

Stronger Epoxy Adhesives Through Engineered Fibre Interfaces

Nuenz helps adhesive manufacturers improve mechanical performance using silicon nitride fibres engineered for practical integration into epoxy formulations.

Familiar silane chemistry, configurable fibre surfaces and formulation support reduce the effort required to evaluate advanced ceramic reinforcement.

PROVEN PERFORMANCE



IT WORKS

Demonstrated improvements in selected adhesive and thermoset properties

EASY TO INTEGRATE



IT FITS YOUR PROCESS

Straightforward dispersion into existing processes without the need for complicated mixing equipment

PRODUCT DIFFERENTIATION



IT CREATES VALUE

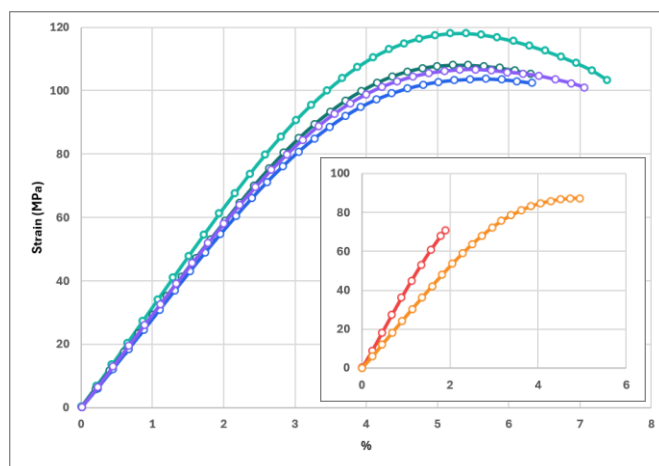
Create higher-performance adhesive products that stand apart from conventional mineral-filled systems

Designed for demanding adhesive systems

- Structural epoxy adhesives
- Bonding and assembly pastes
- Composite joining compounds
- Repair and rebuilding systems
- Wear-resistant coatings and adhesive linings
- Epoxy grouts and high-compression systems

Demonstrated mechanical potential

Nuenz fibres have demonstrated meaningful improvements in selected epoxy and thermoset properties. Results depend on resin chemistry, surface treatment, fibre loading and processing route.



Optimised Nuenz fibre addition improved the Flexural Strength by 5-20% at 0.2% loading in an economy high-BPA resin (-o-), high-performance marine epoxy (-o-), and in reformulated, high-viscosity epoxy mastic (-o-).

A configurable reinforcement platform for epoxy adhesives

Surface treatment selected for the adhesive system

Familiar silane chemistry | Configurable fibre surfaces | Practical ceramic reinforcement.

Nuenz can supply untreated, standard-treated or application-specific fibre surfaces.

Fibre surface	Relevance to epoxy adhesives	Primary formulation purpose
Untreated	Baseline evaluation or customer-treatment	Maximum flexibility for in-house development
Epoxy-functional silane	Direct compatibility with epoxy resin systems	Wetting, dispersion and fibre-matrix bonding
Amino-functional silane	Selected epoxy resins and curing systems	Interfacial bonding and cure-system compatibility
Application-specific treatment	Matched to resin, hardener, and process	Formulation-specific optimisation

Reinforcement that works with the resin

A high-performance fibre only creates value when it can be dispersed, wetted and bonded into the cured adhesive.

Silicon nitride develops a silica-rich surface that responds readily to established silane coupling chemistry. Nuenz uses this surface chemistry to supply fibres tailored for epoxy formulation requirements:

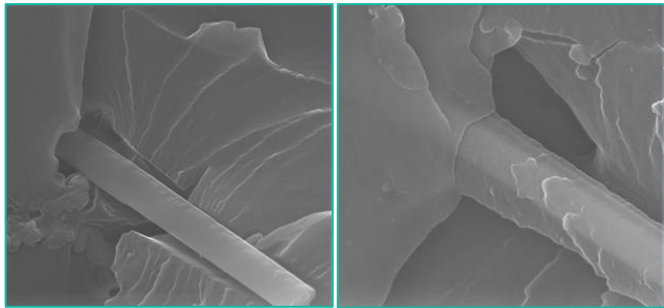
- Untreated fibres for customer-controlled modification or baseline evaluation
- Epoxy-functional silane treatments for direct resin compatibility
- Amino-functional silane treatments for selected resin and curing systems
- Application-specific silane treatments matched to the customer formulation

A practical development route

Nuenz works with formulators to select the fibre grade, surface treatment and dispersion route before final optimisation of the adhesive.

1	Define - Target property, resin, hardener, fillers, process and cost limits
2	Select - Fibre grade and surface treatment matched to the formulation
3	Screen - Two or three loadings against a controlled baseline
4	Optimise - Dispersion, viscosity, cure behaviour and final performance

Evidence of coating and dispersion control



The selected fibre surface materially changes formulation performance and enables optimisation for the resin system.

Without a compatible silane coating, fibres do not bond to the epoxy matrix (left). The strength of the fibres cannot be translated to the epoxy resin. Nuenz’s surface treatments create high-performance bonding (right) where the entire matrix must be ruptured around the high-strength silicon nitride fibre when the structure is damaged.

Why this matters

- Improved fibre wetting and distribution
 - Reduced agglomeration and more consistent processing
 - Stronger fibre-matrix interface and stress transfer
 - Electrical insulation without carbon-based reinforcement
- A familiar integration route using chemistry already understood by adhesive formulators.