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Product identifier used on the label	H Cement	
Other means of identification	Not applicable	
Recommended use of the chemical and restrictions		
on use		
Recommended use	•	cts, including galvanic and electroplatin
	products	
Restrictions on use	For professional users only.	
Details of the supplier of the safety data sheet		
Supplier	VISHAY MEASUREMENTS GROUP	
Address of Supplier	Post Office Box 27777	, inc.
	Raleigh, NC 27611	
	USA	
Telenhone	+1 919-365-3800	
Telephone		
Fax E Mail (compatent parcen)	+1 919-365-3945	
E-Mail (competent person)	mm.us@vishaypg.com	
Emergency telephone number	1-800-424-9300	CHEMTREC (24 hours)
ON 2: HAZARD(S) IDENTIFICATION		
Classification of the substance or mixture in		
accordance with paragraph (d) of 29 CFR 1910.1200		
Physical hazards	Metal Corrosive, Category 1	
Health hazards	Acute toxicity, Category 4 – Oral	
	Acute toxicity, Category 4 – Dermal	
	Acute toxicity, Category 4 – Inhalatio	n
	Skin Corrosion/Irritation, Category 2	
	Skin Sensitisation, Category 1	
	Eye Damage, Category 1	
	Respiratory sensitization, Category 1	
	Reproductive toxicity, Category 2	
	Germ cell mutagenicity, Category 2	
	Carcinogen, Category 1A	
	Specific target organ toxicity — repea	
	Specific target organ toxicity — single	
Environmental hazards	Hazardous to the aquatic environmer	nt, Chronic, Category 2
Hazard Symbol	^ ^	^ ^
		Nr.
	• •	• •
Signal Word(s)	DANGER	
Hazard Statement(s)	May be corrosive to metals.	
	Harmful if swallowed.	
	Harmful in contact with skin.	
	Harmful if inhaled.	
	Causes skin irritation.	

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	May cause allergy or asthma symptoms or breathing difficulties if inhaled. Suspected of damaging fertility. May cause cancer. May cause genetic defects. Causes damage to organs through prolonged or repeated exposure. May cause respiratory irritation. Toxic 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 only in original container. Absorb spillage to prevent material damage. Do not breathe dust/fume/gas/mist/vapours/spray. Wash hands and exposed skin thoroughly after handling. Wear protective gloves/protective clothing/eye protection/face protection. IF INHALED: If breathing is difficult, remove to fresh air and keep at rest in a position comfortable for breathing. If experiencing respiratory symptoms: Call a POISON CENTER/doctor. IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/doctor. IF SWALLOWED: Call a POISON CENTER/doctor if you feel unwell. Rinse mouth. IF ON SKIN: Wash with plenty of water. Call a POISON CENTER/doctor if you feel unwell. IF exposed: Call a POISON CENTER or doctor/physician.
Other hazards	None known
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
Silicon Dioxide	< 25	14808-60-7	238-878-4	Carcinogen, Category 1A Specific target organ toxicity — repeated exposure, Category 1 Specific target organ toxicity — single exposure, Category 3
Phosphoric Acid	< 20	7664-38-2	231-633-2 / 616-646-7	Metal Corrosive, Category 1 Acute toxicity, Category 4 – Oral Skin Corrosion/Irritation, Category 1
Aluminum Oxide	< 10	1344-28-1	215-691-6	Not classified
Chromium (VI) Trioxide	< 5	1333-82-0	215-607-8	Oxidising Solid, Category 1 Acute toxicity, Category 3 – Oral Acute toxicity, Category 2 – Dermal Acute toxicity, Category 2 – Inhalation Skin Corrosion/Irritation, Category 1 Skin Sensitisation, Category 1 Respiratory sensitization, Category 1 Reproductive toxicity, Category 2 Germ cell mutagenicity, Category 1B Carcinogen, Category 1 Specific target organ toxicity — repeated exposure, Category 1 Specific target organ toxicity — single exposure, Category 3

