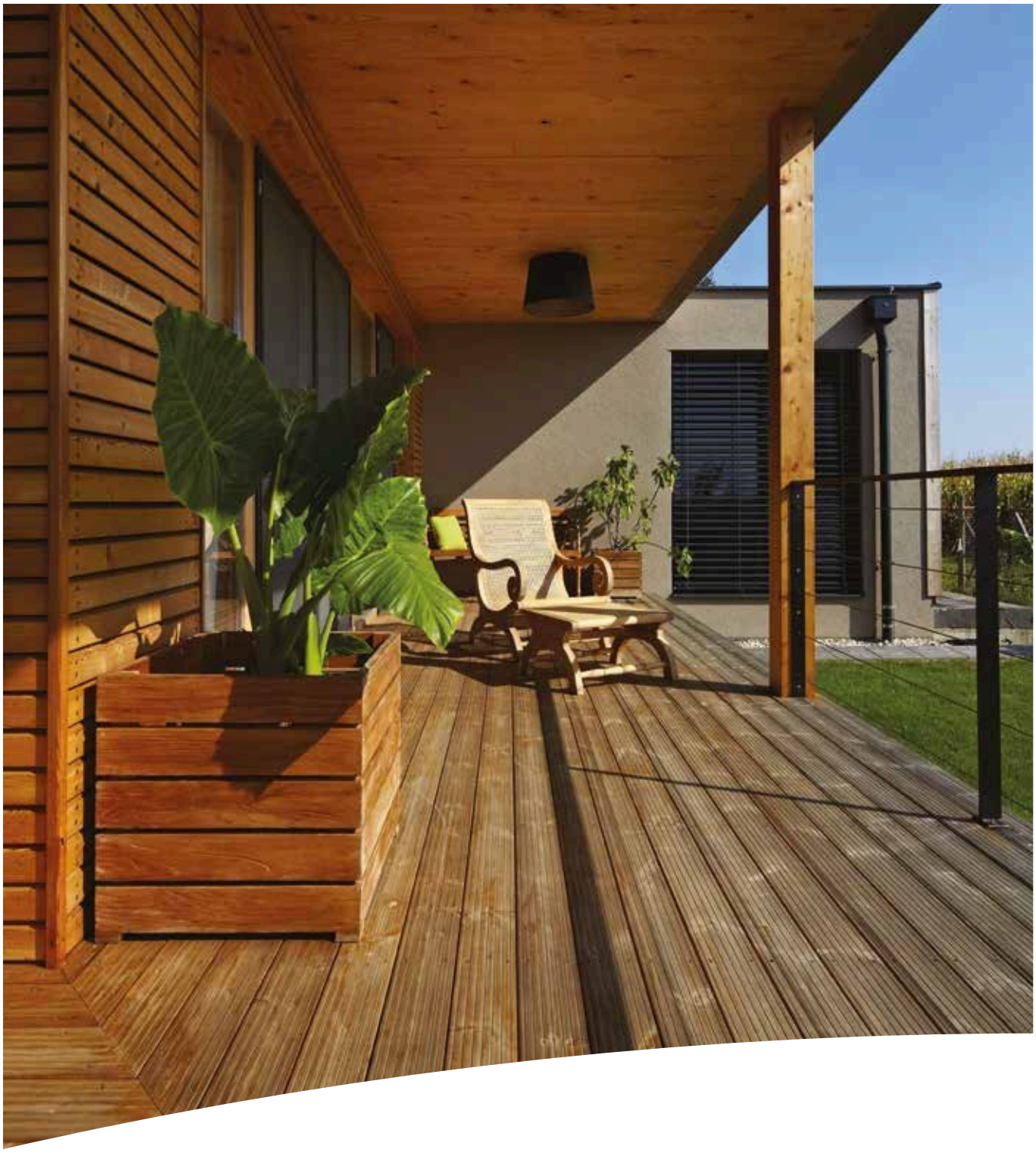


ThermoWood® by Stora Enso

The environmentally friendly choice

Stora Enso
Do good for the people and the planet

Stora Enso is a leading provider of renewable solutions in packaging, biomaterials, wooden constructions and paper on global markets. Our aim is to replace fossil based materials by innovating and developing new products and services based on wood and other renewable materials. We employ some 26 000 employees in more than 35 countries, and our sales in 2015 were EUR 10.0 billion. Stora Enso shares are listed on the Helsinki and Stockholm stock exchanges.

