retardant treated wood products (FRTW) treated with Exterior Fire-X have been tested in accordance with SP-Fire 105. This test simulates fire spreading out through a window, fire spreading along the facade surface, heat radiation from eaves and windows, fire in the building structure and falling components.

3. Exterior Fire-X classification information

3.1. European Standard EN 13501-1 specifies the procedures that are to be used to classify reaction to fire for all products and building elements. According to this standard, reaction to fire is the response of a product to a fire and the contribution of this to the product's decomposition under specific conditions. Reaction to fire should not be confused with fire resistance. Woodsafe Exterior Fire-X is classified as being in class B-s1,d0 in accordance with SS EN13501-1, which is the highest rating for wood materials.

3.2. European Standard EN 13501-2 specifies how fire protection ability should be determined. The standard defines fire protection ability as being the ability of a covering to protect underlying products from being damaged during a specific exposure to fire. Fire protection ability should not be confused with reaction to fire. Woodsafe Exterior Fire-X is CWFT classified as being in class K110 and K210 for thicknesses >12mm.

3.3. The SP-Fire 105 test method tests for fire spread along a facade surface, heat radiation from eaves and windows, fire in the building structure and falling components. Woodsafe Exterior Fire-X has been approved in accordance with SP-Fire 105.

Table of euroclasses

Definition	Classification according to European Standard EN 13501-1				
	Construction products			Floorings	
non-combustible materials	A2 - s1 d0	A2 - s1 d1	A2 - s1 d2	A ₂ _f - s1	A ₂ _f - s2
	A2 - s2 d0	A2 - s2 d1	A2 - s2 d2		
	A2 - s3 d0	A2 - s3 d1	A2 - s3 d2		
combustible materials - very limited contribution to fire	B - s1 d0	B - s1 d1	B - s1 d2	B _f - s1	B _f - s2
	B - s2 d0	B - s2 d1	B - s2 d2		
	B - s3 d0	B - s3 d1	B - s3 d2		
combustible materials - limited contribution to fire	C - s1 d0	C - s1 d1	C - s1 d2	C _f - s1	C _f - s1
	C - s2 d0	C - s2 d1	C - s2 d2		
	C - s3 d0	C - s3 d1	C - s3 d2		
combustible materials - medium contribution to fire	D - s1 d0	D - s1 d1	D - s1 d2	D _f - s1	D _f - s1
	D - s2 d0	D - s2 d1	D - s2 d2		
	D - s3 d0	D - s3 d1	D - s3 d2		
combustible materials - highly contribution to fire	E		E - d2	E _f	
combustible materials - easily flammable	F			F _f	

4. Design considerations.

4.1. Woodsafe Exterior Fire-X is designed for fire-retardant impregnation of externally used non-structural timber and exterior grade plywood and hardboard (WBP). These products are often used in high humidity conditions where building regulations require high fire resistance properties. Typical applications include:

- Internal cladding and wall and ceiling linings for high humidity conditions
- External cladding without coating system
- High humidity applications (i.e. swimming pools and lifeboat stations)

4.2 Treatment does not significantly change timber or plywood appearance.

5. Product range, Exterior Fire-X

5.1. The following range of solid timber products meet the SS-EN13501-1:2007 euro classes specified in table 1 for the stated thicknesses and structures.

Table 1 Fire classifications			
Species	Classification to SS EN13501-1:2007+A1:2009		
	Classification report no.	Thickness (mm)	Euroclass
Siberian larch		≥18mm	B-s1, d0
Thermowood		≥21mm	B-s1, d0
Oak		≥19mm	B-s1, d0
Red Western Cedar ^{5.2 / 5.3}		≥18mm	B-s2, d0
Frake, Thermally Modified		≥18mm	B-s1, d0
Sweet Chestnut		≥22mm	B-s1, d0
Thermowood pine		≥21mm	B-s1, d0

5.2 Red Western Cedar shingles have been tested and approved in accordance with SP-Fire 105.

5.3 Red Western Cedar shingles have been tested and classified as B_{ROOF} (t4) in accordance with EN13501-5:2005, ENV testmethod 2 and 4

6. Accelerated weathering of Woodsafe Exterior Fire-X

6.1 NT Fire 054 DRF became technical specification CEN/TS 15912:2012 and is expected to be adopted as European standard EN16755 (2015-2016). These standards are designed to reflect American standard ASTM D 2898.

