

# WHITEPAPER



## MAN'S LOVE AFFAIR

## WITH SOLID WOOD

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## A special raw material given to us by nature itself

Solid wood is one of the most special raw materials that nature has to offer and has been a source of inspiration for art and architecture for thousands of years; due to its shape and colour, its strength, its flexibility and warmth. When you choose wood, you are choosing flexibility, unlimited supply, ease of use and you are helping the environment. With the focus now more and more on sustainable building, wood is now the emerging material. Solid wood is increasingly used in buildings, not least because the certification of sustainable wood is now much better.

The central question in this white paper is:

*What makes our relationship and experience with wood so strong?* A practical connection that has existed since the dawn of humanity.



An old Chinese proverb says:

*“If you are sick, go to a doctor, if there is nothing more he can do for you, then go and live in a wooden house.”*

*“What makes our relationship and experience with wood so strong?”*

Wood is a healthy material and it protects itself naturally. It has been proven that it contains polyphenols of plant origin, with the result that it does not decay. Wood is also an excellent heat and moisture regulator. It lives, breathes and regulates the humidity of the environment. To get an answer to the question “what makes our relationship and experience with wood so strong?”, we start with the definition of experience and an analysis of the product wood and from there we will get to know the unique properties of this product.

Experience is the way someone experiences or interprets something. Man is central to this; what he sees, feels, smells and hears has an impact on his well-being. To really get the experience of a room, it is important to know what ingredients are needed. The most important ingredient is identity. People, who can identify with the room they are in, feel good. The more people using the room, the more difficult this is.

## Wood is fully organic

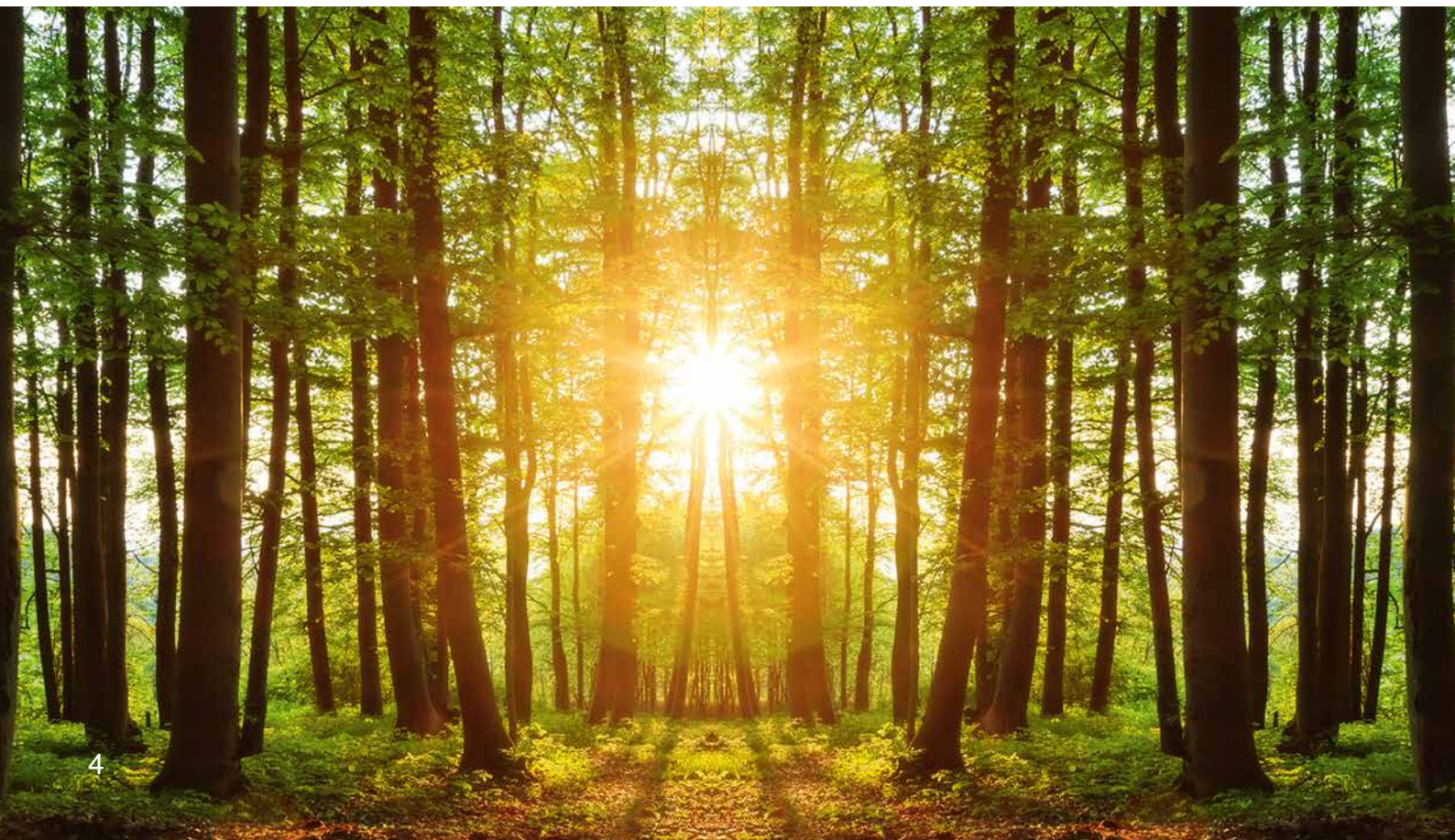
Wood is a natural material, created by trees using water, carbon dioxide (CO<sub>2</sub>) and energy from the sun. Wood consists of the composition of atoms with around 50% of carbon, 42% oxygen, 6% hydrogen, 1% nitrogen and 1% other elements. These organic main components take the form of cellulose (50%) and lignin (20%). Each type of wood has its own characteristics (colour, smell, properties), which are influenced by the age of the wood and the environment in which the tree has grown.

