Product Data Sheet

Atlac *E-Nova* FW 2045

Chemical/physical nature

Atlac *E-Nova* FW 2045 is a modified epoxy bisphenol A vinyl ester urethane resin, dissolved in styrene.

Performance

Atlac *E-Nova* FW 2045 provides the same excellent thermal and chemical resistance against solvents, acids and oxidizing media as an epoxy novolac vinyl ester, but offers in addition also resistance against alkaline.
The *E-Nova* technology combines the easy processing of polyester with the chemical resistance of vinyl ester. Low foam curing is possible with standard MEKP peroxides and compared to traditional vinyl ester resins it shows excellent fibre wetting. Atlac *E-Nova* FW 2045 can be easy made thixotropic.

Major applications

Atlac *E-Nova* FW 2045 can be used in all fabrication methods, but is especially adapted to meet the requirements of filament winding, centrifugal casting, hand lay-up and spray-up applications.

Approvals

Cured non-reinforced Atlac *E-Nova* FW 2045 conforms to type 1310 according to DIN 16946/2 and is classified group 5 according to DIN 18820/1 and group 7B according EN12131/2. Atlac *E-Nova* FW 2045 received from the DIBt (Deutsches Institute für Bautechnik) a general approval for parts to store chemicals.

Product specifications upon delivery

Property	Range	Unit	TM
Viscosity, 23°C	350 - 450	mPa.s	2013
Solids content, IR	58 - 61	%	2033
Appearance	Clear - sl.hazy	-	2265
Acid value, as such	5,5 - 10	mg KOH/g	2401
Gel time from 25 to 35°C	15 - 23	minutes	2625
Cure time from 25°C to peak	22 - 32	minutes	2625
Peak temperature	150 - 180	°C	2625

Remarks
TM 2013: Physica, Z2/100/23°C TM 2625: 3.0 g Accelerator NL49P and 2.0 g Butanox M 50 (both AKZO-Nobel) added to 100 g resin

Properties of the liquid resin (typical values)

Property	Value	Unit	TM
Stability, no init., dark, 20°C	6	months	-
Flash point (indicative)	33	°C	TM 2800

Properties of cast unfilled resin (typical values)

Property	Value	Unit	TM
Tensile strength	90	MPa	ISO 527-2
Tensile E-modulus	3.5	GPa	ISO 527-2
Elongation at break	3 - 4	%	ISO 527-2
Flexural strength	140	MPa	ISO 178
Flexural E-Modulus	3.7	GPa	ISO 178
Heat Deflection Temp. (HDT)	145	°C	ISO 75-Ae
Impact res. - unnotched sp.	25	kJ/m²	ISO 179
Hardness	45	Barcol	DIN EN 59

Curing conditions
The curing characteristics are obtained using 0.3% Accelerator NL 51P, 0.2% Accelerator NL 63-10P and 1.5% Butanox M 50 (all AKZO-Nobel). All test samples were postcured for 3 hours at 100°C and 3 hrs at 150°C.

Properties of reinforced resin (typical values)

Property	Value	Unit	TM
Glass content	30	%	ASTM D 2584
Tensile strength	120	MPa	ISO 527-2
Tensile E-modulus	8.3	GPa	ISO 527-2
Flexural strength	210	MPa	ISO 178
Flexural E-Modulus	8.7	GPa	ISO 178
Hardness	60	Barcol	DIN EN 59

Curing conditions
The curing characteristics are obtained using 0.3% Accelerator NL 51P, 0.2% Accelerator NL 63-10P and 1.5% Butanox M 50 (all AKZO-Nobel). All test samples were postcured for 3 hours at 100°C and 3 hours at 150°C. Laminates were based on 4 layers of 450 g/m² chopped strand mat

Guidelines before use

Before use, the resin should be conditioned at a well-defined, application dependant temperature (usually 15°C minimum for a MEKP / Co cure). Stir the product before blending.

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Storage guidelines
The resin should be stored indoors in the original, unopened and undamaged packaging, in a dry place at temperatures between 5°C and 30°C and the properties might change during storage. The shelf life of styrene containing unsaturated polyesters will be significantly reduced when exposed to light and/or higher temperatures. Store in dark and in 100% light tight containers only.

Test methods
Test methods (TM) referred to in the table(s) are available on request.

Material Safety
A material safety data sheet for the product is available on request.

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