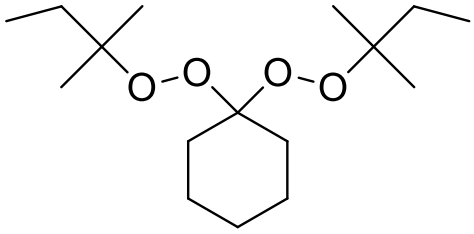
NOROX®510-80-AL3

1,1-Di(*tert*-amylperoxy) cyclohexane
CAS#15667-10-4
Colourless liquid

Structural Formula



Description

Colourless, mobile liquid, consisting of 1,1-di(*tert*-amylperoxy) cyclohexane, phlegmatized with aliphatic hydrocarbons. This cycloaliphatic perketal is used as a radical initiator for curing of unsaturated polyester resins. Main application: Hot press moulding of SMC or BMC in the temperature range of 130 - 150 °C (266 - 302 °F).

Technical Data

Appearance	colourless liquid
Desensitising agent	aliphatic hydrocarbons
Assay	ca. 80 % w/w
Active oxygen (AO)	ca. 8.8 % w/w
Density at 20 °C	ca. 0.90 g/cm³
Viscosity at 20 °C	ca. 6.7 mPa·s
Refractive index at 20 °C	ca. 1.441
Critical temperature (SADT)	ca. 60 °C / 140 °F
Cold storage stability	ca. -20 °C / -4 °F
Kick-off temperature	ca. 80 °C / 176 °F
Recommended storage temperature	below 30 °C / 86 °F
Storage stability as from date of delivery	6 months

Standard Packaging

35 lb and 25 kg (55 lbs) in HDPE canisters

Half-life Data

10 h / 1 h / 1 min (isododecane, 0.1 mol/L)	87 °C / 106 °C / 152 °C

Application

POLYESTER CURING:

Curing agent for UP resins at high temperatures.
Temperature range: 120 - 160 °C (248 - 320 °F)
Usage level: 0.5 - 2.5 %
"Shelf life" (gel time of resin + peroxide) at ambient temperature varies from weeks to months, depending on resin type. In comparison to peresters (*e.g.* TBPB, TBPEH) hardly sensitive to fillers and pigments, as well as to cobalt salts or tertiary aromatic amines. Shelf life can be prolonged considerably by adding 0.1 - 0.3 % Inhibitor BC 500.

CURING CHARACTERISTICS:

In the range of 75 - 90 °C (167 - 194 °F) ("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 115 °C (239 °F). The optimum temperature range for hot press moulding is therefore 125 - 150 °C (257 - 302 °F).
NOROX®510-80-AL3 is slightly faster reacting in standard *ortho*-phthalic polyester moulding resins than NOROX®500-80-AL3.
NOROX®510-80-AL3 can give improved surface properties of SMC-parts.

PROCESSING METHODS:

Mainly hot press moulding of sheet moulding compounds (SMC) or bulk moulding compounds (BMC).

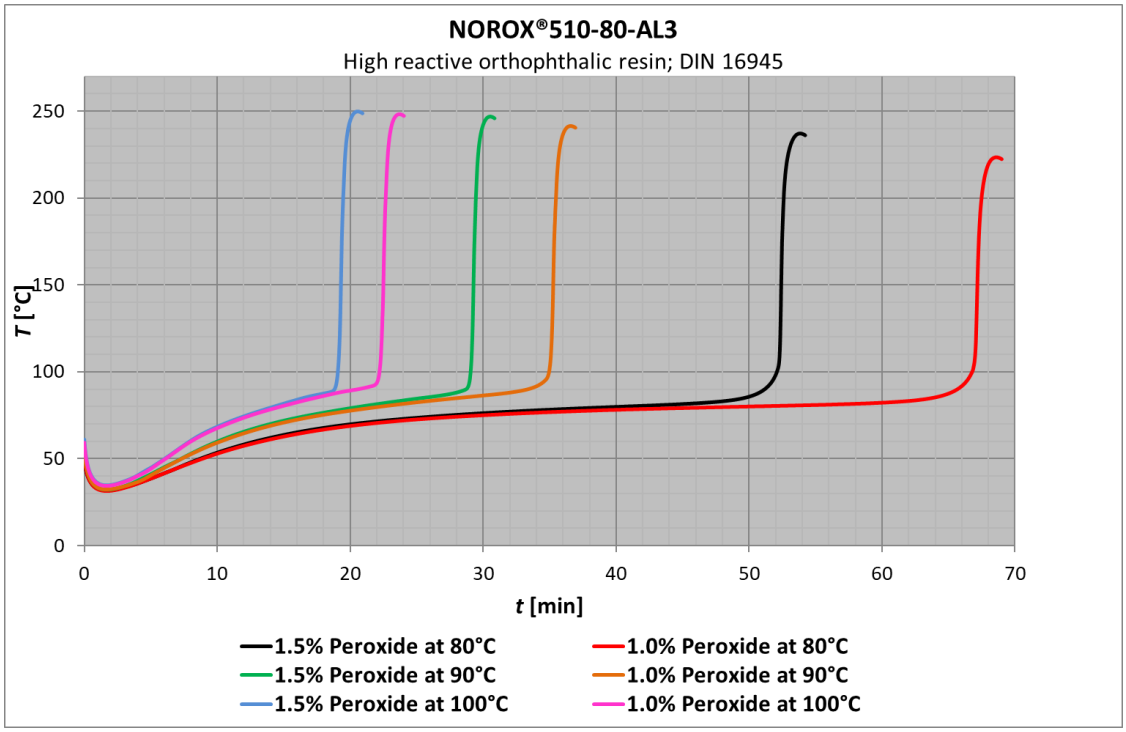
Decomposition Products

Possible detectable decomposition products: *tert*-Amyl alcohol, butanone, cyclohexanone, caprolactone, hexanoic acid

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
Temperature	[°C]	80	80	90	90	100	100
NOROX®510-80-AL3	[Vol-%]	1.5	1.0	1.5	1.0	1.5	1.0
Curing Data							
Gel time 5 °C above start t_{gel}	[min]	49.7	63.8	29.0	34.7	19.1	22.3
Gel time 10 °C above start t_{gel}	[min]	51.2	65.7	29.1	35.0	19.2	22.3
Curing time t_{max}	[min]	53.8	68.6	30.5	36.6	20.6	23.7
Peak temperature T_{max}	[°C]	237	224	247	242	250	248

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