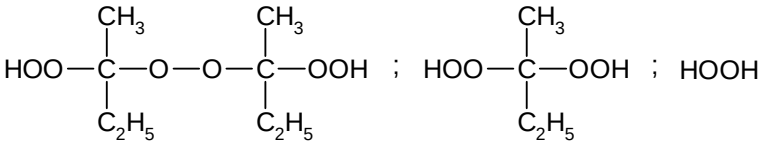
Product Data Sheet

Butanox® LPT-IN

Product description

Methyl ethyl ketone peroxide in diisononyl phthalate



CAS No.	: 1338-23-4
EINECS/ELINCS No.	: 215-661-2
TSCA status	: listed on inventory

Specifications

Appearance	: Clear and colorless liquid
Total active oxygen	: 8.4-8.6%

Characteristics

Density, 20°C	: 1.017 g/cm^3
Viscosity, 20°C	: 32.4 mPa.s

Storage

Due to the relatively unstable nature of organic peroxides a loss of quality can be detected over a period of time. To minimize the loss of quality, AkzoNobel recommends a maximum storage temperature (T_s max.) for each organic peroxide product.

For *Butanox* LPT-IN T_s max. = 25°C

When stored under the recommended storage conditions, *Butanox* LPT-IN will remain within the AkzoNobel specifications for a period of at least six months after delivery.

Thermal stability

Organic peroxides are thermally unstable substances, which may undergo self-accelerating decomposition. The lowest temperature at which self-accelerating decomposition of a substance in the original packaging may occur is the Self-Accelerating Decomposition Temperature (SADT). The SADT is determined on the basis of the Heat Accumulation Storage Test.

For *Butanox* LPT-IN SADT : 60°C

The Heat Accumulation Storage Test is a recognized test method for the determination of the SADT of organic peroxides (see Recommendations on the Transport of Dangerous Goods, Manual of Tests and Criteria - United Nations, New York and Geneva).

Major decomposition products

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

Packaging and transport

The standard packaging is a 30 l HDPE can (Nourytainer®) for 30 kg peroxide solution.

In Asia Pacific the standard packaging is a 30 l HDPE can for 20 kg peroxide solution.

Both packaging and transport meet the international regulations. For the availability of other packed quantities contact your AkzoNobel representative.

Butanox LPT-IN is classified as Organic peroxide type D; liquid; Division 5.2; UN 3105.

Safety and handling

Keep containers tightly closed. Store and handle *Butanox* LPT-IN in a dry well-ventilated place away from sources of heat or ignition and direct sunlight. Never weigh out in the storage room.

Avoid contact with reducing agents (e.g. amines), acids, alkalis and heavy metal compounds (e.g. accelerators, driers and metal soaps).

Please refer to the Safety Data Sheet (SDS) for further information on the safe storage, use and handling of *Butanox* LPT-IN. This information should be thoroughly reviewed prior to acceptance of this product. The SDS is available at www.akzonobel.com/polymer.

Applications

Butanox LPT-IN 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-IN 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-IN is of particular interest.

Butanox LPT-IN 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-IN is very suitable in GRP products for e.g. marine applications.

The low hydrogen peroxide content of *Butanox* LPT-IN 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-IN together with a cobalt accelerator (e.g. Accelerator NL-49P).

Dosing

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

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

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-IN + 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-IN + 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

* phr = parts per hundred resin

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-IN 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-IN	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-IN and a non-preaccelerated UP resin at 20°C.

2 phr *Butanox* LPT-IN	11 h
4 phr *Butanox* LPT-IN	6 h

Colors

Butanox LPT-IN is available in the color red.

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AkzoNobel Polymer Chemistry
Amersfoort, The Netherlands
T +31 33 467 6767
F +31 33 467 6151
E polymerchemistry.nl@akzonobel.com

AkzoNobel Polymer Chemistry
Chicago, U.S.A.
T +1 312 544 7000
T +1 800 828 7929 (Toll free US only)
F +1 312 544 7188
E polymerchemistry.na@akzonobel.com

Akzo Nobel (Asia) Co., Ltd.
Shanghai, PR China
T +86 21 2220 5000
F +86 21 2220 5558
E polymerchemistry.ap@akzonobel.com

www.akzonobel.com/polymer

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