

# MICHELIN

## RESICARE

*Beyond resin, innovation for life.*



### Resi4 WOOD

A unique, non-toxic<sup>1</sup> & renewable-carbon-based araminolic resin engineered for MDF and process panels, offering high moisture resistance.

Furniture

Flooring

Laminate corelayer

Doors

Sandwich panels

  
BUILDING &  
FURNITURE



# Resi4 WOOD

**Araminolic resins** provide a sustainable alternative to conventional thermosetting phenolics, formulated with unique, bio-based monomers that replace **formaldehyde** with **aromatic aldehydes** and **polyphenols**.

**Resi4 WOOD** is a unique, araminolic resin for **generic process panels** aligned with **EN 622-5 MDF HLS** guidelines (moisture resistance). It is a new alternative to historical **Phenolic** and **Melamine Urea Formaldehyde** resins, developed according to REACH legislation for worker safety.

## Benefits and characteristics



**High moisture resistance<sup>3</sup> and optimized formulation for furniture and building**

Meets requirements according to **EN 622-5 MDF HLS standard**

**Moisture resistance:**  
> 0,25 N/mm<sup>2</sup> after cyclic conditions according to EN 317 standard for 12 mm board

**Curing time:** 17s / mm

**Odorless board:** 8/10 on a panel list<sup>4</sup>



**Solving toxicity issues in PF / MUF resins for your workers & offering regulatory peace of mind**

**REACH compliant**

Monomers **free of formaldehyde** on the final product (7 µg/ m<sup>3</sup> after 24H, 8 µg/m<sup>3</sup> after 48H)<sup>5</sup>

**Free of CMR 1 & 2 and endocrine disruptors**

**Water-based resin**



**Supports your company's sustainable development strategy**

**Approaching >85% bio-based formulation<sup>2</sup>**

Bio-based raw materials:  
**5HMF monomer**

**Low CO<sub>2</sub> emissions<sup>2</sup>**

## Advantages



**No serious health hazard pictograms VS Formaldehyde, Phenol and Melamine.**



Serious health hazard



**Resi4 WOOD CO<sub>2</sub> emissions<sup>2</sup> (CO<sub>2</sub>kg / kg)**



(1) Formulated without chemicals meeting SVHC criteria (Substance of Very High Concern) as defined by European Chemicals Agency in date of 01/01/2026.

(2) Upon availability of our sugar-based monomers industrial demonstrators in 2027. Two of our first main industrial monomers demonstrators are based in France. The bio-based content is based on ISO 16620 guidelines based on internal data. CO<sub>2</sub> emission's preliminary figures are based on internal data, compliant with ISO 14044 guidelines. The variability of high and low values is depending of sugar sourcing.

(3) Moisture resistance: Meets Class 3 requirements according to EN 314 standard.

(4) Odor evaluation according to DIN ISO 16000-28.

(5) Chamber emission measures realized according to ISO 16000-3:2023-12.

# Technical Data Sheet

**Product:** Resi4 WOOD. **Description:** Aqueous araminolic resin. **Presentation form:** Red - brown liquid.

**Benefits:** Formol-free, phenol-free, melamine-free. Resistance to humidity.

**Main application:** MDF & HDF from 1 to 22 mm thick. From 650 to 1100 kg/m<sup>3</sup>.

**Main processing method:** Spraying. **Main cross-linking method:** Thermocompression.

**Duration of use and storage:** Up to 20 days at 20°C. Up to 60 days at 5°C.

**Handling precautions:** This product must be used in accordance with the instructions in the Safety Data Sheet. This product may stain the skin.

## Characteristics of liquid resin:

| Property                  | Method                | Unit              | Measure   |
|---------------------------|-----------------------|-------------------|-----------|
| Viscosity at 20°C         | Brookfield Viscometer | mPa.s             | 100 - 500 |
| Dry matter                | Thermobalance         | Mass %            | 58 - 61   |
| pH                        | pH meter              | -                 | 7 - 9     |
| Cross-linking temperature | DSC                   | °C                | 148       |
| Duration of use at 20°C   | Viscosity monitoring  | Days              | 20        |
| Density                   | Gas pycnometry        | g/cm <sup>3</sup> | 1,24      |
| Use temperature           | Thermometer           | °C                | 20 - 40   |

## Catalyst:

| Nature                           | Quantity                  | Effect                                                   |
|----------------------------------|---------------------------|----------------------------------------------------------|
| Ammonium salts in water solution | 0,5 - 3 % of resin weight | Up 3-time-shorter curing time, increase water resistance |

## Characteristics of 0,8 g/cm<sup>3</sup>, MDF 12 mm panel:

| Property             | Method                    | Unit        | Measure    |
|----------------------|---------------------------|-------------|------------|
| Pressing time        | Hot press                 | s/mm        | 17         |
| Pressing temperature | Press temperature control | °C          | 160 - 220  |
| IB                   | EN 622-5                  | MPa         | Up to 1,0  |
| Swelling             | EN 622-5                  | Thickness % | < 8        |
| MOE                  | EN 622-5                  | MPa         | Up to 4000 |
| MOR                  | EN 622-5                  | MPa         | Up to 55   |
| Cycling test         | EN 622-5                  | MPa         | Up to 0,3  |

**Recommendations and precautions:** It is not recommended to mix with acids. Shake before use. Dephase below 20 °C pre-heat  $\geq$  20 °C and stir before use.

**Destruction and disposal:** Disposal with water-based solutions.

**Additional information:** For further information, please reach out to us through the contact form on our website (<https://resicare.michelin.com/contact/>).

## Did you know? REACH regulation focus

I've heard about the REACH regulation...  
Should I really worry about it? Does it impact my business?

Yes! Regarding the European directive 2004/37/EC, employers must reduce the use of CMR substances in the workplace. This must be done by replacing the hazardous substance with a safer alternative, if technically feasible!

Got it... Time to improve our chemistry  
for a safer future!

*Sent by Pioneer customer*

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