SAFETY DATA SHEET

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Date of Issue: 08 May 2017
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ACCORDING TO OSHA HCS (29 CFR 1910.1200)

SECTION 1: IDENTIFICATION

Product identifier used on the label M-Bond 450 Part B

Other means of identification Not applicable

Recommended use of the chemical and restrictions on use

Recommended use: Adhesives.
Restrictions on use: For professional users only.

Details of the supplier of the safety data sheet

Supplier: VISHAY MEASUREMENTS GROUP, INC.
Address of Supplier: Post Office Box 27777
Raleigh, NC 27611
USA
Telephone: +1 919-365-3800
Fax: +1 919-365-3945
E-Mail (competent person): mm.us@vishaypg.com

Emergency telephone number 1-800-424-9300 CHEMTREC (24 hours)

SECTION 2: HAZARD(S) IDENTIFICATION

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200

Physical hazards: Flammable Liquid, Category 2
Health hazards: Acute toxicity, Category 4 – Inhalation
Eye Irritation, Category 2
Specific target organ toxicity — single exposure, Category 3
Specific target organ toxicity — single exposure, Category 2
Specific target organ toxicity — repeated exposure, Category 2
Reproductive toxicity, Category 1B
Environmental hazards: Hazardous to the aquatic environment, Chronic, Category 3

Hazard Symbol

Signal Word(s): DANGER

Hazard Statement(s):
Highly flammable liquid and vapour.
Harmful if inhaled.
Causes serious eye irritation.
May cause drowsiness or dizziness.
May cause damage to organs.
May cause damage to organs through prolonged or repeated exposure.
May damage fertility. May damage the unborn child.
Harmful to aquatic life with long lasting effects.

Precautionary Statement(s):
Obtain special instructions before use.
Do not handle until all safety precautions have been read and understood.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Keep container tightly closed.

Do not breathe vapour.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor if you feel unwell.
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: Call a POISON CENTER/doctor.

Other hazards Repeated exposure may cause skin dryness or cracking.

Percent of the mixture consists of ingredient(s) of unknown acute toxicity: 0%

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures Substances in preparations / mixtures

Chemical identity of the substance	%W/W	CAS No.	EC No.	Hazard classification
2-Ethoxyethanol	50 - 55	110-80-5	203-804-1	Flammable Liquid, Category 3 Acute toxicity, Category 4 – Oral Acute toxicity, Category 3 – Inhalation Reproductive toxicity, Category 1B
Methyl ethyl ketone	25 – 30	78-93-3	201-159-0	Flammable Liquid, Category 2 Eye Irritation, Category 2 Specific target organ toxicity — single exposure, Category 3
4,4'-Sulfonyldianiline	15 – 20	80-08-0	201-248-4	Acute toxicity, Category 4 – Oral Specific target organ toxicity — single exposure, Category 2 Specific target organ toxicity — repeated exposure, Category 2 Hazardous to the aquatic environment, Chronic, Category 2
Xylene	< 7.5	1330-20-7	215-535-7	Flammable Liquid, Category 3 Acute toxicity, Category 4 – Dermal Acute toxicity, Category 4 – Inhalation Skin Corrosion/Irritation, Category 2 Aspiration hazard, Category 1 Eye Irritation, Category 2 Specific target organ toxicity — single exposure, Category 3 Specific target organ toxicity — repeated exposure, Category 2
Boron trifluoride ethylamine complex	< 0.5	75-23-0	200-852-5	Skin Corrosion/Irritation, Category 1

SECTION 4: FIRST AID MEASURES

Description of first aid measures

Self-protection of the first aider: Do not breathe vapour. Wear suitable protective clothing. Wear suitable respiratory protective equipment if exposure to high levels of material are likely. Avoid all contact.

Inhalation: IF INHALED: Remove person to fresh air and keep comfortable for breathing.

	Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. Apply artificial respiration if necessary. Call a POISON CENTER/doctor.
Skin Contact	IF ON SKIN (or hair): Remove contaminated clothing and wash all affected areas with plenty of water. Contaminated clothing should be thoroughly cleaned. If skin irritation 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.
Ingestion	IF SWALLOWED: Rinse mouth. Do not give anything by mouth to an unconscious person. Do not induce vomiting. Call a POISON CENTER/doctor if you feel unwell. IF exposed or concerned: Get medical advice/attention.
Most important symptoms and effects, both acute and delayed	Harmful if inhaled. Repeated exposure may cause skin dryness or cracking. Causes serious eye irritation. May cause drowsiness or dizziness. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure. May damage fertility. May damage the unborn child.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically. Due to possible delayed effect of poisoning and for safety reasons, they should be kept under medical observation for at least 48 hours.

