SAFETY DATA SHEET

Version: 1.0
Date of Issue: 21 March 2018
Date of First Issue: 21 March 2018

www.vishaypg.com

In accordance with Schedule 1 of the Hazardous Products Regulations (HPR) (WHMIS 2015)

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

Product identifier

Product Name	CSM-3
Other Means of Identification	None

Recommended use and restrictions

Recommended use	PC14 Metal surface treatment products, including galvanic and electroplating products
Restrictions on use	Anything other than the above.

Initial Supplier Identifier

Company Identification	VISHAY MEASUREMENTS GROUP, INC. Post Office Box 27777 Raleigh, NC 27611 USA
Telephone	(+1) 800.204.6278
E-Mail (competent person)	mm.us@vishaypg.com

Emergency telephone number

Emergency Phone No.	1-800-424-9300	CHEMTREC (24 hours)
Languages spoken	English	

SECTION 2: HAZARDS IDENTIFICATION

Classification of the substance or mixture

In accordance with Schedule 1 of the Hazardous Products Regulations (HPR) (WHMIS 2015)

Flammable Aerosols - Category 1
Eye Irritation - Category 2
Acute Toxicity (Inhalation) - Category 4
Specific target organ toxicity — single exposure - Category 3
Hazardous to the aquatic environment, Chronic - Category 3

Label elements

Hazard Pictogram(s)

Signal Word(s): DANGER

Hazard Statement(s):
Extremely flammable aerosol.
Causes serious eye irritation.
Toxic if inhaled.
May cause drowsiness or dizziness.
Harmful to aquatic life with long lasting effects.

Precautionary Statement(s):
Avoid breathing mist/vapours/spray.
Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
Pressurized container: Do not pierce or burn container, even after use.
Wash hands and exposed skin thoroughly after handling.
Wear protective gloves/protective clothing/eye protection/face protection.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Call a POISON CENTER/doctor if you feel unwell.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.

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 Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.

SECTION 3: COMPOSITION/INFORMATION ON INGREDIENTS

Substances Not applicable

Mixtures

GHS Classification

Chemical Name	CAS No.	Concentration (%W/W)	Common name(s), synonym(s) of the substance	Hazard classification
Trans-dichloroethylene	156-60-5	<100	(E)-1,2-dichloroethene; Acetylene dichloride	Flammable Liquids - Category 2 Eye Irritation - Category 2 Acute Toxicity (Inhalation) - Category 4 Specific Target Organ Toxicity - Single Exposure - Category 3 (CSN) Aquatic Chronic - Category 3
Carbon dioxide	124-38-9	<50	N/A	Not classified

SECTION 4: FIRST AID MEASURES

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. Do not breathe vapour. Avoid all contact. Contaminated clothing should be laundered before reuse.

Inhalation: IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Keep warm and at rest. Apply artificial respiration if patient is not breathing. If breathing is laboured, oxygen should be administered by qualified personnel. Obtain medical attention.

Skin Contact: IF ON SKIN: Remove contaminated clothing immediately. After contact with skin, wash immediately with plenty of soap and water. Contaminated clothing should be thoroughly cleaned. If skin irritation occurs: Get medical advice/attention.

Eye Contact: IF IN EYES: Flush eyes with water for at least 15 minutes while holding eyelids open. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if eye irritation develops or persists.

Ingestion: IF SWALLOWED: Do NOT induce vomiting. Rinse mouth. Drink two glasses of water. Do not give milk or alcoholic beverages. Do not give anything by mouth to an unconscious person. If aspiration is suspected obtain immediate medical attention.

Most important symptoms and effects, both acute and delayed: Causes serious eye irritation. Harmful if inhaled. May cause drowsiness or dizziness. Ingestion may cause irritation of the gastrointestinal tract.
Inhalation of solvent vapours may give rise to nausea, headaches and dizziness. Swallowing small amounts is not likely to produce harmful effects. Ingestion of larger amounts may produce abdominal pain, nausea and vomiting.