Wood Products division provides versatile wood-based solutions for building and housing. Our product range covers all areas of urban construction including massive wood elements and housing modules, wood components and pellets. We also offer a variety of sawn timber goods. Our customers are mainly construction and joinery companies, merchandisers and retailers. Wood Products operates globally and has more than 20 production units in Europe.

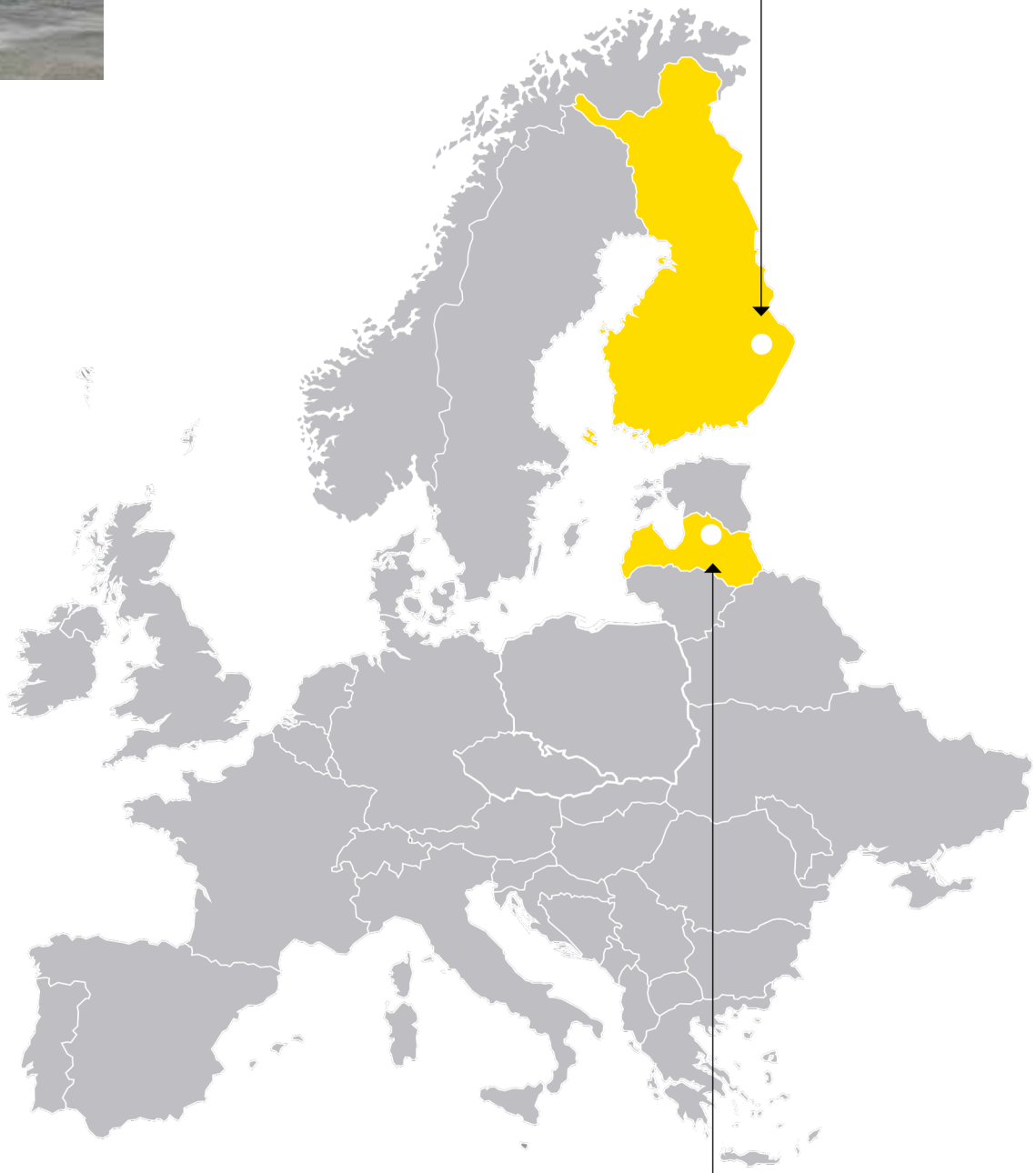
Rethink – is our change engine, serving as a promise that we shall rethink the old and expand to the new in all that we do.

