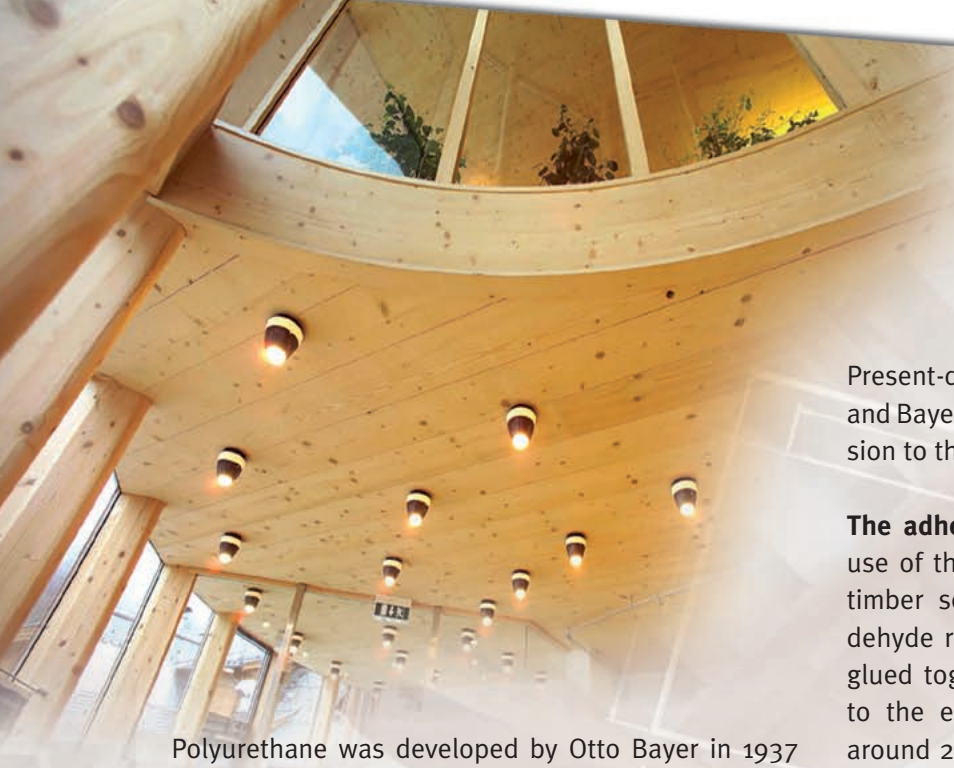
Bayer MaterialScience

PURBOND®
Adhesives for modern timber construction

Purbond
Adhesive systems for engineered wood

Desmodur®



Polyurethane was developed by Otto Bayer in 1937 and today polyurethane materials have a very broad range of application. Typical examples of their use include GORE-TEX® coating systems for permanently waterproof, windproof and breathable clothing; articles for medical technology; implants; flexible foams for cushions and mattresses; and rigid foams for the construction industry.

Polyurethane is a modern binder in which the material properties can be optimized to suit the particular field of application. Polyurethane is also commonly used as an adhesive raw material in the wood, leather and textile industries.

Since the mid-1980s, Bayer MaterialScience has been working with its partner Purbond in the field of engineered wood adhesives. Our joint task has been to develop modern adhesive systems and technologies for bonding load-bearing timber parts for the construction of houses, offices and commercial buildings.

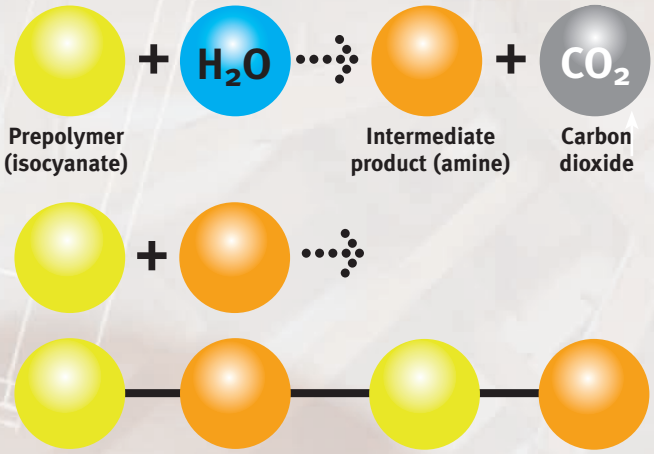
Based on these many years of experience, the first product for the German market was certified in 1994. Wide-ranging, highly demanding and time-consuming tests were required to gain this certification.