Indication of any immediate medical attention and: Treat symptomatically.

special treatment needed

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media	As appropriate for surrounding fire. Extinguish with foam, waterspray or dry chemical. Alcohol resistant foams (ATC type) are preferred. Carbon dioxide.
Unsuitable extinguishing Media	Water is not generally recommended since it can be ineffective; however, it can be used successfully to cool containers exposed to the fire and to disperse fumes. Do not use water jet. Direct water jet may spread the fire.
Special hazards arising from the substance or mixture	Extremely flammable aerosol. Do not pierce or burn container, even after use. Sealed containers may rupture explosively if hot. Combustion products: Hydrogen fluoride, Fluorinated compounds, Hydrocarbons, carbonyl halides, Oxides of carbon, Hydrogen chloride.
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. 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. Do not breathe vapour. Avoid all contact. Use personal protective equipment as required. See Section: 8. Vapours are heavier than air and may travel considerable distances to a source of ignition and flashback.
Environmental precautions	Avoid release to the environment. Do not allow to enter drains, sewers or watercourses. Prevent liquid entering sewers, basements and workpits; vapour may create explosive atmosphere.
Methods and material for containment and cleaning up	Use non-sparking equipment when picking up flammable spill. Adsorb spillages onto sand, earth or any suitable adsorbent material. Do NOT absorb in saw-dust or other combustible absorbents. Transfer to a container for disposal. Ventilate the area and wash spill site after material pick-up is complete. Allow small spillages to evaporate provided there is adequate ventilation. Dispose of this material and its container as hazardous waste.
Reference to other sections	See Section: 8, 13

SECTION 7: HANDLING AND STORAGE

Precautions for safe handling	Take precautionary measures against static discharge. Do not use sparking tools. Ensure adequate ventilation. The vapour is heavier than air; beware of pits and confined spaces. Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking. Do not breathe vapour. Avoid all contact. 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.
Conditions for safe storage, including any incompatibilities	Ground/bond container and receiving equipment. Transfer substance using closed system e.g. using drum pump. Do not pierce or burn container, even after use. 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. Keep away from direct sunlight. Do not store and transport with flammable/combustible materials etc.
Storage temperature	Ambient. Recommended: -10 ℃ > < 50 ℃ .
Incompatible materials	Keep away from: Oxidizing agents (May cause fire), Alkalis, Acids, potassium hydroxide. Avoid contact with alkaline earth metals.
Specific end use(s)	PC14 Metal surface treatment products, including galvanic and electroplating products.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Control parameters

Occupational Exposure Limits

SUBSTANCE	CAS No.	ACGIH® TLV® (ppm)		OSHA PEL (ppm)		Note
		TWA	STEL	TWA	STEL	
Trans-Dichloroethylene	156-60-5	200	-	-	-	ACGIH
Carbon dioxide	124-38-9	5000	9000	-	-	OSHA
		5000	-	30000	-	ACGIH

Source: ACGIH: American Conference of Governmental Industrial Hygiene; Threshold Limit Value (TLV)
OSHA PELs 1910.1000
Note: 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.

Alberta: Occupational Health And Safety Code, 2009; Quebec: Health and Safety Work Act, 2016

SUBSTANCE	CAS No.	8-hour Occupational Exposure Limits			15-minute or ceiling Occupational Exposure Limits		Note
		ppm	mg/m³	f/cc	STEL (ppm)	STEL (mg/m³)	
Trans-Dichloroethylene	156-60-5	500	793	-	-	-	Alberta
Carbon dioxide	124-38-9	5000	9000	-	30000	54000	Alberta
		5000	9000	-	30000	54000	OEL

Source: Alberta: Occupational Health And Safety Code, 2009
OEL: Quebec Work Health and Safety Regulations, Health and Safety Work Act, (chapter S - 2.1, a. 223)

British Coloumbia: Occupational Health and Safety Guidelines, 2015; Northwest Territories: Occupational Health & Safety Regulations, 2012; Ontario: Occupational Health and Safety Act, 1990

SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m³)	Note
Trans-Dichloroethylene	156-60-5	200	-	-	-	WEL
		200	-	250	-	NW
		200	790	250	990	O
Carbon dioxide	124-38-9	5000	-	15000	-	WEL
		5000	-	30000	-	NW
		5000	-	30000	-	O

Source: WEL: Occupational Health and Safety Guidelines Part 5: Chemical Agents and Biological Agents (British Columbia)
NW: WSCC, Occupational Health & Safety Regulations, Northwest Territories Volume 3
Ontario (O): Occupational Health and Safety Act, 1990

Saskatchewan: The Occupational Health and Safety Regulations, 1996.

