Grading

of sawn timber in Europe according to EN 1611-1

Terms and definitions,
methods of measurement
and requirements
Features according to tables
Tables

SWEDISH WOOD™

Preface

Since the mid 1980s the European standardizing organizations and the European timber industry have been deeply committed in producing standards for definitions, testing, classification etc of timber products in order to facilitate trading. This has been done under the auspices of the European standardizing committee CEN, Comité Européen de Normalisation, and also, for so called harmonized standards, the European Union.

For sawn timber uniform grading rules are very important and this actual standard EN 1611-1 will hopefully replace old national grading rules and ultimately be used for most of the trading of appearance graded timber in Europe.

Stockholm, October 2016

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Swedish Wood

Terms and definitions, methods of measurement and requirements

Species

Conifers – Definition	Timber from trees in the botanical group gymnosperms. Pine – *Pinus sylvestris*. Spruce – *Picea abies*.

Fact **How can you distinguish between pine and spruce?**

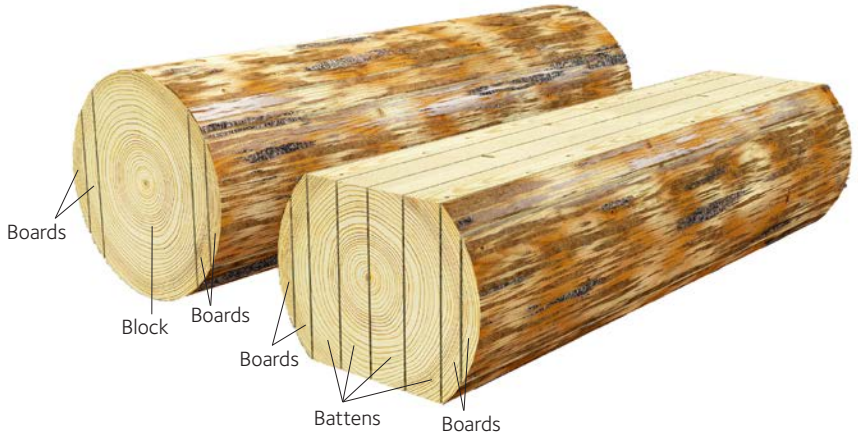
- The heartwood in pine is darker than the sapwood and clearly visible. The heartwood and sapwood in spruce have the same colour when the wood is dry and therefore you cannot see the heartwood in dry timber.
- There are often small pin knots between the branch whorls in spruce but not in pine. The knots in pine are often oval.
- In planed spruce timber there is often chipped grain around the knots. It is easier to plane pine timber without getting chipped grain.
- There are often resin pockets in spruce but very seldom in pine.

Sawing patterns

The sawing patterns described below are the desired cuts through a log. Because of the interior structure and the exterior form of the logs variations can occur.

Four piece cut with centre cut

Definition	First cut takes boards from the opposite sides of the log. The rest of the log (the block) is turned 90 degrees and is cut to boards and battens. The block is cut through the centre (pith). The other cuts result in centre yield and side yield. Centre yield is made up of even pieces of the same width and the same or different thickness (Nordic practice).



Four piece cut with pith catcher

Definition	First cut takes boards from the opposite sides of the log. The rest of the log (the block) is turned 90 degrees and is cut to boards and battens. The block is cut so that the pith is in the middle of a batten (pith catcher). The other cuts result in centre yield and side yield. Centre yield is made up of uneven pieces of the same width and the same or different thickness.

Through cut with centre cut, edged

Definition	The log is cut by a number of parallel cuts with one cut through the pith. The resulting pieces are edged.

Through cut with pith catcher, edged

Definition	The log is cut by a number of parallel cuts of which two are cutting a piece containing the pith (pith catcher). The resulting pieces are edged.

Size

- **Nominal size** (trading size) is used in the name of a piece of timber.
- **Target size** is the size specified (at the reference moisture content) and to which the deviations are to be related.
- **Actual size** is the size present at the time of measurement.

Target size and actual size have to be under consideration of the moisture content in the piece of timber.

Dimension

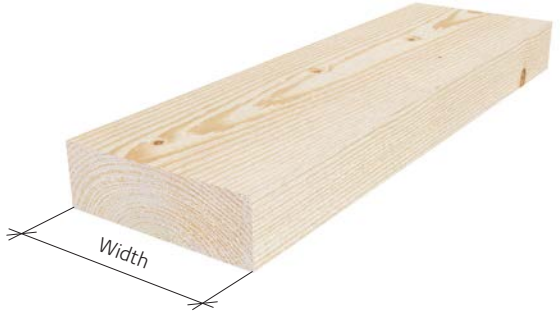
Definition	Name of the cross-section of the piece of timber (rectangular or square) using the nominal sizes for thickness and width in mm (for example 50 × 100 mm).

Thickness

Definition	Distance between the faces of a piece of timber at the specified place of measurement.
Requirement	Thickness in mm at specified moisture content.
Measuring rule	Thickness is measured in the transverse direction near to but at least 150 mm from both ends of the piece of timber and at at least one randomly chosen point in between. Record only the smallest measured thickness.

Width

Definition	Distance between the edges of a piece of timber at the specified place of measurement.
Requirement	Width in mm at specified moisture content.
Measuring rule	Width is measured in the transverse direction near to but at least 150 mm from both ends of the piece of timber and at at least one randomly chosen point in between. Record only the smallest measured width.

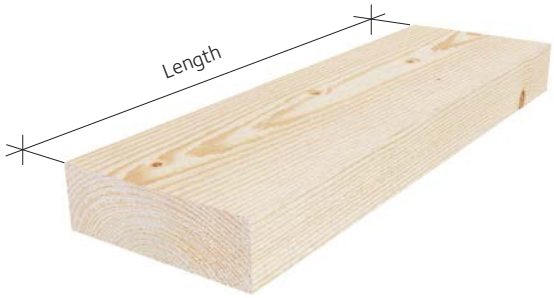


Face width

Definition	Width that is visible after final assembly.
Requirement	Width in mm at specified moisture content.
Measuring rule	Width is measured in the transverse direction near to but at least 150 mm from both ends of the piece of timber and at at least one randomly chosen point in between. Record only the smallest measured width.

Length

Definition	The shortest distance between the ends of a piece of timber.
Requirement	Length in mm or m at specified moisture content.
Measuring rule	Length is measured as the length of the largest possible rectangular parallelepiped that can be inscribed in the piece of timber.



Permitted deviations for thickness, width and length of sawn timber

(According to EN 1313-1:2010)

Definition	Permitted deviation from the target size.
Requirement	Permitted deviations from the target size at the reference moisture content 20 %: For thickness and width ≤ 100 mm: + 3 mm / – 1 mm For thickness and width > 100 mm: + 4 mm / – 2 mm The average thickness and the average width shall not be less than the target sizes. For length: minus deviations not permitted, plus deviations agreed by contract.

