EDITION 1:2025

Handling wood correctly

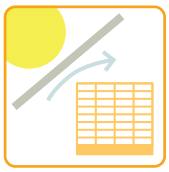
Ordering, handling and storage

SWEDISH WOOD

Wood offers good durability – as long as it is handled correctly. To preserve the high quality of the wood until it is built into the structure, it should be protected from wet weather, ground moisture, sun exposure and dirt.

Protect from wet weather

Protect from ground moisture



Protect from sun

Keep wood for outdoor use ventilated and protected

Protect from dirt

Plan and prepare

Plan deliveries to match the pace of production, order materials in batches and prepare for their delivery and storage. Always ensure that the wood is delivered in packaging (not transparent, as sunlight affects the surface of the timber and increases the risk of condensation forming). This does not apply to treated timber and treated glulam.

Wood to be used in visual interior applications, such as mouldings, cladding and floorboards, must be stored in a well-ventilated space with a heated indoor climate (+18 °C).

Wood for outdoor use and encasing should be stored in an outdoor climate, protected from wet weather. Lay the timber flat in a well-drained location. Always use enough supports to avoid the packaged wood bending. Use clean supports. Make sure air can circulate around the pack of timber. Keep wood-based materials at least 300 mm above the ground or floor.

Choose a storage place where water will not pool under the wood. Asphalt or coarse macadam is a good surface, as there is minimal risk of soil and dirt splashing up.

The ground should be cleared of snow. Do not place the wood where there is a risk of soiling and splashing from guttering or traffic, for example. Make sure the storage location is in the shade in spring, summer and autumn. Packs of timber in sunlight will become warmer than the ambient temperature, which can lead to condensation. This then increases the risk of microbial growth (particularly on the outer layer).

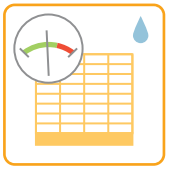
Acceptance checks

Inspect the wood on receipt of the delivery.

- Packaging: check that it is intact (does not apply to treated timber and treated glulam, which are not wrapped for delivery).
- Quantity: make a rough estimate of the quantity.
- Dimensions: check that they match the order and the delivery note.
- Quality: check the delivery for any visible damage. Check the type and labelling against the order and the delivery note.
- Check that the wood is clear of soil and dirt.
- Moisture content: conduct a random check of the moisture content in a number of places using an electrical resistance moisture meter with insulated hammer electrodes to get an indication that the moisture content matches the order, *see also the section Measuring average moisture content and surface moisture content, page 6*.

Check that the packaging is intact

Check the quantity, dimensions and quality, and that the wood is clean



Check the moisture content

Moisture meter

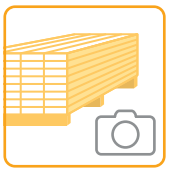
Complaints

Make a claim about the wood immediately if, upon delivery, the moisture content or grade does not match the order.

If a complaint is not registered on receipt of the wood, it can be difficult to resolve a dispute at a later date. In the event of a dispute, sampling is to be performed in line with the prevailing SIS-CEN/TS 12169, with the moisture content requirements set out in EN 14298.

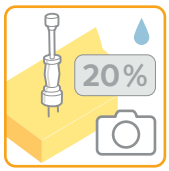
Note
The whole content of the wood pack must be available for inspection in the event of a complaint concerning the condition of the wood.

Photo documentation for complaints
To support a complaint, photos showing the entire side of the pack and the fault that has occurred shall be taken. In addition, a photo showing the pack specification (pack number, batch number, label and shipping mark) shall be taken. If the complaint concerns the condition of the wood, it is important to also take a photo showing the moisture content measured in a piece of wood.



