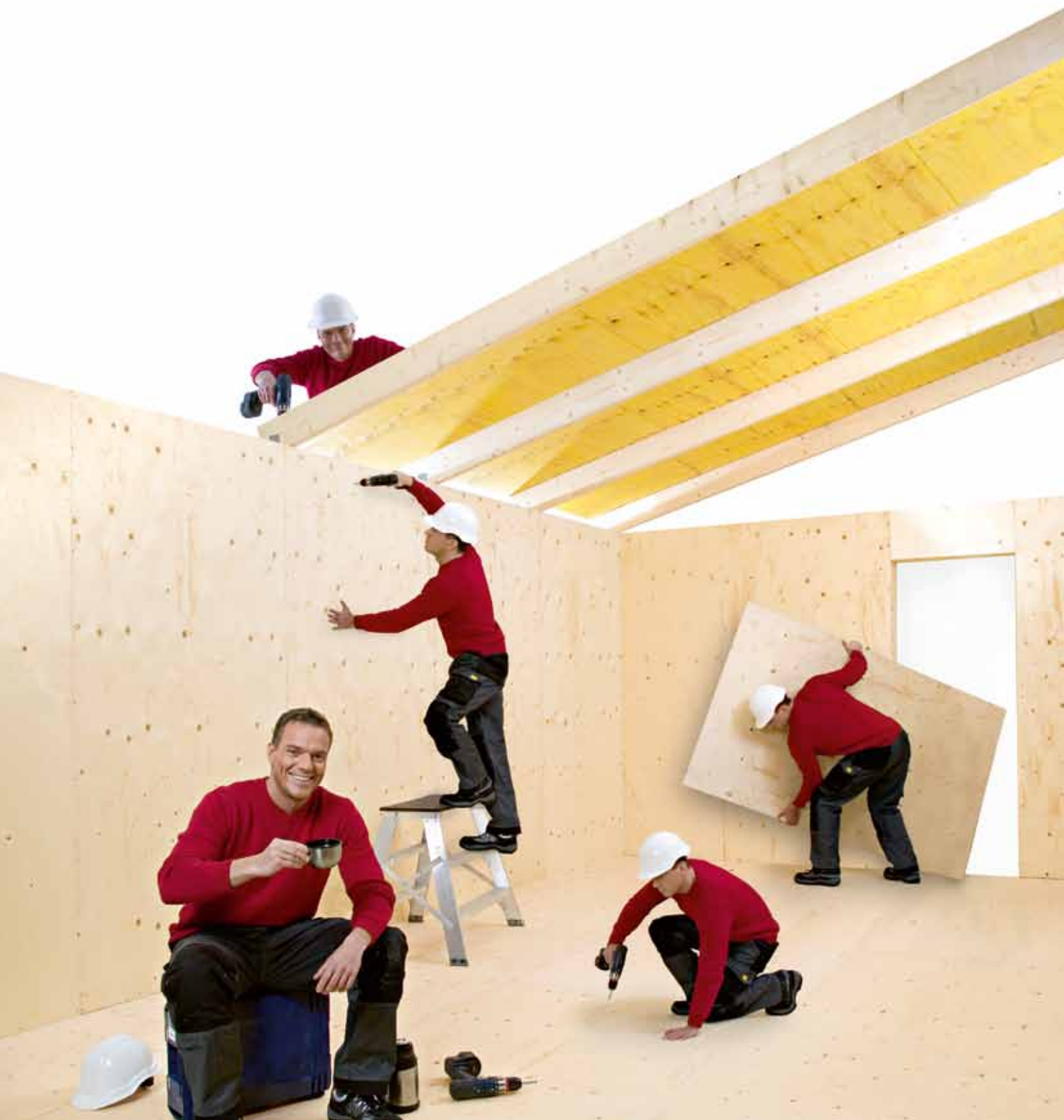
The Biofore Company UPM

WISA®-Spruce Multitalented Plywood



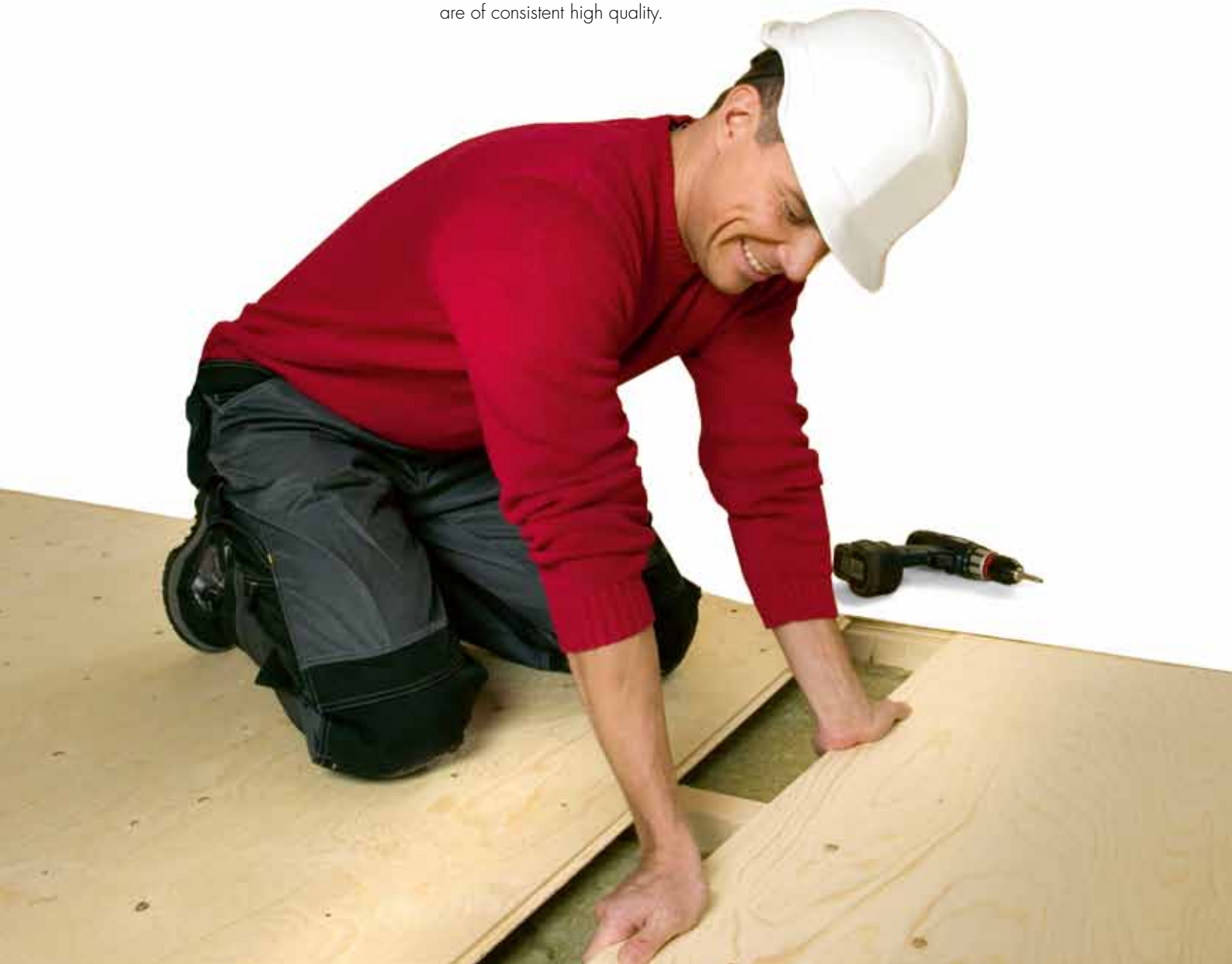
Structural uses and beyond.

Nordic slow growth spruce gives WISA-Spruce its superb combination of high performance characteristics in strength, weight, stability and aesthetical appeal.

WISA-Spruce is a lightweight and economical multi-purpose plywood that is quick and easy to install. It has well known and documented technical characteristics and a well balanced construction. WISA-Spruce is an ideal panel for structural uses and load-bearing applications such as roofing, flooring and wall sheathing.

Smooth sanded faces and attractive aesthetic appeal make WISA-Spruce an excellent panel for joinery, furniture, packaging and vehicle applications.

Consistent high quality.
A carefully managed supply chain of raw materials, modern production lines and over one hundred years of expertise in the manufacture of plywood guarantee that WISA products are of consistent high quality.



WISA-Spruce is a strong multi-purpose plywood that is easy to install.

Some examples of the end-uses

- floors
- walls
- roofs
- soffits
- packaging
- temporary buildings
- vehicles
- joinery
- furniture

Carbon footprint
WISA-Spruce structural plywood used in building elements for floors, walls and roofs obtain A and A+ ratings as detailed in the BRE 'Green Guide to Specification'. These help the builder to achieve the relevant code levels as required in the Code for Sustainable Homes. The Environmental profiles of WISA-Spruce are listed on the BRE website greenbooklive.com or are available from UPM.

Building a better environment.
Environmental protection and management are an integral part of UPM's activities. The group takes responsibility for observing the principles of sustainable development, as well as for continuous improvement of its environmental performance. In its choice of raw materials, sources of energy and production processes, as well as in product development, an important objective is to minimize the impact on nature and the environment.

