

SAFETY DATA SHEET

M-Bond 610 Adhesive

ACCORDING TO EC-REGULATIONS 1907/2006 (REACH), 1272/2008 (CLP)
& 2020/878

www.vpgsensors.com
Date of Issue: 25 August 2021
Date of First Issue: 20 March 2012
Version: 4.0

SECTION 1: IDENTIFICATION OF THE SUBSTANCE/MIXTURE AND OF THE COMPANY/UNDERTAKING

- 1.1 Product identifier**
Product Name M-Bond 610 Adhesive
Unique Formula Identifier (UFI) Not applicable
Nanoform Not applicable
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**
Identified Use(s) Adhesives.
Uses Advised Against None known.
- 1.3 Details of the supplier of the safety data sheet**
Company Identification VISHAY MEASUREMENTS GROUP GMBH
Tatschenweg 1
74078 Heilbronn
Germany
Telephone +49 (0) 7131 39099-0
Fax +49 (0) 7131 39099-229
E-Mail (competent person) mm.de@vpgsensors.com
- 1.4 Emergency telephone number**
Emergency Phone No. (00-1) 703-527-3887
Languages spoken CHEMTREC

SECTION 2: HAZARDS IDENTIFICATION

- 2.1 Classification of the substance or mixture**
2.1.1 Regulation (EC) No. 1272/2008 (CLP) Flam. Liq. 2; H225
Skin Irrit. 2; H315
Skin Sens. 1; H317
Eye Dam. 1; H318
STOT SE 3; H335
STOT SE 3; H336
Carc. 2; H351
Aquatic Chronic 2; H411
- 2.2 Label elements** According to Regulation (EC) No. 1272/2008 (CLP)
Product Name M-Bond 610 Adhesive
Hazard Pictogram(s)



Signal Word(s)

DANGER

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Contains:	Tetrahydrofuran and Polyglycidyl Ether of Phenol-Formaldehyde
Hazard Statement(s)	H225: Highly flammable liquid and vapour. H315: Causes skin irritation. H317: May cause an allergic skin reaction. H318: Causes serious eye damage. H335: May cause respiratory irritation. H336: May cause drowsiness or dizziness. H351: Suspected of causing cancer. H411: Toxic to aquatic life with long lasting effects.
Precautionary Statement(s)	P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. P201: Obtain special instructions before use. P304+P340: IF INHALED: Remove person to fresh air and keep comfortable for breathing. P333+P313: If skin irritation or rash occurs: Get medical advice/attention. P305+P351+P338: IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P310: Immediately call a POISON CENTER/doctor.
Additional Information	EUH019: May form explosive peroxides.
2.3 Other hazards	None known. The substances in the mixture do not meet the PBT/vPvB criteria according to REACH, annex XIII.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

3.1 Substances - Not applicable.

3.2 Mixtures

EC Classification Regulation (EC) No. 1272/2008 (CLP)

Chemical identity of the substance	%W/W	CAS No.	EC No.	REACH Registration No.	Hazard classification
Tetrahydrofuran ^{*^}	55 – 65	109-99-9	203-726-8	Not yet assigned in the supply chain	Flam. Liq. 2; H225 Acute Tox. 4; H302 Eye Dam. 1; H318 STOT SE 3; H335 (SCL ≥ 25%) STOT SE 2; H336 Carc. 2; H351 EUH019
Polyglycidyl Ether of Phenol-Formaldehyde	25 – 33	28064-14-4	608-164-0	Not yet assigned in the supply chain	Skin Irrit. 2; H315 Skin Sens. 1; H317 Eye Irrit. 2; H319 Aquatic Chronic 2; H411
Ethyl methyl ketone ^{*^}	5 – 15	78-93-3	201-159-0	Not yet assigned in the supply chain	Flam. Liq. 2; H225 Eye Irrit. 2; H319 STOT SE 3; H336 EUH066

Note: For full text of H phrases see section 16.

^{*}Substance with a national exposure limit. [^]Substance with a national exposure limit

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SECTION 4: FIRST AID MEASURES



4.1 Description of first aid measures

Self-protection of the first aider

Use personal protective equipment as required. Wear appropriate personal protective equipment, avoid direct contact. Ensure adequate ventilation. Avoid breathing vapours. Avoid all contact. Contaminated clothing should be laundered before reuse.