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media	
Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish preferably with foam, carbon dioxide or dry chemical.
Unsuitable extinguishing Media	Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide and Nitrogen oxides. May form explosive mixture with air particularly in enclosed spaces. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.
Special protective equipment and precautions 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

Personal precautions, protective equipment and emergency procedures	Ensure adequate ventilation. Avoid all contact. Do not breathe vapour. Stop leak if safe to do so. Eliminate all ignition sources if safe to do so. Use personal protective equipment as required. See Section: 8.
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.
Methods and material for containment and cleaning up	Ensure full personal protection (including respiratory protection) during removal of spillages. Use non-sparking equipment when picking up flammable spill. Avoid contact with plastic. Use waterspray to 'knock down' vapour. Adsorb spillages onto sand, earth or any suitable adsorbent material. Do not absorb spillage in sawdust or other combustible 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.

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Avoid all contact. Do not breathe vapour. Use personal protective equipment as required. See Section: 8. Ensure adequate ventilation. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not eat, drink or smoke when using this

	product. Wash hands before breaks and after work. Take precautionary measures against static discharges.
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.
Storage temperature	Ambient. 5 - 25°C
Storage life	Stable under normal conditions.
Incompatible materials	Keep away from: Strong oxidising agents, Reducing agents, strong bases, halogenated compounds, Acids, Amines, Ammonia, Copper and Aluminium (and their alloys). Can react with - Rubber and Resin. Avoid contact with plastic.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
2-Ethoxyethanol	110-80-5	0.5	1.8	-	-	NIOSH, Sk
		200	740	-	-	OSHA, Sk
		5	-	-	-	ACGIH, Sk
Ethyl methyl ketone	78-93-3	200	590	300^	885^	NIOSH
		200	590	-	-	OSHA
		200	-	300	-	ACGIH
Xylene	1330-20-7	100	435	150^	655^	NIOSH
		100	435	-	-	OSHA
		100	-	150	-	ACGIH, A4

Note: OSHA PELs 1910.1000 TABLE Z-1/ NIOSH RELs / ACGIH TLVs

Sk - Can be absorbed through skin.

^NIOSH average value of 15 minutes.

A4: Not Classifiable as a Human Carcinogen: Agents which cause concern that they could be carcinogenic for humans but which cannot be assessed conclusively because of the lack of data. In vitro or animal studies do not provide indications of carcinogenicity which are sufficient to classify the agent into one of the other categories.

The other components listed in Section 3 do not have occupational exposure limits.

Biological Exposure Indices

SUBSTANCE	CAS No.	Determinant	Biological Exposure Indices	Sampling Time	Note
2-Ethoxyethanol (EGGG) and 2Ethoxyethyl acetate (EGEEA)	110-80-5 / 111-15-9	2-Ethoxyacetic acid in urine	100 mg/g creatinine	End of shift at end of workweek	-
Ethyl methyl ketone	78-93-3	Ethyl methyl ketone in urine	2 mg/L	End of shift	Ns
Xylene, o-,m-,p- or mixed isomers	1330-20-7	Methylhippuric acids in urine.	15 g/g Creatinine	End of shift	-

Source: 2015 ACGIH Biological Exposure Indicies (BEIs)

Ns – Nonspecific

The other components listed in Section 3 do not have biological exposure indicies.

Appropriate engineering controls Ensure adequate ventilation or use appropriate containment. Local exhaust

recommended. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Guarantee that the eye flushing systems and safety showers are located close to the working place.

Individual protection measures, such as personal protective equipment (PPE)

Keep good industrial hygiene. Avoid all contact. Do not breathe vapour. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be laundered before reuse. Do not eat, drink or smoke at the work place.

Eye/face protection

Wear eye protection with side protection (EN166). Wear protective eye glasses for protection against liquid splashes. Recommended: Safety spectacles / goggles / full face shield.

Skin protection

Hand protection: Wear impervious gloves (EN374). Gloves should be changed regularly to avoid permeation problems. Breakthrough time of the glove material: refer to the information provided by the gloves' producer. Recommended: Butyl rubber.