Our Values – Lead and Do what's right – are the lights for our journey, anywhere we operate. Our values must be aligned with the local laws and rules, but also take us beyond local practices to bring the people and communities forward.

Our Purpose – Do good for the people and the planet – is why we do all this. Why we set a strategy and then execute it, including but not limited to the financial, market and other metrics. How we want to change the world, the communities and lives of all people who come in contact with us, be it through our products, our operations or our sup- ply chain. Change for better.

Uimaharju Unit

The Uimaharju unit is producing ThermoWood by Stora Enso since 2010 with an annual capacity of approximately 20,000 m³. In addition to ThermoWood the main products are sawn goods for the building industry. The Uimaharju unit is also producing other innovative wood products that enable sustainable and long lasting outdoor structures.



Launkalne Unit

The Launkalne unit in Latvia started the production of ThermoWood by Stora Enso in 2014. The annu- al capacity of the new production is approximate- ly 10,000 m³ of ThermoWood. In addition to the ThermoWood production Launkalne's main prod- ucts are sawn goods for various end-uses and com- ponents for furniture producers. In total the annual production capacity of the unit is approximately 200,000 m³ of wood products.

Natural, durable and attractive: ThermoWood

The importance of wood in construction is constantly increasing. Growing social awareness of resource conservation and new technical developments are bringing mankind's oldest building material back into the spotlight.

