

# SAFETY DATA SHEET

Revision: 3.0 Date: 23 January 2017





ACCORDING TO EC-REGULATIONS 1907/2006 (REACH),  
1272/2008 (CLP) & 2015/830

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

- 1.1 Product identifier**  
Product Name M-Bond 600 Adhesive
- 1.2 Relevant identified uses of the substance or mixture and uses advised against**  
Identified Use(s) Adhesives.  
Uses Advised Against Anything other than the above.
- 1.3 Details of the supplier of the safety data sheet**  
Company Identification VISHAY MEASUREMENTS GROUP UK LTD  
Stroudley Road  
Basingstoke  
Hampshire  
RG24 8FW  
United Kingdom  
Telephone +44 (0) 1256 462131  
Fax +44 (0) 1256 471441  
E-Mail (competent person) mm.uk@vishaypg.com
- 1.4 Emergency telephone number**  
Emergency Phone No. (00-1) 703-527-3887 CHEMTREC (24 hours)  
Languages spoken All official European languages.

## 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  
Acute Tox. 4; H302  
Skin Irrit. 2; H315  
Skin Sens. 1; H317  
Eye Irrit. 2; H319  
STOT SE 3; H335  
Carc. 2; H351  
Aquatic Chronic 2; H411
- 2.2 Label elements**  
Product Name M-Bond 600 Adhesive  
Contains: Tetrahydrofuran and Polyglycidyl Ether of Phenol-Formaldehyde
- Hazard Pictogram(s)
- 
- Signal Word(s) DANGER
- Hazard Statement(s)  
H225: Highly flammable liquid and vapour.  
H302: Harmful if swallowed.  
H315: Causes skin irritation.  
H317: May cause an allergic skin reaction.  
H319: Causes serious eye irritation.  
H335: May cause respiratory irritation.  
H351: Suspected of causing cancer.  
H411: Toxic to aquatic life with long lasting effects.

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## 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.  
P308+P313: IF exposed or concerned: Get medical advice/attention.

## Supplemental information

EUH019: May form explosive peroxides.

## 2.3 Other hazards

None known.

## 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 Statement(s)
Tetrahydrofuran <sup>^*</sup>	45 – 55	109-99-9	203-726-8	Not yet assigned in the supply chain	Flam. Liq. 2; H225 Acute Tox. 4; H302 Eye Irrit. 2; H319 (SCL ≥ 25%) STOT SE 3; H335 (SCL ≥ 25%) Carc. 2; H351 EUH019
Polyglycidyl Ether of Phenol-Formaldehyde	30 – 40	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 <sup>^*</sup>	12-18	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

For full text of H/P Statements see section 16. <sup>^</sup>Substance with a national exposure limit. \*Substance with a community exposure limit

## 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.

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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.
<b>4.2 Most important symptoms and effects, both acute and delayed</b>	Harmful if swallowed. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye irritation. May cause respiratory irritation. Suspected of causing cancer.
<b>4.3 Indication of any immediate medical attention and special treatment needed</b>	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

<b>5.1 Extinguishing media</b>	As appropriate for surrounding fire. Extinguish with carbon dioxide, dry chemical, foam or waterspray.
Suitable Extinguishing media	Do not use water jet. Direct water jet may spread the fire.
Unsuitable extinguishing media	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.
<b>5.2 Special hazards arising from the substance or mixture</b>	
<b>5.3 Advice for fire-fighters</b>	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

<b>6.1 Personal precautions, protective equipment and emergency procedures</b>	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.
<b>6.2 Environmental precautions</b>	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.
<b>6.3 Methods and material for containment and cleaning up</b>	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
<b>6.4 Reference to other sections</b>	See Section: 8, 13

## SECTION 7: HANDLING AND STORAGE

<b>7.1 Precautions for safe handling</b>	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.
<b>7.2 Conditions for safe storage, including any</b>	Ground/bond container and receiving equipment. Keep only in original container.

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<p><b>incompatibilities</b></p> <p>Storage temperature Storage life Incompatible materials</p>	<p>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.</p> <p>Ambient. Keep at temperature not exceeding (°C): 32</p> <p>Stable under normal conditions.</p> <p>Keep away from: Oxidizing agents, Corrosive Substances, Reducing agent, Strong Acids and Alkalis.</p>
<p><b>7.3 Specific end use(s)</b></p>	<p>See Section: 1.2.</p>

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

### 8.1 Control parameters

#### 8.1.1 Occupational Exposure Limits

Users are advised to consider national Occupational Exposure Limits or other equivalent values.