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				Hazardous to the aquatic environment, Acute, Category 1 Hazardous to the aquatic environment, Chronic, Category 1
Aluminum Hydroxide	< 5	21645-51-2	244-492-7	Not classified
Chromium Oxide	< 3	1308-38-9	215-160-9	Not classified
Chromium (III) Hydroxide	< 1	1308-14-1	215-158-8	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. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. If experiencing respiratory symptoms: Call a POISON CENTER or doctor/physician. IF exposed or concerned: Get medical advice/attention. If unconscious, place in recovery position and get medical attention immediately. Apply artificial respiration if necessary. Do not employ mouth-to-mouth method.
Skin Contact	IF ON SKIN: Remove contaminated clothing and wash all affected areas with plenty of water. Contaminated clothing should be thoroughly cleaned. If skin irritation or rash 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. Get medical attention if eye irritation develops or persists. Obtain prompt consultation, preferably from an ophthalmologist.
Ingestion	IF SWALLOWED: rinse mouth. Do NOT induce vomiting. Drink two glasses of water. Do not induce vomiting. Allow the patient to drink 5 - 10 g ascorbic acid (not effervescent tablets) dissolved in water. This dose can be repeated several times. Obtain medical attention.
Most important symptoms and effects, both acute and delayed	Harmful if swallowed. Harmful in contact with skin. Harmful if inhaled. Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. Suspected of damaging fertility. May cause cancer. May cause genetic defects. Causes damage to organs through prolonged or repeated exposure. May cause respiratory irritation.
Indication of any immediate medical attention and special treatment needed	Treat symptomatically
Notes to a physician:	 IF IN EYES: Chemical eye burns may require extended irrigation. IF SWALLOWED: Get medical attention immediately. Allow the patient to drink 5 10 g ascorbic acid (not effervescent tablets) dissolved in water. This dose can be repeated several times. IF ON SKIN: If the skin becomes scratched or wounded, dab it with saturated gauze pads or compresses using a freshly made up ascorbic acid solution (10 g in 100 g water).

SECTION 5: FIRE-FIGHTING MEASURES

Extinguishing media

Suitable Extinguishing Media

Unsuitable extinguishing Media

As appropriate for surrounding fire. Extinguish preferably with foam, carbon dioxide or dry chemical.

Do not use water jet. Direct water jet may spread the fire.

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Special hazards arising from the substance or mixture	May decompose in a fire giving off toxic fumes. May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide, metal oxides/oxides and Oxides of phosphorus.
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. Avoid all contact. Use personal protective equipment as required. See Section: 8. Avoid breathing vapours.
Environmental precautions	Avoid release to the environment. Do NOT wash away into sewer. 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	Adsorb spillages onto sand, earth or any suitable adsorbent material. Neutralize
ир	with: slaked lime (calcium hydroxide), sodium carbonate, calcium carbonate or sodium bicarbonate. Use only non-sparking tools. Transfer to a container for disposal. 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. Ensure adequate ventilation. Avoid all contact. Do not breathe vapour. 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 Storage temperature Storage life	Store in a well-ventilated place. Keep container tightly closed. Keep away from heat, sources of ignition and direct sunlight. Ambient. 5 - 25°C Stable under normal conditions.
Incompatible materials	Keep away from: Combustible materials, Alkalis, Reducing agents, Strong oxidising agents, Acids and metals. Keep away from water. Reacts violently with strong alkalis. Direct contact with alkalis may produce hydrogen gas. Hydrogen gas is released in contact with most metals. Exothermic reaction with water. May be corrosive to metals.
Suitable containers:	Keep only in original container.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Occupational Exposure Limits



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SUBSTANCE	CAS No.	LTEL (8 hr TWA ppm)	LTEL (8 hr TWA mg/m³)	STEL (ppm)	STEL (mg/m ³)	Note
		-	0.05	-	-	NIOSH
Quartz (SiO2)						OSHA
· · ·	14808-60-7	-	30	-	-	Total Dust
(crystalline silica)		-	10	-	-	Respirable Dust
		-	0.025	-	-	ACGIH, A2
		-	1	-	3*	NIOSH
Phosphoric Acid 7664	7664-38-2	-	1	-	-	OSHA
		-	1	-	3	ACGIH
						NIOSH, OSHA
Aluminium Oxide	1344-28-1	-	15	-	-	Total Dust
		-	5	-	-	Respirable Dust
o		-	0.001	-	-	NIOSH, Ca
Chromium III	1333-82-0	-	0.005	-	-	OSHA
compounds		-	0.5	-	-	ACGIH, A4