Document the whole side of the pack and the fault that has occurred

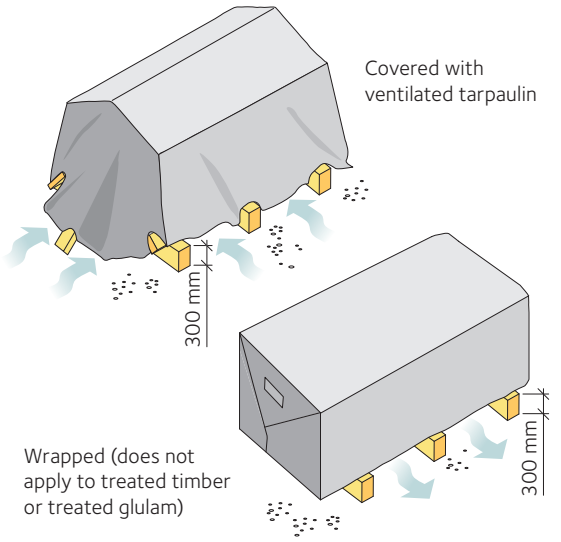
Document the pack specification

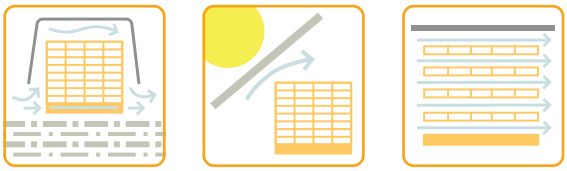


Document the moisture content if relevant

Document the moisture content if relevant.

Document the whole side of the pack and the fault that has occurred.





Ventilation under tarpaulin | Protect from sun | Sticker the wood for drying

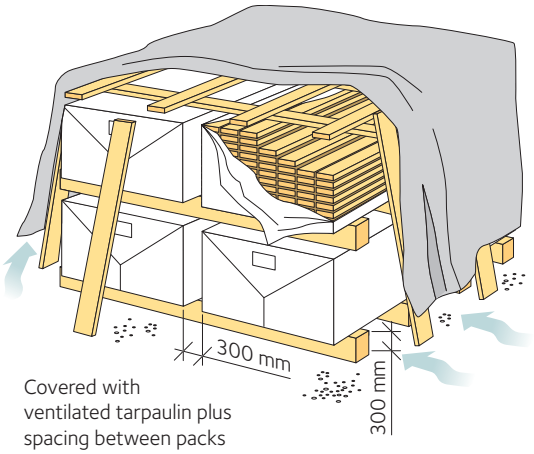


Table 1 **Weight figures for handling**
Use the following weight figures when handling solid wood and glulam:

Product	Weight (kg/m³)
Spruce	approximately 470
Pine	approximately 500
Glulam	approximately 500
Treated glulam	approximately 650 *
Treated wood	approximately 800 *

* Not dried.

Protect the wood

Before covering the pack of wood, check that the tarpaulin is intact, and that it is clean and dry on the inside.

Cover the pack so that the air can circulate around it and so as to avoid too high a temperature or condensation forming. Leave straps and packaging on the wood for as long as possible.

Ventilate between the wood and the tarpaulin, and make sure that the tarpaulin ends are a good way above the ground. Place spacers or similar around the pack of wood so that the tarpaulin does not touch the wood at any point.

Direct sunlight will quickly dry out the surface; cracks will form, the wood might become deformed, and it could develop a higher moisture content on the side in shade.

Treated timber and treated glulam should not be protected with a tarpaulin. With these products, use a ventilated top cover instead, *see the section Glulam and treated timber, page 5*.

Note
The wood should therefore also remain covered during daylight/working hours. Do not use a transparent cover, because sunlight affects the surface of the timber and increases the risk of condensation forming.

If water has penetrated the packaging or the wood has too high a moisture content, the wood must be dried before use. Break open and remove the packaging. Sticker the wood. Cover and leave to dry. Place it in an open location if during the summer.

Place it indoors with a construction fan if it is a cold time of year. Check the moisture content and the surface moisture content before the wood is used.

Note
Wood products made from pine
Pine products for encasing must be handled and stored carefully as pine sapwood absorbs moisture faster than spruce, thus increasing the risk of microbial growth.

