

**Structural
Adhesives**



EVONIK

We are a global player with a presence in local markets; proven, reliable product quality and supply security – on time and on target.

IMPROVING SUSTAINABILITY IN STRUCTURAL EPOXY ADHESIVE APPLICATIONS

Due to the need to address environmental, social and economic challenges of climate change, alongside the increasing shortage of resources, sustainability has become an important driver throughout the industry today. How this trend can be addressed in structural epoxy adhesives can be derived from their typical life cycle taking the aspects of raw materials, application processes, end-use, and end-of-life into account. Accordingly, there are several ways in which Evonik's product portfolio can support developers and formulators of epoxy adhesives to improve the sustainability of their products and reduce their footprint.

The most obvious way relates to products that stem or are derived from renewable sources such as our polyamide, amidoamine and phenalkamine epoxy curing agents based on fatty acids or cardanol, respectively, represented by our Ancamide® 500 series, Ancamide® 260A or Ancamine® 2719 for instance.

A further approach includes products that help to improve the sustainability of processes, for example reducing the energy consumption of bonding processes. Here, Evonik offers a series of thermo-latent modified aliphatic amine curing agents, including Ancamine® 2014 AS & FG, 2337S and 2442 that help to reduce curing temperatures and times in 1K structural

VERSATILE TOOLBOX FOR EPOXY CURING IN ADHESIVE APPLICATIONS

Our Ancamide®, Ancamine®, Amicure® and Curezol® product series offer a versatile toolbox for epoxy curing in structural adhesive applications including a wide range of aliphatic and cycloaliphatic amines to amidoamine and polyamide curing agents, complemented by dicyandiamide, substituted ureas, and imidazoles. These allow developers and manufacturers of structural epoxy adhesives to cope with a broad range of bonding applications and process requirements.



REACTIVE RESIN MODIFIERS

NANOPOX® products are epoxy resins containing 40 wt% of spherical silica nanoparticles. Strength, modulus, compressive strength, and especially fatigue performance is improved significantly. ALBIDUR® and ALBIPOX® products are 40 wt% concentrates of elastomers in epoxy resins. They are based on core shell or rubber tougheners and are used to formulate high performance resins.



adhesive applications and therefore directly contribute to lower CO₂ emissions. Another example addressing the EHS and handling profile of adhesives is Ancamine® 2914UF which offers ultra-fast mercaptan-competitive epoxy curing but without the disadvantage of sulfur odor.

Concerning the end-use sustainability aspects of structural epoxy adhesives, durability is a crucial factor, which can be significantly improved via our modified epoxy resins that utilize nanosilica, elastomers or silicone core-shell particles to enhance the adhesives' toughness and fatigue properties. These can be found in our NANOPOX®, ALBIPOX® and ALBIDUR® product series, respectively. We also offer a number of epoxy curing agents that improve or enable sustainable technologies, for example Ancamide® 910 that offers a set of unique properties including low viscosity and high flexibility combined with enhanced adhesion to various substrates and excellent thermal shock resistance. This makes it an ideal choice for EV car related adhesive applications including lightweight construction and thermal interface materials, for instance.

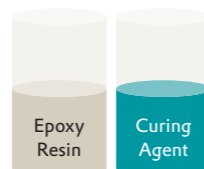
CURING AGENTS AND RESIN MODIFIERS FOR STRUCTURAL EPOXY ADHESIVES

1K



STRUCTURAL BONDS	CURING AGENT	RESIN
Standard – Dicyandiamide	Amicure® CG 1200F Amicure® CG 1400F	Increased toughness & adhesion to oily steel 30 wt% ALBIPOX® 1000 or ALBIPOX® 2000 (standard in automotive adhesives)
Accelerators for Dicyandiamide	Amicure® UR2T Curezol® 2MZ Azine Ancamine® 2014AS/FG Ancamine® 2442	Increased fatigue performance 5–15 wt% NANOPOX® A 410 (DGEBA-based) or NANOPOX® A 510 (DGEBA-based)
Low temperature cure – Modified aliphatic amines	Ancamide® 2014AS/FG Ancamine® 2337S Ancamine® 2442	Increased toughness from -120 to +140 °C 10 wt% ALBIDUR® EP 2240 A (very suitable for structural adhesive tapes)

2K



STRUCTURAL BONDS	CURING AGENT	RESIN
Standard	Ancamide® 3030 Ancamide® 260A	Ready-for-use epoxy resins ALBIPOX® 3001 (toughened, increased adhesion to oily steel)
Flexible	Ancamide® 910 Ancamine® 3456	ALBIPOX® 9013 (hybrid, toughened + extreme fatigue resistance)
Fast	Ancamine® 2914UF Ancamine® 1769	Increased toughness & adhesion to oily steel 30 wt% ALBIPOX® 1000 (increases viscosity)
Low viscosity	Ancamide® 500 Ancamide® 3419	Increased toughness from -120 to +140 °C 10 wt% ALBIDUR® EP 2240 A (no viscosity increase)
High Tg	Ancamine® 2167 Ancamine® 2264	Increased fatigue performance 5–15 wt% NANOPOX® A 410 or NANOPOX® A 510

OUR COMPETENCES

- We offer a broad portfolio of modified resins and reactive resin modifiers as well as amine curing agents for tailored epoxy adhesive solutions.
- We are specialists with a profound knowledge and experience with adhesive related epoxy systems, applications and processes.
- We provide strong technical support with a global footprint.

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Our product portfolio:

Amicure®
Ancamine®
VESTALITE®
VESTAMIN®

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Our product portfolio:

ALBIDUR®
ALBIPOX®
NANOPOX®

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