Note: OSHA PELs 1910.1000 TABLE Z-1/3/ NIOSH RELs / ACGIH TLVs

*15 minutes average value

Ca - Potential occupational carcinogen

A2: Suspected Human Carcinogen: Human data are accepted as adequate in quality but are conflicting or insufficient to classify the agent as a confirmed human carcinogen; OR, the agent is carcinogenic in experimental animals at dose(s), by route(s) of exposure, at site(s), of histological type(s), or by mechanism(s) considered relevant to worker exposure. The A2 is primarily when there is limited evidence of carcinogenicity in humans and sufficient evidence of carcinogenicity in experimental animals with relevance to humans.

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.

(If the list of chemicals in the above table is not the same as that in Section 3, state: The other components listed in Section 3 do not have occupational exposure limits.)

Biological Exposure Indices	Not established
Appropriate engineering controls	Ensure adequate ventilation or use appropriate containment. Atmospheric levels should be controlled in compliance with the occupational exposure limit. Eyewash bottles containing clean water or saline solution. Wash thoroughly after handling.
Individual protection measures, such as personal protective equipment (PPE)	General hygiene measures for the handling of chemicals are applicable. Avoid all contact. Do not breathe vapour. 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.
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.
	Body protection: Chemical protection suit, boots and plastic gloves.
Respiratory protection	Do not use in areas without adequate ventilation. In case of inadequate ventilation wear respiratory protection. A suitable mask with filter type P may be appropriate.

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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Green Slurry.
Odor	No odour
Odor Threshold	Not available.
pH	Not established.
Melting Point/Freezing Point	Not available.
Initial boiling point and boiling range	104.4°C (Mixture)
Flash Point	Not applicable.
Evaporation rate (Butyl acetate = 1)	1 (BuAc = 1) (Mixture)
Flammability (solid, gas)	Not applicable - Liquid
Upper/lower flammability or explosive limits	Not available.
Vapour pressure	23.7 mmHg @ 20°C
Vapour density	<1 (Air = 1)
Relative density	Not available.
Solubility(ies)	Miscible
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	May be corrosive to metals.
Chemical stability	Stable under normal conditions.
Possibility of hazardous reactions	Reacts violently with strong alkalis. Direct contact with alkalis may produce hydrogen gas. Hydrogen gas is released in contact with most metals. Exothermic reaction with water. At high temperature formation of phosphorous oxides.
Conditions to avoid	Keep away from water.
Incompatible materials	Keep away from: Combustible materials, Alkalis, Reducing agents, Strong oxidising agents, Acids and metals.
Hazardous decomposition product(s)	May decompose in a fire giving off toxic fumes. Carbon monoxide, Carbon dioxide, and possibly chromium. Thermal decomposition may yield phosphoric oxide.

SECTION 11: TOXICOLOGICAL INFORMATION

Information on toxicological effects (Substances in preparations / mixtures)

Acute toxicity - Ingestion	Acute toxicity, Category 4; Harmful if swallowed. Acute Toxicity Estimate Mixture Calculation: Estimated LC50 1135.2 mg/kg bw/day.
Acute toxicity - Inhalation	Acute toxicity, Category 4: Harmful if inhaled.
	Acute Toxicity Estimate Mixture Calculation: Estimated LC50 16.7 mg/l.
Acute toxicity - Skin Contact	Acute toxicity, Category 4; Harmful in contact with skin.
	Acute Toxicity Estimate Mixture Calculation: Estimated LC50 1900 mg/kg bw/day.
Skin corrosion/irritation	Skin Corrosion/Irritation, Category 2; Causes skin irritation.
Serious eye damage/irritation	Eye Damage, Category 1; Causes serious eye damage.
Skin sensitization	Skin Sensitisation, Category 1; May cause an allergic skin reaction.
Respiratory sensitization	Respiratory sensitization, Category 1; May cause allergy or asthma symptoms or breathing difficulties if inhaled.