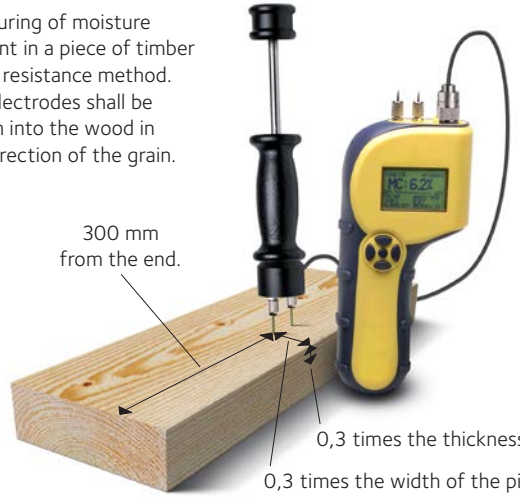
Example

Thickness, target size = 50 mm
Maximum thickness = 50 + 3 = 53 mm
Minimum thickness = 50 – 1 = 49 mm

Moisture content

Definition	Mass of water present in wood expressed as a percentage of the wood's oven dry mass.
Measuring rule	Measuring (estimation) is carried out with a calibrated electrical resistance moisture content meter with isolated hammer electrodes or with a calibrated capacitance moisture content meter.

Measuring of moisture content in a piece of timber – the resistance method. The electrodes shall be driven into the wood in the direction of the grain.



Measuring rule: The oven dry method which is the most exact.

$$\frac{\text{mass of the test piece before drying (raw mass)} - \text{mass of the oven dry test piece (dry mass)}}{\text{mass of the oven dry test piece}} \times 100 = \text{moisture content in percent}$$

Location on piece

In order to grade a piece of timber you need to be able to locate the grade requirements to a certain side of the piece, a certain part of the length or part of the cross section, for instance one edge or 10 mm of any adjacent face.

Side of the piece of timber

Face

Definition	Either of the wider longitudinal opposite surfaces of the piece of timber or any longitudinal surface if the piece is of square cross section.

Outside face

Definition	The face further from the pith of the log.

Inside face

Definition	The face nearer to the pith of the log.

Better face

Definition	The face that, when applying a particular grading rule, is judged to be better than the other face.

Worse face

Definition	The face that, when applying a particular grading rule, is judged to be worse than the other face.

Edge

Definition	Either of the narrower longitudinal opposite surfaces of square edged timber.

Better edge

Definition	The edge that, when applying a particular grading rule, is judged to be better than the other edge.

Worse edge

Definition	The edge that, when applying a particular grading rule, is judged to be worse than the other edge.

Arris

Definition	Line of intersection between an edge and a face or between two faces if the piece is of square cross section.

Arris between edge and outside face

Definition	Arris between edge and outside face.

Arris between edge and inside face

Definition	Arris between edge and inside face.

Features according to table 1

Knot condition

This describes the different types of knots. The type of knot depends on how the knots have developed in the growing tree.

- Sound, intergrown knot
- Partially intergrown knot / Dead knot
- Encased knot
- Unsound knot
- Loose knot.

Knot shape

All knots start from the pith and extend outwards with an increasing diameter. Depending on how the saw cut passes through the knot, its shape on the surface of the timber can vary considerably. These different knot shapes require individual measuring rules and requirement formulations.

- Round knot
- Oval knot
- Traversing edge knot
- Not traversing arris knot
- Traversing arris knot
- Spike knot
- Splay knot
- Pin knot.

Knot cluster

Definition: Knots located so that no grain recovery is evident between adjacent knots.

Knot condition

Sound, intergrown knot

Definition	Knot that, on the surface considered, is intergrown with the surrounding wood along more than 75 percent of its circumference and is free of rot.

Partially intergrown knot / Dead knot

Definition	Knot that, on the surface considered, is intergrown with the surrounding wood for more than 25 percent but less than 75 percent of its circumference (partially intergrown knot) or less than 25 percent of its circumference (dead knot).

Encased knot

Definition	Knot that is surrounded by bark for more than 75 percent of its circumference.

Unsound knot

Definition	Knot affected by rot.

Loose knot

Definition	Dead knot that is not held firmly in the surrounding wood.

Knot shape

Fact **Measuring rules**

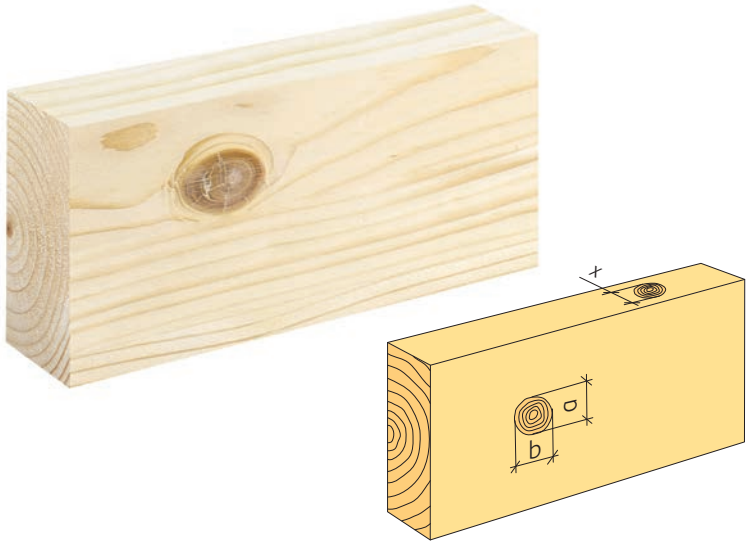
Knots shall be measured by their shape and location on the piece of timber.
The following symbols are used for identification:

a = smallest diameter in mm.
b = largest diameter in mm.
d = knot size in mm.
x = size perpendicular to the length of the piece of timber.
y = size parallel to the length of the piece of timber.

Knot

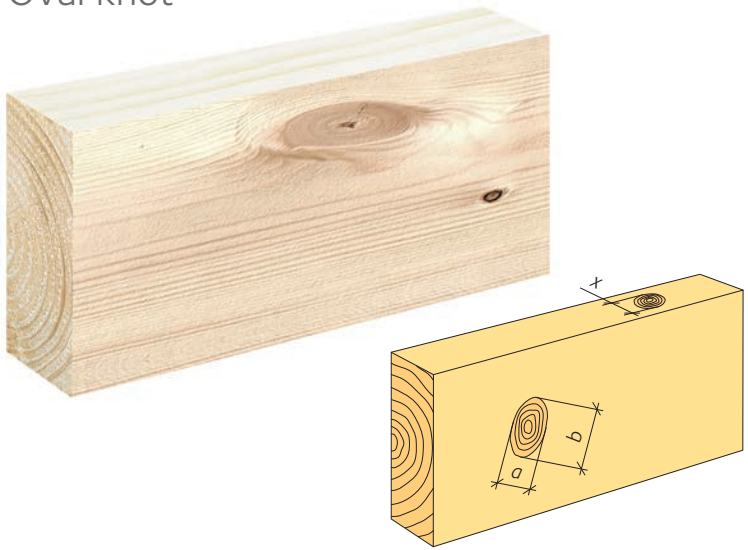
Definition	Portion of a branch embedded in wood.

