# SAFETY DATA SHEET

## M-Bond 450 Part A

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**ACCORDING TO OSHA HCS (29 CFR 1910.1200)**

Date of Issue: 27 January 2023
Date of First Issue: 20 March 2012
Version: 5.0

## SECTION 1: IDENTIFICATION

**Product identifier**

| | |
|---|---|
| Product Name | M-Bond 450 Part A |
| **Other Means of Identification** | None known. |
| **Relevant identified uses of the substance or mixture and uses advised against** | |
| Identified Use(s) | Adhesive |
| Uses Advised Against | Anything other than the above. |

**Details of the supplier of the safety data sheet**

| | |
|---|---|
| Supplier | VISHAY MEASUREMENTS GROUP, INC.<br>Post Office Box 27777<br>Raleigh, NC 27611<br>USA |
| Telephone | 919-365-3800 |
| Fax | 919-365-3945 |
| E-Mail (competent person) | mm.us@vpgsensors.com |

**Emergency telephone number**

| | | |
|---|---|---|
| Emergency Phone No. | +1 800-262-8200 (for spills and releases) | CHEMTREC (24 hours) |
| Languages spoken | English | |

## 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 3 |
| Health hazards | Eye Irritation, Category 2<br>Skin sensitizer, Category 1<br>Carcinogen, Category 1B |
| Environmental hazards | Not classified |

**Label elements**

Hazard Pictogram(s)

| | |
|---|---|
| Signal Word(s) | DANGER |
| Hazard Statement(s) | Flammable liquid and vapour.<br>Causes serious eye irritation.<br>May cause an allergic skin reaction.<br>May cause cancer. |
| Precautionary Statement(s) | Obtain special instructions before use.<br>Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.<br>Take action to prevent static discharges.<br>Wear protective gloves/eye protection/face protection.<br>IF exposed or concerned: Get medical advice/attention.<br>Dispose of contents in accordance with local, state or national legislation. |
| **Other hazards** | Vapours can form explosive mixtures with air. |

| | |
|---|---|
| **Percent of the mixture consists of ingredient(s) of unknown acute toxicity:** | 0% of the mixture consists of ingredients of unknown acute inhalated toxicity.<br>0% of the mixture consists of ingredients of unknown acute oral toxicity.<br>0% of the mixture consists of ingredients of unknown acute dermal toxicity. |

## SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

**Substances**
not applicable

**Mixtures** Substances in preparations / mixtures
Classification: OSHA HCS (29 CFR 1910.1200)

| Chemical identity of the substance | %W/W | CAS No. | EC No. | Hazard classification |
|---|---|---|---|---|
| Butanone | 1 - 10 | 78-93-3 | 201-159-0 | Flammable Liquid, Category 2<br>Eye Irritant, Category 2<br>STOT, Single Exposure, Category 3, Narcotic effects |
| Phenyl glycidyl ether | 0.05 - 0.1 | 122-60-1 | 204-557-2 | Acute toxicity, Oral, Category 4<br>Skin corrosion/irritation, Category 2<br>Skin sensitizer, Category 1<br>Acute toxicity, Inhalation, Category 4<br>STOT, Single Exposure, Category 3, Respiratory Irritation<br>Germ cell mutagenicity, Category 2<br>Hazardous to the aquatic environment, Chronic, Category 3<br>Carcinogenicity, Category 1B |

## SECTION 4: FIRST AID MEASURES

**Description of first aid measures**

| | |
|---|---|
| Self-protection of the first aider | Avoid breathing mist/vapours/spray. Ensure adequate ventilation. Wear suitable protective clothing. Wear suitable respiratory protective equipment if exposure to high levels of material are likely. Avoid contact with skin. Contaminated clothing should be laundered before reuse. Do not use mouth-to-mouth resuscitation. Eyewash facilities should be stationed close to workplace where possible. |
| Inhalation | IF INHALED: Remove person to fresh air and keep comfortable for breathing. Call a POISON CENTER/doctor if you feel unwell. |
| Skin Contact | IF ON SKIN: Gently wash with plenty of soap and water. Remove contaminated clothing and wash clothing before reuse. If irritation (redness, rash, blistering) develops, get medical 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. If symptoms occur obtain medical attention. |
| **Most important symptoms and effects, both acute and delayed** | Causes serious eye irritation.May cause an allergic skin reaction. May cause cancer. |
| **Indication of any immediate medical attention and special treatment needed** | Treat symptomatically. |

