1. IDENTIFICATION OF THE PRODUCT AND COMPANY

1.1 Identification of the preparation: HARDENER LIQUID FOR POLYESTER Code: 51226
1.2 Use of the preparation: B Component for polyester products. Only for professional use.
1.3 Company:
ROBERLO, S.A.
Carretera N-II, Km. 706,5 - E-17457 - Riudellots de la Selva (Girona) - SPAIN
Phone: +34 972 478060 - Fax: +34 972 477394 - msds@roberlo.com - www.roberlo.com
1.4 Emergency phone number: +34 91 5620420 (National Institute of Toxicology)

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2. IDENTIFICATION OF HAZARDS

May cause fire. Harmful if swallowed. Corrosive. Causes burns. Causes burns to the skin or eyes by direct contact or to the digestive tract if swallowed.

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3. COMPOSITION/INFORMATION ON INGREDIENTS

Substances taking part in a percentage higher than the exemption limit and presenting a health or environment hazard, and/or with a Communitarian workplace exposure limit:

25-50 %	Methyl ethyl ketone peroxide E:R2 | C:R7 R22 R34	EC 215-661-2 CAS 1338-23-4
10-20%	Diacetone alcohol Xi:R36	EC 204-626-7 CAS 123-42-2
< 2,5 %	Methylethylketone F:R11 | Xi:R36 | R66-R67	EC 201-159-0 Index No. 606-002-00-3 CAS 78-93-3
< 2,5 %	Hydrogen peroxide C:R5 | O:R8 R:20/22 R:35	EC 231-765-0 CAS 7722-84-1

For more information on dangerous ingredients, see sections 8, 11, 12 and 16.

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4. FIRST AID MEASURES

In case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Never give anything by mouth to an unconscious person.
4.1 By inhalation: Remove the patient out of the contaminated area into the fresh air. If breathing is irregular or stops, administer artificial respiration. If the person is unconscious, place in appropriate recovery position. Keep the patient warm and at rest until medical attention arrives.
4.2 By contact with the skin: Remove contaminated clothing. Wash thoroughly the affected area with plenty of cold or lukewarm water and neutral soap, or use a suitable skin cleanser. Apply lanolin ointment. In the event of cutaneous eruptions contact a doctor.
4.3 By contact with eyes: Remove contact lenses. Rinse eyes copiously by irrigation with plenty of clean, fresh water for at least 15 minutes, holding the eyelids apart, until the irritation is reduced. If possible, alternate the rinsing with a 5% solution of sodium ascorbate in water or a 2% solution of sodium bicarbonate in water. Both solutions should not to be more than 4 weeks old. Do not apply oils. Call a physician immediately.

4.4 By ingestion: In case of accidental swallowing, seek immediate medical attention. If there has been any contact with the mouth, rinse out with large quantities of water only. Do not induce vomiting, due to the risk of perforation. Keep the patient at rest.

5. FIRE-FIGHTING MEASURES

Not combustible, but helps to cause combustion of other substances.
5.1 Means of Extinction: Extinguishing powder or CO2. In the case of more important fires, also alcohol resistant foam and water spray/mist. Do not use for extinguishing: halon.
5.2 Specific risks: As consequence of combustion or thermal decomposition, hazardous decomposition products may be produced, such as: carbon monoxide, carbon dioxide. Exposure to combustion or decomposition products may be a hazard to health.
5.3 Fire-proof protective equipment: Depending on magnitude of fire, heat-proof protective clothing may be required, appropriate independent breathing apparatus, gloves, protective glasses or face masks and boots.
5.4 Other recommendations: Cool with water the tanks, cisterns or containers close to sources of heat or fire. Bear in mind the direction of the wind. Do not allow fire-fighting residue to enter drains, sewers or water courses.

6. ACCIDENTAL SPILLAGE MEASURES

6.1 Personal precautions: Eliminate possible sources of ignition and when appropriate, ventilate the area. Do not smoke. Avoid direct contact with this product. Avoid breathing vapours. For exposure controls and personal protection measures, see section 8.
6.2 Environmental precautions: Avoid contamination of drains, surface or subterranean water and soil. In the case of large scale spills or when the product contaminates lakes, rivers or sewages, inform the appropriate authorities in accordance with local regulations.
6.3 Cleaning-up methods: Contain and mop up spills with non-combustible absorbent materials (earth, sand, vermiculite, diatomaceous earth, etc..). Do not use rags. The peroxide impregnated absorbent must be placed in a safe place and not put into a container. Do not mix with reducing agents, peroxide accelerators. For subsequent waste disposal, follow the recommendations in section 13.