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m <sup>3</sup> )	STEL (ppm)	STEL (mg/m <sup>3</sup> )	Note
Tetrahydrofuran	109-99-9	50	150	100	300	WEL, IOELV, Sk
Methyl ethyl ketone	78-93-3	200	600	300	899	WEL, Sk, BMGV
		200	600	300	900	IOELV

Source: 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

None assigned.

### 8.2 Exposure controls

#### 8.2.1 Appropriate engineering controls

Ensure operatives are trained to minimise exposures. Ensure adequate ventilation. Atmospheric levels should be controlled in compliance with the occupational exposure limit.

#### 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.

IF exposed: Flush with fresh water if contact with skin or eyes.

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)

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Respiratory protection

**Body protection:**

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

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**

Appearance	Almost colourless Liquid
Odour	Ether-like Odour
Odour threshold	Not available.
pH	Not established.
Melting point/freezing point	Not available.
Initial boiling point and boiling range	66°C
Flash point	-14 °C (Mixture)
Evaporation rate	8 (BuAc = 1)
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Flammable Limits (Lower) (%v/v): 1.8 Flammable Limits (Upper) (%v/v): 11.8
Vapour pressure	129 (mmHg) @ 20°C
Vapour density	2.4 (Air = 1)
Relative density	0.9 (H <sub>2</sub> O = 1)
Solubility(ies)	Water: >50%
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	320 °C
Decomposition Temperature	Not available.
Viscosity	Not available.
Explosive properties	Not available.
Oxidising properties	Not oxidising.

**9.2 Other information**

VOC 598 g/L

## SECTION 10: STABILITY AND REACTIVITY

<b>10.1 Reactivity</b>	Stable under normal conditions. May form peroxides on prolonged storage if air is present.
<b>10.2 Chemical stability</b>	Stable under normal conditions.
<b>10.3 Possibility of hazardous reactions</b>	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.
<b>10.4 Conditions to avoid</b>	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.
<b>10.5 Incompatible materials</b>	Oxidizing agents, Corrosive Substances, Reducing agent, Strong Acids and Alkalis.
<b>10.6 Hazardous decomposition product(s)</b>	May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide, Phenolic and Explosive Peroxides.

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## SECTION 11: TOXICOLOGICAL INFORMATION

<b>11.1 Information on toxicological effects</b>	All test data taken from existing ECHA registrations for the substances mentioned.
<b>Acute toxicity - Ingestion</b>	Acute Tox. 4: Harmful if swallowed. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 >750 mg/kg bw/day.
Tetrahydrofuran: <b>Acute toxicity - Inhalation</b>	Test Result LD50 <1 ml/kg bw (Standard acute method) Based upon the available data, the classification criteria are not met.
<b>Acute toxicity - Skin Contact</b>	Acute Toxicity Estimate Mixture Calculation: Estimated LC50 >20.0 mg/l. Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
<b>Skin corrosion/irritation</b> Polyglycidyl Ether of Phenol-Formaldehyde: Ethyl methyl ketone:	Skin Irrit. 2: Causes skin irritation. No data. EU classification and labelling inventory Prolonged skin contact will result in defatting of the skin, leading to irritation, and in some cases, dermatitis. (Smith R & Mayers MR, 1944)
<b>Serious eye damage/irritation</b> Tetrahydrofuran: Polyglycidyl Ether of Phenol-Formaldehyde: Ethyl methyl ketone:	Eye Irrit. 2: Causes serious eye irritation. No data. Harmonised Classification No data. EU classification and labelling inventory Test Result: Irritating to eyes. (OECD 405)
<b>Respiratory or skin sensitization</b> Polyglycidyl Ether of Phenol-Formaldehyde:	Skin Sens. 1: May cause an allergic skin reaction. Allergic contact dermatitis (Pontén, A et al, 1999)
<b>Germ cell mutagenicity</b>	Based on available data, the classification criteria are not met.
<b>Carcinogenicity</b> Tetrahydrofuran:	Carc. 2: Suspected of causing cancer. Test Result: NOAEC 1800 ppm Suspected carcinogen (Unnamed, 1998)
<b>Reproductive toxicity</b>	Based on available data, the classification criteria are not met.
<b>STOT - single exposure</b> Tetrahydrofuran: Ethyl methyl ketone:	STOT SE 3: May cause respiratory irritation. Test Result: Central nervous depression (Malley, L.A. et al, 2001) Rats at all dose levels: gait and/or posture abnormalities. Higher dose groups some rats were comatose or prostrate within a few hours of dosing, with some animals being unconscious for 24 hours. (OECD 423)
<b>STOT - repeated exposure</b>	Based on available data, the classification criteria are not met.
<b>Aspiration hazard</b>	Based on available data, the classification criteria are not met.
<b>11.2 Other information</b>	None known.

