

Overview of “Eco-Friendly Thermosetting Resin”

Main features

(1) Composition

Raw materials	Eco-friendly thermosetting resin		Existing resin material	
	Type	Features	Type	Features
Base resin (epoxy)	Epoxidized linseed oil	Plant oil material	Bisphenol A, etc.	Oil-derived material
Hardener	Phenols (pyrogallol, novolac-type phenolic resin, etc.)	Plant extract or oil-derived material	Acid anhydrides, amines, etc.	Oil-derived material
Filler	Fly ash	Recycled	Silica, alumina	Industrial purified product
Percentage of oil-derived components (by weight)	10% or lower		About 40%	
CO ₂ emissions (LCA-CO ₂)	-5.5 kg (CO ₂)/kg (Result of Meidensha study comparing new resin to existing one)		—	

*Shaded materials are eco-friendly.

(2) Comparison of material properties at room temperature

	Newly developed product	Existing product (insulating material)
Bending strength (MPa)	100 or more	100 or more
Dielectric breakdown strength (kV/mm)	10 or more	10 or more
Volume resistivity ($\Omega \cdot \text{cm}$)	5.5×10^{14}	1.0×10^{15}
Permittivity	5.3	4 or less
Linear expansion coefficient (1/°C)	3.0×10^{-5} or less	3.0×10^{-5} or less

*Characteristics of developed product vary with composition.

(3) Cost

The cost of the developed resin material can be reduced 5% - 20%* compared to existing resin materials.

Because there is no change in the manufacturing process, production costs are the same as or lower than conventional products.

*The developed resin consists of epoxidized linseed oil, novolac-type phenolic resin and fly ash; the existing resin has the material composition that Meidensha uses in existing equipment.



Photo 1: Example of a product (cubicle insulator) made with the developed resin