Certification for quality and environment

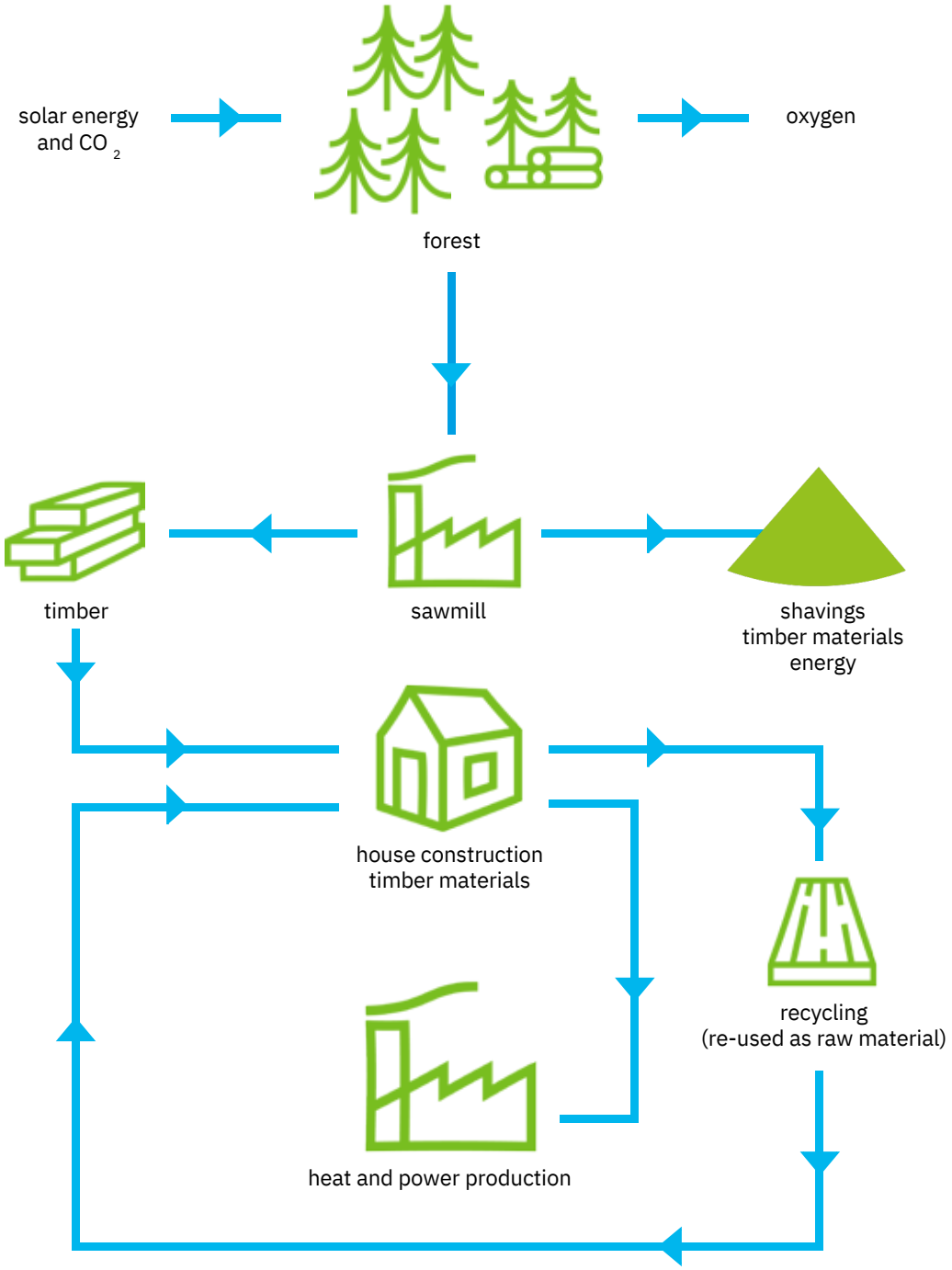
PEFC™
PEFC/02-32-32
Promoting Sustainable Forest Management
www.pefc.org