SUBSTANCE	CAS No.	Time Weighted Average (TWA) (ppm)	STEL (ppm)	Note
Trans-Dichloroethylene	156-60-5	200	250	SK
Carbon dioxide	124-38-9	5000	30000	SK

Source: Saskatchewan (SK): The Occupational Health and Safety Act, 1993. O-1.1 REG 1 The Occupational Health and Safety Regulations, 1996.

Biological limit value Not established.

Exposure controls

Appropriate engineering controls	Ensure adequate ventilation or use appropriate containment. 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.
Individual protection measures, such as personal protective equipment (PPE)	Keep good industrial hygiene. 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. Avoid breathing vapours. Avoid all contact. IF exposed: Wash immediately with water. Wash contaminated clothing before reuse. Do not eat, drink or smoke at the work place.
Eye/face protection 	Wear protective eye glasses for protection against liquid splashes. Recommended: Class 2B goggles
Skin protection 	**Hand protection:** 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, Minimum thickness: 0.5mm, breakthrough time: >480 minutes., Polychloroprene - CR, Minimum thickness: 0.5mm, Polyvinyl chloride - PVC. **Body protection:** Flame-resistant antistatic protective clothing. 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.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Information on basic physical and chemical properties

Appearance	Colourless liquid
Odour	Sharp, Harsh
Odour threshold	17 ppm
pH	Not established.
Melting point/freezing point	- 50 ℃
Initial boiling point and boiling range	48 ℃
Flash point	2 – 4 ℃
Evaporation rate (Water = 1)	2.80
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Flammable Limits (Upper) (%v/v): 12.8 Flammable Limits (Lower) (%v/v): 9.7
Vapour pressure	Not determined.
Vapour density	Not determined.
Relative density	1.28 g/ml @ 20 ℃
Solubility(ies)	Soluble in water. 6.3 mg/ml @ 25 ℃
Partition coefficient: n-octanol/water	Kow 115
Auto-ignition temperature	Not available.
Decomposition Temperature	Not available.
Viscosity	Not available.
Explosive properties	Not explosive.

Oxidising properties	Not oxidising.
Other information	Volatile Organic Compound Content: 96%

SECTION 10: STABILITY AND REACTIVITY

Reactivity	Stable under normal conditions.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Extremely flammable aerosol. 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 away from direct sunlight. Do not use sparking tools.
Incompatible materials	Isolate from reducers and flammable/ combustible materials etc in storage. Keep away from: Oxidizing agents (May cause fire), Alkalis, Acids, potassium hydroxide. Avoid contact with alkaline earth metals.
Hazardous decomposition product(s)	May decompose in a fire giving off toxic fumes. Combustion products: Hydrogen fluoride, Fluorinated compounds, Hydrocarbons, carbonyl halides, Oxides of carbon, Hydrogen chloride.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects

Acute toxicity - Ingestion	Based upon the 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 (Inhalation) - Category 4 Acute Toxicity Estimate Mixture Calculation: Estimated LC50 11.0 mg/l.
Acute toxicity - Skin Contact	Based upon the available data, the classification criteria are not met. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 > 2000 mg/kg bw/day.
Skin corrosion/irritation	Skin Irritation - Category 2: Causes skin irritation.
Serious eye damage/irritation	Eye Irritation - Category 2: Causes eye irritation.
Trans-dichloroethylene	Eye Irritation - Category 2 Irritating to eyes. (rabbit) (OECD 405)
Respiratory or skin sensitization	Based upon the available data, the classification criteria are not met.
Germ cell mutagenicity	Based upon the available data, the classification criteria are not met.
Carcinogenicity	Based upon the available data, the classification criteria are not met.
Reproductive toxicity	Based upon the available data, the classification criteria are not met.
STOT - single exposure	Specific target organ toxicity — single exposure - Category 3: May cause drowsiness or dizziness.
Trans-dichloroethylene	Specific target organ toxicity — single exposure - Category 3 LC50 (rat) 7902 mg/kg bw. Central nervous depression, Ataxia (impaired locomotor coordination), Depressed respiration. (Hayes et al., 1987)
STOT - repeated exposure	Based upon the available data, the classification criteria are not met.
Aspiration hazard	Based upon the available data, the classification criteria are not met.
Other information	None known.