## 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** | Flammable liquid and vapour. Vapours can form explosive mixtures with air. Containers may explode when involved in a fire. Keep container(s) exposed to fire cool, by spraying with water. Thermal decomposition will evolve toxic and corrosive vapours: Carbon dioxide, Carbon monoxide. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. Sealed containers may rupture explosively if hot. |
| **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

| | |
|---|---|
| **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. Avoid breathing mist/vapours/spray. Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. See Section: 8. The vapour is heavier than air; beware of pits and confined spaces. |
| **Methods and material for containment and cleaning up** | Ensure suitable personal protection during removal of spillages. Use non-sparking equipment when picking up flammable spill. Adsorb spillages onto sand, earth or any suitable adsorbent material. Do NOT absorb in saw-dust or other combustible absorbents. Transfer to a lidded container for disposal or recovery. Ventilate the area and wash spill site after material pick-up is complete. Dispose of this material and its container as hazardous waste. Allow small spillages to evaporate provided there is adequate ventilation. |
| **Large spillages:** | Evacuate the area and keep personnel upwind. Notify police and fire brigade as soon as possible. |

## SECTION 7: HANDLING AND STORAGE

| | |
|---|---|
| **Precautions for safe handling** | Ensure adequate ventilation. Avoid breathing mist/vapours/spray. Avoid contact with skin, eyes or clothing. Use personal protective equipment as required. See Section: 8. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Take precautionary measures against static discharge. Do not use sparking tools. Do not spray on an open flame or other ignition source. Do not eat, drink or smoke when using this product. Wash hands before breaks and after work. Ground/bond container and receiving equipment. |
| **Conditions for safe storage, including any incompatibilities** | Store in a cool/low-temperature, well-ventilated (dry) place away from heat and ignition sources. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep away from direct sunlight. Do not reuse empty containers. |
| Storage temperature | Store in a cool/low temperature. |
| Incompatible materials | Keep away from: Strong oxidising agents, Strong acids and alkali. |

## SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

**Occupational Exposure Limits**

| SUBSTANCE | CAS No. | ppm (a)[1] | mg/m3(b)[1] | Skin designation | Source |
|---|---|---|---|---|---|
| 2-Butanone (Methyl ethyl ketone) | 78-93-3 | 200 | 590 | - | OSHA |

**Source**:
OSHA: Occupational Health and Safety Act - Permissible Exposure Limit (PEL), 1910.1000 TABLE Z-1

Notes:
A4 - Not Classifiable as a Human Carcinogen

**Biological exposure indicies**

| SUBSTANCE | CAS No. | Determinant | Biological Exposure Indices | Sampling Time | Note |
|---|---|---|---|---|---|
| 2-Butanone (Methyl ethyl ketone) | 78-93-3 | Methyl ethyl ketone in urine | 2mg/L | End of Shift | Ns |

**Source:**
2015 ACGIH Biological Exposure Indicies (BEIs)
**Notes:**
Nonspecific - The determinant is nonspecific, since it is also observed after exposure to other chemicals.

**Appropriate engineering controls**

Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Local exhaust recommended. Use non-sparking ventilation systems, approved explosion-proof equipment, and intrinsically safe electrical systems. Eyewash facilities should be stationed close to workplace where possible.

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

General hygiene measures for the handling of chemicals are applicable. Avoid contact with skin, eyes or clothing. Avoid breathing mist/vapours/spray. Wash hands before breaks and after work. Keep work clothes separately. Contaminated clothing should be thoroughly cleaned. 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). 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: PVC / Nitrile rubber.

During full contact:
Protective index 6, corresponding > 480 minutes of permeation time according to EN 374.
Nitrile rubber (Minimum thickness: 0.33 mm)
Butyl rubber (Minimum thickness: 0.5 mm)

During splash contact:
At least protective index 5, corresponding > 240 minutes of permeation time according to EN 374
Polychloroprene - CR (Minimum thickness: 0.5 mm)

Unsuitable gloves materials:
Natural rubber/natural latex, Polyvinyl chloride - PVC.

**Body protection:**
Wear dustproof working clothes. Wear impervious protective clothing, including boots, lab coat, apron or coveralls, as appropriate, to prevent skin contact.

Respiratory protection

Use only in well-ventilated areas. In case of inadequate ventilation wear respiratory protection. A suitable mask with filter type A (EN141 or EN405) may be appropriate.