Round knot



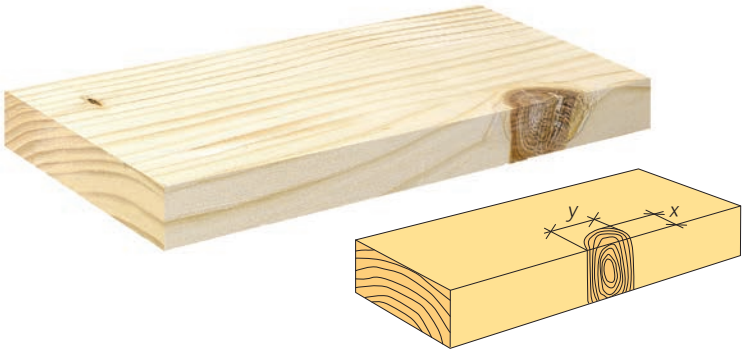
Definition	Knot cut more or less straight through so that the ratio between the largest and the smallest transverse measurement is not more than 1,5.
Requirement	Face: Maximum size = 10 percent of the width + [table value] (mm). Maximum number on worst meter. Edge: Maximum size in percent of thickness. Maximum number on worst meter.
Measuring rule	Face: Average value of smallest and largest diameters $d = (a + b) / 2$. Edge: $d = x$.

Oval knot



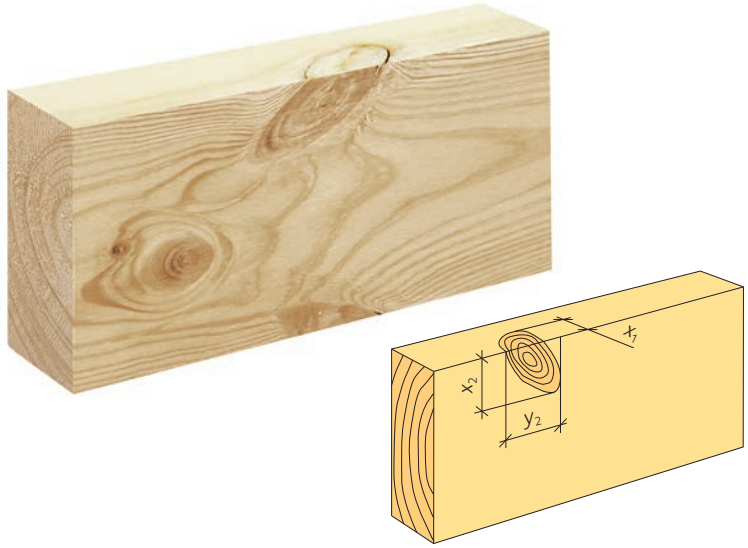
Definition	Knot cut more or less straight through so that the ratio between the largest and the smallest transverse measurement is more than 1,5 but not more than 4.
Requirement	Face: Maximum size = 10 percent of the width + [table value] (mm). Maximum number on worst meter. Edge: Maximum size in percent of thickness. Maximum number on worst meter.
Measuring rule	Face: Average value of smallest and largest diameters $d = (a + b) / 2$. Edge: $d = x$.

Traversing edge knot



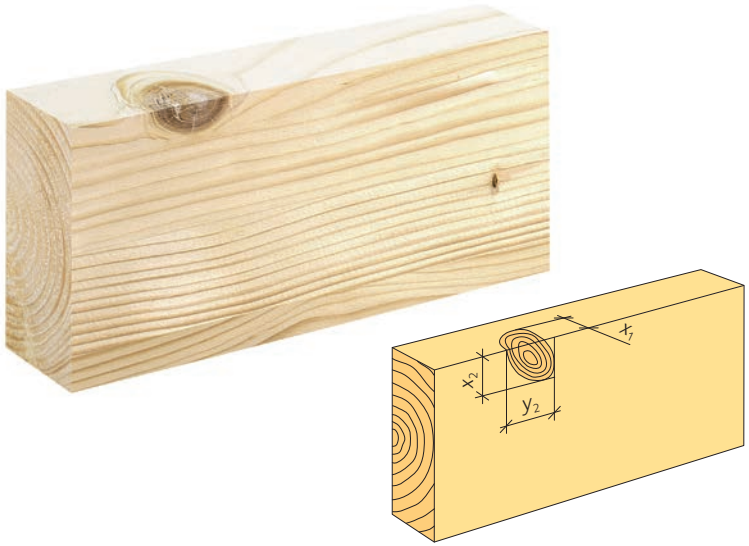
Definition	Through cut knot that runs across the edge from one face to the other.
Requirement	Face: Maximum size = 10 percent of the width + [table value] (mm). Maximum number on worst meter. Edge: Maximum number on worst meter.
Measuring rule	Face: Average value of width and length $d = (x + y) / 2$. Edge: Not to be measured.

Not traversing arris knot



Definition	Knot that is exposed on an arris on the inside face of a piece of timber.
Requirement	Face: Maximum size = 10 percent of the width + [table value] (mm). Maximum number on worst meter. Edge: Maximum size in percent of thickness. Maximum number on worst meter.
Measuring rule	Face: Average value of width and length $d = (x_2 + y_2) / 2$. Edge: $d = x_1$.

Traversing arris knot

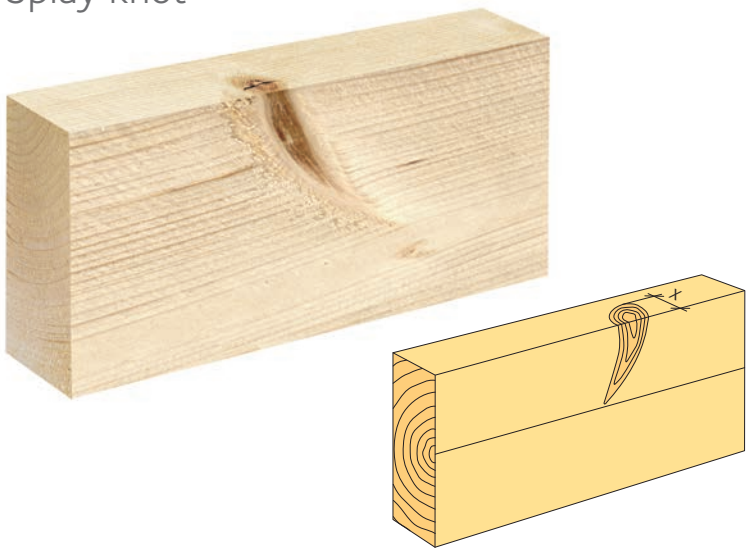


Definition	Knot that is exposed on an arris on the outside face of a piece of timber.
Requirement	Face: Maximum size = 10 percent of the width + [table value] (mm). Maximum number on worst meter. Edge: Maximum size in percent of thickness. Maximum number on worst meter.
Measuring rule	Face: Average value of width and length $d = (x_2 + y_2) / 2$. Edge: $d = x_1$.

Spike knot

Definition	Knot cut so that the ratio between the largest and the smallest transverse measurement exceeds 4 and that does not reach an arris.
Requirement	Maximum number on worst meter.
Measuring rule	Not to be measured.

Splay knot



Definition	Knot cut through the longitudinal axis that, on the inside face, splays towards the edge/arris and is also partially exposed on the edge. The ration between the largest and the smallest transverse measurement exceeds 4.
Requirement	Face: Maximum number on worst meter. Edge: Maximum size in percent of thickness. Maximum number on worst meter.
Measuring rule	Face: Not to be measured. Edge: $d = x$.

