SAFETY DATA SHEET

M-Bond 450 Part B

www.vpgsensors.com

ACCORDING TO OSHA HCS (29 CFR 1910.1200)

Date of Issue: 15 April 2024
Date of First Issue: 20 March 2012
Version: 6.0

SECTION 1: IDENTIFICATION

Product identifier

Product Name	M-Bond 450 Part B
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. Post Office Box 27777 Raleigh, NC 27611 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 2
Health hazards	Serious eye damage/irritation, Category 2 Acute toxicity, Category 4 - inhalation Specific target organ toxicity — single exposure, Category 3 (Narcotic effects) Reproductive toxicant, Category 1B Specific target organ toxicity — single exposure, Category 2 Specific target organ toxicity - Repeated exposure, Category 1
Environmental hazards	Hazardous to the aquatic environment (Chronic), Category 3

Label elements

Hazard Pictogram(s)

Signal Word(s)	DANGER
Hazard Statement(s)	Highly flammable liquid and vapour. Causes serious eye irritation. Harmful if inhaled. May cause drowsiness or dizziness. May damage fertility. May damage the unborn child. May cause damage to organs. Causes damage to organs through prolonged or repeated exposure. 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.
Ground and bond container and receiving equipment.
Use explosion proof electrical equipment.
Use non-sparking tools.
Take action to prevent static discharges.
Do not breathe mist/vapours/spray.
Wash hands and exposed skin thoroughly after handling.
Do not eat, drink or smoke when using this product.
Use only outdoors or in a well-ventilated area.
Avoid release to the environment.
Wear protective gloves/eye protection/face protection.
IF ON SKIN or hair: Take off immediately all contaminated clothing. Rinse skin with water.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
IF exposed or concerned: Call a POISON CENTER/doctor.
In case of fire: Use foam to extinguish.
Store in a well-ventilated place. Keep container tightly closed.
Store in a well-ventilated place. Keep cool.
Store locked up.
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.
0% of the mixture consists of ingredients of unknown acute oral toxicity.
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
2-Ethoxyethanol	50 - 55	110-80-5	203-804-1	Flammable liquid, Category 3 Acute Toxicity, Category 4 - oral Acute Toxicity, Category 4 - inhalation Reproductive toxicant, Category 1B
Butanone	25 - 30	78-93-3	201-159-0	Flammable liquid, Category 3 Serious eye damage/irritation, Category 2 Specific Target Organ Toxicity — Single Exposure, Category 3 (Narcotic effects)
4,4'-Sulfonyldianiline	15 – 20	80-08-0	201-248-4	Acute Toxicity, Category 4 - oral Specific Target Organ Toxicity — Single Exposure, Category 2 (blood) Specific target organ toxicity - Repeated exposure, Category 1(Testes, epididymis) Specific target organ toxicity - Repeated exposure, Category 2 (blood, spleen, liver) Hazardous to the aquatic environment, Chronic, Category 2

Xylene	1 - 10	1330-20-7	215-535-7	Flammable liquid, Category 3 Aspiration toxicity, Category 1 Acute Toxicity, Category 4 Skin corrosion/irritation, Category 2 Serious eye damage/irritation, Category 2 Acute Toxicity, Category 4 - inhalation Specific Target Organ Toxicity — Single Exposure, Category 3 Specific target organ toxicity - Repeated exposure, Category 2 Hazardous to the aquatic environment, Chronic, Category 3
Boron trifluoride ethylamine complex	0.1 - 0.5	75-23-0	200-852-5	Acute Toxicity, Category 4 - oral Skin corrosion/irritation, Category 2 Serious eye damage/irritation, Category 2 Specific Target Organ Toxicity — Single Exposure, Category 3

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	May be harmful if swallowed. Causes serious eye irritation. Harmful if inhaled. May cause drowsiness or dizziness. May damage fertility. May damage the unborn child. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure.
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	Highly 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
2-Ethoxyethanol (Cellosolve)	110-80-5	200	740	X	OSHA
Xylenes (o-, m-, p-isomers)	1330-20-7	100	435	-	OSHA

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

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
2-Ethoxyethanol (Cellosolve)	110-80-5	2-Ethoxyacetic acid in urine	2mg/L creatinine	End of shift at end of workweek	-

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	Amber coloured Liquid
Odor	Sweetish ketone odor.
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	0.89 g/cm^3 (H2O = 1)
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)	Highly 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. When heated to soldering temperatures, the solvents are evaporated and rosin may be thermally degraded. 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: Acute toxicity, Category 4 - inhalation; Harmful if inhaled.

	Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 10 - <20 mg/l. (Vapour)
2-Ethoxyethanol	Acute toxicity, Category 4 - inhalation; Harmful if inhaled. LC50 :7.3 mg/kg EU Data: Harmonised Classification/ ECHA registration dossier
Xylene	Acute toxicity, Category 4 - inhalation; Harmful if inhaled. LC50 :29 mg/kg EU Data: Harmonised Classification/ ECHA registration dossier
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; Causes serious eye irritation. Test Result: Irritating to eyes. (OECD 405) EU Data: Harmonised Classification/ ECHA registration dossier
Xylene	Serious eye damage/irritation, Category 2; Causes serious eye irritation. Test Result: Irritating to eyes.(rabbit) (EU Method B.4) EU Data: Harmonised Classification/ ECHA registration dossier
Boron trifluoride ethylamine complex	Serious eye damage/irritation, Category 2; Causes serious eye irritation. Test Result: Irritating to eyes. (rabbit) (Unnamed publication, 1979) EU Data: ECHA registration dossier
Respiratory or skin sensitization	Mixture: Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Mixture: Based upon the available data, the classification criteria are not met.
Carcinogenicity	Mixture: Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Mixture: Reproductive toxicant, Category 1B; May damage fertility. May damage the unborn child.
2-Ethoxyethanol	Reproductive toxicant, Category 1B; May damage fertility. May damage the unborn child. Developmental toxicity NOAEL: 23 mg/kg/day (oral) Developmental toxicity LOAEC: 37.4 mg/kg/day (inhalation) EU Data: Harmonised Classification/ ECHA registration dossier
STOT - single exposure	Mixture: Based upon the available data, the classification criteria are not met.
Butanone	Specific target organ toxicity — single exposure, Category 3 (Narcotic effects); May cause drowsiness or dizziness. EU Data: Harmonised Classification/ ECHA registration dossier
4'-Sulfonyldianiline	Specific target organ toxicity — single exposure, Category 2; May cause damage to organs: blood EU Data: Harmonised Classification/ ECHA registration dossier
Xylene	Specific target organ toxicity — single exposure, Category 3; May cause respiratory irritation. EU Data: ECHA registration dossier
Boron trifluoride ethylamine complex	Specific target organ toxicity — single exposure, Category 3; May cause respiratory irritation. ECHA registration dossier
STOT - repeated exposure	Mixture: Specific target organ toxicity - Repeated exposure, Category 1; Causes damage to organs through prolonged or repeated exposure.
4,4'-Sulfonyldianiline 4,4'-磺酰基双苯胺	Specific target organ toxicity - Repeated exposure, Category 1; Causes damage to organs through prolonged or repeated exposure.(Testes, epididymis) Specific target organ toxicity - Repeated exposure, Category 2; May cause damage to organs through prolonged or repeated exposure. (blood, spleen, liver) EU Data: Harmonised Classification/ ECHA registration dossier
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. Harmful if inhaled. May cause drowsiness or dizziness. May damage fertility. May damage the unborn child. May cause damage to organs. May cause damage to organs through prolonged or repeated exposure.
Delayed health effects from exposure	None Known
Exposure levels and health effects	See Section: 8
Interactive effects	
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	Mixture: Hazardous to the aquatic environment (Chronic), Category 3; Harmful to aquatic life with long lasting effects. Estimated Mixture LC50(96 hour) >10 - <100 mg/l (Fish)
4,4'-Sulfonyldianiline	Aquatic Chronic 2; H411: Toxic to aquatic life with long lasting effects. Harmonised Classification/ ECHA registration dossier
Xylene	Aquatic Chronic 3; H412: Harmful to aquatic life with long lasting effects. NOEC: 0.714 mg/l LOEC: 1.29 mg/l (OECD 210) Harmonised Classification/ ECHA registration dossier
Persistence and degradability	No data for the mixture as a whole.
2-Ethoxyethanol	Readily biodegradable (according to OECD criteria).
Butanone	Readily biodegradable (according to OECD criteria). Water degradation rate (%): 98 (28 days) OECD 301D
4,4'-Sulfonyldianiline	Not biodegradable
Xylene	Readily biodegradable (according to OECD criteria).
Boron trifluoride ethylamine complex	Degrades by hydrolysis. Degradation products: flourborn-complexes and ethylamine (Readily biodegradable.)
Bioaccumulative potential	No data for the mixture as a whole.
2-Ethoxyethanol	Log Pow: -0.32 - -0.43 Bioconcentration factor (BCF): 0.28 -0.34 Low bioaccumulative potential
Butanone	Low bioaccumulative potential
4,4'-Sulfonyldianiline	Log KOW : <3 Low bioaccumulative potential
Xylene	Log KOW : 3.1 – 3.2 Low bioaccumulative potential
Boron trifluoride ethylamine complex	No data available
Mobility in soil	No data for the mixture as a whole.
2-Ethoxyethanol	Adsorption to solid soil phase is not expected.
Butanone	Adsorption to solid soil phase is not expected.
4,4'-Sulfonyldianiline	Adsorption to solid soil phase is not expected.
Xylene	Log Koc: 2.73 (OECD 121) Adsorption to solid soil phase is not expected.
Boron trifluoride ethylamine complex	No data available
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	II	II	II
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: 2-Ethoxyethanol; 4,4'-Sulfonyldianiline; Xylene
NIOSH Occupational Carcinogen List	All chemicals are not listed
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: 2-Ethoxyethanol
Massachusetts, New Jersey, Pennsylvania, Rhode Island- State Right to Know Lists	Listed: Butanone; 2-Ethoxyethanol; 4,4'-Sulfonyldianiline; Xylene
New York -State Right to Know Lists	Listed: Butanone; 2-Ethoxyethanol; Xylene
Minnesota - State Right to Know Lists	Listed: Butanone; 2-Ethoxyethanol; Xylene
Massachusetts – Toxic Use reduction act	Listed: Butanone; 2-Ethoxyethanol; Xylene