High concentrations: Wear suitable respiratory equipment. Recommended: Self-contained breathing apparatus (DIN EN 137)

## SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

**Information on basic physical and chemical properties**

| | |
|---|---|
| Appearance | Liquid |
| Odor | Not established. |
| Odor Threshold | Not established. |
| pH | Not established. |
| Melting Point/Freezing Point | Not established. |
| Initial boiling point and boiling range | Not established. |
| Flash Point | Not established. |
| Evaporation Rate | Not established. |
| Flammability (solid, gas) | Not established. |
| Upper/lower flammability or explosive limits | Not established. |
| Vapour pressure | Not established. |
| Vapour density | Not established. |
| Relative density | Not established. |
| Solubility(ies) | Not established. |
| Partition coefficient: n-octanol/water | not applicable - Mixture |
| Auto-ignition temperature | Not established. |
| Decomposition Temperature | Not established. |
| Viscosity | Not established. |

## SECTION 10: STABILITY AND REACTIVITY

| | |
|---|---|
| **Reactivity** | Stable under normal conditions. |
| **Chemical stability** | Stable under normal conditions. Hazardous polymerisation will not occur. |
| **Possibility of hazardous reactions** | Vapour is explosive in air at temperatures higher than the flash point. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. |
| **Conditions to avoid** | Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Keep from direct sunlight. Do not spray on an open flame or other ignition source. Take precautionary measures against static discharge. |
| **Incompatible materials** | Strong oxidising agents, Strong acids and alkali. |
| **Hazardous decomposition product(s)** | Flammable liquid and vapour. May decompose in a fire giving off toxic fumes. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback. In confined spaces, sewers, etc., the vapours may collect to form explosive mixtures with air. Decomposition products: Carbon monoxide, Carbon dioxide, aliphatic aldehydes, aromatic aldehydes, acids and terpenes. |

## SECTION 11: TOXICOLOGICAL INFORMATION

**Information on toxicological effects**

| | |
|---|---|
| **Acute toxicity - Ingestion** | Mixture: Based upon the available data, the classification criteria are not met. Calculated acute toxicity estimate (ATE) >2,000 mg/kg. |
| **Acute toxicity - Skin Contact** | Mixture: Based upon the available data, the classification criteria are not met. |

| | | |
|---|---|---|
| | | Calculated acute toxicity estimate (ATE) >2,000 mg/kg. |
| **Acute toxicity - Inhalation** | | Mixture: Based upon the available data, the classification criteria are not met. |
| | | Calculated acute toxicity estimate (ATE) > 5 mg/l |
| **Skin corrosion/irritation** | | Mixture: Based upon the available data, the classification criteria are not met. |
| **Serious eye damage/irritation** | | Mixture: Serious eye damage/irritation, Category 2: Causes serious eye irritation |
| | Butanone | Eye Irrit. 2; H319: Causes serious eye irritation. Test Result: Irritating to eyes. (OECD 405) |
| | | EU Data: Harmonised Classification/ ECHA registration dossier |
| **Respiratory or skin sensitization** | | Mixture: Skin sensitizer, Category 1: May cause an allergic skin reaction. |
| | Phenyl glycidyl ether | Skin sensitizer, Category 1: May cause an allergic skin reaction. |
| | | Buehler test Sensitisation (guinea pig) – Positive (Adverse effects observed) |
| | | EU Data: Harmonised Classification/ ECHA registration dossier |
| **Germ cell mutagenicity** | | Mixture: Based upon the available data, the classification criteria are not met. |
| **Carcinogenicity** | | Mixture: Carcinogen, Category 1B: May cause cancer |
| | Phenyl glycidyl ether | Carcinogen, Category 1B: May cause cancer |
| | | EU Data: Harmonised Classification/ ECHA registration dossier |
| **Reproductive toxicity** | | Mixture: Based upon the available data, the classification criteria are not met. |
| **STOT - single exposure** | | Mixture: Based upon the available data, the classification criteria are not met. |
| **STOT - repeated exposure** | | Mixture: Based upon the available data, the classification criteria are not met. |
| **Aspiration hazard** | | Mixture: Based upon the available data, the classification criteria are not met. |

| | |
|---|---|
| **Information on likely routes of exposure** | |
| Inhalation | Possible – accidental exposure |
| Ingestion | Possible – accidental exposure |
| Skin Contact | Possible – accidental exposure |
| Eye Contact | Unlikely – accidental exposure |
| **Early onset symptoms related to exposure** | Causes serious eye irritation. May cause an allergic skin reaction. May cause cancer. |
| **Delayed health effects from exposure** | None Known |
| **Exposure levels and health effects** | See Section: 8 |
| **Other information** | |
| OSHA Designated Carcinogen | No components of the mixture are listed |
| NIOSH Occupational Carcinogen List | No components of the mixture are listed |
| NTP Report on Carcinogens | No components of the mixture are listed |
| IARC Monographs | No components of the mixture are listed |