*7. HANDLING AND STORAGE

7.1 Handling precautions: Comply with the health and safety at work laws.
- General recommendations: Handle with care, avoiding any discharge. Do not weigh it in the storage area. Avoid friction, rough handling or strong impacts. Avoid any type of leakage or escape. Keep the container tightly closed.
- Recommendations for the prevention of fire and explosion risks: Vapours are heavier than air and may spread along floors to a considerable distance. Vapours can form explosive mixtures with air and are able to reach distant ignition sources and flame up or explode. Due to its flammability, this material should only be used in areas from which all naked lights and other sources of ignition have been excluded and away from other heat or electrical sources. Do not smoke. Electrical equipment should be protected to the appropriate standard. No tools with a potential for sparks should be used.
- Flash point: >61ºC Setaflash
- Autoignition temperature: 559ºC

- Recommendations for the prevention of toxicological risks: Do not eat, drink or smoke while handling. After handling, wash hands with soap and water. For exposure controls and personal protection measures, see section 8.

7.2 Storage conditions: Prevent unauthorized access. Keep out of reach of children. This product should be stored isolated from heat and electrical sources. Do not smoke in storage area. Keep in a cool place. Keep container in a well-ventilated place. In order to avoid leakages, the containers, after use, should be closed carefully and placed in a vertical position. Due to its corrosive properties, extreme precaution in the selection of materials for pumps, packages and lines should be taken. The floor must be waterproof and corrosion resistant, with a canal system allowing the liquid to be channelled towards a neutralising pit. The electrical equipment must be made of non-corrodible materials. For more information, see section 10.1. Class of store: Class Xn. According to ITC MIE APQ-7, RD 379/2001. Temperature interval: min: 5ºC, max: 25ºC.

- Incompatible materials: Keep away from reducing agents, oxidizing agents, acids, alkalis, amines, metals, heavy-metal compounds.
- Type of packaging: According to current legislation.
- Limit quantity, in accordance with Directive 96/82/EC~2003/105/EC (Seveso III): Lower threshold limit: 50 tons, Upper threshold limit: 200 tons.

7.3 Specific uses: For the use of this product do not exist particular recommendations apart from that already indicated.

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8. EXPOSURE CONTROLS/PERSONAL PROTECTION 98/24/EC

8.1 Occupational Exposure Limits (TLV) AGCIH 2006

	TWA		STEL		C - Ceiling value.	Year
	ppm	mg/m3	ppm	mg/m3		
Ethylmethylketone peroxide			0, 20	1,5	C	1977
Ethylmethylketone	200	590	300	885		1976
Hydrogen peroxide				1, 4		2009
Diacetone alcohol				238		2009

8.2 Occupational exposure controls, Directive 89/686/EEC: Provide adequate ventilation. Where reasonably practicable, this should be achieved by the use of local exhaust ventilation and good general extraction. If these measures are not sufficient to maintain concentrations of particulates and vapours below the Occupational Exposure Limits, suitable respiratory protection must be worn.

- Protection of respiratory system: Avoid the inhalation of vapours. Mask: Mask for gases and vapours (EN141). In order to obtain a suitable protection level, the filter class must be selected depending on the type and concentration of the contaminating agents present, in accordance with the specifications supplied by the filter producers. The respiratory equipment with filters does not work satisfactorily when the air contains high concentrations of vapour.
- Protection of eyes and face: Install emergency eye baths close to the working area. Goggles: Safety goggles for chemicals, with suitable lateral protection (EN166). Face shield: Recommendable when peroxides are handled in large amounts.
- Protection of hands and skin: Install emergency showers close to the working area. Barrier creams may help to protect the exposed areas of the skin. Barrier creams should not be applied once exposure has occurred. Gloves: Neoprene rubber gloves (EN374). The breakthrough time of the selected glove material should be superior to the pretended period of use. The gloves should be immediately replaced when any sign of degradation is noted.
- Boots: Neoprene rubber boots (EN347).
- Apron: Apron resistant against corrosive products.
- Clothing: Clothing resistant to corrosive products will have to be worn. Put away work clothes under control and separately from the rest. Do not take contaminated clothing home. Wash contaminated work clothes before wearing them again.

