

Wood windows manufacture

- PVAc dispersion adhesives with high strength levels
- EPI dispersion adhesives for extreme weather exposure
- Polyurethane adhesives for special requirements



Jowacoll® 102.25/26/27

Jowacoll® 103.30

Jowacoll® 107.20

Jowacoll® Five Star 102.49

Jowapur® 687.40

Wood windows and scantlings manufacture



Requirements for adhesive bonding today are higher than ever before. More and more building owners attach particular importance to the impact of construction products on human health and the environment.

Demand for wood windows therefore remains unbroken. Elaborate designs, long-lasting surface coatings and the combination with other materials facilitate classic wood windows with high resistance and at the same time visual appeal.

Apart from their characteristic, natural properties, wood windows are also increasingly becoming established as an ecological alternative. Wood has excellent carbon storage properties and therefore its use contributes to a climate-friendly environment.

The **Jowacoll®** dispersion adhesives with durability class D4 (according to EN 204/205) currently used in the manufacture of window scantlings are characterised by high bond strength and uncomplicated processing.

For even higher requirements with regard to water and temperature resistance, Jowat supplies dispersion adhesives based on emulsion polymer isocyanate (EPI). These adhesives provide superior strength due to a high degree of crosslinking, while also being easy to process like PVAc dispersion adhesives.

The Jowat portfolio allows processors to choose the right adhesive for the individual process. With the powerful **Jowacoll®** dispersion adhesives, Jowat supplies a multitude of alternatives for efficient bonding.

The extensive product range provides solutions for different application technologies, whether by roller, blade, nozzle or pouring.

With extensive expertise in the industry, Jowat understands the requirements for the end products and is consistently developing its portfolio further.

With the addition of **Jowacoll® 107.20**, Jowat has added a product that is supplied ready for use to its range of D4 dispersion adhesives.

This means, the processor can process this 1-component (1K) system without having to mix in a hardener or crosslinking agent.



Overview of adhesives portfolio

- Jowacoll® 102.25:** Low-viscosity D4 dispersion, e.g. for fingerjointing
- Jowacoll® 102.26:** Short cycle times in high-frequency presses
- Jowacoll® 102.27:** High-viscosity D4 dispersion for highly absorbent wood species
- Jowacoll® 103.30:** D3 with high initial strength and IMO certification for interior finishing in shipbuilding
- Jowacoll® 107.20:** 1-component D4 for the manufacture of window scantlings. Processed without addition of hardener
- Jowat® 195.35:** Aluminium nitrate hardener for 2-component D4 dispersion adhesives
- Jowat® 195.40:** Crosslinking agent based on isocyanate for D3 dispersions to increase resistance to moisture
- Jowat® 195.60:** Crosslinking agent based on isocyanate for EPI dispersion adhesives

INFO: Dispersion adhesives

Dispersion adhesives (glues) are water-based adhesive systems that form a bond through physical hardening by the evaporation of water. The bonding effect is provided by a polymeric component in the formulation, which forms an adhesive film when the aqueous component evaporates. Depending on the application and the chemical basis of the dispersion, it may be necessary to mix in an additional isocyanate crosslinking agent or a salt hardener during processing. This can increase the temperature strength and water resistance of the bondline.

The powerful dispersion adhesives from the **Jowacoll®** range are used in a multitude of applications in the wood industry. Dispersion adhesives of the latest generation facilitate efficient bonding processes with low emissions during bonding as well as from the end product.

Product Informationen

Jowacoll®	102.25	102.26	102.27	103.30	107.20
Characteristics	low-viscosity, e.g. for fingerjointing	"all-rounder" for laminating	high-viscosity	high initial strength	1-component D4
Durability class	D4	D4	D4	D3/D4	D4
Type	2K with 195.35	2K with 195.35	2K with 195.35	1K oder 2K with 195.40	1K
Viscosity at 20 °C [mPas]	5,000	7,000	24,000	approx. 12,500	approx. 5,000
Solids content [%]	approx. 45	approx. 50	approx. 50	approx. 53	approx. 49
Application amount (wet) [g/m ²]	approx. 150	approx. 150	175 ± 25	approx. 150	approx. 150
Open assembly time at 20 °C, 150 – 200 g/m ² [min]	approx. 8	approx. 8	approx. 10	approx. 9	approx. 10
Pressing time at RT [min]	approx. 40	approx. 30	approx. 30	approx. 10	approx. 30

Jowacoll® Five Star 102.49

Mixed with crosslinking agent Jowat® 195.60, the two-component (2K) adhesive Jowacoll® Five Star 102.49 facilitates bonds with superior strength levels. This product provides reliable and stable results even in extreme conditions. Both the high resistance to water as well as the good strength levels in dry heat are noteworthy. Jowacoll® Five Star 102.49 coupled with crosslinking agent Jowat® 195.60 is therefore a good combination for exterior applications (adequate surface protection required).