## Infinite source of raw materials

Did you know that the name Holland actually came from the word Holtland (wood land)? Our ancestors were surrounded by forests and wood. They did everything with it but they were also aware of the fact that you must not take wood out of the forest faster than it grows. Cutting down a few trees is not a problem, but razing the whole forest to the ground means the end of the growth cycle. Forest management is therefore extremely important in terms of trees, animals, plants and humans.

Wood is a natural product that is always and forever available with sustainable forest management, just like grain and corn. It grows in a relatively short time frame, whereas raw materials like petroleum and ore take ages to develop and building materials like concrete, steel, aluminium and plastic come from a finite resource.

Each country has set the management of its forests in a Forestry Code. Wood that is produced in accordance with this law is called legal timber. Various environmental organisations have formulated guidelines and created quality marks to check and monitor forest management in any given forest. The best known of these are FSC® and PEFC.

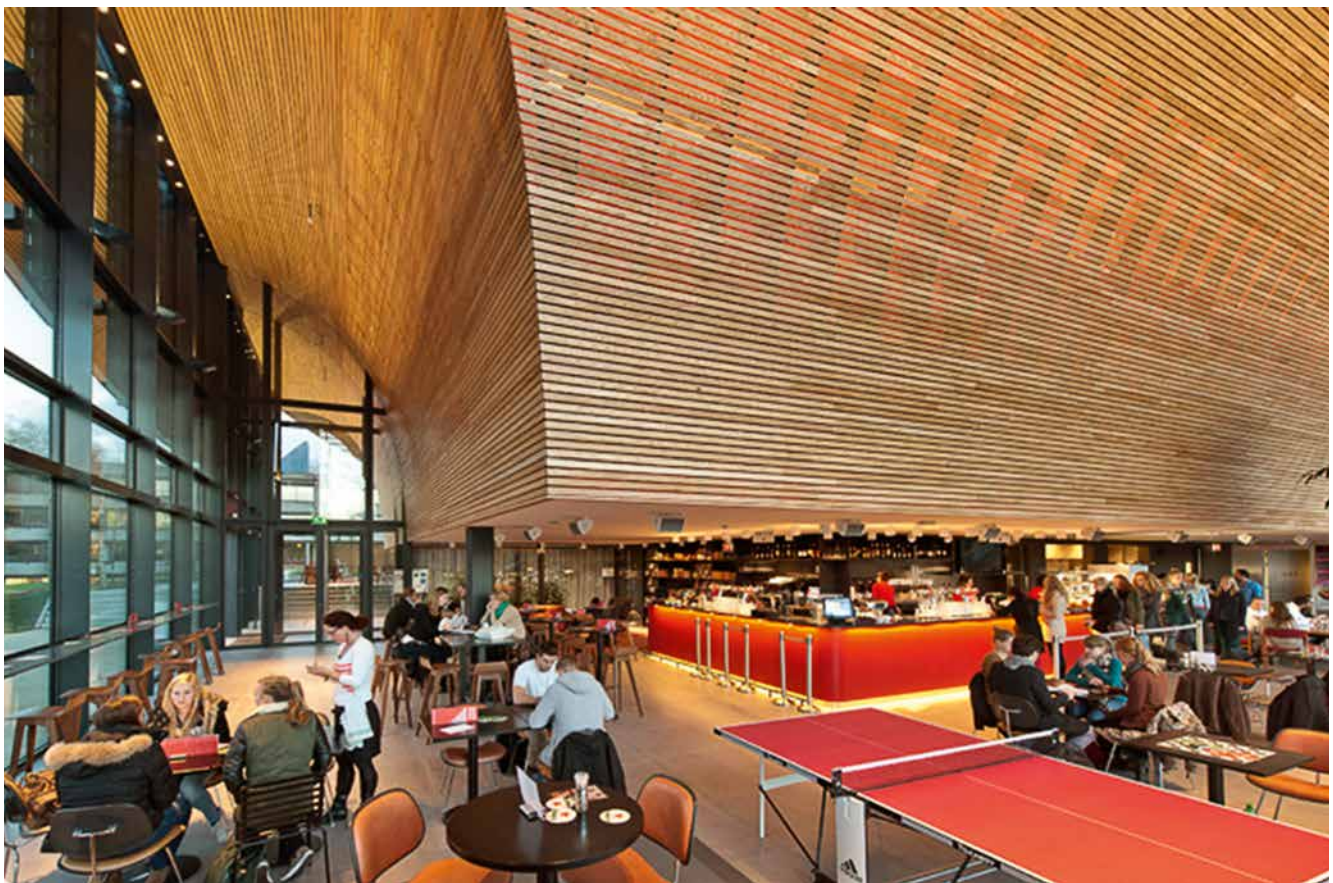


## Love of wood

We all love surrounding ourselves with wood, both inside and outside; from the smallest toy to the biggest yacht, from glasses frames to furniture, from the most ordinary things to the most special. So, where does this love for wood come from? We can put this down to the following properties:

### **Tranquillity and warmth**

Compared to many other types of material like concrete, steel and plastic, solid wood has a very warm and tranquil character. It comes in many designs and options. It can be sawn, dried, glued to form larger parts, sanded, painted or varnished. There are even techniques developed to further enhance the natural properties specifically for certain applications. The colour range of wood runs from light to very dark, so that it fits into any interior. Wood has character. Often copied but never equalled. Every piece is unique and gives us a feeling of style.



### **Good thermal insulation and acoustics**

Using wood leads to extraordinary thermal comfort and low heating costs. The heat insulating properties of wood are 6 times greater than those of brick, 12 times greater than concrete, 450 times greater than steel and 1700 times greater than in aluminium. A 16-cm timber-framed partition is as insulating as a one-metre thick stone wall. Wood in itself has a good acoustic value. This is very nice in an environment where there are a lot of people together. Too much noise pollution and echo is very unpleasant for many people and can be a disturbing factor.