8.3 Environmental exposure controls: Avoid any spillage in the environment of the product, wastes, packages or spraybooth sewages. Avoid any release into the atmosphere above the legal limits allowed.

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*9. PHYSICAL AND CHEMICAL PROPERTIES

- Physical state:	Liquid
- Colour:	Colourless
- Odour:	Characteristic
- Viscosity:	24 mPa.s 20ºC
- Specific gravity:	1,18 g/cc at 20ºC
- Available peroxydic oxygen:	9,1 % OO
- Flash point:	>61ºC Setaflash
- Self accelerating decomposition temperature:	60ºC (SADT)
- Vapour pressure:	0,10 kPa at 84ºC

For additional information concerning physical and chemical properties related to safety and environment, see sections 7 and 12.

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*10. STABILITY AND REACTIVITY

10.1 Conditions to avoid: Stable under recommended storage and handling conditions.
- Heat: This preparation is quite stable at normal temperatures (around 20ºC). However, at higher temperatures an exo-thermic decomposing reaction takes place. In the event of the decomposition taking place so fast that the heat only partially dissipates, an increased acceleration of the product's temperature occurs, finally giving rise to an auto-accelerated breaking down of the organic peroxide. Depending on the circumstances, eg. the amount, the degree of containment, etc.., intense decomposition, auto-ignition or even an explosion may take place.
- Light: Avoid direct contact with sunlight as this could cause a rise in temperature, with the subsequent danger of the peroxide decomposing.
- Humidity: Avoid extreme humidity conditions.

10.2 Materials to avoid: Possible dangerous reaction with reducing agents, oxidizing agents, acids, alkalis, amines, metals, heavy-metal compounds. Special care must be taken under all circumstances that there is no direct contact with accelerators, given that a violent decomposition could take place or even an explosion.
10.3 Thermal decomposition: As a consequence of thermal decomposition, hazardous decomposition products may be produced: oxygen. The vapours given off on decomposing are inflammable, therefore any source of ignition could cause a fire.

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*11. TOXICOLOGICAL INFORMATION

No experimental toxicological data on the preparation is available. The toxicological classification for this preparation has been carried out by using the conventional calculation method of the Directive 1999/45/EC.
11.1 Toxicological effects: Exposure to solvent vapour concentrations in excess of the stated occupational exposure limit, may result in adverse health effects, such as mucous membrane and respiratory system irritation and adverse effects on kidneys, liver and central nervous system. Symptoms and signs include: headache, dizziness, fatigue, muscular weakness, drowsiness and, in extreme cases, unconsciousness. Ingestion may result in the following effects: sore throat, abdominal pain, drowsiness, nausea, vomiting and diarrhoea; other effects

may be as described for exposure to vapours. Repeated or prolonged contact with the solvents of the preparation, may cause removal of natural fat from the skin, resulting in non-allergic contact dermatitis and absorption through the skin. Some organic peroxides will cause serious, irreversible ocular injuries to the cornea, even after brief contact. Causes burns to the skin or eyes by direct contact or to the digestive tract if swallowed. The mists of fine particles are skin and respiratory tract irritants.

11.2 Dose and lethal concentrations for individual ingredients :

	DL50 Oral mg/kg		DL50 Cutaneous mg/kg		CL50 Inhalation mg/l.4hours	
Ethylmethylketone peroxide	480	Rat			1,5	Rat
Ethylmethylketone	2737	Rat	6480	Rabbit	24	Rat
Diacetone alcohol	4000	Rat	2000	Rat	1500(8h)	Rat
Hydrogen peroxide	1232	Rat	2000	Rat	2	Rat

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*12. ECOLOGICAL INFORMATION

No experimental ecotoxicological data on the preparation as such is available. The ecotoxicological classification for this preparation has been carried out by using the conventional calculation method of the Directive 1999/45/EC.

