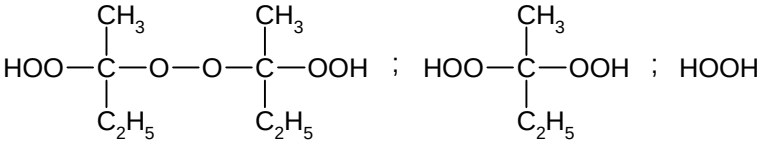
AKZO NOBEL

POLYMER CHEMICALS

Butanox® LPT

Product description

Methyl ethyl ketone peroxide in dimethyl phthalate



Peroxide content	:	35%
Balance	:	60% DIP, 5% MEK + water
CAS No.	:	1338-23-4; 84-69-5; 78-93-3
Einecs	:	2156612; 2015532; 2011590
TSCA	:	registered

Specification

Appearance	:	clear and colorless liquid
Total active Oxygen	:	8.4-8.6%

Physical properties

Density, 20°C	:	1060 kg/m^3
Viscosity, 20°C	:	28 mPa.s

Safety characteristics

Flash point	:	above the SADT*
SADT	:	60°C
Auto ignition temperature	:	220°C

Solubility

Insoluble in water. Soluble in phthalates.

Hazardous reactions

Oxidizing agent. Decomposes violently under the influence of heat or by contact with reducing agents. Never mix with accelerators.

Major decomposition products

Carbon dioxide, water, acetic acid, formic acid, propionic acid, methyl ethyl ketone.

Toxicological Data

LD 50, acute oral (rat)	:	1017 mg/kg (MEKP-40%)
LD 50, acute inhalation (rat)	:	17 mg/l (4 hours exposure) (MEKP-40%)
Primary skin irritation	:	Corrosive (MEKP-33%)
Eye irritation	:	Severely irritating/corrosive (MEKP-33%)
Ames test	:	Not mutagenic

Packaging

Standard packaging size for Butanox LPT is 30 kg net.
Smaller packaging size available on request.

* SADT = Self Accelerating Decomposition Temperature

Applications

Butanox LPT is a methyl ethyl ketone peroxide (MEKP) for the curing of unsaturated polyester resins in the presence of a cobalt accelerator at room and elevated temperatures.

Butanox LPT gives in comparison with most other ketone peroxides a significantly longer gel time and is therefore particularly suitable for those applications where a long gel time or production time is required, for instance in the production of large parts and in filament winding.
Also in areas with high ambient temperatures Butanox LPT is of particular interest.

Butanox LPT is especially recommended for the cure of vinyl ester resins. This MEKP formulation gives less "foaming" than standard MEKP's.

Practical experience throughout many years has proven that by the guaranteed low water content and the absence of polar compounds, Butanox LPT is very suitable in GRP products for e.g. marine applications.

The low hydrogen peroxide content of Butanox LPT makes this peroxide very suitable for the cure of those gelcoats, which tend to microporosity caused by the decomposition of the hydrogen peroxide.

For room temperature application it is necessary to use Butanox LPT together with a cobalt accelerator (e.g. Accelerator NL-49P).

Dosage

Depending on working conditions, the following peroxide and accelerator dosage levels are recommended:

Butanox LPT	1 - 4 phr*
Accelerator NL-49P	0.5 - 3 phr
Inhibitor NLC-10	0 - 0.2 phr

Cure Characteristics at ambient temperatures

In a high reactive standard orthophthalic resin in combination with Accelerator NL-49P (= 1% cobalt) the following application characteristics were determined:

Gel times at 20°C

2 phr Butanox LPT	+ 1.0 phr Acc. NL-49P	20 minutes
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P	7 minutes

* phr = parts per hundred resin

Cure of 4 mm laminates at 20°C

4 mm laminates have been made with a 450 g/m^2 glass chopped strand mat. The glass content in the laminates is 30% (w/w).

The following parameters were determined:
- Time-temperature curve.
- Speed of cure expressed as the time to achieve a Barcol hardness (934-1) of 0-5 and 25-30 respectively.
- Residual styrene content after 24 h at 20°C and a subsequent postcure of 8 h at 80°C.

		Gel time min.	Time to Peak min.	Peak exotherm °C
2 phr Butanox LPT	+ 1.0 phr Acc. NL-49P	24	54	41
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P	8	26	64

		Barcol 0-5 h	Barcol 25-30 h	Res. styrene 24 h 20°C %	Res. styrene + 8 h 80°C %
2 phr Butanox LPT	+ 1.0 phr Acc. NL-49P	3	13	6	<0.1
2 phr Butanox M-50	+ 1.0 phr Acc. NL-49P		1	5	<0.1

Cure Characteristics at elevated temperatures

The fact that processing times of several hours can be achieved with low cobalt dosages and small amounts of an inhibitor makes Butanox LPT very suitable for use in e.g. filament winding techniques. Simulating the manufacture of a pipe at 70°C consisting of a laminate of 4 mm with a glass content of 30% gave the following results:

Butanox LPT	1.5 phr
Accelerator NL-49P	0.3 phr
Inhibitor NLC-10	0.2 phr
Gel time at 20°C:	200 minutes
Curing data at 70°C:	
Gel time	7 minutes
Time to Peak	17 minutes
Peak exotherm	119°C

Barcol hardness 10 minutes after reaching the peak: 44

Pot life at 20°C

Pot lives were determined of a mixture of Butanox LPT and a non-preaccelerated UP resin at 20°C.

2 phr Butanox LPT	11 h
4 phr Butanox LPT	6 h

Colors

Butanox LPT is available in the color red.

Recommended	Handling Procedures and First Aid
Protective equipment and handling instructions	- Use safety goggles or face shield and gloves. - Extra ventilation recommended. - Use clean equipment and tools of inert material, such as stainless steel, polyethylene, glass. - All equipment should be earthed. - Do not pipet by mouth. - Avoid contact with rust. - Never bring peroxide into direct contact with accelerators. - Never weigh out in the storage room.
Storage conditions	Keep container tightly closed in a well-ventilated place. Temperature max. +25°C. Keep away from reducing agents e.g. amines, acids, alkalis, heavy metal compounds (e.g. accelerators, driers, metal soaps). Never weigh out in the storage room.
Storage stability	Only when stored under these recommended storage conditions, the product will remain within the Akzo Nobel specifications for a period of at least three months after delivery.
Fire fighting	Extinguish a small fire with powder or carbon dioxide; then apply water to prevent re-ignition. Extinguish a big fire with large amounts of water, applied from a safe distance.
Spillage	Mix with e.g. vermiculite. Sweep up with dustpan and brush of inert material, flush the remainder with water. Remove the waste to a safe place. The waste should NOT be confined.
Disposal	According to local regulations.
Spillage on clothes	Remove contaminated clothes. Examine skin. If skin contact, wash or shower; apply a lanolin-based ointment. Launder clothes normally.
Eye contact	Rinse with plenty of water for at least 15 minutes. Seek medical advice.
Skin contact	Wash with plenty of water (and soap) or shower, afterwards apply a lanolin-based ointment. Seek medical advice.
Ingestion	Rinse mouth. Give water to drink. Seek medical advice. Do NOT induce vomiting.
Inhalation	Move to fresh air, rest, half-upright position. Loosen clothing. Seek medical advice.

For more detailed information reference can be made to the SDS of this product.

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