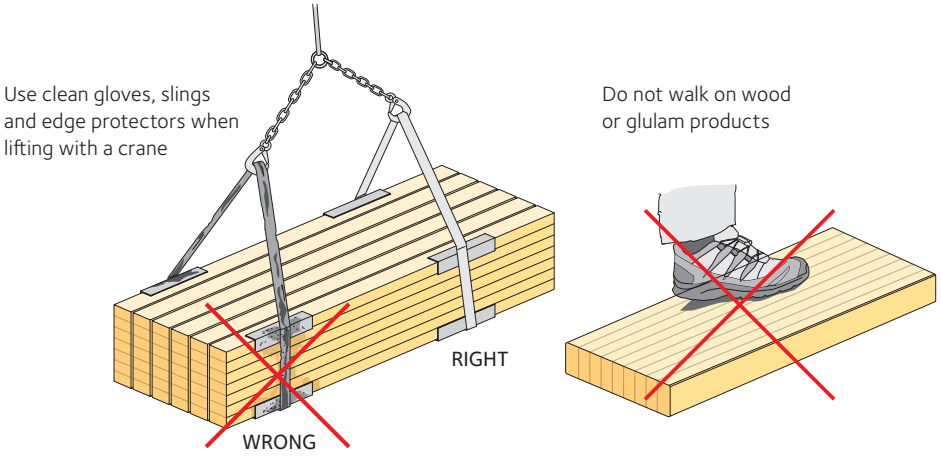
Preserve the moisture content

Construction timber

Construction timber such as structural timber, dimension planed timber, sheathing or exterior cladding normally has a target moisture content of 16 % on delivery from the sawmill or planing mill. The wood can be stored in the packaging outdoors for a short time, as long as it is fully protected against wet weather and moisture absorption. To cover the wood use fully waterproof tarpaulins that are clean and dry on the inside. Make sure that moisture does not rise from the ground under the tarpaulin and that air can circulate around the whole pack of wood. Place the pack of wood in the shade.

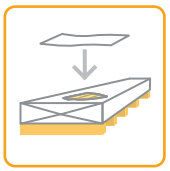
Glulam

The moisture content of glulam is usually no more than the target moisture content of 16 % (not treated glulam) on delivery from the glulam manufacturer. Glulam is covered to protect it in transit.

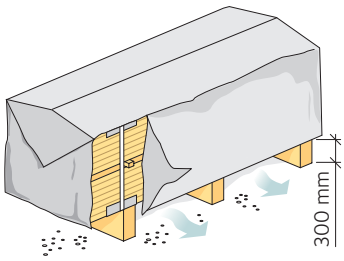


Handle timber and glulam correctly

If the transport packaging is fully sealed, glulam can be stored outside under a roof for a short time. If the transport packaging is broken, mend it (even minor tears) or remove it entirely and then store the glulam in a dry and warm place if being used indoors. Glulam that is to be used in unheated buildings or in an outdoor climate, protected under a roof, can be stored in a cold place, well protected from wet weather. Treated glulam for use outdoors can be stored in a cold, well-ventilated space protected from wet weather. Treated glulam is not delivered in transport packaging.



Repair the transport packaging on individual glulam elements



Example of how to give glulam short-term protection on the construction site

Mouldings, interior cladding and floorboards

Mouldings and interior cladding normally have a target moisture content of 12 % on delivery from the manufacturer, while floorboards will usually be 8 % on delivery from the manufacturer. They should be wrapped in six-sided plastic packaging and have a moisture content that is tailored to the application in the finished building. Do not, therefore, store these materials on the construction site. Make sure they are not delivered or encased until drying of the initial moisture in the building has been completed. If they do have to be stored on the construction site, it should be in a location with a heated indoor climate (+18 °C).