## SECTION 12: ECOLOGICAL INFORMATION

<b>12.1 Toxicity</b>	Aquatic Chronic 2; Toxic to aquatic life with long lasting effects. Estimated Mixture LC50 > 1 to ≤ 10 mg/l. (Fish)
Polyglycidyl Ether of Phenol-Formaldehyde:	EC50 1.6 mg/l 48hr (Daphnia magna) (Wyness LE et al, 1993)
<b>12.2 Persistence and degradability</b>	Part of the components are poorly biodegradable.
<b>12.3 Bioaccumulative potential</b>	The product has low potential for bioaccumulation.
<b>12.4 Mobility in soil</b>	The product is predicted to have high mobility in soil.
<b>12.5 Results of PBT and vPvB assessment</b>	Not classified as PBT or vPvB.
<b>12.6 Other adverse effects</b>	None known.

## SECTION 13: DISPOSAL CONSIDERATIONS

<b>13.1 Waste treatment methods</b>	Dispose of this material and its container as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.
<b>13.2 Additional Information</b>	Dispose of contents in accordance with local, state or national legislation.

## SECTION 14: TRANSPORT INFORMATION

<b>14.1 UN number</b>	<b>ADR/RID</b> UN 1133	<b>IMDG</b> UN 1133	<b>IATA/ICAO</b> UN 1133
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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
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	Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable.		

## SECTION 15: REGULATORY INFORMATION

15.1	Safety, health and environmental regulations/legislation specific for the substance or mixture	
15.1.1	EU regulations	Not restricted
	Authorisations and/or Restrictions On Use	Tetrahydrofuran: Substance evaluated in 2013; evaluating Member State has proposed to ask the registrants to provide further information
	CoRAP Substance Evaluation	Ethyl methyl ketone: Substance identified for evaluation in 2018
15.1.2	National regulations	
	Germany	Water hazard class: 2
15.2	Chemical Safety Assessment	A chemical safety assessment is not required under REACH.

## SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: New SDS Regulation 2015/830 format, all sections have been updated to include new information. Please review SDS with care.

### References:

Existing Safety Data Sheet (SDS), Harmonised Classification(s) for Tetrahydrofuran (CAS No. 109-99-9) and Ethyl methyl ketone (CAS No. 78-93-3). Existing ECHA registration(s) for Tetrahydrofuran (CAS No. 109-99-9), Ethyl methyl ketone (CAS No. 78-93-3) the Classification and Labelling Inventory for Polyglycidyl Ether of Phenol-Formaldehyde (CAS No. 28064-14-4).

### Literature References:

- Smith R & Mayers MR, 1944, Study of poisoning and fire hazards of butanone and acetone, Industrial Hygiene: 23, 174-176
- Pontén, A. and Bruze, M. (1999), Occupational allergic contact dermatitis from epoxy resins based on bisphenol F. Contact Dermatitis, 41: 235. doi:10.1111/j.1600-0536.1999.tb06149.x
- 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
- Wyness LE, Cheeman H, Lad DD and Baldwin MK (1993), EPIKOTE 862: Acute toxicity to *Oncorhynchus mykiss*, *Daphnia magna* and *Selenastrum capricornutum*; SBGR.92.237

EU Classification: This Safety Data Sheet was prepared in accordance with EC Regulation (EC) 1907/2006 (REACH), 1272/2008 (CLP) & 2015/830.

Classification of the substance or mixture According to Regulation (EC) No. 1272/2008 (CLP)	Classification Procedure
Flam. Liq. 2; H225	Flash Point [Closed cup] Test Result/ Boiling Point (°C) Test Result
Acute Tox. 4; H302	Acute Toxicity Estimate (ATE) Calculation.
Skin Irrit. 2; H315	Threshold Calculation
Skin Sens. 1; H317	Threshold Calculation
Eye Irrit. 2; H319	Threshold Calculation
STOT SE 3; H335	Threshold Calculation
Carc. 2; H351	Threshold Calculation
Aquatic Chronic 2	Summation Calculation



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## LEGEND

LTEL: Long Term Exposure Limit

DNEL: Derived No Effect Level

PBT: PBT: Persistent, Bioaccumulative and Toxic

STEL: Short Term Exposure Limit

PNEC: Predicted No Effect Concentration

vPvB: very Persistent and very Bioaccumulative

## 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 Irrit. 2; Eye Irritation, Category 2

STOT SE 3; Specific target organ toxicity — single exposure, Category 3

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

EUH066: Repeated exposure may cause skin dryness or cracking.

EUH019: May form explosive peroxides.

## Hazard Statement(s)

H225: Highly flammable liquid and vapour.

H302: Harmful if swallowed.

H315: Causes skin irritation.

H317: May cause an allergic skin reaction.

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.

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