Technical Data Sheet

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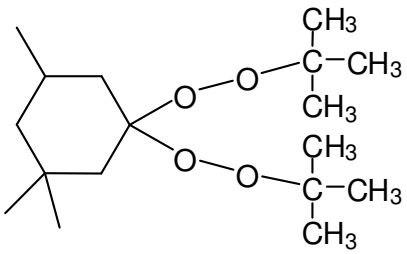
TMCH

1,1-Bis(tert.butyl peroxy)3,3,5-trimethyl cyclohexane
CAS#6731-36-8
Molar mass: 302.4 g/mol
Liquid, technically pure

Structural Formula



Description

Colourless, mobile liquid, consisting of technically pure 1,1-bis(tert.butylperoxy)3,3,5-trimethyl cyclohexane. This cyclo-aliphatic perketal is used as an initiator (radical source) in the curing of unsaturated polyester resins. Main application: hot press moulding of SMC or BMC in the range of 130-160°C.

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Appearance	colourless liquid
Peroxide content	approx. 98% w/w
Active oxygen	approx. 10.37 % w/w
De-sensitising agent	none
Density at 20°C	approx. 0.91 g/cm^3
Viscosity at 20°C	approx. 36 mPa·s
Refractive index at 20°C	approx. 1.441
Miscibility	immiscible with water, miscible with alcohols and styrene
Critical temperature (SADT)	approx. 60 °C
Cold storage stability	to below -30 °C
Kick-off temperature	approx. 75 °C
Recommended storage temperature	below 30 °C
Storage stability as from date of delivery	6 months

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

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Half-life Data

10 h/1 h/1 min (0.1 m/isododecane): 95 / 114 / 155 °C

Application

POLYESTER CURING:
Curing agent for UP resins. Temperature range: 120-160°C. Usage level: 1-3% as supplied. "Shelf life" (gel time of resin + peroxide) several weeks at ambient temperature. Hardly sensitive to fillers and pigments as well as cobalt salts and tertiary amines. Shelf life can be prolonged considerably by adding 0.1-0.3% Inhibitor BC 500.
CURING CHARACTERISTICS:
In the range of 70-80°C("kick-off" temperature) the curing rate is not very high, if the reaction heat does not cause temperature rise (e.g. within a heat-retaining mould). Really short cure times of 1-3 minutes can be achieved only above 120°C.The optimum temperature range for hot press moulding is therefore 130-160°C.
PROCESSING METHODS:
Mainly hot press moulding of sheet moulding compounds (SMC) and bulk moulding compounds (BMC) but also suitable in peroxide blends for pultrusion and cured in place pipes (CIPP)

Activity

Influence of temperature and peroxide dosage [1]) 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	130 °C		140 °C		150 °C		160 °C	
Formulation (parts by weight)								
Standard SMC (resin proportion)	100	100	100	100	100	100	100	100
TMCH	0.75	1.5	0.75	1.5	0.75	1.5	v	1.5
Curing performance (SMC pellets)								
Time to start of reaction (t_R) [min]	1.45	1.25	1.05	0.95	0.90	0.80	0.75	0.65
Time to peak (t_{max}) [min]	2.45	2.15	1.95	1.75	1.50	1.30	1.30	1.20
Temp. at start of reaction (TR) [°C]	108	105	108	105	107	104	110	108
Peak exotherm (T_{max}) [°C]	167	168	171	170	177	176	179	180
Degree if cure (SMC sheets [2])								
Barcol (934) hardness	10	15	25	25	25	25	30	30
Residual styrene content (%)	3.0	2.4	0.8	0.6	0.7	0.3	0.2	0.1

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

Standard Packaging 25 kg in HDPE canister

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Disclaimer

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