Inhalation

IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. IF exposed or concerned: Get medical advice/attention.

Skin Contact

IF ON SKIN: Remove contaminated clothing and wash all affected areas with plenty of water. Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention.

Eye Contact

IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. IF exposed or concerned: Get medical advice/attention.

Ingestion

IF SWALLOWED: Rinse mouth. Make victim drink plenty of water. Do not give anything by mouth to an unconscious person. Do not induce vomiting unless instructed to do so by medical personnel. Call a POISON CENTER/doctor if you feel unwell. IF exposed or concerned: Get medical advice/attention.

4.2 Most important symptoms and effects, both acute and delayed

Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause respiratory irritation. May cause drowsiness or dizziness. Suspected of causing cancer.

4.3 Indication of any immediate medical attention and special treatment needed

Treat symptomatically

Notes to a physician: IF INHALED: Respiratory symptoms, including pulmonary edema, may be delayed.

IF IN EYES: After rinsing affected eyes must be seen by an ophthalmologist

SECTION 5: FIREFIGHTING MEASURES

5.1 Extinguishing media

Suitable Extinguishing media

As appropriate for surrounding fire. Extinguish with carbon dioxide, dry chemical, foam or waterspray.

Unsuitable extinguishing media

Do not use water jet. Direct water jet may spread the fire.

5.2 Special hazards arising from the substance or mixture

Highly flammable liquid and vapour. May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide, Phenolic and Explosive Peroxides. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Prevent liquid entering sewers, basements and workpits; vapour may create explosive atmosphere. May form explosive peroxides.

5.3 Advice for fire-fighters

Fire fighters should wear complete protective clothing including self-contained breathing apparatus. Do not breathe fumes. Keep containers cool by spraying with water if exposed to fire. Avoid run off to waterways and sewers.

SECTION 6: ACCIDENTAL RELEASE MEASURES

6.1 Personal precautions, protective equipment and emergency procedures

Ensure adequate ventilation. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Use personal protective equipment as required. See Section: 8. Avoid breathing vapours.

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- 6.2 Environmental precautions** Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Spillages or uncontrolled discharges into watercourses must be alerted to the Environment Agency or other appropriate regulatory body.
- 6.3 Methods and material for containment and cleaning up** Use non-sparking equipment when picking up flammable spill. Adsorb spillages onto sand, earth or any suitable adsorbent material. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous waste
- 6.4 Reference to other sections** See Section: 8, 13

SECTION 7: HANDLING AND STORAGE

- 7.1 Precautions for safe handling** Ensure operatives are trained to minimise exposures. Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid all contact. Do not breathe vapour. Ensure adequate ventilation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. May form explosive peroxides. Take precautionary measures against static discharges. Use personal protective equipment as required. See Section: 8. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work.
- 7.2 Conditions for safe storage, including any incompatibilities** Ground/bond container and receiving equipment. Keep only in original container. Store in a well-ventilated place. Keep container tightly closed. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. May form explosive peroxides. Keep away from direct sunlight. Ambient. Keep at temperature not exceeding (°C): 32
Stable under normal conditions.
Keep away from: Oxidizing agents, Corrosive Substances, Reducing agent, Strong Acids and Alkalis.
- Storage temperature
Storage life
Incompatible materials
- 7.3 Specific end use(s)** See Section: 1.2.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

- 8.1 Control parameters**
8.1.1 Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m ³)	STEL (ppm)	STEL (mg/m ³)	Note
Ethyl cyanoacrylate	7085-85-0	-	-	0.3	1.5	IOELV, UK WEL, Sk
Methyl ethyl ketone	78-93-3	200	600	300	900	IOELV
		200	600	300	899	UK WEL, Sk, BMGV

Note: WEL: Workplace Exposure Limit (UK HSE EH40), Sk - Can be absorbed through skin., Bmgv: Biological monitoring guidance value (UK HSE EH40), IOELV: Indicative Occupational Exposure Limit Value

- 8.1.2 Biological limit value**

SUBSTANCE	CAS No.	Biological monitoring guidance value	Sampling Time
Methyl ethyl ketone	78-93-3	70 µmol butan-2-one/L in urine	Post shift

Note: Bmgv: Biological monitoring guidance value (UK HSE EH40)

- 8.1.3 PNECs and DNELs** Not established.