Six-sided packaging

Wood for indoor use should be stored indoors

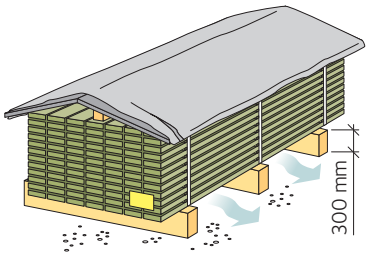
Treated wood

On delivery from the treatment plant, treated wood such as structural timber, decking etc. normally has a higher moisture content than untreated wood. There are no requirements or rules for the moisture content of treated wood for outdoor structures.

Treated wood should be protected from dirt and sunlight, and a top cover can be a good idea in order to allow the moisture content in the pack to even out, depending on the outdoor climate. Make sure that the treated wood is at least 300 mm off the ground and that air is able to circulate around the whole pack.

Treated wood for use outdoors can also be stored in a cold, well-ventilated space protected from wet weather.

Treated wood should be protected under a top cover



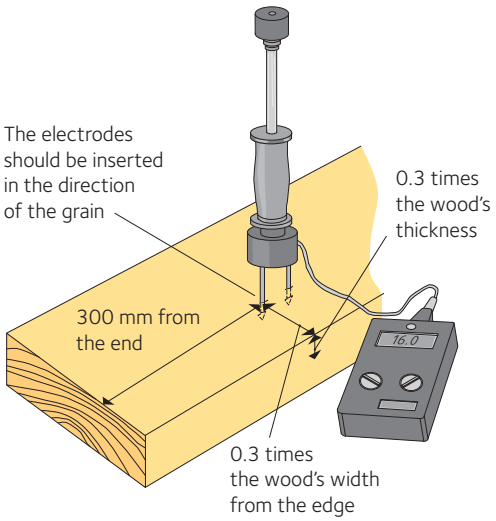
Example of how to protect treated wood with a top cover on the construction site

Waste

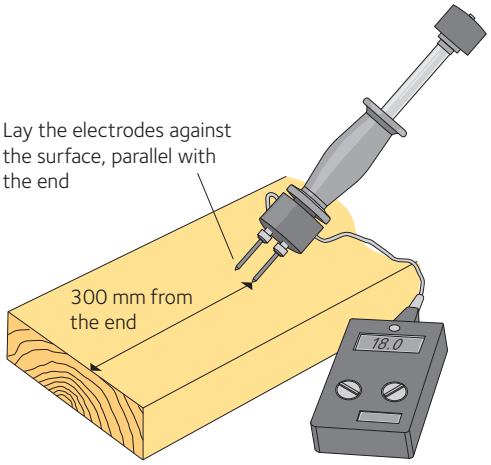
Sort wood waste as a separate category that can then be chipped and burned for energy recovery. Waste from treated wood should be handled in line with instructions from the municipal environmental office.

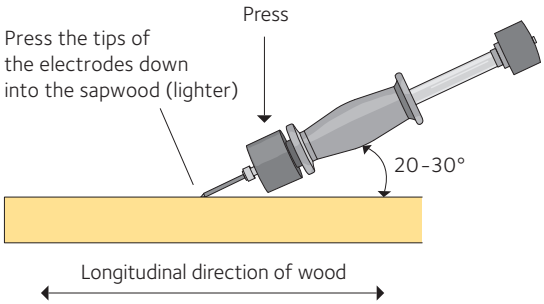
Waste regular wood

Waste treated and painted wood



Measuring average moisture content in a piece of wood – electrical resistance method





Measuring surface moisture content in a piece of wood
The lower part of the electrode can be filed down to achieve the correct angle.

Measuring average moisture content and surface moisture content

Check both the average moisture content and the surface moisture content over the course of construction, in line with the established quality plan. Check on delivery, before encasing and installation, and before painting.

