

Swedish wood products

Fact sheet

Relative to its weight, wood is one of the strongest building materials. Its strength and ease of working – cutting, assembling using mechanical joints, adhesives etc. – makes timber ideal for many architectural and functional applications. It can also easily be used in combination with other materials. Wood has good durability. It has a very low coefficient of thermal conductivity and thus good heat insulation properties. Wood burns, but at a predictable rate, making it one of the best building materials for fire performance. This fact sheet will give some basic facts about properties, quality and dimensions of Swedish sawn timber.

Production standards of Swedish softwood



The Swedish sawmills deliver sawn timber according to the qualities and sizes specific markets demand. For the European market, the European EN standard and the Swedish publication *SS-EN 1611-1 Sawn timber – Appearance grading of softwoods – European spruces, firs, pines, Douglas fir and larches* are typically applicable. The EN standards are developed by the European Committee for Standardization, CEN.

For other markets, specific standards are developed. Sawn timber with qualities, strength grades, sizes and moisture contents not described in the European EN Standards and the Nordic Timber Grading rules is usually intended for overseas markets. Swedish sawmills have the capacity to produce and export large quantities of timber that complies with Japanese, American and Chinese national standards. The Chinese national product standard for European structural timber is one such example.

IMPORTANT EN STANDARDS FOR STRENGTH-GRADED TIMBER AND SAWN TIMBER

STRENGTH-GRADED TIMBER

- EN 336 Structural timber – Sizes, permitted deviations.
- EN 338 Structural timber – Strength classes.
- EN 384 Timber structures – Determination of characteristic values of mechanical properties and density.
- EN 408 Timber structures – Structural timber and glued laminated timber – Determination of some physical and mechanical properties.
- EN 1912 Structural timber – Strength classes – Assignment of visual grades and species.
- EN 14081-1 Timber structures – Strength-graded structural timber with rectangular cross section – Part 1: General requirements. Sawn timber.
- EN 1309 -1 Round and sawn timber – Method of measurement of dimensions – Part 1: Sawn timber.
- EN 1313-1 Round and sawn timber – Permitted deviation and preferred sizes – Part 1: Softwood sawn timber.
- EN 1611-1 Sawn timber – Appearance grading of softwoods – Part 1: European spruces, firs, pines, Douglas fir and larches.
- EN 14298 Sawn timber – Assessment of drying quality.

Technical data

The values given in Table 1 for the strength and the modulus of elasticity are average values, and refer to small test samples, with no imperfections, at an average temperature of +20 °C. In spite of the differences between redwood and whitewood, they can in fact be regarded as being equally good as construction or building materials.

Table 1. Technical data for redwood and whitewood

PROPERTY		REDWOOD	WHITEWOOD
Moisture content (%)		12	12
Density (kg/m ³)		470	440
Tensile strength (MPa)		104	90
	⊥	3	2.5
Bending strength (MPa)		87	75
Compression strength (MPa)		46	40
	⊥	7.5	6
Shear strength (MPa)		10	9
Impact strength (kJ/m ²)		70	50
Hardness (Brinell)		4	3.2
	⊥	1.9	1.2
Modulus of elasticity (MPa)		12 000	11 000
	⊥	460	550
Thermal conductivity (W/m °C)		0.26	0.24
	⊥	0.12	0.11
Heat capacity (J/kg °C)		1 650	1 650
Calorific value (MJ/kg)		16.9	16.9

|| = parallel to the fibres

⊥ = perpendicular to the fibres

Quality classes of timber

The Swedish sawmills produce a wide selection of different qualities of sawn and planed redwood and whitewood, in accordance with the provisions and recommendations given in *SS-EN 1611-1 Sawn timber - Appearance grading of softwoods - European spruces, firs, pines, Douglas fir and larches*. The Swedish sawmills are flexible in their approach to business and can also provide specially ordered grades of timber, and timber with special dimensions.

Table 2. Quality classes of timber. Approximate relations between the different quality classes

SS-EN 1611-1 (2000)

Sawn timber. Appearance grading of softwoods. European spruces, firs, pines, Douglas fir and larches.

Two faces and two edges	G4-0	G4-1	G4-2	G4-3	G4-4
One face and one edge*	G2-0	G2-1	G2-2	G2-3	G4-4

Nordic Timber Grading rules (1994) ("The Blue book")

	A				B	C	D
	A1	A2	A3	A4			

Guiding principles for grading of Swedish sawn timber (1960) ("The Green book")

	U/S				Fifth quality	Sixth quality	Seventh
	I	II	III	IV	V	VI	VII

*One face and one edge is seldom used in Sweden.