- 8.2 Exposure controls**

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- 8.2.1 Appropriate engineering controls** Ensure adequate ventilation. Atmospheric levels should be controlled in compliance with the occupational exposure limit. A washing facility/water for eye and skin cleaning purposes should be present.
- 8.2.2 Individual protection measures, such as personal protective equipment (PPE)** General hygiene measures for the handling of chemicals are applicable. Keep good industrial hygiene. Avoid all contact. Avoid breathing vapours. Wash hands before breaks and after work. Keep work clothes separately. Do not eat, drink or smoke at the work place.

Protective clothing should be selected specifically for the working place, depending on concentration and quantity of the hazardous substances handled. The resistance of the protective clothing to chemicals should be ascertained with the respective supplier.

Eye/ face protection



Wear protective eye glasses for protection against liquid splashes. Wear eye protection with side protection (EN166).

Skin protection



Hand protection:

Wear impervious gloves (EN374). Protective index 6, corresponding > 480 minutes of permeation time according to EN 374. Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer.

Suitable materials: Polyethylene-Laminate (Minimum thickness 0.1mm)

Body protection:

Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection



In case of inadequate ventilation wear respiratory protection. A suitable mask with filter type A (EN141 or EN405) may be appropriate. A suitable mask with filter type A (EN141 or EN405) may be appropriate.

Thermal hazards

Not applicable

8.2.3 Environmental Exposure Controls

Avoid release to the environment.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

9.1 Information on basic physical and chemical properties

Physical state	Liquid
Colour	Almost colourless
Odour	Not available.
Melting point and freezing point	66°C
Boiling point or initial boiling point and boiling range	214°C (EU Method A.2)
Flammability	Not applicable - Liquid
Lower and upper explosion limit or lower and upper flammability limit	Flammable Limits (Lower) (%v/v): 1.8 Flammable Limits (Upper) (%v/v): 11.8
Flash point	-14 °C (Mixture)
Auto-ignition temperature	480°C (EU Method A.15)
Decomposition temperature	320 °C
pH	Not established.
Kinematic viscosity	Not established.
Solubility	Water: >50%
Partition coefficient n-octanol/water (log value)	24 µg/L In Water (EU Method A.6)

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Vapour pressure	129 (mmHg) @ 20°C
Density and Relative density	0.9 (H ₂ O = 1)
Relative vapour density	2.4 (Air = 1)
Particle characteristics	Not applicable (Liquid)

9.2 Other information

Evaporation rate	8 (BuAc = 1)
Volatile Organic Compound Content	VOC 712 g/L
Explosive properties	Not available. (May form explosive peroxides.)
Oxidising properties	Not oxidising.

SECTION 10: STABILITY AND REACTIVITY

10.1	Reactivity	Stable under normal conditions. May form peroxides on prolonged storage if air is present.
10.2	Chemical stability	Stable under normal conditions.
10.3	Possibility of hazardous reactions	Highly flammable liquid and vapour. The vapour may be invisible, heavier than air and spread along ground. May form explosive peroxides. Contact with aliphatic amines will cause irreversible polymerization with considerable heat build-up.
10.4	Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from direct sunlight. Keep at a temperature not exceeding (°C): 32. Avoid contact with air. Avoid contact with heat and ignition sources and oxidizers. Avoid distillation to dryness, which can form explosive peroxides.
10.5	Incompatible materials	Oxidizing agents, Corrosive Substances, Reducing agent, Strong Acids and Alkalis.
10.6	Hazardous decomposition product(s)	May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide, Phenolic and Explosive Peroxides.

