

NOROX[®] 410

tert. Butylperoxy-2-ethylhexanoate
CAS#3006-82-4
Liquid, techn. pure

Structural Formula

Description

Colourless, mobile liquid, consisting of technically pure tert. butyl-per-2-ethyl hexanoate. This branched, aliphatic perester is used as an initiator (radical source) in curing unsaturated polyester resins at 70-150°C, possibly in combination with cobalt accelerators.

Technical Data

Appearance	colourless liquid
Peroxide content	ca. 99 % w/w
Active oxygen	ca. 7.32 % w/w
De-sensitising agent	none
Density at 20°C	ca. 0.90 g/cm ³
Viscosity at 20°C	ca. 4 mPa•s
Refractive index at 20°C	ca. 1.428
Miscibility	immiscible with water miscible with alcohols, phthalate
Critical temperature (SADT)	ca. 40 °C
Cold storage stability	to below -25 °C
Kick-off temperature	ca. 70 °C
Recommended storage temperature	max. 10 °C
Maintenance of activity	3 months

This product is in compliance with the Elektro G (EU-Directives: RoHS 2002/95/E G, WEEE 2002/96/EG)

Half-life Data

10h/1h/1min (0.1 m benzene): 74/92/130 °C

Application

POLYESTER CURING:

Curing agent for UP resins, possibly in combination with cobalt accelerators. Temperature range: 70-150°C. Usage level: 1-2% as supplied, possibly together with 0.5-1% Accelerator C-101. "Shelf life" (gel time of resin + peroxide) at ambient temperature several weeks, depending on resin type, filler, pigment. "Pot life" (gel time of resin + peroxide + accelerator) up to several days, depending on temperature and peroxide level. Shelf or pot life can be prolonged considerably by adding 0.1-0.3% Inhibitor BC 500.

CURING CHARACTERISTICS:

In the range of 65-75°C ("kick-off" temperature) the curing rate is not very high unless there is a reaction exotherm (e.g. within a heat-retaining mould). Short cure times of a few minutes can be achieved only in the optimum temperature range for wet press moulding at 110-130°C.

PROCESSING METHODS:

In particular continuous impregnating (paper laminates), wet or hot press moulding, surface coating with wood varnishes, dripping electrical insulating varnishes with infrared heating.

Measurements

Activity

Influence of temperature and peroxide dosage¹⁾ on curing performance and degree of cure. Hot press moulding of 16 mm thick SMC pellets and 3 mm thick SMC sheets.

Temperature of mould	120°C	120°C	130°C	130°C	140°C	140°C	150°C	150°C
Formulation (parts of weight)								
Standard SMC (resin proportion)	100	100	100	100	100	100	100	100
Norox® 410	1.1	2.2	1.1	2.2	1.1	2.2	1.1	2.2
Curing performance (SMC pellets)								
Flow time (min)	1.05	0.90	0.90	0.80	0.70	0.65	0.60	0.55
Time to peak t _{max} (min)	1.75	1.50	1.45	1.25	1.20	1.10	1.00	0.95
Peak exotherm T _{max} (°C)	157	158	165	162	167	164	168	165
Degree of cure (SMC sheets ²⁾)								
Barcol (934) hardness	15	20	20	20	25	25	30	30
Residual styrene content (%)	2.0	1.2	0.9	0.7	0.7	0.4	0.5	0.3

¹⁾ The amounts added are equivalent to 1% or 2% w/w techn. pure t-butyl perbenzoate

²⁾ The press cycles for the SMC sheets are equal to the t_{max}. of the corresponding SMC pellets.

Further information on suitable curing agents for unsaturated polyester resins is given in our application brochures on this subject.

Packaging

Standard packaging of Norox 410 is 25 kg.

Disclaimer

This information and all further technical advice are reflecting our present knowledge and experience based on internal tests with local raw materials with the purpose to inform about our products and applications. The information should not be construed as guaranteeing specific properties of products described or their suitability for a particular application, nor as providing complete instructions for use. The information implies no guarantee for product and shelf life properties, nor any liability or other legal responsibility on our part, including with regard to existing third party intellectual property rights, especially patent rights. We reserve the right to make any changes according to technological progress or further developments.

Application and usage of our products based on our technical advice is out of our control and sole responsibility of the user. The user is not released from the obligation to conduct careful inspection and testing of incoming goods in order to verify the suitability for the intended application.

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