UPM ensures that it is practicing sustainable forestry by implementing policies and tools that have the economic, environmental and social management of forests as their focus. One of those tools is chain of custody. UPM's chain of custody provides customers and other stakeholders independent third party verification that UPM knows the origin of wood and that the wood fibre used in its products is sustainable, legal and not from protected forest areas.

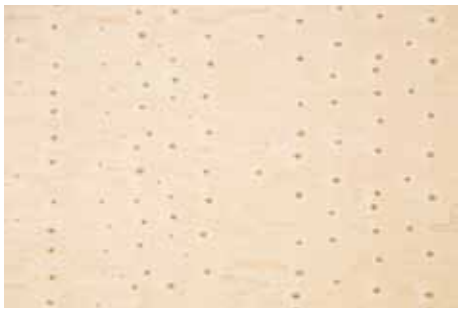
We keep our promises.
Paying attention to our customers' needs in products and services is the cornerstone of our business. To ensure that WISA products always meet the needs of the customer our work incorporates continuous testing, improvements and modifications. We provide solutions to help you achieve your goals.

PEFC (= Programme for the Endorsement of Forest Certification Schemes) World's largest forest certification system which shows that product has been manufactured from wood raw material sourced from sustainably managed forests.

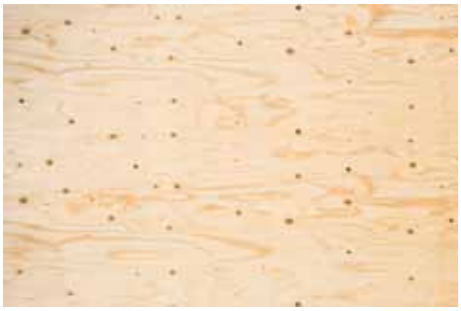
CE (= Conformite Europeenne/European Conformity) Shows that product complies with all the necessary legal requirements in Europe. Marking on the panel:
CE 0809-CPD-0252 UPM 11 EN 13986
EN 636-2 S E1.

Technical information

Surface: Face qualities according to EN 635 - 3:1995
WISA-Spruce is fully sanded 2 sides.



II = Some small open defects allowed



III = Open defects more generally allowed

Machinings: By request edge machinings tongue and groove and half lap.

Nominal thicknesses: Standard nominal thicknesses 9,0 - 27,0 mm
- Veneer thicknesses 2,6 & 3,2 mm

Sizes (mm): Standard sizes 2400 x 1200, 2440 x 1220, 2500 x 1250

Bonding: Weather resistant glueing (EN 314-2 class 3 exterior).
Fulfils the EN 1084/class A (=E1) requirement for formaldehyde.

Product type (EN 636) - plywood for use in humid conditions (EN 636-2)
- service class 2 (EN 1995-1-1)
- biological hazard class 2 (EN 335-3)
- fire class D-s2, d0 (EN 13501)

Nominal thickness mm	Min. number of plies	Min. thickness mm	Max. thickness mm	Pcs/ pallet	Average weight kg/m² (460 kg/m³)
9	3	8.8	9.5	110	4.1
12	5	11.5	12.5	80	5.5
15	5	14.3	15.3	65	6.9
18	7	17.1	18.1	55	8.3
21	7	20.0	20.9	45	9.7
24	9	22.9	23.7	40	11.0
27	9	25.2	26.8	35	12.4

