

MICHELIN

RESICARE

Beyond resin, innovation for life.



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AERONAUTICS &
TRANSPORTATION

Resi4 PREG

A unique, **non-toxic¹** & **renewable-carbon-based** araminolic resin engineered for pre-impregnated composites offering high thermal and FST properties.

Thermal protection Internal security parts Trim panels

Seat sandwich panels: Honeycomb and foam compatible

Battery casing



Resi4 PREG

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 PREG is a unique, **bio-based, formaldehyde-free araminolic resin that is certified FAR25, EN45545, and UL 94V0** for pre-impregnated applications. Resi4 PREG replaces phenolics and is designed in accordance with REACH legislation. This renewable-carbon-based resin contributes to your company's sustainable strategy and petroleum resource independence.

Benefits and characteristics

FAR25

EN45545 (HL3 R1)

UL94 V0



High thermal resistance for demanding applications in aeronautics

FAR25 certified (results on glass fiber 0,4 mm 2 ply)

Zero after-flame time

HRRmax: **35 kW/m²**

THR: **16 kW.min/m²**

Total concentration gasses **< 103 ppm**

Resin thermal resistance:
Tg = degradation temperature > 300°C



Solving toxicity issues in phenolic resins for your workers & offering regulatory peace of mind

REACH compliant

Monomers **free of formaldehyde** and **phenol** by design

Free of CMR and **endocrine disruptors**

Bioethanol-solvent-based resin



Supports your company's sustainable development & sovereignty strategy

100% bio-based formulation²

Bio-based raw materials:
5HMF monomer

Low CO₂ emissions²

European sourcing²

Advantages



No acute toxicity & serious health hazard pictograms VS Formaldehyde, Phenol, Furfuraldehyde.



Acute toxicity



Serious health hazard



Resi4 PREG
CO₂ emissions² (CO₂kg / 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. CO₂ 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.

Technical Data Sheet

Product: Resi4 PREG. **Description:** solvent-based araminolic resin. **Presentation form:** dark-red liquid.

Benefits: formol-free, phenol-free, compatible with fiberglass, carbon, flax, aramid. Excellent thermal and flame resistance. Good char yield.

Main application: resin for prepregging process.

Prepregging process: liquid bath impregnation (foulard). Achievable impregnation from 30%w to 45%w resin.

Resin shelf life: 20 days at 20°C. 6 months at -18°C.

Handling precautions: This product must be used and disposed in accordance with the instructions in the Safety Data Sheet and in this technical datasheet. This product may stain the skin. Mixing the resin with strong acidic, oxidizing or reducing compounds is not recommended.

Destruction and disposal of liquid resin: Clean and rinse liquid resin mixture with water; hot water will help. Disposal with aqueous basic wastes.

Liquid resin characteristics

Property	Method	Unit	Measure
Viscosity at 20°C	Brookfield Viscometer	mPa.s	100 - 3000
Dry matter	Thermobalance	%	60 - 65
pH	pH meter	-	9 - 11
Density	Pycnometer	-	1,2
Duration of use at 20°C	Viscosity monitoring	Days	20

Cured resin characteristics

Flame resistance	FAR25, EN45545 HL3 and UL94V0 certified
Thermal resistance	Tg > 320°C
Char Yield	> 50%

Example of prepreg properties

300gsm 8 satin glass fabric 30%w Resi4 PREG resin – 90min @150°C 3Bars:

Property	Method	Unit	Measure
Cured ply thickness	Curing pressure 3Bars	mm	0.2
Flexural modulus	ISO14125	GPa	> 30
Flexural strength	ISO14125	MPa	> 500
ILSS	ISO14130	MPa	> 32

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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