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Material Safety Data Sheet

BUTANOX M-50

SAFETY DATA SHEET

According to Regulation (EC) No. 1907/2006

PRODUCT: BUTANOX M-50

1. IDENTIFICATION OF THE SUBSTANCE/PREPURATION

Product label name

Butanox M-50 - Methyl ethyl ketone peroxide, solution in dimethyl phthalate

Intended use

Curing agent

Chemical family

Peroxides

2. HAZARDS IDENTIFICATION

May cause fire. Harmful if swallowed. Causes burns.

3. COMPOSITION/INFORMATION ON INGREDIENTS

This product is to be considered as a preparation in conformance to EC directives.

Information on hazardous ingredients

Chemical description

Methyl ethyl ketone peroxide, solution in dimethyl phthalate

Composition / information on ingredients:

Number	%	w/w	CAS-number	Chemical name
1	30 - 37		001338-23-4	Methyl ethyl ketone peroxide
2	55 - 70		000131-11-3	Dimethyl phthalate
3	1 - 5		000078-93-3	Methyl ethyl ketone
4	1 - 3		007732-18-5	Water

Annex-1 number

EC-number

Symbol(s)

(EU classification)

1	215-661-2	C E
2	205-011-6	none
3	606-002-00-3	F Xi
4	201-159-0	none
	231-791-2	

Risk-phrase(s)

R02 R07 R22 R34

R11 R36 R66 R67

4. FIRST AID MEASURES

Symptoms and effects

Harmful if swallowed. Causes burns. Causes injury to the cornea and eyelids. Risk of serious damage to eyes.

First aid General

Call a physician immediately.

Inhalation

Remove to fresh air. If not breathing, give artificial respiration. Oxygen may additionally be given, by trained personnel, if it is available. Get medical attention immediately.

Skin

Immediately start continuous flushing of skin with water for at least 15 minutes, while removing contaminated clothing and shoes. Get medical attention immediately. Wash clothing before reuse. Thoroughly clean or destroy contaminated shoes.

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Eye

Immediately start continuous flushing of eyes with water for at least 15 minutes. If easy to do, contact lenses should be removed during the flushing, by trained personnel. Hold the eyelids apart during the flushing to ensure rinsing the entire surface of the eye and lids with water. Get medical attention immediately.

Ingestion

DO NOT induce vomiting. Get medical attention immediately by calling a physician or a poison control center. If victim is conscious and alert, give a cupful of water. Never give anything by mouth to an unconscious or convulsing person. If vomiting occurs, the patient should lie on their left side while vomiting to reduce the risk of aspiration.

Advice to physician

Persons with pre-existing skin, respiratory, and/or central nervous system disease may be at increased risk if exposed to this material. This material is severely corrosive to the eyes and may cause delayed keratitis. The normally prescribed 15 minute eye irrigation after exposure may be difficult because of the severe pain. The prior installation of a topical ocular anesthetic is essential to facilitate a comprehensive ocular lavage. If swallowed, do not induce vomiting. Give patient plenty of water to drink. Ingestion of this corrosive material may result in severe ulceration, inflammation, and possible perforation of the upper alimentary tract, with hemorrhage and fluid loss. Aspiration of this material during induced emesis can result in severe lung injury. Contact a Poison Control Center for additional treatment information. Treat any additional effects symptomatically.

5. FIRE-FIGHTING MEASURES

Extinguishing media

Water spray, alcohol resistant foam, sand, dry chemical powder, CO₂.

Unsuitable extinguishing media

Halones

Hazardous decomposition / combustion products

CO₂, Carbon Monoxide, Water, Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone.

Protective equipment

Firefighters must wear fire resistant protective equipment. Wear approved respirator and protective gloves.

Other information

Evacuate all non-essential personnel. Extinguish a small fire with powder or carbon dioxide then apply water to prevent re-ignition. Cool closed containers with water. Water used to extinguish a fire should not be allowed to enter the drainage system or water courses. After a fire, ventilate thoroughly the area and soak with water, clean the walls and metallic surfaces.

Fire and explosion hazard

CAUTION: Reignition may occur. Decomposition under effect of heating (See also Section Hazardous decomposition products). If involved in a fire, it will support combustion. Vapors may form explosive mixtures with air. In case of fire and/or explosion do not breathe fumes.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions

Do not breathe fumes/vapors. Avoid contact with skin and eyes. For personal protection see Section 8.

Environmental precautions

Do not allow to enter drains or water courses.

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Methods for cleaning up

Stop leakage if possible. Eliminate all sources of ignition, and do not generate flames or sparks.

