



Phenolic Curing Agents

Airable is developing a series of phenolic curing agents for epoxy resins. These curing agents feature high functionality and bio-based content, making them a greener alternative for use in coating and composite applications. These phenolic curing agents further support sustainable material design by offering reduced environmental impact while maintaining high-performance curing profiles.

THE TECHNOLOGY

The phenolic structures added to a soy feedstock enable improved chemical resistance, customizable cure schedules, and enhanced durability across coating and composite applications. The phenolic structures also increase crosslink density, enabling enhanced chemical resistance, tunable curing behavior, and improved long-term durability. Performance testing highlights strong and consistent results across the resin series.

To demonstrate performance, the resins were formulated 1:1 equivalent with Epon 160 (~173 EEW) and cured in a two-stage process: first at 100°C for two hours and then at 180°C for four hours. The cured resins exhibited strong adhesion to carbon steel in crosshatch testing, high Shore D hardness, and high pencil hardness. MEK double rub testing confirmed chemical resistance. Films also demonstrate moderate flexibility in conical mandrel bend testing.

APPLICATIONS

- Coatings
- Composites

Resin	Equivalent Weight (g/eq)	Gardner Color*	Form	Viscosity* (cPs, 25C)	D2240
PhenoAir 0478	108	8	Solid	16	100.0
PhenoAir 0534	454	13	Viscous Liquid	38	70.5
PhenoAir 5992	438	14	Viscous Liquid	40	69.4
PhenoAir 5996	464	14	Viscous Liquid	18	71.1

*50% in ethanol

Resin	Shore D	Pencil Hardness	Crosshatch Adhesion	MEK Double Rub*
PhenoAir 0478	80.5	6H	5B	>100
PhenoAir 0534	79.5	6H	4B	>100
PhenoAir 5992	71.0	5H	4B	>100
PhenoAir 5996	76.5	6H	4B	>100

*Until coating is damaged

BENEFITS

- High bio-based content
- Compatible with commercially available curing agents