Pin knot

Definition	Small, intergrown, rot-free knot, not larger than 5 mm. Not to be considered.

Knot cluster

Definition	Knots located so that no grain recovery is evident between adjacent knots. Note: Normally the distance to an adjacent knot should be less than the width of the piece of timber or less than 150 mm if the width exceeds150 mm.
Measuring rule	Knots shall be measured individually in the same way as other knots.

Features according to table 2

Other natural features

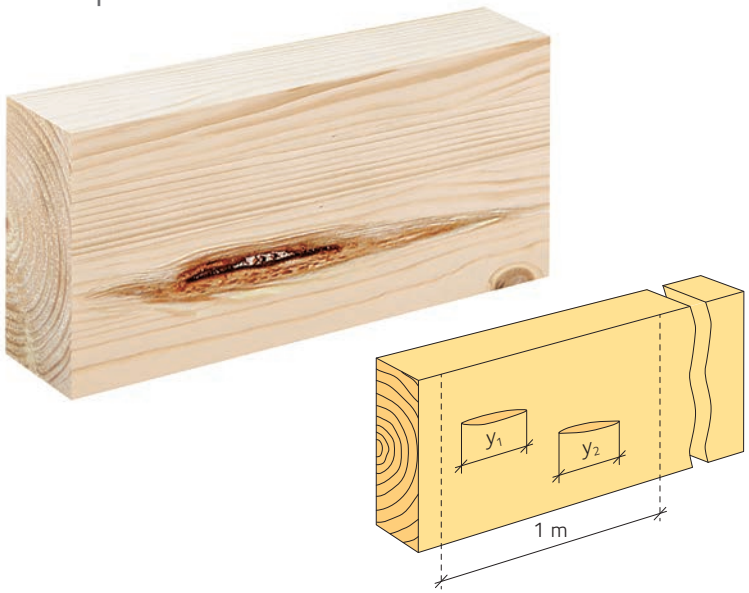
Some biological phenomena, so called features, in wood that have strong influence on the quality.

- Bark pocket
- Resin pocket
- Resin wood
- Reaction wood, so called compression wood
- Strong, abnormal grain structure:
  - Slope of grain
  - Curly grain
  - Top rupture
- Pith.

Note Resin

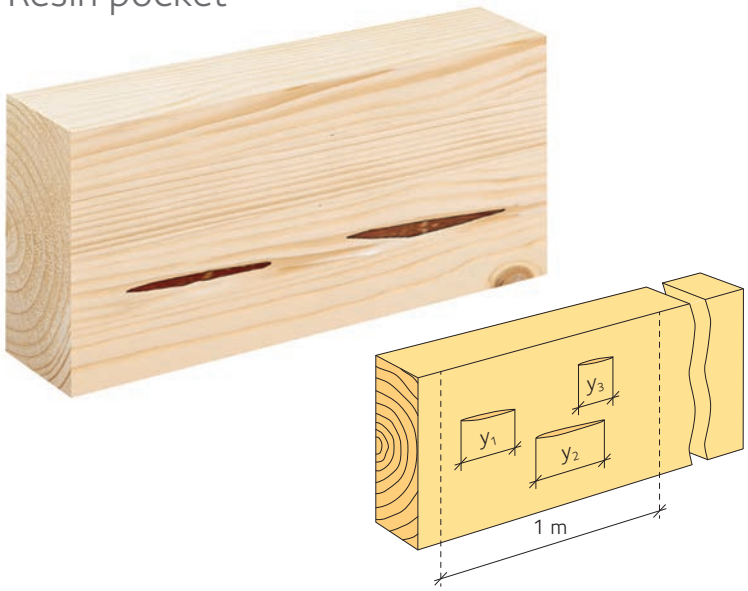
Definition: The task of the resin is to defend wood against micro-organisms and against drying out in the event of damage. It is stored under pressure in the wood's resin channels. When mechanical damage occurs, the resin flows and accumulates.

Bark pocket



Definition	Bark that is partly or wholly enclosed in the wood.
Requirement	Maximum total length and maximum number on worst meter.
Measuring rule	Length *y* in the longitudinal axis of the piece of timber. $y = y_1 + ... + y_n$.

Resin pocket

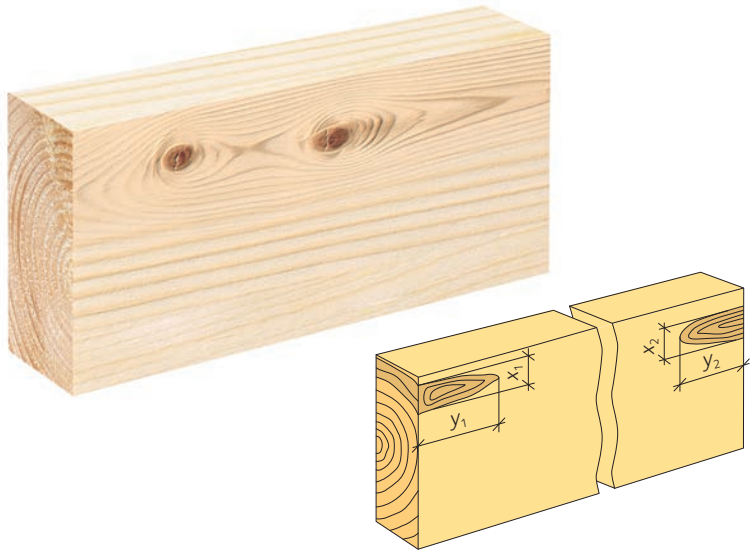


Definition	Lens-shaped cavity in the wood containing, or that has contained, resin. Depending on how the saw cuts into the cavity, the resin pocket is visible as a wide, shallow depression or as an oblong opening in the surface. Can also be a round cavity.
Requirement	Maximum total length and maximum number on worst meter.
Measuring rule	Length *y* in the longitudinal axis of the piece of timber. $y = y_1 + ... + y_n$.

Resin wood

Definition	Wood that has been saturated with resin. Usually darker than surrounding, normal wood. The resin wood is formed through a more dense concentration of resin channels.
Requirement	Maximum total area in percent of the area of the side.
Measuring rule	Total area on the side. $A = x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

Reaction wood (Compression wood)



Definition	Wood with a distinctive anatomical character with different properties, which normally occurs in crooked or leaning trees and in branches. Most distinctive are very large moisture movements in the grain direction.
Requirement	Maximum total area in percent of the area of the side.
Measuring rule	Total area on the side. $A = x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

Slope of grain

Definition	Divergence in the direction of the grain in relation to the longitudinal axis of the piece of timber. Does not refer to disruption of the grain around knots or other local deviations.
Requirement	Not permitted / permitted.

Curly grain

Definition	Grain that follows tight, irregular curves.
Requirement	Not permitted / permitted.

Top rupture

Definition	Grain deviation caused when a leading shoot breaks and a side shoot takes over its role, after which everything is gradually encased by the increasingly thick stem. Depending on the location of the saw cut in the log, the top rupture is either clear and illustrative on the surface of the piece of timber or if it is deeper down, when it is only possible to see a rough yet diffuse disturbance in the grain. Often to be found in connection with curly grain and rot.
Requirement	Not permitted / permitted.