Transfer remaining product from leaking container to a clean and suitable container. Cover the remainder with inert absorbent (e.g. vermiculite) for disposal. Keep contents moist. The waste should NOT be confined. Flush surroundings with large amounts of water.

Other information

CAUTION: Reignition may occur. Vapors are heavier than air and may spread along floors. Vapors may travel to a source of ignition and flash back. Evacuate personnel to safe area.

7. HANDLING AND STORAGE

Handling

Never weigh out in the storage room. When using, do not eat, drink or smoke. Do not pipette by mouth. Do not breathe fumes/vapor. Handle in well ventilated areas. Eliminate all sources of ignition, and do not generate flames or sparks. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps). Keep product and emptied container away from heat and sources of ignition. Confinement must be avoided. Avoid contact with skin and eyes. Avoid Incompatible materials (See Section 10).

Fire and explosion prevention

Use explosion protected equipment. Keep away from sources of ignition - No smoking. Vapors are heavier than air and may spread along floors. Use non-sparking tools in area's where explosive vapor air mixtures may occur. Do not cut or weld on or near this container even when empty.

Storage requirements

Store in accordance with local/national regulations. Keep away from food, drink and animal feeding stuffs. Store in a dry well ventilated place away from sources of heat and direct sunlight. Store separate from other chemicals. Keep only in the original container. Keep container upright to prevent leakage.

Storage

For maximum quality store below: 25 °C.

Other information

It is recommended to use electrical equipment of temperature group T3. However, auto ignition can never be excluded. Wash hands thoroughly after handling or contact. Keep working clothing separately and do not take them home.

NR-7-UK-HSE Guidance (07)

A COSHH assessment necessary to ensure compliance.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering controls

Ensure good ventilation and local exhaustion of the working area. Explosion proof ventilation recommended.

Personal protection

Respiratory

In case of insufficient ventilation wear suitable respiratory equipment (respirator with Filter A).

Hand

Wear suitable protective gloves of neoprene or synthetic rubber.

Eye

Wear eye/face protection.

Skin and body

Wear suitable protective clothing.

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Other information

Emergency-shower and facilities for rinsing eyes must be accessible. Launder clothes before reuse.

Methyl ethyl ketone peroxideShort Term Exposure Limit (STEL) 1.5 mg/m³**Dimethyl phthalate**Short Term Exposure Limit (STEL) 10 mg/m³Time Weighted Average (TWA) 5 mg/m³**Methyl ethyl ketone**

Can be absorbed through skin.

Short Term Exposure Limit (STEL) 899 mg/m³Time Weighted Average (TWA) 600 mg/m³**9. PHYSICAL AND CHEMICAL PROPERTIES****Appearance:** liquid**Color:** colorless clear**Odor:** faint**Boiling point/range:** not applicable (Decomposes)**Melting point/range:** not determined**Flash point:** Above the SADT value**Flammability:** Decomposition products may be flammable.**Explosive properties:** no**Oxidizing properties:** not applicable**Vapor pressure:** 0.10 kPa (84°C / 183°F)**Density:** 1180 kg/m³ (20°C / 68°F) Specific gravity = 1.180 (2 0°C / 68°F)**Bulk density:** not applicable**Solubility in water:** Partly miscible with water (20°C / 68°F)**Solubility in other solvents:** Miscible with phthalates (20°C / 68°F)**pH value:** slightly acidic**Partition coefficient n-octanol/water:** not determined**Relative vapor density (air=1):** not determined**Viscosity:** 24 mPa.s (20°C / 68°F)**Active oxygen content:** 8,8 - 9,0 %**Peroxide content:** 30-37 %**Autoignition temperature:** Test method not applicable (See Section 7)**SADT:** 60 °C. See also Section 10.**Explosion limits:** not determined**Volatile %:** 5 %**10. STABILITY AND REACTIVITY****Stability**

SADT - (Self accelerating decomposition temperature) is the lowest temperature at which self accelerating decomposition may occur with a substance in the packaging as used in transport. A dangerous self-accelerating decomposition reaction and, under certain circumstances, explosion or fire can be caused by thermal decomposition at and above the following temperature: 60 °C. Contact with incompatible substances can cause decomposition at or below the SADT 60 °C.

Conditions to avoid

To maintain quality store in original closed container below: 25 °C.

Avoid shock and friction. Confinement must be avoided.

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Incompatibles

Avoid contact with rust, iron and Copper. Contact with incompatible materials such as acids, alkalis, heavy metals and reducing agents will result in hazardous decomposition. Do not mix with peroxide accelerators. Use only Stainless steel 316, PVC, polyethylene or glass-lined equipment.

Polymerization

Polymerization does not occur.

Hazardous decomposition products

Water, Acetic acid, Formic acid, Propanoic acid, Methyl ethyl ketone.