FSC
www.fsc.org
FSC® C125195
The mark of responsible forestry

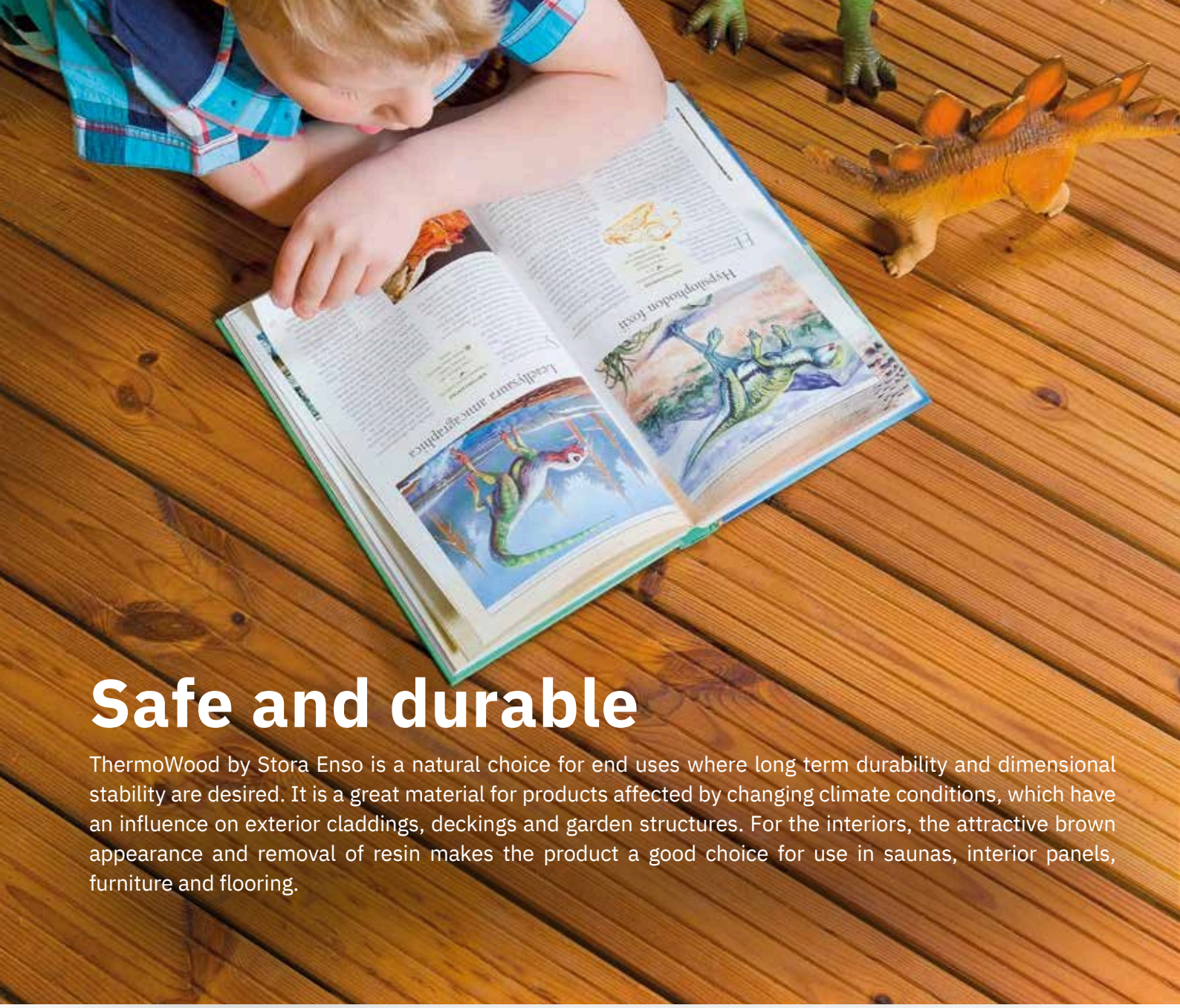
Wood is our most important raw material. We use wood from sustainably managed forests and promote sustainable forestry practices. The wood supply chains for ThermoWood by Stora Enso production are covered by a wood traceability system, which is thirdparty certified according to both PEFCTM and FSC® forest certification systems. We believe in a sustainable and energyefficient construction method for the public and private sectors.

ThermoWood® is a registered trademark owned by the International ThermoWood Association. Stora Enso Wood Products Division is a member of the International ThermoWood Association. The production of ThermoWood works under strict quality management systems. The quality control system and requirements are set by the ThermoWood Association which sets the general standards for ThermoWood by Stora Enso classes S and D. Since Stora Enso Wood Products Division aims to be the leading supplier of high quality ThermoWood products we have added further requirements for each specific end use.

Natural cycle: wood can be used again and again



Wood is an excellent reusable material. Timber products can be recycled or used as energy.



Safe and durable

ThermoWood by Stora Enso is a natural choice for end uses where long term durability and dimensional stability are desired. It is a great material for products affected by changing climate conditions, which have an influence on exterior claddings, deckings and garden structures. For the interiors, the attractive brown appearance and removal of resin makes the product a good choice for use in saunas, interior panels, furniture and flooring.

Product applications

ThermoClad is a perfect material for usage as exterior and interior claddings and panels. The high level of durability and stability ensures that there is very little dimensional movement in the product once it has been fixed to the wall. As a result of the reduced movement, surface coatings applied after installation will have a far better service life. In addition, the resins are removed during the process thus removing the problem of resin leakage from knots and pockets.

ThermoDeck is a standard range of grooved decking boards. ThermoWood by Stora Enso provides a safe material with superior durability and stability. The material is the perfect solution for a warm, attractive deck to spend time and enjoy the delights of your garden.

ThermoSauna products bring an attractive alterna- tive material to your sauna or spa. Relax and enjoy the comfort, which is achieved because of the reduced thermal conductivity and resin-freeness.

Oil treatment: ThermoClad and ThermoDeck products can also be provided with an additional oil finish — a new wood treatment method developed by Stora Enso. The oil treatment further improves the wood properties such as weather resistance, colour stability and water repellency.