Present-day timber architecture proves that Purbond and Bayer MaterialScience have brought a new dimension to the art of bonding.

The adhesive system. The adhesive system makes use of the natural moisture of the wood to join the timber sections together – no solvents or formaldehyde required. The individually plies of wood are glued together automatically, with adhesive applied to the entire surface. The amount of adhesive is around 200g per m^2 and joint. The applied pressure ensures a high-quality bond.

In the first step of the bonding process, the water, the water contained in the substrate (for example, the moisture in the wood) reacts with some of the isocyanate to form amine, splitting off carbon dioxide (CO_2). As with carbonated drinks, the adhesive begins to foam up slightly. The amine then reacts very quickly with a further isocyanate group and results in a cross-linked structure as with two-component systems.

One-component polyurethane:



Environmental responsibility is key. The PURBOND® line of moisture-curing, liquid one-component adhesive systems based on Desmodur® offers a number of advantages in this regard:

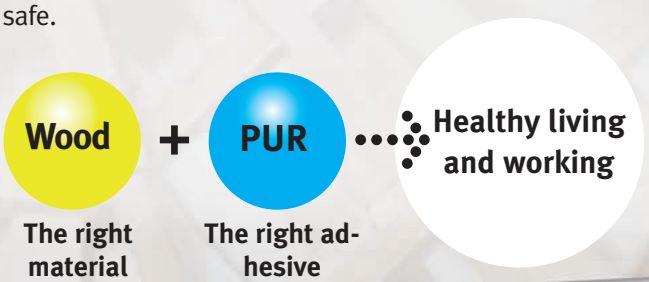
Less environmental impact. Liquid one-component adhesive systems based on Desmodur® emit at most CO_2 – no formaldehyde – and do not contain any solvents. They are completely inert when cured, i.e. they do not react further with substances in the environment. This has been proved by decades of experience in applications in the home, medicine and other areas of use. In a nutshell, this means a minimum impact on the environment and human health.

Odorless. 100 % solids without solvent.

Conserve resources. The PURBOND® adhesives have a higher yield thanks to the lower application weight. This conserves resources in the production process, because less adhesive is needed than with other adhesive solutions.