Other information

Emergency procedures will vary depending on conditions. The customer must have an emergency response plan in place.

11. TOXICOLOGICAL INFORMATION

No experimental toxicological data on the preparation as such available. The following data are applicable to the ingredient(s) listed below.

Methyl ethyl ketone peroxide, 40 % in Dimethyl phthalate

Acute toxicity

Oral LD50: rat: 1017 mg/kg

Dermal LD50: rat: 4000 mg/kg

Inhalation LC50: rat: 17 mg/l ; 4 hours exposure time

Irritation

Skin: Corrosive

Eye: Corrosive

Sensitization: Not sensitizing

Genotoxicity: Ames test: Not mutagenic

Dimethyl phthalate

Acute toxicity

Oral LD50: rat: >2400 mg/kg

Dermal LD50: rabbit: >10.000 mg/kg

Inhalation LC50: 9300 mg/m³ (6.5 hours)

Irritation

Skin: Mildly irritating

Eye: Minimally irritating

Methyl ethyl ketone

Acute toxicity

Oral LD50: rat: 2737 mg/kg

Dermal LD50: rabbit 6480 mg/kg

Inhalation LC50: rat 23.5000 mg/m³

Irritation

Skin: Moderately irritating

Eye: Moderately irritating

12. ECOLOGICAL INFORMATION

No experimental ecological data are available on the preparation as such. The following data are applicable to the ingredient(s) listed below.

Methyl ethyl ketone peroxide, 40 % in Dimethyl phthalate

Ecotoxicity

Fish: Acute toxicity, 96h-LC50 = 44.2 mg/l. (*Poecilia reticulata*.)

Bacteria: Activated sludge respiration inhibition test EC50 = 48.0 mg/l.

Fate

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Degradation Biotic: Readily biodegradable (Closed bottle test).

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Dimethyl phthalate

Ecotoxicity

Fish: Lepomis macrochirus: 96h-LC50: 420 ppm

Algae: Selenastrum capricornutum: 39.8 mg/l (96h-IC50)

Fate

Degradation Biotic: Readily biodegradable.

Other information

Bio Concentration Factor (BCF) fish 5.4 (24 hours)

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Dimethyl phthalate

Ecotoxicity

Fish: Lepomis macrochirus: 96h-LC50: 420 ppm

Algae: Selenastrum capricornutum: 39.8 mg/l (96h-IC50)

Fate

Degradation Biotic: Readily biodegradable.

Other information

Bio Concentration Factor (BCF) fish 5.4 (24 hours)

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Methyl ethyl ketone

Ecotoxicity

Fish: Lepomis macrochirus: 96h-LC50: 3.22 g/l

Fate

Degradation Biotic: Readily biodegradable.

Other information

Naturally occurring substance

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13. DISPOSAL CONSIDERATIONS

Product

Due to the high risk of contamination recycling/recovery is not recommended. Waste disposal in accordance with regulations (most probably controlled incineration).

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Contaminated packaging

According to local regulations. Emptied container might retain product residues. Follow all warnings even after the container is emptied.

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Other information

For further advice contact manufacturer.

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Waste code number

Waste should be regarded as special waste for disposal. Please refer to your specific industry in the European Waste Catalogue.

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14. TRANSPORT INFORMATION

Land transport

Class: 5.2

Classification Code: P1

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RID class: 5.2

Substance Identification No. 3105

TREM-Card or ERG number: CEFIC TEC(R)- 52GP1-L

UN number: 3105

Proper Shipping Name: Organic peroxide type D, liquid (Methyl ethyl ketone peroxide)

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Required labels: 5.2

Sea transport (IMDG-code / IMO)

Class: 5.2

Packing group: II

UN number: 3105

EMS: F-J, S-R

Marine pollutant: no

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Proper Shipping Name: Organic peroxide type D, liquid (Methyl ethyl ketone peroxide)

Other information

Label(s): 5.2

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Air transport (ICAO-TI / IATA-DGR)

UN number: 3105

Class: 5.2

Packing group: II

Proper Shipping Name: Organic peroxide type D, liquid (Methyl ethyl ketone peroxide)

Other information

Label(s): 5.2

15. REGULATORY INFORMATION**Product label name**

Methyl ethyl ketone peroxide, solution in dimethyl phthalate

Labelling according to EC directives**EC-number:** not applicable**Risk phrase(s) (EU classification)**

R07. May cause fire.

R22. Harmful if swallowed.

R34. Causes burns.

Safety phrase(s) (EU classification)

S03/07. Keep container tightly closed in a cool place.

S14B. Keep away from reducing agents (e.g. amines), acids, alkalies and heavy metal compounds (e.g. accelerators, driers, metal soaps).