Table 3. Common timber qualities, classes and species

TYPE OF WOOD PRODUCT	QUALITY CLASS	SPECIES
Building timber	G4-2 – G4-3	Whitewood and redwood
Graded construction timber	G4-0 – G4-2	Whitewood and redwood
Tongued and grooved timber with sawn face	G4-2 – G4-3	Whitewood
Formwork timber	G4-4	Whitewood and redwood
Packaging timber	G4-3	Whitewood and redwood
External cladding, barge board	G4-0 – G4-2	Whitewood
Internal cladding	at the lowest G4-2	Redwood and whitewood
Joinery timber for internal use	at the lowest G4-1	Redwood
Floorboards	at the lowest G4-2	Redwood and whitewood
Fence	G4-0 – G4-2	Whitewood, possibly impregnated redwood
Mouldings	A – B	Redwood

In Sweden all sawn timber is kiln dried. The delivery target moisture content is around 18% for sawn timber and 16% for planed timber. But the Swedish saw-

mills also deliver timber with lower specified moisture content – according for example to EN 14298 – adapted to product and customer demand.



Construction timber

Many parts of a building are load-bearing, for example floor beams, roof trusses and certain parts of timber framed walls. It is often necessary to calculate the loads involved and then choose a dimension which can carry these loads. In relation to its weight, timber is a strong material and it is therefore frequently used in load-bearing constructions. The timber for these purposes is called construction timber, and it is stress-graded – either by machine or visually – on the basis of various stress-grading rules.

Table 4. Visually graded construction timber

Strength class	C30	C24	C18	C14
Visually graded according to SS 23 01 20	T3	T2	T1	T0

Table 5. Machine graded construction timber

Strength class	C35	C30	C24	C18
SS-EN 338	C35	C30	C24	C18

Thicknesses and widths of timber

The table below illustrates the dimensions of timber the Swedish sawmills normally produce for different areas of use – construction, building and joinery, and for other purposes. The table also illustrates the most common cross-

sectional dimensions of both planed timber (planed on all four sides) and timber with one fine sawn face (re-sawn surface) for different areas of use. The cross-sectional dimensions are given in mm (thickness x width), and apply to a

target moisture content of 18% for sawn timber and 16% for planed timber. Other dimensions are however also available, since the Swedish sawmills can adapt their production to both the international and Swedish markets.

Table 6. Cross-sectional dimensions of sawn and planed timber

SAWN TIMBER		TIMBER WITH ONE SAWN FACE		PLANED TIMBER	
Thickness	Width	Thickness	Width	Thickness	Width
12	-	10	-	9	-
16	-	14	-	13	-
19	-	17	-	16	-
22	-	20	-	19	-
25	25	23	22	22	22
32	32	30	28	28	28
38	38	36	34	34	34
50	50	48	45	45	45
63	63	61	58	58	58
75	75	73	70	70	70
100	100	98	95	95	95
-	115	-	110	-	110
-	125	-	120	-	120
-	150	-	145	-	145
-	175	-	170	-	170
-	200	-	195	-	195
-	225	-	220	-	220

The handling and storage of timber

Swedish timber is a valuable material and therefore it should be handled with care, to avoid damage. Timber should be handled properly in transit, in joinery factories and on building sites in order to achieve the best possible final results. Timber can be stored outdoors provided

that it is protected from rain and snow, from the sun, and from dirt and ground damp. Timber intended for visible indoor use, for example paneling, flooring, pre-manufactured joinery and fitments, should, when necessary, be stored in heated and ventilated indoor premises.

Table 7. Weight of timber for handling

THE FOLLOWING WEIGHTS OF TIMBER CAN BE USED FOR HANDLING:

Whitewood	460 kg/m ³
Redwood	535 kg/m ³

SWEDISH WOOD

part of the Swedish Forest Industries Federation

Swedish Wood spreads knowledge, provides inspiration and encourages development relating to wood, wood products and wood construction. The goal is to increase the use of wood in Sweden and in selected international markets through information and inspiration.

Swedish Wood is a department within the trade and employer organisation the Swedish Forest Industries Federation. Swedish Wood is supported by the Swedish sawmill sector.

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