6.2 Third party inspection. The codes require fire-retardant treated lumber and plywood to be manufactured in accordance with established treating and re-drying standards and to be certified by an independent third party inspection agency such as SP Technical Research Institute of Sweden.

6.3 Fire-retardant resistance does not apply to a specific wood species and therefore is the performance criteria that approvals are based on. Fire resistance properties are assessed under a number of classifications methods.

6. 4 Accelerated aging is based on 28 years of average rainfall in Europe. Exterior application approvals are based on the fire properties not being changed by aging - aging being 28 years of average rainfall in Europe.

6.5 Fire-X treated timber, plywood and hardboard will absorb moisture when exposed to humid conditions at a rate that is similar to that for untreated materials and at a substantially lower rate than for timber, plywood or hardboard treated with conventional fire-retardants. Conventional fire-retardant treatments result in moisture contents. The moisture content of Fire-X treated timber, plywood and hardboard is, however, not higher than the fibre saturation point and metal fittings fastened to timber and plywood or hardboard that is treated in this way will not corrode more than fittings fastened to untreated wood. They will furthermore corrode substantially less than fittings fastened to wood treated with conventional fire-retardants.

6.6 Woodsafe Exterior Fire-X is a non-leachable fire-retardant treatment and Fire-X treated products can be installed where there is direct exposure to precipitation. Fire-X products cannot, however, substitute preservative treated wood.

7. Reach SVHC

REACH: Candidate List of Substances of Very High Concern

A permit is not required to use the product and no labelling requirements or other restrictions apply to the products or finished products placed on the market by Woodsafe Timber Protection AB. The wood production process does not involve substances with a weight percent > 0.1%. These substances are therefore not included in the latest version of the Candidate List for REACH (EC 1907/2006) which was published by the ECHA (The European Chemicals Agency) on 24 June 2013. Woodsafe Timber Protection AB, as distributor, is obliged by REACH (Regulation (EC) No 1907/2006 of the European Parliament and of the Council) to distribute information from the producer down through the distribution network to downstream users. Send an e-mail to helpdesk@woodsafese or ring Thomas Bengtsson, CEO and REACH coordinator for Woodsafe Timber Protection AB on +46 21 14 72 73

8. Code compliance (US)

8.1 Exterior Fire-X fire-retardant treated lumber and plywood meets or exceeds the requirements of the following agencies:

- Military Specification MIL-L-19140
- International Code Conference (ICC)
- Building Officials and Code Administrators (BOCA)
- Southern Building Code Congress International (SBCCI)
- International Conference of Building Officials (ICBO)
- Insurance Service Office (ISO)
- American Nuclear Insurers
- Nuclear Mutual Limited

9. Performance compliance (US)

9.1 Exterior Fire-X fire-retardant treated lumber and plywood achieves a flame spread index of 25 or less when tested in accordance with ASTM E-84 Standard Test Method for Surface Burning Characteristics of Building Materials. The same index value is furthermore achieved when this test is extended from the standard 10 minutes to 30 minutes.

10. IMPORTANT

All exposed surfaces of the product must protect against fire if the product as a whole is to have the capacity to provide fire protection. This is particularly important where products are installed at a distance from the underlying surface, where there is a risk of burn-through or where the product is assembled with an air gap. Fire-retardant treatment properties must also be verified for exposure to climate, humidity and UV where products are to be installed outdoors. This is particularly important for salt base products and fire-retardant paints.

11. Fasteners

International Building Code (IBC) Section 2304.9.5.3 states - Fasteners for fire-retardant-treated wood used in exterior applications or wet or damp locations. Fasteners, including nuts and washers, for fire-retardant-treated wood used in exterior applications or wet or damp locations shall be of - Stainless steel nails of at least A2 quality, at the seaside or similar location location A4 quality.

Woodsafe recommends the following for EXTERIOR FIRE-X:

- Always use stainless steel (A2 or A4, see initial recommendation) fasteners in cedar, oak, larch and wood with similar characteristics including acidity, for use in preservative or fire retardant treated wood and for an outdoor application which is exposed to rainfall, wetting or damp.

12. Working

12.1 Lumber. Do not rip or mill fire-retardant treated lumber. Cross cuts, joining cuts and drilling holes are permitted.
12.2 Plywood. Fire-retardant treated plywood can be cut in any direction.

14. Personal protective equipment

No restrictions apply to using Woodsafe Exterior Fire-X products. We however recommend that industry-standard safety equipment such as gloves, goggles and dust masks (where dust is generated) are used

15. Waste disposal

Surplus FR-lumber and plywood materials can be disposed of as ordinary combustible wood (although with lower flammable properties).