## SECTION 12: ECOLOGICAL INFORMATION

| | | |
|---|---|---|
| **Ecotoxicity** | | Based upon the available data, the classification criteria are not met. |
| | | Estimated Mixture LC50 >100 mg/l (Fish) |
| **Persistence and degradability** | | No data for the mixture as a whole. |
| | Butanone | Readily biodegradable (according to OECD criteria). |
| | | Degradation rate (%): 98 (28 days) OECD 301D |
| | Phenyl glycidyl ether | Not readily biodegradable (OECD 302C) |
| **Bioaccumulative potential** | | No data for the mixture as a whole. |
| | Butanone | Low bioaccumulative potential |
| | Phenyl glycidyl ether | No data available |
| **Mobility in soil** | | No data for the mixture as a whole. |
| | Butanone | Adsorption to solid soil phase is not expected. |
| | Phenyl glycidyl ether | The substance is predicted to have high mobility in soil. |
| | | Koc at 25℃ = 41.09, Log Koc = 1.61 (Q)SAR |
| **Other adverse effects** | | None known |

## SECTION 13: DISPOSAL CONSIDERATIONS

**Waste treatment methods**

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

## SECTION 14: TRANSPORT INFORMATION

| | Road/Rail (ADR/RID) | Sea transport (IMDG) | Air (ICAO/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** | III | III | III |
| **Environmental hazards** | Not applicable | Not classified as a Marine Pollutant. | Not applicable |
| **Special precautions for user** | See Section: 2 | | |
| **Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** | Not applicable | | |
| **Additional Information** | None | | |

## SECTION 15: REGULATORY INFORMATION

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

**US Federal Regulations**

| | |
|---|---|
| TSCA Chemical Data Reporting (CDR) Rule | Listed: Phenyl glycidyl ether |
| NIOSH Occupational Carcinogen List | Listed: Phenyl glycidyl ether |
| EPCRA Section 313 | All chemicals are not listed |
| CWA 307- Toxic | All chemicals are not listed |
| CERCLA - Hazardous Substances | All chemicals are not listed |
| CWA Section 311 List of Hazardous Substances | All chemicals are not listed |

**US State Regulations**

| | |
|---|---|
| Proposition 65 (California) | Listed: Phenyl glycidyl ether |
| Massachusetts, New Jersey, Pennsylvania, Rhode Island- State Right to Know Lists | Listed: Phenyl glycidyl ether; Butanone |
| New York -State Right to Know Lists | Listed: Phenyl glycidyl ether; Butanone |
| Minnesota - State Right to Know Lists | Listed: Phenyl glycidyl ether; Butanone |
| Massachusetts – Toxic Use reduction act | Listed: Phenyl glycidyl ether; Butanone |

**Non-Regional**

| | |
|---|---|
| IARC Monographs | Listed:<br>Phenyl glycidyl ether IARC Classification: Group 2B. |

## SECTION 16: OTHER INFORMATION

**The following sections contain revisions or new statements:** V5.0

| | |
|---|---|
| **Version** | 5.0 |
| **Revision Date** | 27 January 2023 |
| **Date of First Issue** | 20 March 2012 |

This Safety Data Sheet was prepared in accordance with US Regulation OSHA HCS (29 CFR 1910.1200)

**References:**
EU Data: Harmonised Classification(s) for Butanone (CAS No. 78-93-3) and Phenyl glycidyl ether (CAS No. 122-60-1).

Existing ECHA registration(s) for Butanone (CAS No. 78-93-3) and Phenyl glycidyl ether (CAS No. 122-60-1).
IARC Monographs

| **Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200** | **Classification Procedure** |
|---|---|
| Flammable Liquid, Category 3 | Expert judgement - Flash point |
| Eye Irritation, Category 2 | Threshold Calculation |
| Skin sensitizer, Category 1 | Threshold Calculation |
| Carcinogen, Category 1B | Threshold Calculation |

**LEGEND**

| | |
|---|---|
| ADR/RID | ADR: European Agreement concerning the International Carriage of Dangerous Goods by Road / RID: Regulations concerning the international railway transport of dangerous goods |
| BCF | Bioconcentration factor (BCF) |
| CAS | CAS: Chemical Abstracts Service |
| DNEL | Derived No Effect Level |
| EU | European Union |
| EC | EC: European Community |
| EU | European Union |
| IATA | IATA: International Air Transport Association |
| ICAO/IATA | ICAO: International Civil Aviation Organization / IATA: International Air Transport Association |
| IMDG | IMDG: International Maritime Dangerous Goods |
| PBT | Persistent, Bioaccumulative and Toxic |
| PNEC | Predicted No Effect Concentration |
| UN | United Nations |
| 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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