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Germ cell mutagenicity	Germ cell mutagenicity, Category 1; May cause genetic defects.	
Carcinogenicity	Carcinogen, Category 1A; May cause cancer.	
Reproductive toxicity	Reproductive toxicity, Category 2; Suspected of damaging fertility.	
STOT - single exposure	Specific target organ toxicity — single exposure, Category 3; May cause respiratory irritation.	
STOT - repeated exposure	Specific target organ toxicity — repeated exposure, Category 1; Causes damage to organs through prolonged or repeated exposure.	
Aspiration hazard	Based upon the available data, the classification criteria are not met.	
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	Causes skin irritation. May cause an allergic skin reaction. Causes serious eye damage. May cause allergy or asthma symptoms or breathing difficulties if inhaled. May cause respiratory irritation.	
Delayed health effects from exposure	Harmful if swallowed. Harmful in contact with skin. Harmful if inhaled. Suspected of damaging fertility. May cause cancer. May cause genetic defects. Causes damage to organs through prolonged or repeated exposure.	
Other information		
NTP Report on Carcinogens	Chromium Trioxide: Chromium hexavalent compound - Known to be a human carcinogen	
	Silicon dioxide: Group K - Known To Be Human Carcinogens	
IARC Monographs	Silicon dioxide: Group 1 - Carcinogenic to humans	
	Chromium Trioxide: Chromium (VI) compound - Group 1 - Carcinogenic to humans	
OSHA Designated Carcinogen	All chemicals are not listed	
OSHA Designated Carcinogen	All chemicals are not listed	

SECTION 12: ECOLOGICAL INFORMATION

Ecotoxicity

Persistence and degradability

Bioaccumulative potential Mobility in soil Other adverse effects Aquatic Chronic 2: Toxic to aquatic life with long lasting effects. Estimated Mixture LC50 > $1 \le 10 \text{ mg/l}$ (Fish) The methods for determining the biological degradability are not applicable to inorganic substances. No data for the mixture as a whole. The product is predicted to have moderate mobility in soil. None known.

SECTION 13: DISPOSAL CONSIDERATIONS

Waste treatment methods

Do not release undiluted and unneutralised to the sewer. Dispose of this material and its container as hazardous waste. Containers must be decontaminated in accordance with all applicable regulations. Dispose of contents in accordance with local, state or national legislation.

Additional Information

SECTION 14: TRANSPORT INFORMATION

UN number	UN 1760	UN 1760	UN 1760
UN proper shipping name	CORROSIVE LIQUID	CORROSIVE LIQUID	CORROSIVE LIQUID
	N.O.S	N.O.S	N.O.S
Transport hazard class(es)	8	8	8
Packing group	111	111	III
Environmental hazards	Environmentally	Classified as a Marine	Environmentally

