

Technical Data Sheet (TDS)

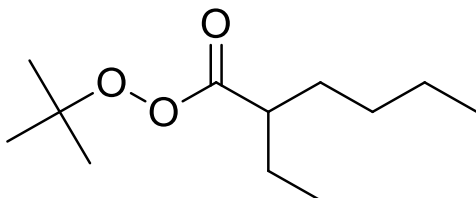
TBPEH
Thermoset (TS)



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/cm ³
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

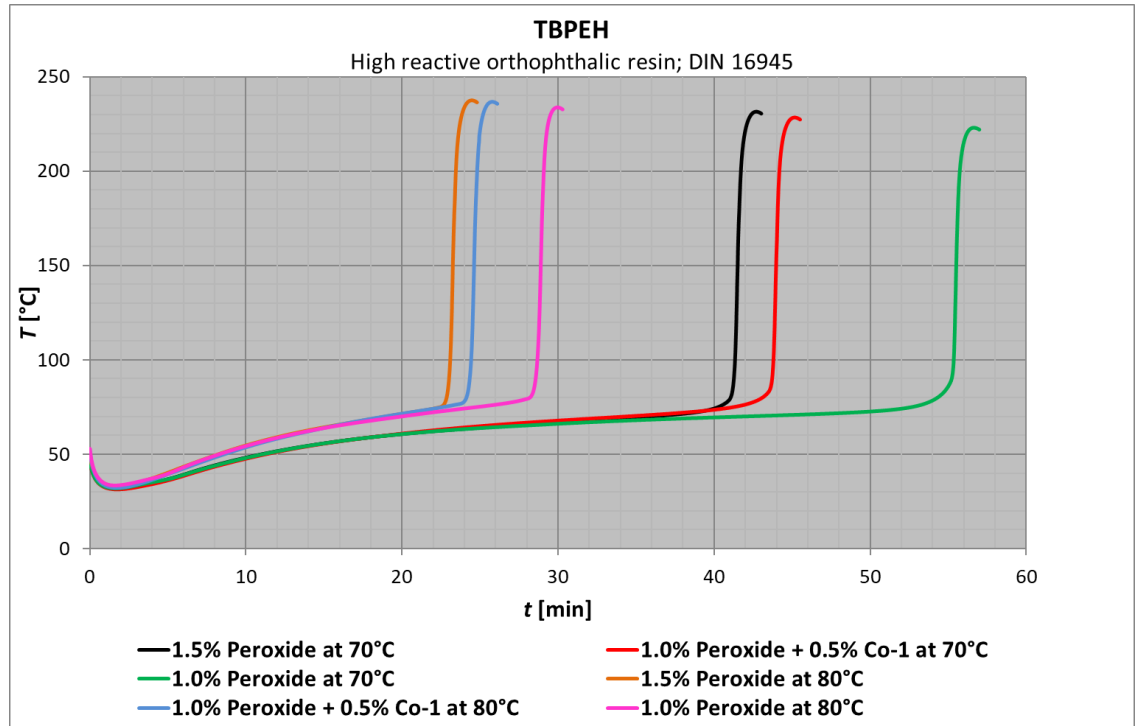
Avoid any source of heat, light, humidity and protect the product from impurities.
Keep within save temperature limits.

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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

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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

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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