Pith

Definition	Zone within the first growth ring that consists chiefly of soft tissue. Dark colour.
Requirement	Not permitted / permitted.

Attacks of micro-organisms and insects

Refers to attacks of fungus, bacteria and insects.

- Dote
- Soft rot
- Surface blue stain
- Deep blue stain
- Insect attack.

Note **Rot**

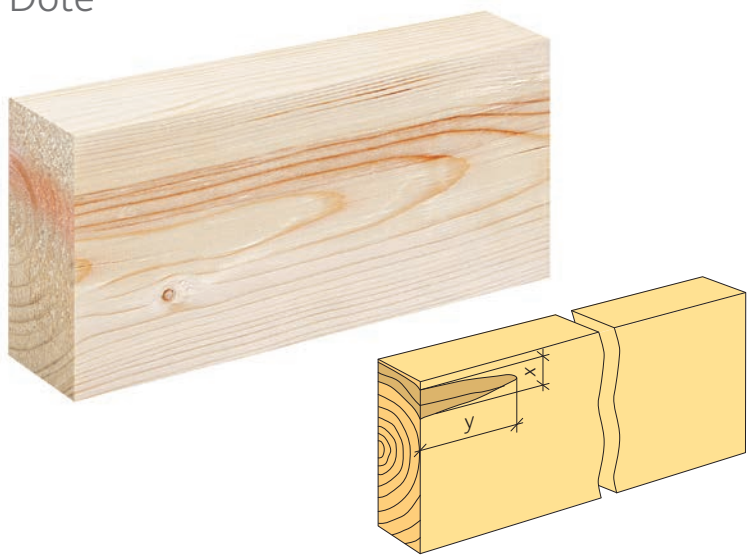
Definition	Decomposition of wood due to fungi or other micro-organisms resulting in softening, progressive loss of strength and mass, and often changes in colour and texture.

Note **Blue stain**

Definition	Stain caused by fungi, where the discolouration ranges from pale blue to black, usually in sapwood.

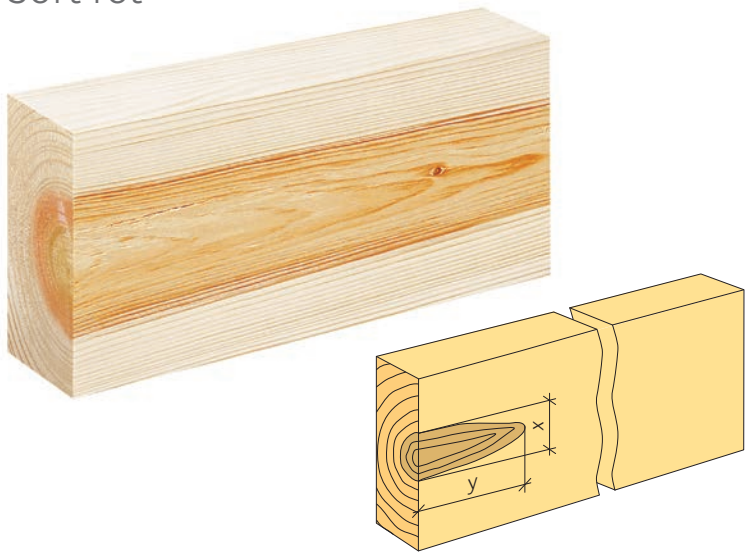
Attacks of micro-
organisms and insects

Dote



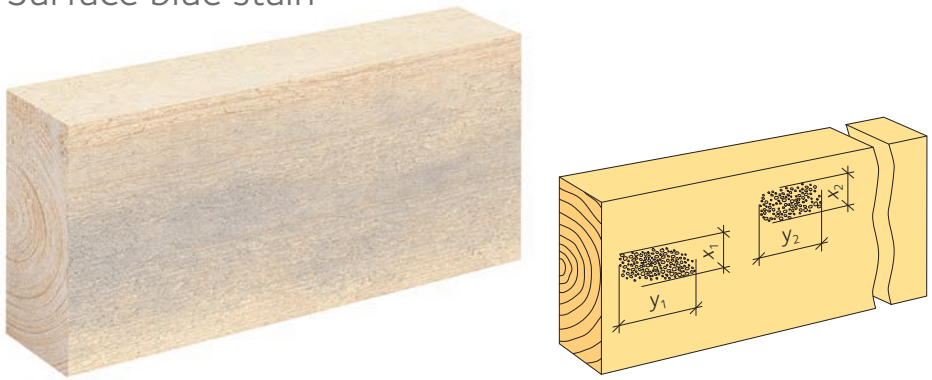
Definition	Early stage of rot, characterized by discoloured streaks or patches (often at knots) in the wood. The general texture and strength properties remain more or less unchanged.
Requirement	Maximum total area in percent of the area of the side.
Measuring rule	Total area on the side. $A = x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

Soft rot



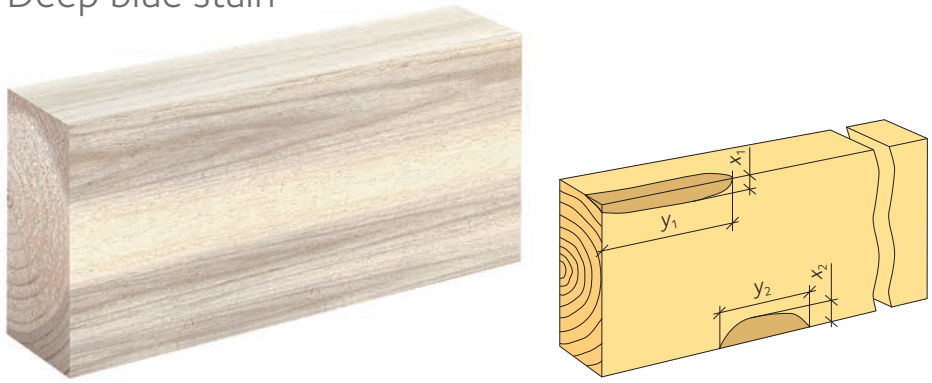
Definition	The wood has been attacked by rot and has lost its firmness. It gives way to pressure.
Requirement	Maximum total area in percent of the area of the side.
Measuring rule	Total area on the side. $A = x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

Surface blue stain



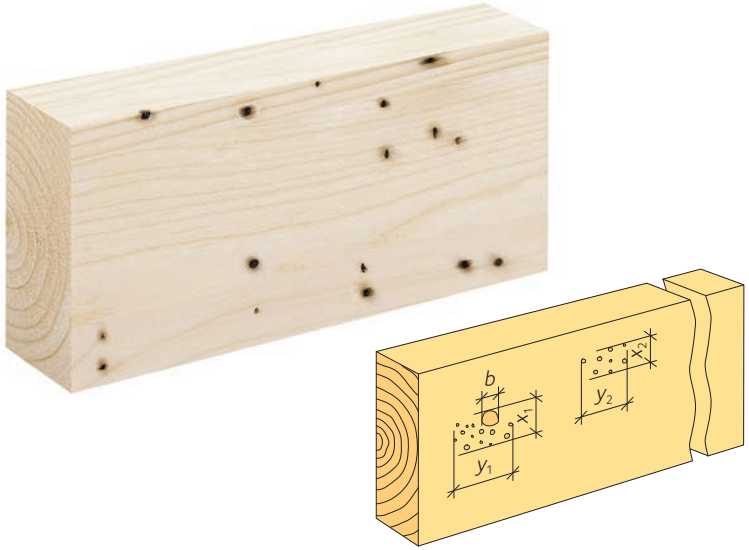
Definition	Superficial blue stain, less than 2 mm deep, that can be removed by surface planing.
Requirement	Maximum total area in percent of the area of the side.
Measuring rule	Total area on the side. $A = x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