SECTION 11: TOXICOLOGICAL INFORMATION

11.1	Information on hazard classes as defined in Regulation (EC) No 1272/2008	
	Acute toxicity	
	Ingestion	Mixture: Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
	Inhalation	Mixture: Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 20 mg/l. (Vapour)
	Skin Contact	Mixture: Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
	Skin corrosion/irritation	Mixture: Skin Irrit. 2: H315: Causes skin irritation.
	Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac)	Skin Irrit. 2: H315: Causes skin irritation. EU classification and labelling inventory – 1217 Notifiers
	Serious eye damage/irritation	Mixture: Eye Dam. 1; H318: Causes serious eye damage.
	Tetrahydrofuran	Eye Dam. 1; H318: Causes serious eye damage. Causes serious eye damage (rabbit) (Unnamed publication, 2010)
	Respiratory or skin sensitization	Mixture: Skin Sens. 1; H317: May cause an allergic skin reaction.
	Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac)	Skin Sens. 1; H317: May cause an allergic skin reaction. EU classification and labelling inventory – 1217 Notifiers
	Germ cell mutagenicity	Mixture: Based upon the available data, the classification criteria are not met.
	Carcinogenicity	Mixture: Carc. 2; H351: Suspected of causing cancer.
	Tetrahydrofuran	Carc. 2; H351: Suspected of causing cancer. Result: Carcinogenic effect (female Mouse)
	Reproductive toxicity	Mixture: Based upon the available data, the classification criteria are not met.
	STOT - single exposure	Mixture: STOT SE 3; H335: May cause respiratory irritation. STOT SE 3; H336: May cause drowsiness or dizziness.

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	Tetrahydrofuran	STOT SE 3; H335: May cause respiratory irritation. EU Harmonised Classification STOT SE 3; H336: May cause drowsiness or dizziness. NOEL (rat) – 500 ppm (Malley et al. 2001)
	Methyl ethyl ketone	STOT SE 3; H336: May cause drowsiness or dizziness. EU Harmonised Classification Mixture: Based upon the available data, the classification criteria are not met. Mixture: Based upon the available data, the classification criteria are not met.
STOT - repeated exposure		
Aspiration hazard		
11.2 Information on other hazards		
11.2.1	Endocrine disrupting properties	No substances identified as having endocrine-disrupting properties.
11.2.2	Other information	None known

SECTION 12: ECOLOGICAL INFORMATION

12.1 Toxicity		Mixture: Aquatic Chronic 2; H411: Toxic to aquatic life with long lasting effects.
	Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac)	Aquatic Chronic 2; H411: Toxic to aquatic life with long lasting effects. EU classification and labelling inventory – 1217 Notifiers
12.2 Persistence and degradability		No data for the mixture as a whole.
	Tetrahydrofuran	Inherently Biodegradable Degradation in water (28 days): 39% (Van Ginkel et al. 1992)
	Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac)	No data
	Methyl ethyl ketone	Readily biodegradable. Water % Degradation: 98% (28 days) (Unnamed publication, 1998)
12.3 Bioaccumulative potential		No data for the mixture as a whole.
	Tetrahydrofuran	Test not required. Low bioaccumulative potential (log Kow ≤ 3) EU ECHA Registration Endpoint summary
	Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac)	No data
	Methyl ethyl ketone	Low bioaccumulation potential. No data for the mixture as a whole.
12.4 Mobility in soil		Test not required. Low Partition coefficient: n-octanol/water EU ECHA Registration Endpoint summary
	Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac)	No data
	Methyl ethyl ketone	The substance is predicted to have high mobility in soil. EU ECHA Registration Endpoint summary
12.5 Results of PBT and vPvB assessment		Not classified as PBT or vPvB.
12.6 Endocrine disrupting properties		No substances identified as having endocrine-disrupting properties.
12.7 Other adverse effects		None known

SECTION 13: DISPOSAL CONSIDERATIONS

13.1 Waste treatment methods	This material and its container must be disposed of as hazardous waste. Dispose of wastes in an approved waste disposal facility.
13.2 Additional Information	Dispose of contents in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	IMDG	IATA/ICAO
14.1 UN number or ID number	UN 1133	UN 1133	UN 1133
14.2 UN proper shipping name	ADHESIVES containing flammable liquid	ADHESIVES containing flammable liquid	ADHESIVES containing flammable liquid
14.3 Transport hazard class(es)	3	3	3

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14.4	Packing group	II	II	II
14.5	Environmental hazards	Environmentally hazardous substance	Classified as a Marine Pollutant.	Environmentally hazardous substance
14.6	Special precautions for user	See Section: 2		
14.7	Maritime transport in bulk according to IMO instruments	Not applicable.		
14.8	Additional Information	None.		

SECTION 15: REGULATORY INFORMATION

15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1	EU regulations	
	Substance(s) of Very High Concern (SVHCs)	None.
	Authorisations and/or Restrictions On Use	None.
15.1.2	National regulations	
	Wassergefährdungsklasse (Germany)	WGK 2 (Self classification)
15.2	Chemical Safety Assessment	A REACH chemical safety assessment has not been carried out.