Other End Uses: ThermoWood can be used in many other end uses such as windows, doors, garden structures, cabins, car ports, and even in large civil engineering projects like motorway sound barriers. Contact us for more information: www.storaenso.com/woodproducts

Material properties

Ecological & safe: ThermoWood is produced using high temperature and steam. Since no chemicals are added during the process ThermoWood contains only renewable substances. Disposal of off-cuts can be burned or given into the normal waste system. The product is safe for surroundings with kids.

Appearance: During the thermal treatment process wood takes on an attractive hardwood-like brown colour consistent through the entire section of each timber piece. Higher temperatures produce a darker shade. If the product's appearance and colour is to be maintained, it should be surface treated. Covering is also recom- mended to lengthen the service life by slowing down the natural weathering effect. Unprotected, non-toxic, wood will change color and turn to grey. Mould will start in any non-toxic enviroment but will not lead to decay.

Dimensional stability: The thermal treatment process greatly reduces wood's tendencies to warp, swell or shrink in different humidity conditions. The wood's equilibrium moisture balance may be decreased to less than 40–50% compared to untreated timber. ThermoWood by Stora Enso maintains its dimensional stability when exposed to variances of humidity.

Durable and resistant to natural rot: The thermal modification of wood significantly improves its resistance to rot and fungal decay. The process ensures that all the material is treated and not just the surfaces. ThermoWood by Stora Enso is not resistant to termites but is resistant to long horn beetles.

Thermal properties: The tests have shown that the thermal conductivity of ThermoWood is considerably lower compared to untreated wood, thus giving improved insulation performance.

Material properties: The material properties of the finished product are influenced by wood selection and pre-treatment procedures, as well as wood species and treatment level used. ThermoWood is available in spruce or pine.

ThermoWood by Stora Enso product	Dimensional stability acc. to EN 1910	Equilibrium Moisture Content at 65% RH*	at 95% RH*	Durability according to EN 113
ThermoClad – Spruce	excellent	5–6%	11–12%	durable (2)**
ThermoClad – Pine	good	5–6%	11–12%	durable (2)**
ThermoDeck – Spruce	excellent	5–6%	11–12%	durable (2)**
ThermoDeck – Pine	good	6–7%	12–13%	durable (2)**
ThermoSauna – Spruce	very good	6–7%	13–14%	moderately (3)
ThermoSauna – Pine	good	7–8%	14–16%	moderately (3)

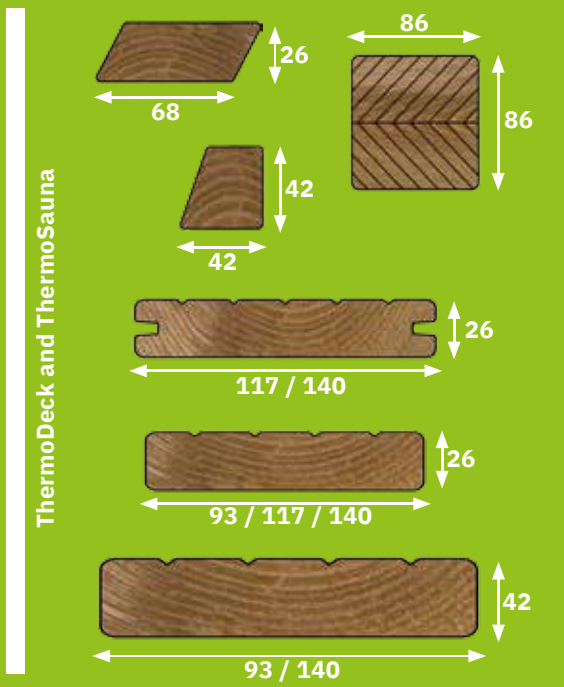
General service situations and use classes given in EN 335-1:
1) Above ground, covered (dry)
2) Above ground, covered (risk of wetting)
3) Above ground, not covered