Taking delivery

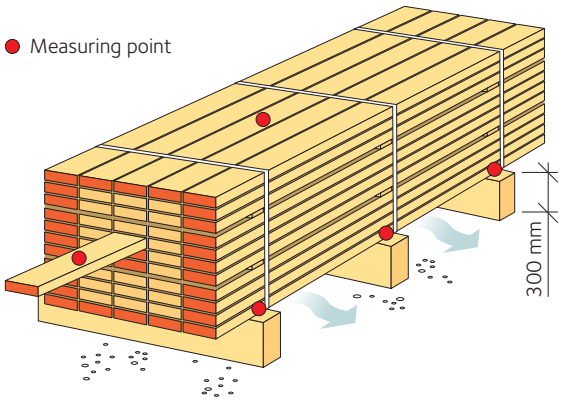
When taking delivery of wood, take sample measurements on a number of pieces of timber using an electric resistance moisture meter with insulated hammer electrodes to get an indication that the correct moisture content has been delivered. The average moisture content is measured in line with EN 13183-2 and EN 13183-2/AC:2004 as follows: measure at least 300 mm from the end. Insert the insulated hammer electrodes into the face of the wood, in the direction of the grain, and along an imaginary line running 0.3 times the width of the wood in from the edge. The measurement depth should be 0.3 times the thickness of the wood.

Note that the pack of wood should have the agreed target moisture content on delivery.

Encasing and painting

The moisture content on and just below the surface of the wood and the moisture content a little further into the wood can differ quite considerably. It is important to check the surface moisture content before encasing the wood, since it is crucial in determining the risk of microbial growth. It also has an impact on the adhesion of paint.

The wood may have become damp due to rain, incorrect storage or the wood being placed in contact with damp concrete, giving it an elevated surface moisture content. The moisture content in the inner part of the wood will not normally be affected by short-term exposure to damp.



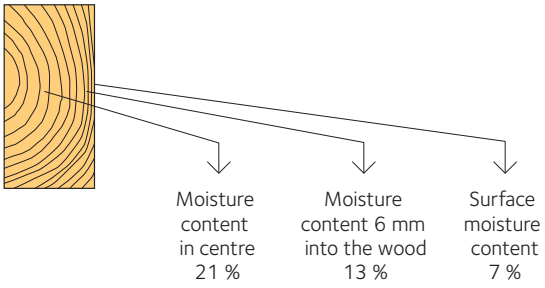
Example of relevant measuring points in a wood pack when checking before construction

Wood that has become damp must be dried — naturally, with a dehumidifier or with a construction fan — and the surface moisture content should be max 18 % prior to it being encased. Check that the average moisture content is no higher than 16 %.

Wood that is to be painted on the construction site should be primed as quickly as possible to protect against sun exposure. The surface moisture content should be no more than 16 % at the time of painting. Check that the average moisture content is no higher than 16 %.

Measure the surface moisture content with an electrical resistance moisture meter by pressing the conical jacket of the insulated hammer electrode tips down into the springwood of the surface by hand, so that half the jacket of the electrode tips makes an impression in the wood, going across the grain. Always take three measurements close to each other at the measuring point and then work out an average. The average can then be checked against the relevant requirement.

It is recommended that exposed wood such as exterior cladding and interior casings should be given an industrial surface treatment.



The variation in the moisture content of a piece of wood at the sawmill after drying
An electrical resistance moisture meter with insulated hammer electrodes measures 16 % in line with EN 13183-2. The wood may be included in a batch with a target moisture content of 16 %.

Table 2 **Target moisture content for deliveries of wood products for different applications**

Target moisture content (%)	Use
8	Floorboards indoors in heated rooms
12	Exposed cladding, mouldings and subfloors in heated rooms
16	Timber and glulam for encasing and exterior cladding

Order the right wood and the right moisture content

Order the right wood

Be clear about the requirements for the wood. Order construction timber that complies with EN 1611-1 or *Commercial Grading of Timber* with the requirements for structural timber in EN 14081-1 and graded according to EN 338.

Construction timber is ordered in dimensions as set out in the Swedish Wood Product Catalogue, **www.swedishwoodproducts.com**.

Exterior and interior cladding is ordered in dimensions as set out in the Swedish Wood Product Catalogue, **www.swedishwoodproducts.com**. The products should have properties and be labelled in line with EN 14915.