The high solids content of Jowacoll® Five Star 102.49 ensures a fast hardening of the adhesive, even on wood with slow moisture absorption (e.g. wood textures with fine pores). There are virtually no limits to the choice of wood species. Another application that plays to the strength of Jowacoll® Five Star 102.49 is the gluing of curved parts. Due to the hard glue line, the parts joined can keep their shape despite the tension forces in the material.



Bond strength according to EN 14257 (WATT 91):
10,4 N/mm²

Classification according to EN 204:
durability class D4

Jowacoll® Five Star 102.49			
Durability class	Conditioning sequence	Minimum value acc. to EN 204 in N/mm ²	Average value of bond strength in N/mm ²
D4	1	≥ 10	11,3
D4	3	≥ 4	7,9
D4	5	≥ 4	5,6



INFO: EPI dispersion adhesives

EPI (Emulsion Polymer Isocyanate) adhesives are dispersions that are crosslinked with an isocyanate. The chemical reaction considerably reduces the thermoplastic characteristics of the adhesive. Therefore, these products can be considered a transition to thermosetting adhesives. Compared to the typically tough-elastic glue film of PVAc dispersions, cured EPI adhesives are relatively hard and brittle.

INFO: Tensile shear strength



Tensile shear strengths of >10 N/mm² at 80 °C are being achieved in heat resistance tests according to the testing instruction EN 14257 (Watt 91). The recommended minimum strength for the manufacture of window scantlings is just >7 N/mm². The tensile shear strengths required for durability class D4 (according to EN 204/205) are also being exceeded significantly by these adhesive systems.



INFO: Classification and evaluation of thermoplastic adhesives

PVAc dispersion adhesives are generally classified into four different durability classes (D1-D4) according to EN 204 depending on their resistance to water. Jowat supplies a range of different adhesives for each durability class. The portfolio provides a variety of products for interiors (relative humidity <15 %) as well as for wet environments (high humidity and short-term exposure to water) and for exteriors with exposure to weathering (with an adequate surface protection).

A testing procedure for heat resistance is described in EN 14257 (Watt 91). The procedure facilitates a neutral evaluation, without specifying any minimum requirements. There is only a minimum limit of 7 N/mm² for the tensile shear strength of window scantlings that are certified according to RAL. Many Jowacoll® dispersion adhesives meet that requirement.

INFO: Chemically modified wood for the manufacturing of windows

Accoya® is chemically modified wood manufactured and marketed under license from Accsys Technologies. In a process called acetylation, wood species with a limited resistance by nature are improved to resist the elements in outdoor applications.

The high resistance of the modified timber (Accoya®) is based among other factors on a significantly slower moisture absorption and release. However, this characteristic and the additional components in the wood due to the modification process also make the material more difficult to bond. The use of water-based PVAc adhesives, for instance, would usually be uneconomic due to considerably longer pressing times.

Jowat also supplies a solution for bonding chemically modified wood that meets the special requirements. Liquid PUR prepolymers are a particularly good choice for those needs. They cure with moisture and are processed as single component.

Jowapur® 687.40 is an adhesive with a solids content of 100 %. The low moisture absorption of durable wood therefore has no impact on the setting time. However, it must be ensured that there is sufficient moisture available in the glue line to facilitate a complete chemical reaction of the polyurethane adhesive. If the

moisture content in the wood is less than 8 %, additional moisture is necessary in the joint. PUR adhesives are processed using special applicators which ensure that the adhesive does not come into contact with any moisture prior to the actual application.

The Jowat product portfolio provides solutions developed specially for laminating modified wood as well as for fingerjointing.

Jowapur® 687.40

Waiting time at 20 °C / 50 % AH	[min]	30 - 40
Minimum pressing time at 20 °C	[min]	105 - 120
Viscosity Brookfield at 20 °C	[mPas]	approx. 6.000
Solid content	[%]	approx. 99
Foaming		low
Colour of the glue film		light beige

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