S36/37/39. Wear suitable protective clothing, gloves and eye/face protection.

S45. In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible).

S50D. Do not mix with peroxide-accelerators or reducing agents.

Symbol(s) (EU classification)**A E****CORROSIVE OXIDIZING****Other information**

Substance and/or product listed in Directive 96/82/EC.

German Water Hazard Class (WGK): 1 (VwVwS Anhang 4 Nr. 3)**16. OTHER INFORMATION****R-phrase information****Chemical name: Risk phrase(s) (EU classification)**

Methyl ethyl ketone peroxide: R02 R07 R22 R34 Risk of explosion by shock, friction, fire or other sources of ignition. May cause fire. Harmful if swallowed Causes burns.

Dimethyl phthalate: none

Methyl ethyl ketone: R11 R36 R66 R67 Highly flammable irritating to eyes Repeated exposure may cause skin dryness or cracking. Vapors may cause drowsiness and dizziness

Water: none

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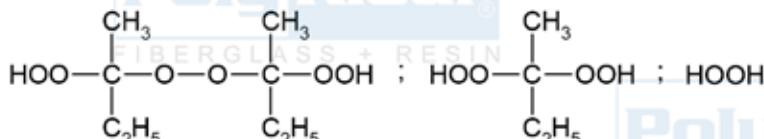


Technical Data Sheet

Butanox® M-50

Product description

Butanox M-50 - methyl ethyl ketone peroxide in dimethyl phthalate



Specification

Peroxide content	: 33%
Balance	: 63% DMP, 4% MEK + water
CAS No.	: 1338-23-4; 131-11-3; 78-93-3
Einecs	: 2156612; 2050116; 2011590
TSCA	: registered

Physical properties

Density, 20°C	: 1180 kg/m ³
Viscosity, 20°C	: 24 mPa.s

Safety characteristics

Flash point	: above the SADT*
SADT	: 60°C
Auto ignition temperature	: 260°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 M-50 is 30 kg net.
Smaller packaging size available on request.

* SADT = Self Accelerating Decomposition Temperature

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Applications

Butanox M-50 is a general purpose methyl ethyl ketone peroxide (MEKP) for the curing of unsaturated polyester resins in the presence of a cobalt accelerator at room and elevated temperatures.

The curing system Butanox M-50/cobalt accelerator is particularly suitable for the curing of gelcoat resins, laminating resins, lacquers and castings; moreover the manufacture of light resistant parts may be possible contrary to the curing system benzoyl peroxide/amine accelerator.

Practical experience throughout many years has proven that by the guaranteed low water content and the absence of polar compounds in Butanox M-50, this peroxide is very suitable in GRP products for e.g. marine applications.

For room temperature application it is necessary to use Butanox M-50 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 M-50
Accelerator NL-49P

1 - 4 phr
0.5 - 3 phr

Cure Characteristics

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 M-50 + 0.5 phr Acc. NL-49P
2 phr Butanox M-50 + 1.0 phr Acc. NL-49P

12 minutes
7 minutes

Cure of 1 mm pure resin layer at 20°C

The speed of cure is expressed as the time to reach a Persoz hardness of respectively 30, 60 and 120 s.

Persoz: 30 60 120 s

2 phr Butanox M-50 + 0.5 phr Acc. NL-49P
2 phr Butanox M-50 + 1.0 phr Acc. NL-49P

2.4 4.1 13 h
1.7 3.0 9.5 h

phr = parts per hundred resin

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Cure of 4 mm laminates at 20°C

4 mm laminates have been made with a 450 g/m² 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.

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2 phr Butanox M-50 + 0.5 phr Acc. NL-49P
2 phr Butanox M-50 + 1.0 phr Acc. NL-49P

Gel time min.	Time to Peak min.	Peak exotherm °C
13	36	44
8	26	64

Barcol 0-5	25-30 h	Res. styrene 24 h 20°C	+ 8 h 80°C
h	h	%	%
3	15	6	0.3
	1	5	0.1

Pot life at 20°C

Pot lives were determined of a mixture of Butanox M-50 and a non-preaccelerated UP resin at 20°C.

2 phr Butanox M-50
4 phr Butanox M-50

12 h
7 h

PolyKlear
Colors
FIBERGLASS + RESIN

Butanox M-50 is available in the colors blue, yellow-A, red-YM and red-YM 1/6.

PolyKlear
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Butanox is a registered trademark of Akzo Nobel Chemicals bv.

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PolyKlear
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s.e.a.

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Protective equipment and handling instructions

Poly Klear
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Recommended Handling Procedures and First Aid

- 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

Poly Klear
FIBERGLASS + RESIN

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.

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

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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.

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