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. Open system(s): Wear suitable respiratory protective equipment. Long Term Exposure: A self contained breathing apparatus may be appropriate.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Amber Coloured liquid.
Odor	Sweetish ketone odor.
Odor Threshold	Not available.
pH	Not established.
Melting Point/Freezing Point	Not available.
Initial boiling point and boiling range	Not available.
Flash Point	Not available.
Evaporation rate (Butyl acetate = 1)	Not available.
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	Not available.
Vapour density	Not available.
Relative density	0.89 g/cm^3 (H2O = 1)
Solubility(ies)	Water: >10%
Partition coefficient: n-octanol/water	Not available.
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Highly flammable liquid and vapour. The vapour may be invisible, heavier than air and spread along ground.

Conditions to avoid	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharges.
Incompatible materials	Keep away from: Strong oxidising agents, Reducing agents, strong bases, halogenated compounds, Acids, Amines, Ammonia, Copper and Aluminium (and their alloys). Can react with - Rubber and Resin. Avoid contact with plastic.
Hazardous decomposition product(s)	May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide and Nitrogen oxides.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Based on available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 >2000 mg/kg bw/day.
Acute toxicity - Inhalation	Acute toxicity, Category 4; Harmful if inhaled. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 13.4 mg/l.
Acute toxicity - Skin Contact	Based on available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Skin corrosion/irritation	Repeated exposure may cause skin dryness or cracking.
Serious eye damage/irritation	Eye Irritation, Category 2; Causes serious eye irritation.
Respiratory or skin sensitization	Based on available data, the classification criteria are not met.
Germ cell mutagenicity	Based on available data, the classification criteria are not met.
Carcinogenicity	Based on available data, the classification criteria are not met.
Reproductive toxicity	Reproductive toxicity, Category 1B; May damage fertility. May damage the unborn child.
STOT - single exposure	Specific target organ toxicity — single exposure, Category 2; May cause damage to organs. Specific target organ toxicity — single exposure, Category 3; May cause drowsiness or dizziness.
STOT - repeated exposure	Specific target organ toxicity — repeated exposure, Category 2; May cause damage to organs through prolonged or repeated exposure.
Aspiration hazard	Aspiration hazard, Category 1; May cause allergy or asthma symptoms or breathing difficulties if inhaled.

Information on likely routes of exposure

Inhalation	Possible – accidental exposure
Ingestion	Unlikely – accidental exposure
Skin Contact	Possible – accidental exposure
Eye Contact	Unlikely – accidental exposure

Early onset symptoms related to exposure	Harmful if inhaled. Causes serious eye irritation. May cause drowsiness or dizziness. May cause damage to organs (Blood).
Delayed health effects from exposure	Symptoms may be delayed for as long as 48 hours following exposure. Harmful if inhaled. Repeated exposure may cause skin dryness or cracking. May cause damage to organs (central nervous system, liver, kidney) through prolonged or repeated exposure. May damage fertility. May damage the unborn child.

Other information

NTP Report on Carcinogens	All chemicals are not listed
IARC Monographs	4,4'-Sulfonyldianiline: Group 3 - Not classifiable as to its carcinogenicity to humans Xylene: Group 3 - Not classifiable as to its carcinogenicity to humans
OSHA Designated Carcinogen	All chemicals are not listed

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity	Aquatic Chronic 3: Harmful to aquatic life with long lasting effects. Estimated Mixture LC50 >10 ≤ 100 mg/l (Fish)
Persistence and degradability	Readily biodegradable.
Bioaccumulative potential	The product has low potential for bioaccumulation.
Mobility in soil	The product is predicted to have high mobility in soil.
Other adverse effects	None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Do not release undiluted and unneutralised to the sewer. This material and its container must be disposed of as hazardous waste. Dispose of wastes in an approved waste disposal facility. Containers of this material may be hazardous when empty since they retain product residue.
Additional Information	Dispose of contents in accordance with local, state or national legislation.

SECTION 14: TRANSPORT INFORMATION

	ADR/RID	**IMDG**	**IATA**
UN number	UN 1133	UN 1133	UN 1133
UN proper shipping name	ADHESIVES containing flammable liquid	ADHESIVES containing flammable liquid	ADHESIVES containing flammable liquid
Transport hazard class(es)	3	3	3
Packing group	II	II	II
Environmental hazards	Not classified	Not classified as a Marine Pollutant.	Not classified
Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code	Not applicable		
Special precautions for user	See Section: 2		

SECTION 15: REGULATORY INFORMATION

Safety, health and environmental regulations/legislation specific for the substance or mixture

