



Norwegian Strength Grading Inspection Scheme
Product data sheet for structural timber

Valid for strength graded timber of spruce (*Picea abies*) and pine (*Pinus sylvestris*) for structural purposes, graded according to NS-INSTA 142 or NS-EN 519 and controlled by Norwegian Strength Grading Inspection Scheme. The timber has the control scheme's mark and also the relevant strength class according to NS-EN 338, in addition to the NS-mark for the producers that have certifying licence. The dimension tolerances are given in NS-EN 336.

Normal moisture content	14 - 20 %	Water content divided by dry weight
Heat conductivity (λ)	0,12 W/m*K	Practical λ across the fibres.

Mechanical properties
 (characteristic values according to NS-EN 338)

Grades (NS-INSTA 142)	Strength classes (NS-EN 519)	Bending strength ($f_{m,k}$) [N/mm ²]	Modulus of elasticity ($E_{0,mean}$) [kN/mm ²]	Density (ρ_k) [kg/m ³]
T0	C14	14	7	290
T1	C18	18	9	320
T2	C24	24	11	350
T3	C30	30	12	380

Exterior environment

Production

The production of timber is based on the renewable source timber. Through silviculture, harvest and transport to the sawmill, and the internal transport at the sawmill and distribution of products, fossil fuel is consumed, while the major part of the energy consumption at a sawmill is made up by thermal energy to dry the timber. This energy is usually produced by in-house heating plants based on self produced bio fuel. The consumption of electricity is dominated by energy to the fans in the drying kilns and machinery and equipment for sawing- and planing machines.


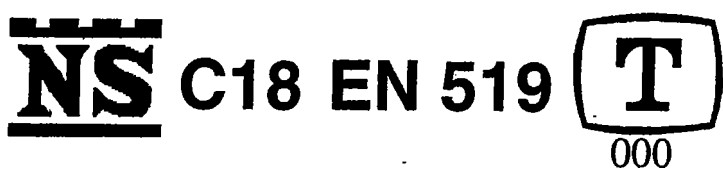


Resources used in a sawmill are i.a. timber, fuel oil, diesel, lubrication oil, hydraulic oil, marking paint, and packaging. By-products from the timber production are bark, chemical pulp chips, sawdust, shavings, stubs and rejects. This is mainly used by the timber and wood processing industry and by the plants themselves for thermal energy production. Normally less than 1 % waste bark is deposited.

Consumption and disposal

Timber in buildings has a very long lifetime if it is protected against moisture and other decomposing factors. Demolishing can usually be done in an effective way, and in principle timber can always be re-used or recycled as material or energy. Timber has an effective heat value of abt. 16 MJ/kg at 20 % moisture content. Used timber is considered a resource.

Interior environment

There is no knowledge of clean and dry wood having allergy-causing effects in an interior environment. Emission from pine and spruce is usually dominated by mono terpenes ("wood scent"). The most usual being alpha- and beta-pinen, 3-karen, limonen and terpinolen. Wood must not be built into moist surrounding materials due to the risk for mould and rot.

Marking	
Illustration of marking of structural timber visually graded according to NS-INSTA 142:	
	
Illustration of marking of structural timber machine graded according to NS-EN 519:	
	
	Shows that the relevant producer has certifying licence.
T1	Indicates grading class according to NS-INSTA 142
C18	Indicates strength class according to NS-EN 338
	Indicates the producer's plant number in the Norwegian Strength Grading Inspection Scheme.
Reference	
Mall för byggvarudeklaration av "Sågade och hyvlade trävaror". Trätekt/Träinformation, 1997	
NS-INSTA 142 – Nordic visual strength grading rules for timber.	
NS-EN 519 – Structural timber – grading requirements for machine strength graded timber and grading machines.	
NS-EN 336 – Structural timber – coniferous and poplar – sizes, permissible deviations.	
NS-EN 338 – Structural timber – strength classes.	
The product data sheet is prepared by Norwegian Strength Grading Inspection Scheme (NTI) which is the scheme's secretariat.	
P.O.box 113 Blindern, 0314 Oslo Tel.: (+47) 22 96 55 00 Fax (+47) 22 60 42 91 E-mail: firmapost@troteknisk.no	