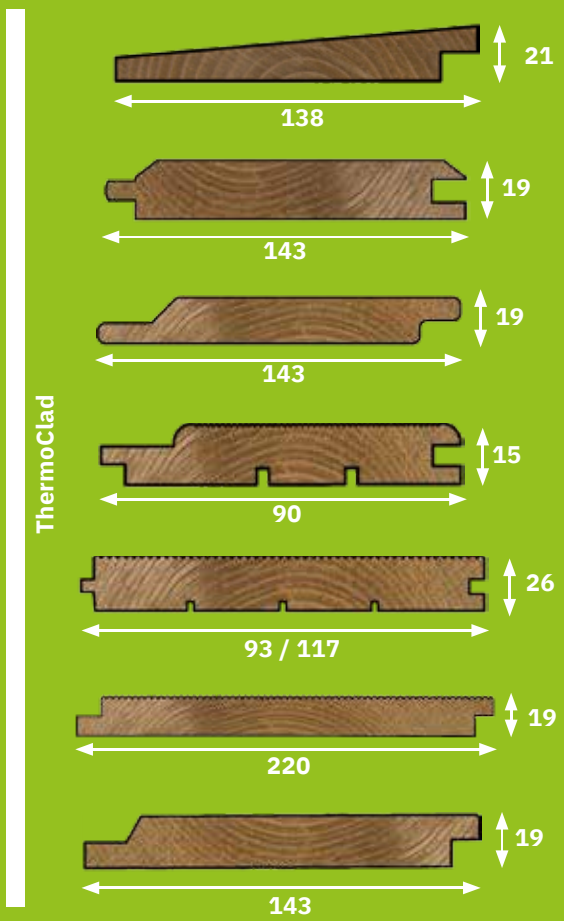
* Relative humidity

** ThermoWood by Stora Enso is not intended to be used in direct ground contact. If it is used in direct contact with the ground or under constantly wet conditions then the risk of fungal attack is higher and the durability would be classed as 2–3.

The strength of wood reduces during the heat treatment process at the same time as brittleness increases. As the strength reduction is greatly influenced by knots, we recommend contacting our sales organisation regarding choice of wood quality for ThermoWood. The stiffness of wood is generally only affected to a minor extent. Brinell hardness is generally slightly higher or unaffected as compared to untreated wood.

Here are examples of the ready planed products. We manufacture also non-standard products according to your needs.





If you want to plane the material yourself, it has similar working properties as wood species such as Western Red Cedar and some hardwoods. It is essential that tools are sharp for sawing and planing.

Stora Enso
Division Wood Products
Kanavaranta 1, PO Box 309
FI-00101 Helsinki
www.storaenso.com

Production:
Uimaharju Unit, PO Box 1, FI-81281 Uimaharju
Launkalne unit, “Krogzemji”, Launkalne Parish,
Smiltene County, 4718 Latvia

THE RENEWABLE MATERIALS COMPANY

Thermowood by Stora Enso

Fact sheet

Dimensions

(See next page)

Thermowood out of pine and spruce is available as standard: 25 x100 / x125 / x150 32 x100 / x125 / x150 50 x100 / x125 / x150

Planed sizes are often 19, 26, 42 mm thick and 92, 117 and 140 mm wide. Other sizes available on request.