Deep blue stain



Definition	Blue stain, more than 2 mm deep, that cannot be removed by surface planing. Normally found in the log even before sawing (log blue stain).
Requirement	Maximum total area in percent of the area of the side.
Measuring rule	Total area on the side. $A = x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

Insect attack



Definition	Bore holes or pinholes in wood caused by insects or insect larvae.
Requirement	Maximum diameter and maximum total damaged area in percent of the area of the side.
Measuring rule	Maximum diameter *b*, total damaged area on the side. $A = x_1 \cdot y_1 + ... + x_n \cdot y_n$.

Features according to table 3

Production related features

- Wane.

Fissures

- Check:
  - Not traversing
  - Traversing (Split)
- End shake.

Warp

- Bow
- Spring
- Twist
- Cup.

Note Fissure

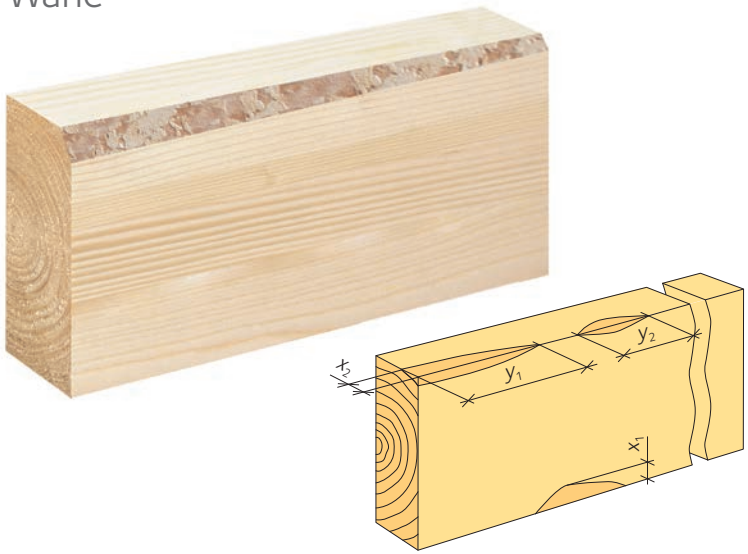
Definition	Opening between the wood cells resulting in longitudinal separation of fibres.

Note Warp

Definition	Distortion of a piece of timber in the process of conversion and/or drying and/or storage.

Production related features

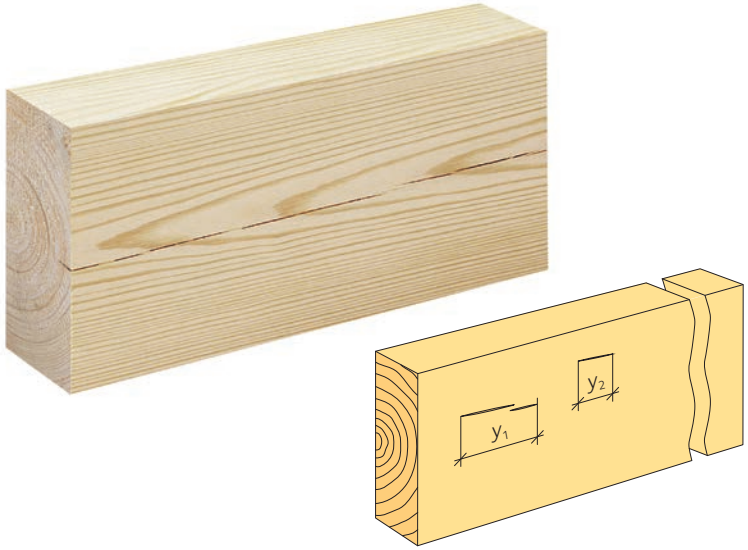
Wane



Definition	Original rounded surface of a log, with or without bark, on an arris in sawn timber. Also surface formed during ring chipping.
Requirement	Maximum total length of wane on each arris in percent of the length of the piece of timber. Maximum width of wane on face and edge respectively in mm.
Measuring rule	Total length on each arris, $y = y_1 + ... + y_n$. Maximum width of wane on face x_1, Maximum width of wane on edge x_2.

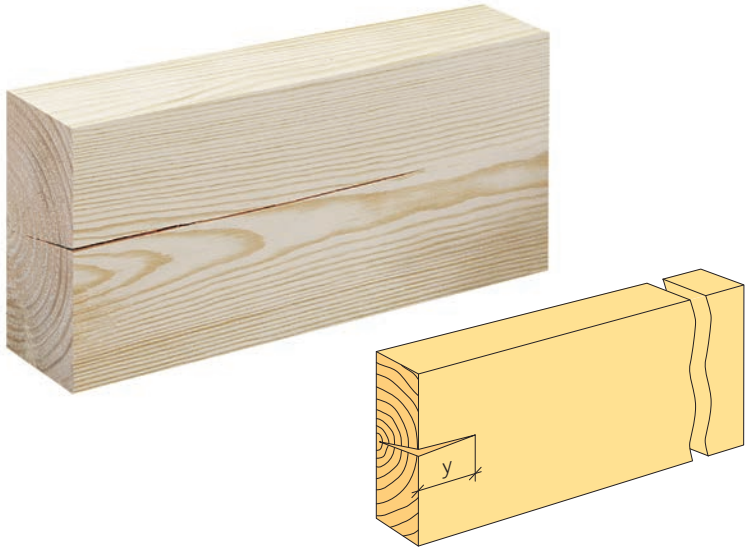
Fissures

Check



Definition	**Not traversing check:** Short, narrow and shallow fissure, only visible on one side of the piece of timber. **Traversing check (Split):** Fissure that extends from one side to another.
Requirement	Maximum total length of checks, *y* in percent of the length of the piece of timber.
Measuring rule	Total length of checks, $y = y_1 + ... + y_n$ measured parallel with the longitudinal axis of the piece of timber.

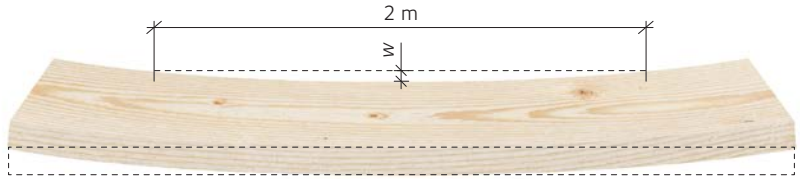
End shake



Definition	Fissure showing on the end surface of the piece of timber. Usually extending through the piece from one side to another and of limited length.
Requirement	Maximum length *y* in percent of the width of the piece of timber.
Measuring rule	Individual fissure length *y* measured parallel with the longitudinal axis of the piece of timber.

