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RESICARE

Beyond resin, innovation for life.

AUTOMOTIVE, 2 WHEELS

Resi4 FRICTION

A unique, non-toxic[1], renewable-carbon-based araminolic resin engineered for demanding brake pad applications.

Brake pads **Clutch linings**

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Resi4 FRICTION

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 FRICTION is a unique, **bio-based**, **formaldehyde-free and hexamine-free araminolic resin** for friction applications. Resi4 FRICTION 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

Characteristics demanded for brake pad performance

Flow distance: 15 - 20mm (ISO8619:2003)

B-time: 40 - 80 sec (ISO 8987 / 150°C)

Coke rate: 50 - 55%

Particule size: D50 < 25 µm

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

REACH compliant

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

Free of CMR and **endocrine disruptors**

Supports your company's sustainable development strategy

Approaching >85% bio-based formulation[2]

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

Low CO_2 emissions[2]

Advantages

No acute toxicity & serious health hazard pictograms VS **Formaldehyde** and **Phenol.**

Acute toxicity

Serious health hazard

Resi4 FRICTION CO_2 emissions[2] (CO_2kg / 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
Resi4 FRICTION

Applications:

Brake pads | Clutch linings

Product: Resi4 FRICTION.

Description: araminolic resin.

Presentation form: red-brown powder.

Benefits: formol-free, phenol-free, hexamine-free formulation.

Main application: brake pads.

Main cross-linking mode: thermocompression.

Duration of use and storage: data in progress (>4 months) – stored at room temperature.

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

Powder resin characteristics

Property	Method	Unit	Measure
Flow distance	ISO 8619:2003	mm	15 - 20
Humidity	Karl Fisher	%	3 - 4
Onset cross-linking temperature	DSC – Ramp 10°C/min	°C	115 - 125
Peak cross-linking temperature	DSC – Ramp 10°C/min	°C	135 - 145
Particule size	Malvern	µm	D50 < 25 D90 < 75
B-Time	ISO 8987 / 150°C	sec	40 - 80
Coke rate – residu at 850°C	TGA – Ramp 10°C/min – Nitrogen	%	> 50

Destruction and disposal: Cleaning of powder resin with water. Disposal with basic aqueous waste.

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

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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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CERTIFICATION UTAC ISO 9001
UTAC CERAM