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hazardous substance

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/legislat US Federal Regulations	tion specific for the substance or mixture
TSCA (Toxic Substance Control Act)	Silicon dioxide: Subject to 25,000 lb reporting threshold
	Phosphoric Acid: Subject to 25,000 lb reporting threshold
	Aluminium Oxide: Subject to 25,000 lb reporting threshold
	Chromium Trioxide: Subject to 25,000 lb reporting threshold
	Aluminium Hydroxide: Subject to 25,000 lb reporting threshold
	Chromium Oxide: Subject to 25,000 lb reporting threshold
EDCDA/CADA Section 202 Extremely Listeriday	Chromium (III) Hydroxide: Subject to 25,000 lb reporting threshold
EPCRA/SARA Section 302 Extremely Hazardous Substances	All chemicals are not listed
EPCRA Section 313 Toxics Release Inventory (TRI)	Aluminium Oxide: De Minimis limit: 1%
Program	Chromium Trioxide: Chromium VI compound - De Minimis limit: 0.1%
riogram	Chromium Oxide: Chromium III compound - De Minimis limit: 1%
NIOSH Occupational Carcinogen List	Silicon dioxide
OSHA List of highly hazardous chemicals, toxics and	All chemicals are not listed
reactives	
NTP Report on Carcinogens (RoC) List	Chromium Trioxide: Chromium hexavalent compound - Known to be a human
	carcinogen
	Silicon dioxide: Group K - Known To Be Human Carcinogens
Poison Prevention Packaging Act US State Regulations	All chemicals are not listed
California State, Proposition 65 List	Chromium Trioxide: Chromium (VI) compound - Safe harbor level - NSRL: 0.001
	(inhalation) ug/day; MADL: 8.2 (oral) ug/day
California State, Safer Consumer Products Regulations	Silicon dioxide: Candidate Chemicals List
	Phosphoric Acid: Candidate Chemicals List
	Chromium Trioxide: Initial Candidate Chemicals List
Maine State, Toxic Chemicals in Children's Products Act	
	Chromium Trioxide: COC list
New Jersey State Worker and Community RTK Act	Silicon dioxide: RTKHSL. SHHSL
	Phosphoric Acid: RTKHSL. SHHSL
	Aluminium Oxide: RTKHSL Chromium Trioxide: RTKHSL. SHHSL
	Chromium Oxide: RTKHSL SHISL
	Chromium (III) Hydroxide: Chromium compound - RTKHSL
Pennsylvania State, Worker and Community RTK Act	Silicon dioxide: Hazardous Substance List
· ······, · ······, · ······, · ······	Phosphoric Acid: Hazardous Substance List. Environmental Hazard List
	Aluminium Oxide: Hazardous Substance List. Environmental Hazard List
	Chromium Trioxide: Hazardous Substance List. Special Hazardous Substance
	List
	Chromium Oxide: Chromium compound - Hazardous Substance List.
	Environmental Hazard List
	Chromium (III) Hydroxide: Chromium compound - Hazardous Substance List.
	Environmental Hazard List
Rhode Island State, Hazardous Substances RTK Act	Silicon dioxide: Hazardous Substance List
	Phosphoric Acid: Hazardous Substance List
	Aluminium Oxide: Hazardous Substance List
	Chromium Trioxide: Hazardous Substance List
New Device of	Chromium Oxide: Chromium (III) compound - Hazardous Substance List
Non-Regional	Silicon diavida: Graun 1

hazardous substance

IARC Monographs, List of Classifications

Silicon dioxide: Group 1 Chromium Trioxide: Chromium (VI) compound - Group 1

Pollutant

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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.

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Date of First Issue	24 August 2012

References:

Existing Safety Data Sheet (SDS), EU Data: Harmonised Classification(s) for Phosphoric Acid (CAS# 7664-38-2) and Chromium (VI) trioxide (CAS# 1333-82-0), Existing ECHA registration(s) for Phosphoric Acid (CAS# 7664-38-2), Aluminum Oxide (CAS# 1344-28-1), Chromium (VI) trioxide (CAS# 1333-82-0), Aluminum Hydroxide (CAS# 21645-51-2) and Chromium Oxide (CAS# 1308-38-9), and the Classification and Labelling Inventory for Silicon Dioxide (CAS# 14808-60-7) and Chromium (III) Hydroxide (CAS# 1308-14-1).

GHS Classification of the substance or mixture	Classification Procedure
Metal Corrosive, Category 1	Estimated Physico-chemical properties of substance
Acute toxicity, Category 4	Acute Toxicity Estimate Mixture Calculation
Skin Corrosion/Irritation, Category 2	Threshold Calculation
Skin Sensitisation, Category 1	Threshold Calculation
Eye Damage, Category 1	Threshold Calculation
Respiratory sensitization, Category 1	Threshold Calculation
Reproductive toxicity, Category 2	Threshold Calculation
Germ cell mutagenicity, Category 1	Threshold Calculation
Carcinogen, Category 1A	Threshold Calculation
Specific target organ toxicity — repeated exposure,	Threshold Calculation
Category 1	
Specific target organ toxicity — single exposure, Category 3	Threshold Calculation
Hazardous to the aquatic environment, Chronic, Category 2	Summation Calculation

LEGEND

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