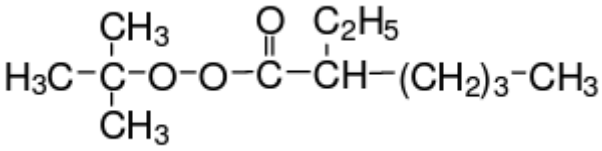
TBPEH

tert.Butyl-per-2-ethylhexanoate
CAS#3006-82-4
colourless liquid

Structural Formula



Description

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

Technical Data

Appearance	colourless liquid
Assay	ca. 99 % w/w
Active oxygen (AO)	ca. 7.32 % w/w
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
Flash point	ca. 78 °C
Vapour pressure at 20 °C	ca. 0.02 mbar
Critical temperature (SADT)	ca. 35 °C
Cold storage stability	ca. - 25 °C
Recommended storage temperature	max. 10 °C
Maximum transport temperature	20 °C
Storage stability as from date of delivery	3 months

Standard Packaging

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:
In particular continuous 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.Butylalcohol; Acetone, Heptane

Storage

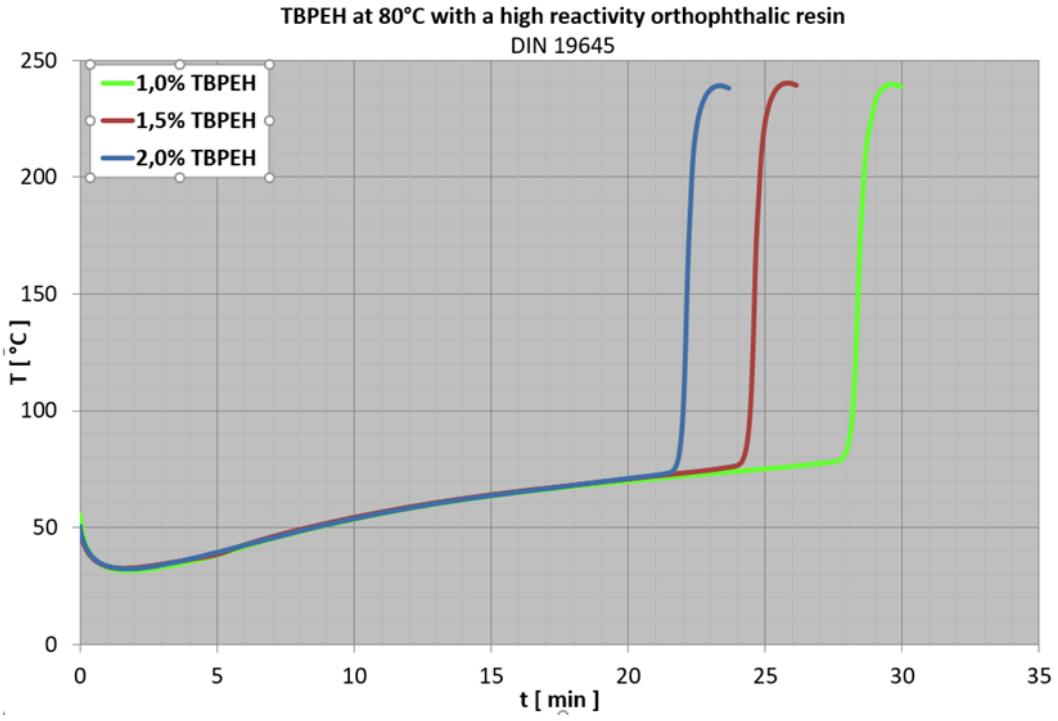
Avoid any source of heat, light, humidity and protect the product from impurities. Keep within save temperature limits.

Measurements

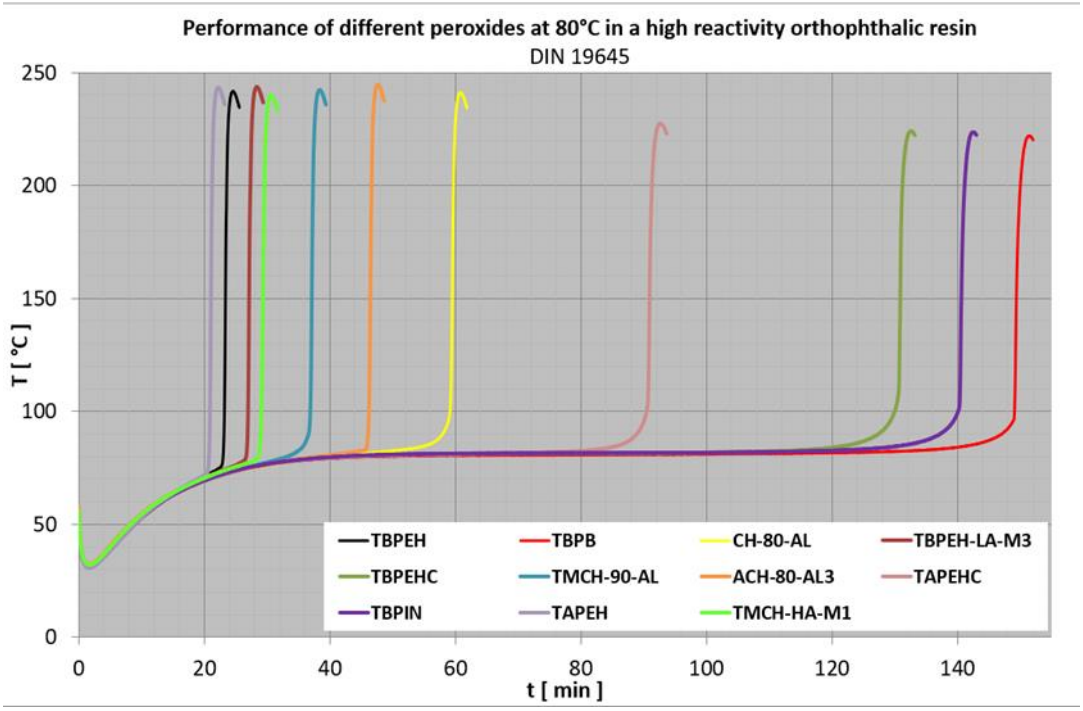
ACTIVITY:
Influence of temperature and peroxide dosage on curing performance and degree of cure. Hot press moulding of 16 mm thick SMC-pellets and 3 mm thick SMC-sheets.

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

Performance of different TBPEH dosages at 80 °C:



Performance of different SMC-peroxides at 80 °C:



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