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated version and date. Updated substance / mixture classification New SDS Regulation 2020/878 format, all sections have been updated to include new information. Please review SDS with care.

References:

Existing Safety Data Sheet (SDS),
EU Harmonised Classification(s) for Tetrahydrofuran (CAS No. 109-99-9) and Methyl ethyl ketone (CAS No. 78-93-3).
Existing ECHA registration(s) for Tetrahydrofuran (CAS No. 109-99-9) and Methyl ethyl ketone (CAS No. 78-93-3).
EU classification and labelling inventory for Polyglycidyl Ether of Phenol-Formaldehyde (Epoxy Novolac) (CAS No. 28064-14-4)

Literature References:

1. Malley, L.A., Christoph, G.R., Stadler, J.C., Hansen, J.F., Biesemeir, J.A. and Jasti, S. 2001. Acute and subchronic neurotoxicology evaluation of tetrahydrofuran by inhalation in rats. Drug Chem. Toxicol. 24(3):201-219.
2. Van Ginkel, C.G., Stroo, C.A. 1992. Simple method to prolong the closed bottle test for the determination of the inherent biodegradability. Ecotoxicology and environmental safety 24:319-327.

EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2020/878

Classification of the substance or mixture According to Regulation (EC) No. 1272/2008 (CLP)	Classification Procedure
Flam. Liq. 2; H225	Flash point (°C) / Boiling Point (°C)
Skin Irrit. 2; H315	Threshold Calculation
Skin Sens. 1; H317	Threshold Calculation
Eye Dam. 1; H318	Threshold Calculation
STOT SE 3; H335	Threshold Calculation
STOT SE 3; H336	Threshold Calculation
Carc. 2; H351	Threshold Calculation
Aquatic Chronic 2; H411	Summation Calculation

LEGEND

ADR	ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road
BCF	Bioconcentration factor
CLP	Regulation (EC) No 1272/2008 on classification, labelling and packaging of substances and mixtures
DNEL	Derived no effect level
EC50	Half maximal effective concentration
HSE	Health and Safety Executive

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IATA	IATA: International Air Transport Association
ICAO	ICAO: International Civil Aviation Organization
IMDG	IMDG: International Maritime Dangerous Goods
LC50	Lethal concentration at which 50% of the population is killed
LD50	Lethal dose at which 50% of the population is killed
LTEL	Long term exposure limit
OEL	Occupational exposure limits
PBT	PBT: Persistent, Bioaccumulative and Toxic
PNEC	Predicted No Effect Concentration
(Q)SAR	Quantitative structure-activity relationship
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals
RID	RID: Regulations concerning the international railway transport of dangerous goods
TWA	Time Weighted Average
STEL	Short term exposure limit
vPvB	vPvB: very Persistent and very Bioaccumulative
WGK	Wassergefährdungsklasse (Germany) / Water hazard class

Hazard classification / Classification code:

Flam. Liq. 2; Flammable liquid, Category 2
Acute Tox. 4; Acute Toxicity, Category 4
Skin Irrit. 2; Skin corrosion/irritation, Category 2
Skin Sens. 1; Skin Sensitisation, Category 1
Eye Dam. 1; Eye damage, category 1
Eye Irrit. 2; eye Irritation, Category 2
STOT SE 3; Specific target organ toxicity — single exposure, Category 3

Carc. 2; Carcinogenicity, Category 2
Aquatic Chronic 2; Hazardous to the aquatic environment, Chronic , Category 2

Hazard Statement(s)

H225: Highly flammable liquid and vapour.
H302: Harmful if swallowed.
H315: Causes skin irritation.
H317: May cause an allergic skin reaction.
H318: Causes serious eye damage.
H319: Causes serious eye irritation.
H335: May cause respiratory irritation.
H336: May cause drowsiness or dizziness.
H351: Suspected of causing cancer.
H411: Toxic to aquatic life with long lasting effects.

EUH019: May form explosive peroxides.
EUH066: Repeated exposure may cause skin dryness or cracking.

Training advice: Consideration should be given to the work procedures involved and the potential extent of exposure as they may determine whether a higher level of protection is required.

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