16. Guidelines for finishing and use of adhesives

16.1 Woodsafe Exterior Fire-X treated wood can be finished or glued with good results. The treatment chemicals are waterborne and contain no petroleum or solvents and the precautions and procedures for finishing or gluing Exterior Fire-X are similar to those for untreated wood. As with untreated wood, the quality of the finish is highly dependent on moisture content, species, surface preparation, application method and product system.

16.2 Moisture content is a critical factor in the finish quality and adhesive performance of both treated or untreated wood. Post-installation drying and moisture content stabilization is, however, often overlooked in construction projects, results being poor where post-installation moisture content is high. Consult with finish or adhesive manufacturers for application parameters.

16.3 Woodsafe Exterior Fire-X treated wood should not be painted or stained immediately after installation. The product should be finished after a period of dry, sunny weather when wood moisture content is low. Woodsafe Exterior Fire-X treated products are always kiln dried after treatment (KDAT). However, additional drying time is required after installation due to potential re-wetting at the construction site or moisture gain due to high humidity. Freshly KDAT wood does not have a moisture content that is low enough for painting or staining. Shop application of paint or stain to freshly un-bundled wood is therefore not recommended.

16. 4 Paint or Stain?

According to the U.S. Forest Products Laboratory (FPL), wood shrinkage and swelling due to fluctuating moisture content constantly stresses a paint film and will cause cracking and peeling. Penetrating stains are therefore likely to perform better for exterior wood, because they don't crack or peel. FPL studies show that all-acrylic latex solid-colour stains are generally superior to oil-based solid-colour stains on exterior wood where two coats are applied. Stain-blocking primers are recommended. Brush application is more effective than spray or roller application. Primer and finish coat should be from the same manufacturer. If cracks develop, apply a clear water-repellent preservative. If paint is used, FPL testing shows that two coats of all-acrylic topcoat paint applied over a stain-blocking acrylic latex primer lasts longer than other paint systems for exterior wood. Oil-based paint films usually provide the best moisture shield. They do, however, tend to become brittle and are more likely to crack and peel. FPL recommends use of a paintable water-repellent preservative as the first coat. Any surface that cannot be reached after installation should be painted or given a protective water-repellent preservative coating before installation.

16.5 Surface preparation

Surface preparation is a very important factor in determining the performance of adhesives, paints or stains. The surface must be completely dry and be free of dirt, surface deposits, pitch, dust, mildew and other contaminants and may need to be sanded, scraped, brushed or wiped to achieve this level of cleanliness. Avoid washing because it re-wets the wood.

16.6 Surface

Surface may have some extent surplus of fire retardant. Some can be sanded or brushed off, or easier planing of the panel. Cavity of plywood panels can be filled with Fire-X and represent color variation through the veneer layer.

16.7 Testing of finishing

The very wide range of weather conditions, building exposures, storage conditions, finishing systems, adhesives, and construction techniques means that Woodsafe Timber Protection AB. cannot provide more detailed recommendations on the use of EXTERIOR FIRE-X treated wood and accepts no liability with respect to the finish or adhesion of its products. IT IS THE USER'S RESPONSIBILITY TO TEST PRODUCTS ON SAMPLE MATERIAL AND EXPOSE THEM TO ACTUAL CONDITIONS TO DETERMINE WHETHER THE DESIRED EFFECT CAN BE ACHIEVED.



About **Woodsafe Timber Protection AB.**

Woodsafe Timber Protection services is a refinement stage between the sawmill industry, building trade and clients.

Woodsafe Timber Protection's production site is located just outside of Västerås in Sweden. All activities carried out at the facility relate to the fire-retardant impregnation of solid wood and plywood. Woodsafe refines wood's natural properties using advanced vacuum and pressure processes. Finished end products are marketed under the trade name Woodsafe®, including products such as Woodsafe standard, Woodsafe Exterior Fire-X, Woodsafe Interior and Woodsafe Acoustics.

Woodsafe manufacturing is subject to manufacturing and factory inspections carried out by bodies such as SP Technical Research Institute of Sweden, notified body 0402.

Please do not hesitate to contact us if you need technical advice or fire-retardant wood material. We are very happy to provide you with more information and assistance.

Contact our technical support: +46 707 420420, switchboard + 46 21 147273 or helpdesk@woodsafese.se / contact@woodsafese.se

TECHNICAL SUPPORT

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