WISA-Spruce strength properties

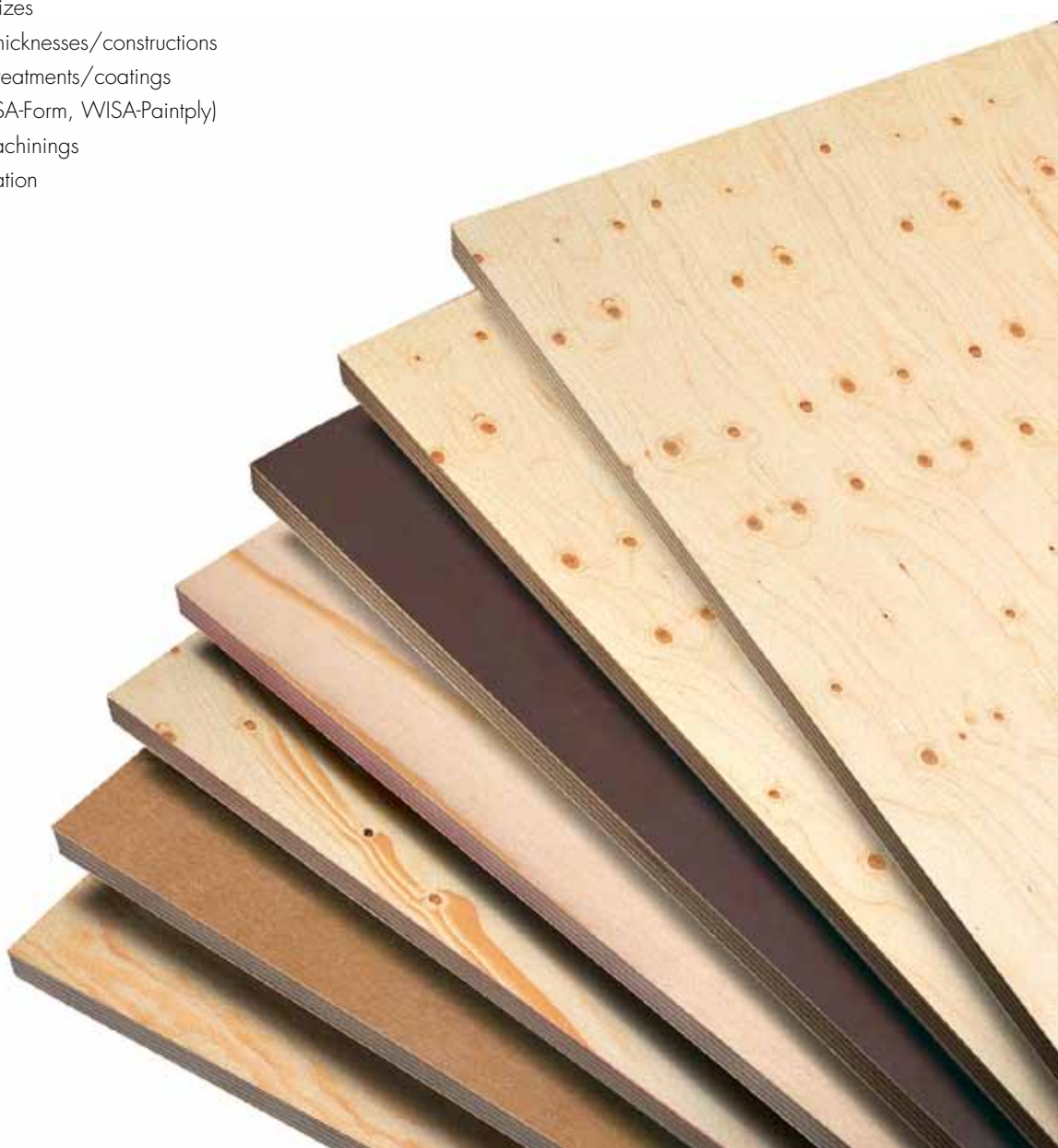
		Section properties				Characteristic strength						Mean modulus of elasticity			
						Bending		Compression		Tension		Bending		Tension and compression	
Nominal thickness	Number of plies	Mean thickness mm	A mm^2/mm	W mm^3/mm	I mm^4/mm	fm|| N/mm^2	fm_|_ N/mm^2	fc|| N/mm^2	fc_|_ N/mm^2	ft|| N/mm^2	ft_|_ N/mm^2	Em|| N/mm^2	Em_|_ N/mm^2	Et,c || N/mm^2	Et,c_|_ N/mm^2
9	3	9.0	9.0	13.5	60.8	28.7	3.8	19.3	10.7	11.6	6.4	11 461	539	7733	4267
12	5	12.4	12.4	25.6	159	22.8	11.4	17.4	12.6	10.5	7.5	9123	2876	6968	5032
15	5	15.4	15.4	39.5	304	23.0	11.2	17.5	12.5	10.5	7.5	9201	2799	7013	4987
18	7	17.6	17.6	51.6	454	20.4	13.0	16.7	13.3	10.0	8.0	8170	3830	6682	5318
21	7	20.6	20.6	70.7	728	18.9	14.3	16.0	14.0	9.6	8.4	7547	4453	6408	5592
24	9	24.0	22.8	86.6	988	19.4	13.1	17.0	13.0	10.2	7.8	7751	4249	6800	5200
27	9	26.4	26.4	116	1533	19.3	13.8	15.5	14.5	9.3	8.7	7702	4298	6182	5818

Structural properties WISA-Spruce is intended for use as a structural panel within the context of the UK Building Regulations. The structural properties of WISA-Spruce are listed in BS 5268-2:2002 (table 51).

Disposal Can be burnt (in compliance with local regulations).

By request

- special sizes
- special thicknesses/constructions
- surface treatments/coatings (e.g. WISA-Form, WISA-Paintply)
- CNC machinings
- impregnation



UPM – The Biofore Company

UPM leads the integration of bio and forest industries into a new, sustainable and innovation-driven future.

UPM

www.upm.com

www.wisaplywood.com