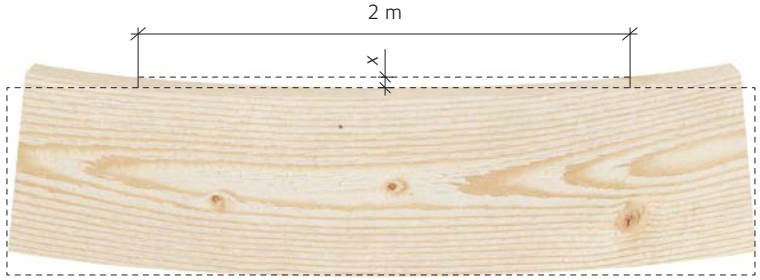
Warp

Bow



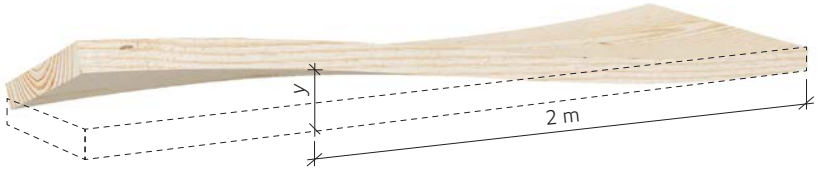
Definition	Lengthwise curvature of a piece of timber at right angles to the face.
Requirement	Maximum deviation, dimension *w*, in mm.
Measuring rule	Largest deviation, dimension *w*, over the worst 2 m length.

Spring



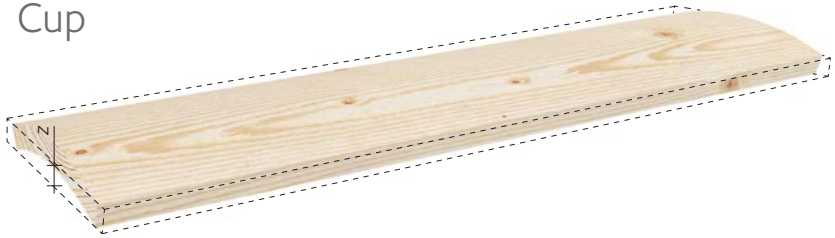
Definition	Lengthwise curvature of a piece of timber at right angles to the edge.
Requirement	Maximum deviation, dimension *x*, in mm.
Measuring rule	Largest deviation, dimension *x*, over the worst 2 m length.

Twist



Definition	Lengthwise spiral distortion of a piece of timber.
Requirement	Maximum deviation, dimension *y*, in percent of the width of the piece of timber.
Measuring rule	Largest deviation, dimension *y*, over the worst 2 m length in relation to the outside face of the piece of timber.

Cup



Definition	Curvature of a piece of timber across the width of the face.
Requirement	Maximum deviation, dimension *z*, in percent of the width of the piece of timber.
Measuring rule	Largest deviation, dimension *z*, over the width of the piece of timber.

Tables

Grading methods

Judgement of features shall be done with regard to the grading method and the location of the feature on the piece of timber.

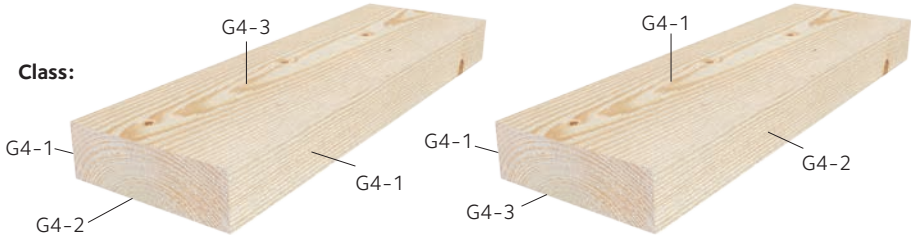
Grading method	Location	Judgement according to tables
G4, 4-sided grading	Faces	All features
	Edges	

G2, 2-sided grading, is seldom used in Sweden.

Determination of grade

Each side is judged separately and assigned its own class. If, when determining the grade of the piece of timber as a whole, one face is of a lower class than any of the other three sides, the grade of the piece is one grade better than this worse face.

Example:



Grade: G4-2 **Grade: G4-2**

General

The rules are applicable to all sawn timber, dried or undried. Only the lower limit for each grade is given. A lot of timber graded according to the rules shall contain a fair distribution of quality.

Table 1 Knots.

		Feature		Class of the side				
2-sided grading	4-sided grading	Maximum permitted on worst meter	2-sided grading [4]	G2-0	G2-1	G2-2	G2-3	G2-4
			4-sided grading	G4-0	G4-1	G4-2	G4-3	G4-4
		Face		Knot size 10 percent of the width + [table value] (mm)				
		Sound intergrown knot		10	20	35	50	[6]
		Partially intergrown knot / Dead knot		0	10	20	50	
		Encased knot		[1]	0	15	40	
		Unsound or loose knot		[1]	[1]	15	40	
				Knot number				
		Total number		2	4	6	[3]	[6]
		Of which encased, unsound and/or loose knots		0	1 [2]	2	5	
		Of which spike and/or splay knots		0	4	6	[3]	
		Edge		Knot size in percent of thickness [5] (%)				
		Sound intergrown knot		50	90	100	100	[6]
		Partially intergrown knot / Dead knot		33	67	75	100	
		Encased knot		[1]	33	50	90	
		Unsound or loose knot		[1]	[1]	50	90	
				Knot number				
		Total number		1	2	4	[3]	[6]
		Of which encased, unsound and/or loose knots		0	1 [2]	2	3	

Maximum permitted knot size on face is 10 percent of the width + [table value] (mm).
Knots of 10 mm or less are not considered unless they are unsound or loose.
Traversing edge knots are permitted in G4-2, G4-3 and G4-4 but if unsound or loose only permitted in G4-4.

Compensation rule for face knots
If the knots are smaller than the maximum permitted knot size a larger number may be permitted but the sum of the sizes of such knots shall not exceed the maximum permitted size multiplied by the maximum permitted number of the largest knots. Only applicable for face knots.

In spruce in widths of 225 mm or wider the maximum permitted knot size on face may be increased by 10 mm. In pine in widths of 180 mm or wider the maximum permitted knot size on face may be increased by 10 mm. The total number of knots on worst meter for widths 225 mm or wider may be increased by 50 percent on both face and edge.

[1] Not permitted.
[2] Applies to encased knots.
[3] Unlimited.
[4] 2-sided grading, G2, is seldom used in Sweden.
[5] The knot size on edge must not be larger than the corresponding maximum permitted knot size on face.
[6] Knot size and knot number unlimited but the piece of timber must hold together.

Table 2 Other features.