Non-Regional

IARC Monographs	Listed: Xylene IARC Classification: Group 3

SECTION 16: OTHER INFORMATION

The following sections contain revisions or new statements: Not applicable – V1.0

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), 2-Ethoxyethanol (CAS No. 110-80-5), 4,4'-Sulfonyldianiline (CAS No. 80-08-0), Xylene (CAS No. 1330-20-7)
Existing ECHA registration(s) for Butanone (CAS No. 78-93-3), 2-Ethoxyethanol (CAS No. 110-80-5), 4,4'-Sulfonyldianiline (CAS No. 80-08-0), Xylene (CAS No. 1330-20-7), Boron trifluoride ethylamine complex (CAS No. 75-23-0)

Classification of the substance or mixture in accordance with paragraph (d) of 29 CFR 1910.1200	**Classification Procedure**
Flammable Liquid, Category 2	Expert judgement - Flash point
Serious eye damage/irritation, Category 2	Threshold Calculation
Acute toxicity, Category 4 - inhalation	Acute Toxicity Estimate (ATE) Calculation.
Specific target organ toxicity — single exposure, Category 3 (Narcotic effects)	Threshold Calculation
Reproductive toxicant, Category 1B	Threshold Calculation
Specific target organ toxicity — single exposure, Category 2	Threshold Calculation
Specific target organ toxicity - Repeated exposure, Category 1	Threshold Calculation
Hazardous to the aquatic environment (Chronic), Category 3	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.

Disclaimers

Information contained in this publication or as otherwise supplied to Users is believed to be accurate and is given in good faith, but it is for the Users to satisfy themselves of the suitability of the product for their own particular purpose. Vishay Precision Group gives no warranty as to the fitness of the product for any particular purpose and any implied warranty or condition (statutory or otherwise) is excluded except to the extent that exclusion is prevented by law. Vishay Precision Group accepts no liability for loss or damage (other than that arising from death or personal injury caused by defective product, if proved), resulting from reliance on this information. Freedom under Patents, Copyright and Designs cannot be assumed.

Disclaimer

ALL PRODUCTS, PRODUCT SPECIFICATIONS AND DATA ARE SUBJECT TO CHANGE WITHOUT NOTICE.

Vishay Precision Group, Inc., its affiliates, agents, and employees, and all persons acting on its or their behalf (collectively, “VPG”), disclaim any and all liability for any errors, inaccuracies or incompleteness contained herein or in any other disclosure relating to any product.

The product specifications do not expand or otherwise modify VPG’s terms and conditions of purchase, including but not limited to, the warranty expressed therein.

VPG makes no warranty, representation or guarantee other than as set forth in the terms and conditions of purchase. **To the maximum extent permitted by applicable law, VPG disclaims (i) any and all liability arising out of the application or use of any product, (ii) any and all liability, including without limitation special, consequential or incidental damages, and (iii) any and all implied warranties, including warranties of fitness for particular purpose, non-infringement and merchantability.**

Information provided in datasheets and/or specifications may vary from actual results in different applications and performance may vary over time. Statements regarding the suitability of products for certain types of applications are based on VPG’s knowledge of typical requirements that are often placed on VPG products. It is the customer’s responsibility to validate that a particular product with the properties described in the product specification is suitable for use in a particular application. You should ensure you have the current version of the relevant information by contacting VPG prior to performing installation or use of the product, such as on our website at vpgsensors.com.

No license, express, implied, or otherwise, to any intellectual property rights is granted by this document, or by any conduct of VPG.

The products shown herein are not designed for use in life-saving or life-sustaining applications unless otherwise expressly indicated. Customers using or selling VPG products not expressly indicated for use in such applications do so entirely at their own risk and agree to fully indemnify VPG for any damages arising or resulting from such use or sale. Please contact authorized VPG personnel to obtain written terms and conditions regarding products designed for such applications.

Product names and markings noted herein may be trademarks of their respective owners.