### **Very resistant to fire**

Contrary to what most people think, wood reacts much better to fire than steel. Wood that is exposed to fire develops a layer of charcoal that forms an excellent heat shield. Although the exposed surface carbonises, this occurs at a very low, constant speed. The wood that is intact under its layer of charcoal retains its mechanical strength and can continue to fulfil its carrying function. Thanks to this behaviour, people can be evacuated in the event of fire; since the building remains stable for longer. In addition, burning wood releases very few toxic gases. Why do you think fire doors are made out of wood? Wood can also be treated using various techniques to make it fire-retardant.

### **Strong and reliable**

Wood can absorb large forces and retains its constructive properties longer than steel for example. Its load-bearing capacity is 5 times greater than that of reinforced concrete. It would take 10 cars sitting on top of each other to crush a wooden cube with a 5-cm surface. It also has a very good resistance against chemicals.

### **Easy to handle**

Many species of wood have a low specific gravity compared to other materials. That means that a wooden house hardly ever needs a foundation that is as heavy as those built of stone or concrete. Light in weight, yet durable and easy to machine. There are of course also heavier woods and we see these often in applications where durability is required.

### **Easy to maintain**

Wood products can be easily maintained. Take frames that are adapted to a trend in colour at any time. In contrast to products of another material, damage can easily be corrected, leaving the product as good as new again, but with a contemporary colour and character.

## **Sustainability**

With a good design and a proper finish, wood applications do not need any chemical treatment to achieve long life in a building. Wood is resistant to heat, frost, corrosion and pollution. The only factor that has to be kept under control is moisture. Don't give moisture a chance. It is therefore important to keep an eye on the quality of the paint or varnish finishing system. Cracks and blisters ruin the protection, allowing moisture to get into the wood. Not all species of wood are susceptible to this. Wood retains its shape under extreme heat, with only UV light having a bleaching effect on untreated wood. This effect is called ageing and there are several ways of dealing with this natural effect.

## Recyclable and a low carbon footprint

Unlike other materials like plastic and metal, wood is completely biodegradable, so future generations will not be landed with waste from back in 'our' time. No other material is as easy to recycle as wood and no large amount of energy is required for the recycling process. If wood is not recycled, it can easily be used to produce green energy. The amount of CO<sub>2</sub> that is released is not any more than the amount of CO<sub>2</sub> stored in the growth in the wood. This makes the use of wood for energy CO<sub>2</sub>-neutral.

During the mechanical finishing of wood, there is little waste produced, since almost all by-products are used, either as raw material or as a source of energy. Energy use in buildings, including the processing and transport of building materials and construction of those buildings, is considerably lower for wood products and systems than for other building materials. Prescribing wood can contribute to achieving the objectives of national and local climate programmes and encouraging the use of wood products is a green alternative to the use of materials that are produced with (lots of) fossil fuels.

## Areas of application

Wood lends itself to all architectural applications. Architects designing with wood can give free rein to their creativity and better meet the needs of the candidate-client. In addition, wood can easily be combined with other materials like concrete, glass and metal. In the renovation and restoration market, wood is taking on an ever more prominent role in terms of materialisation issues.

## A little sun, a little rain

A little sun, a little rain and the tree grows naturally with its own characteristics and properties. No fossil fuels and no environmental pollution. As already mentioned in the introduction, when you choose wood, you are choosing flexibility, unlimited supply, ease of use and you are helping the environment.

*This will enable man to continue his love affair with solid wood.*

### Colophon

This white paper has been written by Derako International B.V..  
The following sources were used: De Vrienden van Hout, Centrum Hout, CEI Bois Timmer aan minder klimaatverandering, gebruik hout and [www.houtinfobois.be](http://www.houtinfobois.be)



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