US Federal Regulations

TSCA (Toxic Substance Control Act)	2-Ethoxyethanol: Subject to 2,500 lb reporting threshold Methyl ethyl ketone: Subject to 2,500 lb reporting threshold 4,4'-Sulfonyldianiline: Subject to 2,500 lb reporting threshold Xylene: Subject to 2,500 lb reporting threshold Boron trifluoride ethylamine complex: Subject to 2,500 lb reporting threshold
EPCRA/SARA Section 302 Extremely Hazardous Substances	All chemicals are not listed
EPCRA Section 313 Toxics Release Inventory (TRI) Program	2-Ethoxyethanol: De Minimis limit: 1% Xylene: De Minimis limit: 1%
NIOSH Occupational Carcinogen List	All chemicals are not listed
OSHA List of highly hazardous chemicals, toxics and reactives	All chemicals are not listed
NTP Report on Carcinogens (RoC) List	All chemicals are not listed
Poison Prevention Packaging Act	Xylene: Substance requiring special packaging - Solvents for paint or other similar surface-coating material

US State Regulations

California State, Proposition 65 List	2-Ethoxyethanol: Safe harbor level - MADL: 750 (oral) ug/day, 960 (inhalation) ug/day
California State, Safer Consumer Products Regulations	2-Ethoxyethanol: Initial Candidate Chemicals List, Group Member List: Glycol ethers Methyl ethyl ketone: Candidate Chemicals List Xylene: Initial Candidate Chemicals List
Maine State, Toxic Chemicals in Children's Products Act	2-Ethoxyethanol: COC list

New Jersey State Worker and Community RTK Act	2-Ethoxyethanol: RTKHSL. SHHSL Methyl ethyl ketone: RTKHSL. SHHSL Xylene: RTKHSL. SHHSL
Pennsylvania State, Worker and Community RTK Act	2-Ethoxyethanol: Hazardous Substance List. Environmental Hazard List Methyl ethyl ketone: Hazardous Substance List. Environmental Hazard List Xylene: Hazardous Substance List. Environmental Hazard List
Rhode Island State, Hazardous Substances RTK Act	2-Ethoxyethanol: Hazardous Substance List Methyl ethyl ketone: Hazardous Substance List Xylene: Hazardous Substance List
Non-Regional	
IARC Monographs, List of Classifications	4,4'-Sulfonyldianiline: Group 3 Xylene: Group 3

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Updated substance / mixture classification. New SDS Regulation compliant with HazCom 2012 format, all sections have been updated to include new information. Please review SDS with care.

Version	4.0
Revision Date	08 May 2017
Date of First Issue	20 March 2012

References:
Existing Safety Data Sheet (SDS). EU Data: Harmonised Classification(s) for 2-Ethoxyethanol (CAS# 110-80-5), Methyl ethyl ketone (CAS# 78-93-3), 4,4'-Sulfonyldianiline (CAS# 80-08-0) and Xylene (CAS# 1330-20-7). Existing ECHA registration(s) for 2-Ethoxyethanol (CAS# 110-80-5), Methyl ethyl ketone (CAS# 78-93-3), 4,4'-Sulfonyldianiline (CAS# 80-08-0) and Xylene (CAS# 1330-20-7), and the Classification and Labelling Inventory for Boron trifluoride ethylamine complex (CAS# 75-23-0).

GHS Classification of the substance or mixture	Classification Procedure
Flammable Liquid, Category 2	Flash Point [Closed cup]/ Estimated Boiling Point (°C)
Acute toxicity, Category 4	Acute Toxicity Estimate (ATE) Calculation.
Eye Irritation, Category 2	Threshold Calculation
Specific target organ toxicity — single exposure, Category 3	Threshold Calculation
Specific target organ toxicity — single exposure, Category 2	Threshold Calculation
Specific target organ toxicity — repeated exposure, Category 2	Threshold Calculation
Reproductive toxicity, Category 1B	Threshold Calculation
Hazardous to the aquatic environment, Chronic, Category 3	Summation Calculation

LEGEND

ACGIH: American Conference of Governmental Industrial Hygienists
BEI: Biological Exposure Indices (ACGIH)
IARC: International Agency for Research on Cancer
Irr: Irritation
NIOSH: National Institute of Occupational Safety and Health
NTP: National Toxicology Program
OSHA: The Occupational Safety & Health Administration
PBT: Persistent, Bioaccumulative and Toxic
PEL: Permissible exposure limit
REL: Recommended exposure limit
SCL: Specific Concentration Limit
Skin": Risk of overexposure via dermal contact
STEL: Short Term Exposure Limit
TLV: Threshold Limit value
TSCA: Toxic Substance Control Act
TWA: Time Weighted Average
URT: Upper respiratory tract
vPvB: very Persistent and very Bioaccumulative

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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