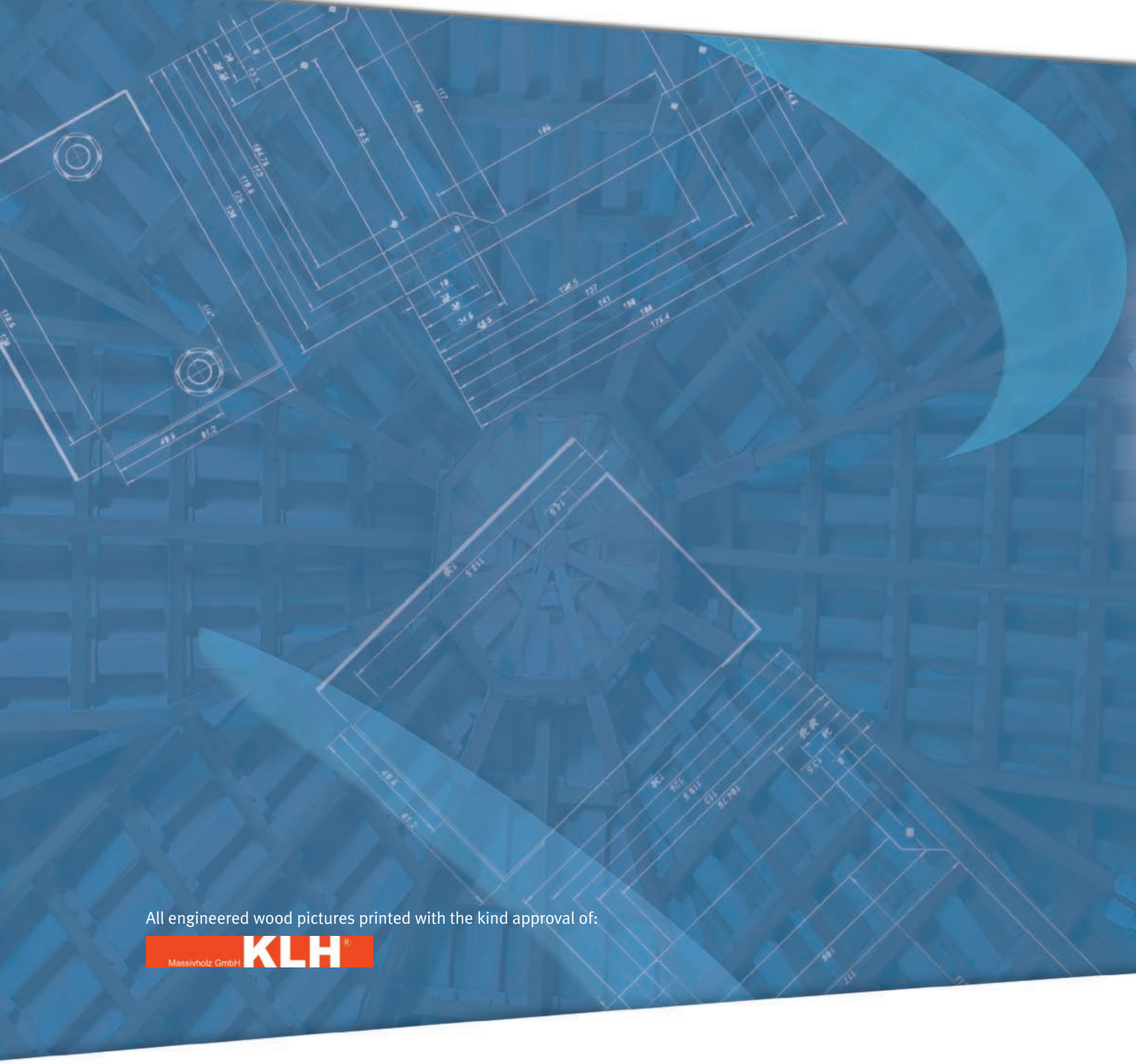
Handling. The adhesives are applied directly from the can to the joints of the timber parts. No mixing is required, and no effluent is produced.

Low environmental impact of polyurethane adhesives. Many years of experience with polyurethane materials in the home (e.g. with upholstered furniture, mattresses), in the sports segment (textiles) and in medicine (also with medical implants) show that fully cured polyurethane systems are completely inert and toxicologically safe.



Healthy living and working. A healthy indoor climate is very important. PURBOND® adhesives containing Desmodur® are based on a system that complies with the very latest specifications. As is confirmed in a report from the WKI (the Fraunhofer Wilhelm Klauditz Institute in Germany) dated February 2002, timber parts produced with formaldehyde-free polyurethane adhesives are absolutely comparable with natural solid wood. Timber is a modern but young building material. It has proved its popularity time and again, radiating a feeling of warmth and coziness. Wood is in fashion, and it is important that the right adhesive is used with the right material. Engineered wood with PURBOND® adhesives are the long-term solution.

Desmodur®



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Bayer MaterialScience

Bayer MaterialScience AG
Coatings, Adhesives and Sealants
51368 Leverkusen
Germany

www.bayermaterialscience.com
info@adhesives-sealants.com

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