Ecological & safe

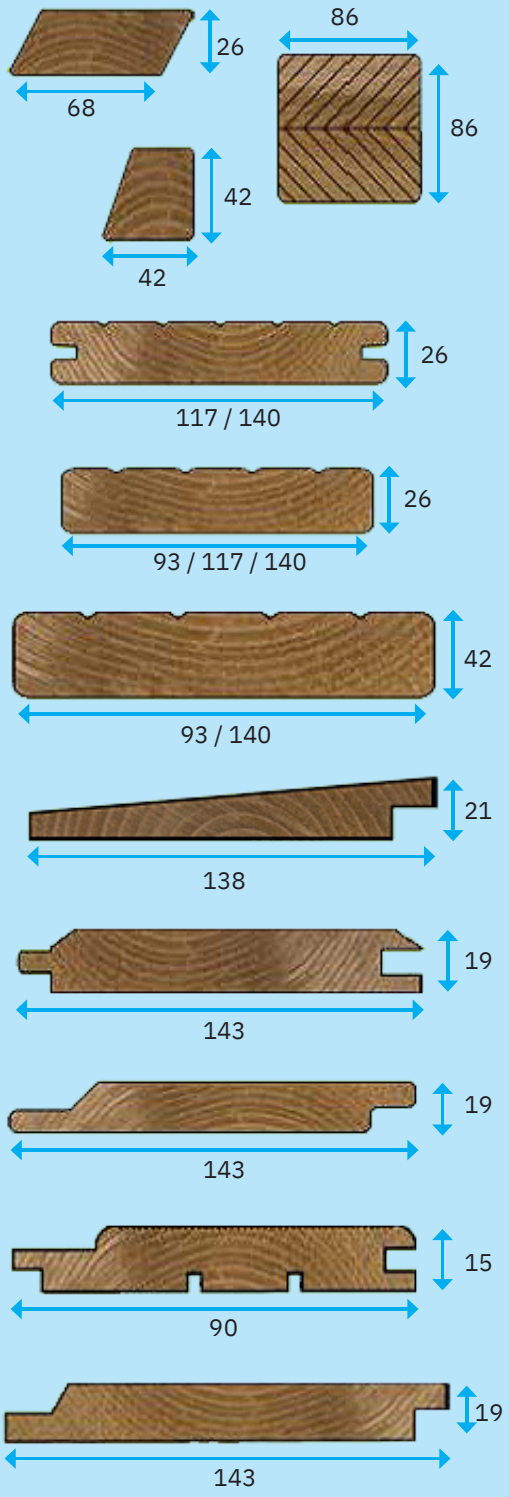
ThermoWood is produced using high temperature and steam. Since no chemicals are added during the process ThermoWood contains only renewable substances. Disposal of off-cuts can be burned or given into the normal waste system.

Heat treatment classes

Stora Enso is producing two standard thermal modification classes:
Thermo-D: The wood is thermally modified at 212°C. Because of this modification the durability and stability is improved and products are suitable for external applications. The wood has a dark brown tone.
Thermo-S: The wood is thermally modified at 190°C. This treatment improves the stability compared to untreated wood. Those products have a light brown color and are suitable for internal applications.

Certification for qualiy and environment

Examples of ready planed products



Use Class
Stora Enso ThermoWood with Thermo-D treatment is suitable for use class 3 (EN 335). Use class 3 is defined as “Situation in which the wood- based product is above ground and exposed to the weather (particularly rain”.

Therefore ThermoWood is suitable for external applications like facades and decking but is not recommended for use in direct ground contact.

Durable and resistant to natural rot
The thermal modification of wood (Thermo-D) significantly improves its resistance to rot and fungal decay. The process ensures that all the material is treated and not just the surfaces.

Thermo-D is falling into durability class 2 (EN 350). Without additional treatments ThermoWood by Stora Enso is not resistant to termites.

Dimensional stability:
The thermal treatment process greatly reduces wood’s tendencies to warp, swell or shrink in different humidity conditions. The wood’s equilibrium moisture balance may be decreased to less than 40–50 % compared to untreated timber.

Thermal properties
Tests have shown that the thermal conductivity of ThermoWood is reduced by 20–25 % compared with normal kiln dried softwoods.

Appearance and weathering
ThermoWood cladding without any surface coating will start to grey and weather in quite a short period of time, as can be expected with all natural wood products which are exposed to the weather effects (ultra violet radiation and rain). Regular maintenance is recommended to maintain original appearance and prevent small surface cracks.

Fire resistance When testing ThermoWood in accordance with the SBI (single burning item) test, the results found that it can reach fire class D. As with typical cladding materials such as Western Red Cedar or Larch it is possible to treat ThermoWood with commercially available fire retardant to obtain a higher fire rating.

Leaching
As no substances are added during the ThermoWood process, no chemical leaching will occur. In addition as the resin is removed during the process, the problem of resin leakage through the knots or pitch pockets is removed.