Treated wood is treated in line with EN 351-1 and NTR Document No. 1 — Part 1 for treated pine and NTR Document No. 1 —Part 2 for treated spruce. NTR is a trusted quality labelling system used for the classification and quality control of wood and wood products that have been treated with preservatives or have been modified. It is mainly applied by treaters in the Nordic and Baltic countries.

Order glulam that is produced using adhesive that meets the requirements for Type I in EN 301 and is classified in accordance with EN 14080. Treated glulam is treated in line with EN 351-1 and NTR classified preservative-treated glued laminated timber — wood protection classes and guidance on third party quality control.

Structural timber

Relative humidity and wood's moisture content

Different applications demand different target moisture content. This is because the moisture content in the wood will always seek to achieve equilibrium with the relative humidity, RH, in the surrounding environment. This takes some time, but as the moisture content changes, so does the volume of the wood. Encased wood should therefore have a moisture content that is as close as possible to the equilibrium moisture content in the finished structure, in order to reduce moisture-related movement.

In winter, there is a substantial difference between the relative humidity of indoor air and the air outside, with the indoor air being very dry and the outdoor air at its dampest. The difference is less pronounced in summer. The importance of storing indoor products indoors and outdoor products outdoors thus cannot be stressed enough.

Target moisture content

Target moisture content, as defined in EN 14298, is a term used to represent the desired moisture content. The average moisture content in a batch and the moisture content of the individual pieces are allowed a certain range of variation as set out in *table 3*.

Table 3 **Target moisture content**
Allowable variation for the average moisture content.

Ordered moisture content (target moisture content)	Allowable variation in the timber batch's average moisture content		Allowable range for the moisture content in 93.5 percent of the pieces in the timber batch	
(%)	Lower limit (%)	Upper limit (%)	Lower limit (%)	Upper limit (%)
8	7	9	5.6	10.4
12	10.5	13.5	8.4	15.6
16	13.5	18	11.2	20.8

When measuring the moisture content of all the pieces in a batch with a target moisture content of 16 %, the average value for the moisture content of the whole batch (average moisture content) is allowed to fall between 13.5 % and 18 % to be approved. As regards the individual pieces in a batch, the moisture content of 93.5 percent of these must fall between 11.2 % and 20.8 %.

Note
These figures describe the moisture content a little way into the wood, as set out in the section *Measuring average moisture content and surface moisture content – Taking delivery, page 6*, and thus not the surface moisture content.