Feature		Class of the side				
Maximum permitted	2-sided grading [4]	G2-0	G2-1	G2-2	G2-3	G2-4
	4-sided grading	G4-0	G4-1	G4-2	G4-3	G4-4
Bark pocket						
Number on worst meter		[1]	2	2	4	[3]
Total length (mm)		[1]	100	200	300	[3]
Resin pocket						
Number on worst meter		2	4	4	4	[3]
Total length (mm)		75	100	200	300	[3]
Resin wood						
Percent of the area of the side (%)		[1]	10	30	50	[3]
Reaction wood (Compression wood)						
Percent of the area of the side (%)		[1]	10	30	50	[3]
Strong, abnormal grain structure		[1]	[1]	[5]	[5]	[5]
Soft rot		[1]	[1]	[1]	[1]	[2]
Blue stain and dote						
Deep blue or dote, percent of the area of the side (%)		[1]	[1]	10	50	[3]
Surface blue, percent of the area of the side (%)		[1]	[1]	20	100	[3]
Insect attack, diameter < 2 mm						
Percent of the area of the side (%)		[1]	[1]	[1]	15	[5]
Pith		[1]	[5]	[5]	[5]	[5]

Strong, abnormal grain structure includes slope of grain, curly grain, top rupture and similar features.
Active insect attack is not permitted.
Bark pockets and resin pockets are only considered on face.
No compensation rule for bark pockets and resin pockets.
When features are unlimited in G2-4 and G4-4 the piece of timber must still hold together.

For features that are limited as a percent of the area of the side and there are several affected areas those areas shall be summarized according to:
Affected area = $x_1 \cdot y_1 + \ldots + x_n \cdot y_n$.

The *x*- and *y*-measurements shall be taken as a rectangle enclosing the affected areas respectively.

[1] Not permitted.
[2] Small areas permitted.
[3] Unlimited.
[4] 2-sided grading, G2, is seldom used in Sweden.
[5] Permitted.

Table 3 **Wane, fissures, warp.**

Features		Class of the side				
Maximum permitted	2-sided grading [2]	G2-0	G2-1	G2-2	G2-3	G2-4
	4-sided grading	G4-0	G4-1	G4-2	G4-3	G4-4
Wane						
Width, on face (mm)		3	5	10	20	30
Width, on edge (mm)		3	5	10	20	20
Length, percent of each arris (%)		20	20	30	50	100
Fissures						
End shake, percent of timber width (%)		100	100	150	200	500
Check, percent of timber length (%) for:						
timber thicknesses < 60 mm		10	25	35	75	100
timber thicknesses ≥ 60 mm		10	33	50	90	100
Split, percent of timber length (%)		[1]	[1]	[1]	20	40
Warp						
Bow, mm on 2 m for:						
timber thicknesses < 45 mm		10	10	15	50	50
timber thicknesses ≥ 45 mm		10	10	10	20	50
Spring, mm on 2 m		4	4	4	10	30
Twist, percent of timber width on 2 m (%)		8	8	8	10	20
Cup, percent of timber width (%)		3	3	3	5	5

Wane with bark is not permitted.
Check on edge is judged as split.
Ring shake is judged as split.

[1] Not permitted.
[2] 2-sided grading, G2, is seldom used in Sweden.

Trading qualities – grades

The timber is shown in the cross-sections: 25 × 100, 50 × 150 och 75 × 200 mm

–
Grade A1 – Pine
Grade I – Pine

–
Grade A1 – Spruce
Grade I – Spruce

–
Grade A2 – Pine
Grade II – Pine

–
Grade A2 – Spruce
Grade II – Spruce

European Standard EN 1611-1

According to the standard for appearance grading of softwoods, EN 1611-1, the grading can be based on both the faces and the edges or only on the faces (as regards knots). The grades are called G4 and G2 respectively. The grade name is followed by a figure which details the grade of the timber, 0-4, where 0 is the highest grade. A grade can be G4-2 which denotes 4-sided visual grading of typical building timber, corresponding to grade V according to an older grading rule. An approximate comparison with older grading rules is given in *table 4, page 54*. The grading method G2 is seldom used in Sweden.

Grade G4-0 – Pine
Grade A3 – Pine
Grade III – Pine

Grade G4-0 – Spruce
Grade A3 – Spruce
Grade III – Spruce

Grade G4-1 – Pine
Grade A4 – Pine
Grade IV – Pine

Grade G4-1 – Spruce
Grade A4 – Spruce
Grade IV – Spruce

Older grading rules for trading qualities – grades

Nordic Timber – Grading rules (The "Blue book")
According to the rules in "Nordic Timber — Grading rules" the timber is graded in three grades: A, B and C, where grade A is the highest grade, used for high-class joinery and visible boarding. Grade A can be subdivided into the grades A1-A4. Grade B is commonly used in building, while grade C is used in for example packing.

Grade G4-2 – Pine
Grade B – Pine
Grade V – Pine

Grade G4-2 – Spruce
Grade B – Spruce
Grade V – Spruce

Grade G4-3 – Pine
Grade C – Pine
Grade VI – Pine

Grade G4-3 – Spruce
Grade C – Spruce
Grade VI – Spruce

Guiding principles for grading of Swedish sawn timber (The "Green book")
According to the rules in "Guiding principles for grading of Swedish sawn timber" the timber is graded in six grades, where grade I is the highest grade. Usually the grades I—IV are not separated but sold together under the name U/S, unsorted. Grade V is usually named fifths and grade VI is named sixths.

Table 4 **Timber qualities.** Approximate relations between the different trading qualities – grades.

Grading rules	The grades						
EN 1611-1							
4-sided grading	-	-	G4-0	G4-1	G4-2 [2]	G4-3	G4-4
2-sided grading [1]	-	-	G2-0	G2-1	G2-2	G2-3	G2-4

Older grading rules	The grades						
Nordic timber – Grading rules, 1994 (The "Blue book")	A				B	C	D
	A1	A2	A3	A4			
Guiding principles for grading of Swedish sawn timber, 1976 (The "Green book")	U/S				Fifths	Sixths	Rejects
	I	II	III	IV	V	VI	VII

[1] 2-sided grading, G2, is seldom used in Sweden.
[2] Typical building timber.

References

This book is based on the content of the following standards and reports:

EN 844-1 Round and sawn timber — Terminology — Part 1: General terms common to round timber and sawn timber.

EN 844-3 Round and sawn timber — Terminology — Part 3: General terms relating to sawn timber.

EN 844-4 Round and sawn timber — Terminology — Part 4: Terms relating to moisture content.

EN 844-6 Round and sawn timber — Terminology — Part 6: Terms relating to dimensions of sawn timber.

EN 844-7 Round and sawn timber — Terminology — Part 7: Terms relating to anatomical structure of timber.

EN 844-9 Round and sawn timber — Terminology — Part 9: Terms relating to features of sawn timber.

EN 844-10 Round and sawn timber — Terminology — Part 10: Terms relating to stain and fungal attack.

EN 844-11 Round and sawn timber — Terminology — Part 11: Terms relating to degrade by insects.

EN 844-12 Round and sawn timber — Terminology — Part 12: Additional terms and general index.

EN 1313-1:2010 Round and sawn timber — Permitted deviations and preferred sizes — Part 1: Softwood sawn timber.

EN 1611-1:1999 Sawn timber — Appearance grading of softwoods — Part 1: European spruces, firs, pines and Douglas firs.

EN 1611-1:1999/A1:2002 Sawn timber — Appearance grading of softwoods — Part 1: European spruces, firs, pines, Douglas fir and larches.

Defining quality — A guide to the specification of softwood (ISBN 91-88170-31-4).

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