12.1 Ecotoxicity for individual ingredients:

	CL50 mg/l.96hours		CE50 mg/l.48hours		CI50 mg/l.72hours
Ethylmethylketone peroxide	44	Fishes			
Ethylmethylketone	3220	Fishes	5091	Daphnia	
Diacetone alcohol	8930 (48h)	Fishes	9000(24h)	Daphnia	
Hydrogen peroxide	16,4	Fishes	7,7 (24h)	Daphnia	

12.2 Mobility: Not available.
- Spills on the soil: Prevent contamination of soil.
- Spills in water: Do not allow to escape into drains, sewers or water courses.
- Emissions to the atmosphere: Avoid any release into the atmosphere.
- Product VOC: 752 g/l ASTM D-3960

12.3 Persistence and degradability: Not available.
12.4 Bioaccumulative potential: Not available.
12.5 Results of PBT assessment: Not available.
12.6 Other adverse effects: Not available.

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*13. CONSIDERATIONS FOR DISPOSAL

13.1 Handling of waste, Directive 75/442/EEC~91/156/EC: Take all necessary measures to prevent the production of waste whenever possible. Analyse possible methods for revaluation or recycling. Do not discharge into drains or the environment, dispose of at an authorised waste collection point. Waste should be handled and disposed of in accordance with current local/national regulations. For exposure controls and personal protection measures, see section 8.

13.2 Disposal of empty containers, Directive 94/62/EC: Emptied containers and packaging should be disposed of in accordance with currently local/national regulations. Never re-use a container which has contained peroxides.

13.3 Procedures for neutralising or destroying the product: Controlled incineration in special facilities for chemical waste, but in accordance with local regulations. Before burning dilute with organic solvents.

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*14. TRANSPORT INFORMATION

ORGANIC PEROXYDE TYPE E, LIQUID (contains Ethylmethylketone peroxide)

14.1 Transport by road, Directive 94/55/EC (ADR):
Transport by rail, Directive 96/49/EC (RID):
Class: 5.2 UN nº3105 Packaging group: -
Transport document: Consignment paper
Written instructions.
14.2 Transport by sea (IMDG):
Class: 5.2 UN nº3105 Marine pollutant: no Packaging group: -
Emergency Sheet (EmS): F-J,S-R
First Aid Guide (MFAG): 735
Transport document: Shipping Bill of Lading
14.3 Transport by air (ICAO/IATA):
Class: 5.2 UN nº3105 Packaging group: -
Transport document: Air Bill of Lading

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15. INFORMATION ON REGULATIONS

15.1 EC Labelling: O, C
This product is OXIDIZING and CORROSIVE in accordance with Guideline 67/548/EEC and 1999/45/EC.
R7 May cause fire.
R22 Harmful if swallowed.
R34 Causes burns.
S3/7 Keep container tightly closed in a cool place.
S14 Keep away from reducing agents, oxidizing agents, acids, alkalis, amines, metals, heavy-metal compounds.
S26 In case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
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).
S50 Do not mix with peroxide accelerators or reducing agents.
Dangerous ingredients: Ethylmethylketone peroxide
15.2 Restrictions to the marketing and use in accordance with Directive 76/769/EEC: Not applicable.
15.3 Other regulations: Not available.

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16. OTHER INFORMATION

Intended use: Catalyst, mainly for the hardening of unsaturated polyesthers.
Text of R-phrases listed in sections 2 and 3:
R2 Risk of explosion by shock, friction, fire or other sources of ignition.
R7 May cause fire.
R11 Highly flammable.
R22 Harmful if swallowed.
R34 Causes burns.
R36 Irritating to eyes.
R66 Repeated exposure may cause skin dryness or cracking.
R67 Vapours may cause drowsiness and dizziness.

Material Safety Data Sheet regulations: Material Safety Data Sheet in accordance with the Annex II of the Regulation (EC) No. 1907/2006 (REACH).

Main data sources:
- European Chemicals Bureau: Existing Chemicals, http://ecb.jrc/existing-chemicals/
- Industrial Solvents Handbook, Ibert Mellan (Noyes Data Co., 1970).
- Threshold Limit Values, (AGCIH).
- European agreement on the international carriage of dangerous goods by road, (ADR).
- International Maritime Dangerous Goods Code, IMDG (IMO).

The information of this Material Safety Data Sheet, is based on the present state of knowledge and on current UE and national laws, as the users' working conditions are beyond our knowledge and control. The product is not to be used for other purposes than those specified, without first obtaining written handling instruction. It is always the responsibility of the user to take all necessary steps in order to fulfil the demand laid down in the local rules and legislation. The information in this Material Safety Data Sheet is meant as a description of the safety requirements of the product and it is not to be considered as a guarantee of the product's properties.