SECTION 12: ECOLOGICAL INFORMATION

Toxicity	Aquatic Chronic 3: Harmful to aquatic life with long lasting effects. Estimated Mixture LC50 > 10 to ≤ 100 mg/l (Fish)
Trans-dichloroethylene	Aquatic Chronic - Category 3 Harmonised Classification Aquatic acute: LC50 (bluegill sunfish) mg/l 135 ((96 hour). (US EPA, 1980) Aquatic chronic: No data
Persistence and degradability	No data for the mixture as a whole.
Bioaccumulative potential	No data for the mixture as a whole.
Mobility in soil	The product is predicted to have high mobility in soil (Highly volatile. May

	evaporate quickly.)
Other adverse effects	Not classified as PBT or vPvB. None of the substances in this product fulfil the criteria for being regarded as a PBT or vPvB substance.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods	Do not pierce or burn container, even after use. Dispose of this material and its container as hazardous waste. Send after pre-treatment to a appropriate hazardous waste incinerator facility according to legislation.

SECTION 14: TRANSPORT INFORMATION

		ADR/RID	IMDG	IATA/ICAO
14.1	**UN number**	UN 1950	UN 1950	UN 1950
14.2	**UN proper shipping name**	AEROSOLS, flammable	AEROSOLS, flammable	AEROSOLS, flammable
14.3	**Transport hazard class(es)**	2	2	2
14.4	**Packing group**	None assigned.	None assigned.	None assigned.
14.5	**Environmental hazards**	Not classified	Not classified as a Marine Pollutant.	Not classified
14.6	**Special precautions for user**	See Section: 2		
14.7	**Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code**	Not applicable		

SECTION 15: REGULATORY INFORMATION

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

National regulations

CEPA, Domestic Substances List	Trans-dichloroethylene: Yes Carbon dioxide: Yes
CEPA, List of Toxic Substances (Schedule 1)	Trans-dichloroethylene: VOC - Item 65 Carbon dioxide: VOC - Item 74
CEPA, National Pollutant Release Inventory	Trans-dichloroethylene: Threshold Category: Part 5, Mass Threshold: 1 tonnes of 10 tonnes Total air release, Concentration threshold: N/A

SECTION 16: OTHER INFORMATION

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

Date of First Issue: **21 March 2018**
Date of Issue: **21 March 2018**

References:

Existing Safety Data Sheet (SDS).
EU: Harmonised Classification(s) for Trans-dichloroethylene (CAS No. 156-60-5). Existing ECHA registration(s) for Trans-dichloroethylene (CAS No. 156-60-5).

Literature References:

1. Hayes JR, Condie LW Jr, Egle JL Jr and Borzelleca JF. 1987. The acute and subchronic toxicity in rats of trans-1,2-dichloroethylene in drinking water. J. Am. Coll. Toxicol., 6:471-478.
2. US EPA. Ambient Water Quality Criteria for Dichloroethylenes. Office of Water Regulations and Standards Criteria and Standards Division. Washington DC 20460. 1980. EPA 440/5-80-041. p.B5.

LEGEND

LTEL: Long Term Exposure Limit
STEL: Short Term Exposure Limit
DNEL: Derived No Effect Level
PNEC: Predicted No Effect Concentration
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
ACGIH: American conference of Governmental Industrial
BEI: Biological Exposure Indices (ACGIH)

Hygiene

TLV: Threshold Limit Value (ACGIH)	TWA: Time Weighted Average
OSHA = Occupational Safety and Health Administration	NIOSHTIC: National Institute for Occupational Safety and Health Technical Information Center
IARC: International Agency for Research on Cancer	CEPA (Canadian Environmental Protection Act)
VOC: Volatile Organic Compound	EU: European Union

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.