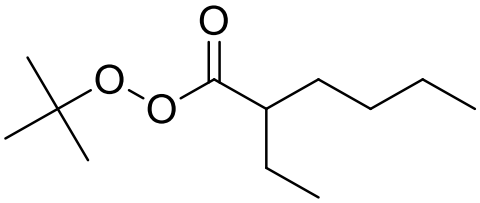
TBPEH

***tert*-Butyl peroxy-2-ethylhexanoate**
CAS#3006-82-4
colourless liquid

Structural Formula



Description

Colourless liquid, consisting of technically pure *tert*-butyl peroxy-2-ethyl hexanoate. This branched, aliphatic perester functions as a radical initiator in curing process of unsaturated polyester resins at 70 – 150 °C and can be used in combination with cobalt accelerators if required.

Technical Data

Appearance	colourless liquid
Assay	approx. 99 % w/w
Active oxygen (AO)	approx. 7.32 % w/w
Density at 20 °C	approx. 0.90 g/cm³
Viscosity at 20 °C	approx. 4 mPa·s
Refractive index at 20 °C	approx. 1.428
Flash point	approx. 78 °C
Vapour pressure at 20 °C	approx. 0.02 mbar
Critical temperature (SADT)	approx. 35 °C
Cold storage stability	approx. - 25 °C
Recommended storage temperature	max. 10 °C
Maximum transport temperature	20 °C
Storage stability as from date of delivery	3 months

Standard Packaging

5 kg, 15 kg, 20 kg, 25 kg HDPE canister

Half-life Data

10 h / 1 h / 1 min (benzene, 0.1 mol/L)	74 °C / 92 °C / 130 °C

Application

POLYESTERCURING:

Curing agent for UP resins, possibly in combination with cobalt accelerators
Temperature range: 70 - 150 °C
Usage level: 1 - 2 %, possibly together with 0.5 - 1 % cobalt accelerator
"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:

- Impregnating (paper laminates)
- Wet or hot press moulding
- Surface coating with wood varnishes
- Dripping electrical insulating varnishes with infrared heating

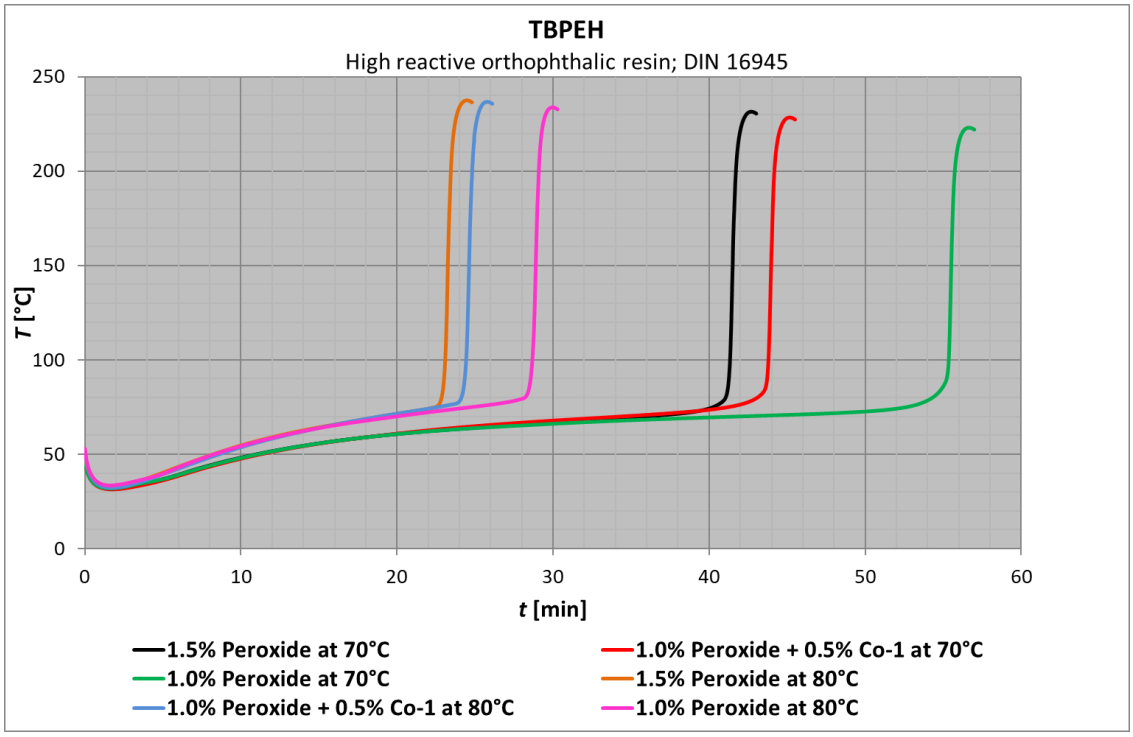
Decomposition Products

Possible detectable decomposition products: *tert*-butyl alcohol; acetone, heptane

Storage

Avoid any source of heat, light, humidity and protect the product from impurities. Keep within save temperature limits.

Measurements



Formulation (parts per weight)							
Resin		100	100	100	100	100	100
TBPEH	[Vol-%]	1.5	1.0	1.0	1.5	1.0	1.0
Co-1	[Vol-%]		0.5			0.5	
Curing Data							
Gel time +5 °C t_{gel}	[min]	40.3	41.2	52.6	23.0	24.3	28.5
Curing time t_{max}	[min]	42.7	45.2	56.6	24.5	25.8	30.0
Peak temperature T_{max}	[°C]	232	229	223	238	237	234

ACTIVITY for SMC:

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

Moulding tool temperature [°C]	120	120	130	130	140	140	150	150
Standard SMC (resin proportion)	100	100	100	100	100	100	100	100
TBPEH [%]	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 temperature T_{max} [min]	1.75	1.50	1.45	1.25	1.20	1.10	1.00	0.95
Maximum peak temperature (T_{max})	157	158	165	162	167	164	168	165
Degree of cure (SMC sheets)								
Barcol hardness (934)	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

United Initiators
Europe
T: +49 89 74422 237
F: +49 89 74422 6237
cs-initiators.eu@united-in.com

United Initiators
Nafta
T: +1 800 231 2702
F. +1 440 323 0898
cs-initiators.nafta@united-in.com

United Initiators
China
T: +86 21 6117 2760
F: +86 139 2503 8952
cs-initiators.cn@united-in.com

www.united-initiators.com