Product Information

NANOPOX® F 400

PRODUCT DESCRIPTION

NANOPOX® F 400 is a high performance, versatile, silica reinforced Bisphenol A based epoxy resin for the use in fiber composites. The silica phase consists of surface-modified synthetic SiO2 nanospheres of very small size (average diameter of 20 nm) with a narrow particle size distribution (maximum diameter 50 nm).

Despite the high SiO2 content of 40 wt%, NANOPOX® F 400 has a comparatively low viscosity due to the agglomerate-free colloidal dispersion of the nanoparticles in the resin.

Typical Properties

Property	Unit	Value
Appearance		opaque liquid
Base Resin		Bisphenol A diglycidyl ether
Density at 20 °C	g/cm³	1.4
Epoxy Equivalent Weight	g/eq	295
Viscosity at 25°C	mPa·s	60000

The data represents typical values (no product specification)

TYPICAL APPLICATIONS

NANOPOX® F 400 is a versatile dispersion of colloidal silica in epoxy resin (DGEBA) for the use in fiber reinforced composites. It enables highly filled, low viscosity formulations and improves mechanical properties, especially impact resistance. During impregnation process the nanoparticles of NANOPOX® F 400 penetrate into fiber bundles and stabilizes them. Further more it reduced cure shrinkage & thermal expansion. In comparision to NANOPOX® F 520 it inherently provides better mechanical properties.

Product Composition

Product Composition	Unit	Value
Silicon Dioxide (SiO_2) Content	wt%	38-42

The data represents typical values (no product specification)

BENEFITS & ADVANTAGES

- Improved modulus and flexural strength, increase in toughness and compressive strength
- Enables extremely high loading levels in combination with suitable micron particles
- Significantly improved fatigue performance
- Lower CTE, reduced shrinkage
- Low viscosity, thus suitable for injection processes
- Improved surface quality, no fiber-printthrough (Class A)
- Suitable for underfill applications
- Nanoparticles do not sedmentate and stabilze co-fillers

HANDLING & PROCESSING

NANOPOX® F 400 can be used as any other Bisphenol A diglycidyl ether. However, the colloidal silica in NANOPOX® products tends to agglomerate if the stabilisation is affected by inappropriate formulation components like hydrocarbon solvents (e. g. xylene).

Therefore the compatibility between NANOPOX® F 400 and all other formulation components should be tested separately before starting formulation development.

NANOPOX® F 400 should be handled in accordance with good industrial practice. Detailed information is provided in the Material Safety Data Sheet.

STORAGE

NANOPOX® F 400 tends to crystallize at ambient temperatures. The product can be easily re-melted by heating it up to 70°C for a short period of time.

Keep container(s) tightly closed when not in use!

SHELF LIFE

6 months if stored in the original unopened container.

The shelf life period can be subject to prolongations based on reapprovals in accordance with the established Evonik ISO 9001 quality management process.

HAZARDOUS SUBSTANCE

Information concerning

- Classification and labelling according to regulations for transport and for dangerous substances
- Protective measures for storage and handling
- Measures in case of accidents and fire
- Toxicity and ecological effects

is given in our material safety data sheets.

REGISTRATION LISTING SUMMARY

The relevant components of NANOPOX® F 400 are listed/ registered or exempt in the following chemical inventories.

Registration Listings	
Registry	**Status**
China (IECSC)	Yes
EU (EINECS/ELINCS)	Yes
Japan (ENCS)	Yes
South Korea (TCCL)	Yes
Taiwan (TCSI)	Yes
USA (TSCA)	Yes

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