Quick guide

Protect the wood

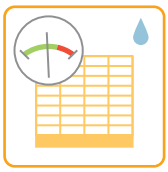
From wet weather

From ground moisture

From sun

From dirt

Handling wood correctly

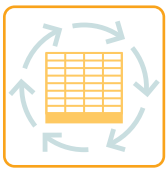


Check the moisture content

Check the quantity, dimensions and quality, and that the wood is clean

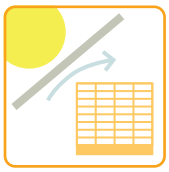
Check that the packaging is intact

Use supports and make sure the ground is drained



Keep wood for outdoor use ventilated and protected

Protect from wet weather



Protect from sun

Protect from dirt

Wood for indoor use should be stored indoors

Treated wood should be protected under a top cover

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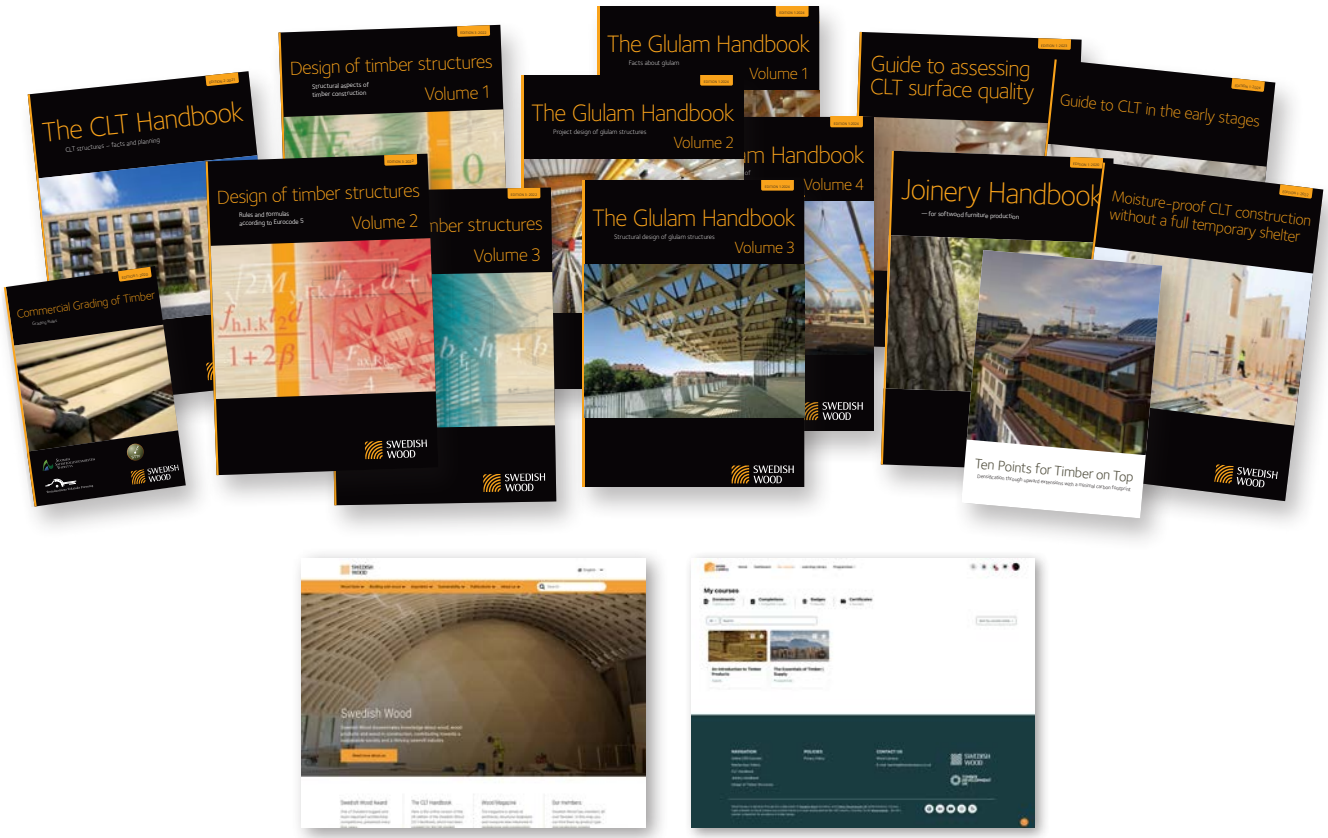

Further knowledge, information and practical guidance on wood and building in wood can be found at **www.swedishwood.com**, **woodcampus.co.uk** and in the publications *Commercial Grading of Timber*, *The CLT Handbook*, *Design of timber structures Volume 1–3*, *The Glulam Handbook Volume 1–4*, *Guide to assessing CLT surface quality*, *Guide to CLT in the early stages*, *Joinery Handbook*, *Moisture-proof CLT construction without a full temporary shelter* and *Ten Points for Timber on Top*.

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First edition

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SWEDISH WOOD

Swedish Wood disseminates knowledge about wood, wood products and wood in construction, contributing towards a sustainable society and a thriving sawmill industry. We achieve this by inspiring, educating and driving technical advances.

Swedish Wood represents the Swedish sawmill industry and is part of the Swedish Forest Industries Federation. Swedish Wood represents the Swedish glulam, CLT and packaging industries, and collaborates closely with Swedish builders' merchants and wholesalers of wood products.

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