Dibutyltin(IV) oxide

sc-239691

Material Safety Data Sheet

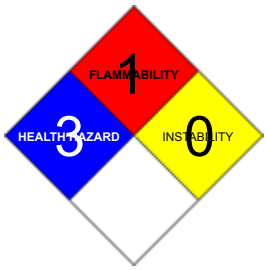
Hazard Alert Code Key:	EXTREME	HIGH	MODERATE	LOW

Section 1 - CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME
Dibutyltin(IV) oxide

STATEMENT OF HAZARDOUS NATURE
CONSIDERED A HAZARDOUS SUBSTANCE ACCORDING TO OSHA 29 CFR 1910.1200.

NFPA



SUPPLIER
Santa Cruz Biotechnology, Inc.
2145 Delaware Avenue
Santa Cruz, California 95060
800.457.3801 or 831.457.3800

EMERGENCY
ChemWatch
Within the US & Canada: 877-715-9305
Outside the US & Canada: +800 2436 2255
(1-800-CHEMCALL) or call +613 9573 3112

SYNONYMS
C8-H18-O-Sn, (CH3(CH2)3)2Sn(=O), dibutyloxostannane, "stannane, dibutyloxo-", "dibutyloxide of tin", dibutyloxotin, "dibutylstannane oxide", "dibutylstannium oxide", "di-n-butyltin oxide", "tin, dibutyloxo-", "tin, dibutyl-, oxide", DBTO

Section 2 - HAZARDS IDENTIFICATION

CHEMWATCH HAZARD RATINGS

		Min	Max
Flammability	1		
Toxicity	3		
Body Contact	2		
Reactivity	1		
Chronic	2		

Min/Nil=0
Low=1
Moderate=2
High=3
Extreme=4

CANADIAN WHMIS SYMBOLS

EMERGENCY OVERVIEW

RISK

Toxic if swallowed.
Possible risk of harm to the unborn child.
Harmful danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
Irritating to respiratory system and skin.
Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

POTENTIAL HEALTH EFFECTS

ACUTE HEALTH EFFECTS

SWALLOWED

■ Toxic effects may result from the accidental ingestion of the material; animal experiments indicate that ingestion of less than 40 gram may be fatal or may produce serious damage to the health of the individual.
■ Subchronic exposures to mono-, di- and tri- and tetra-substituted organotin compounds may elicit toxic response in the central nervous, immune and renal systems, the liver and bile duct and the skin.
■ Dialkyl organotin compounds irritate the intestine and cause vomiting.
If injected, more serious effects can occur.

EYE

■ There is evidence that material may produce eye irritation in some persons and produce eye damage 24 hours or more after instillation.
Severe inflammation may be expected with pain.

SKIN

■ The material may cause mild but significant inflammation of the skin either following direct contact or after a delay of some time.
Repeated exposure can cause contact dermatitis which is characterized by redness, swelling and blistering.
■ Skin contact with the material may damage the health of the individual; systemic effects may result following absorption.
■ Open cuts, abraded or irritated skin should not be exposed to this material.
■ Entry into the blood-stream, through, for example, cuts, abrasions or lesions, may produce systemic injury with harmful effects.
Examine the skin prior to the use of the material and ensure that any external damage is suitably protected.
■ Dibutyltin compounds can cause skin burns and itching which is slow to heal.
Areas most likely to be affected are the lower abdomen, thighs and groin due to absorption by clothing.

INHALED

■ The material can cause respiratory irritation in some persons.
The body's response to such irritation can cause further lung damage.
■ Inhalation of dusts, generated by the material during the course of normal handling, may produce serious damage to the health of the individual.
■ Persons with impaired respiratory function, airway diseases and conditions such as emphysema or chronic bronchitis, may incur further disability if excessive concentrations of particulate are inhaled.
■ The acute toxicity of inhaled organotin compounds resembles that foundby other means of exposure.

CHRONIC HEALTH EFFECTS

■ Harmful danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
Harmful danger of serious damage to health by prolonged exposure through inhalation, in contact with skin and if swallowed.
This material can cause serious damage if one is exposed to it for long periods. It can be assumed that it contains a substance which can produce severe defects.

Results in experiments suggest that this material may cause disorders in the development of the embryo or fetus, even when no signs of poisoning show in the mother.
Limited evidence suggests that repeated or long-term occupational exposure may produce cumulative health effects involving organs or biochemical systems.
Long term exposure to high dust concentrations may cause changes in lung function i.e. pneumoconiosis; caused by particles less than 0.5 micron penetrating and remaining in the lung.
Both tributyltins (TBT) and dibutyltins (DBT) have negative effects on the reproductive system in mammals. In line with these facts, TBT and TPT were given the highest category in a European review of endocrine disrupting chemicals (BKH, 2000) “Evidence for endocrine disruption in living organisms”. TBT was also classified as “Evidence of potential to cause endocrine disruption in humans”.
Organotins are also toxic by other mechanisms. For instance, several organotins are strongly immunosuppressive, display developmental and reproductive effects and are neurotoxic
TPT is classified as category 3 carcinogenic in the EU, but as category 2 (probable human carcinogenic) by the USEPA (EFSA, 2004). DBT may actually be more toxic than TBT to certain enzyme systems. Immunotoxic and developmental effects in mammals may also be more sensitive to DBT than to TB. Both TBT and TPT may be classified as Persistent, Bioaccumulative and Toxic (PBT) and very Persistent,very Bioaccumulative (vPvB) substances according to certain, whereas DBT and dioctyl tin (DO)T may be classified as PBT
For human health, there are no epidemiological studies on chronic low level exposure available It has been suggested that toxicity was equal for DBT, TBT, DOT and TPT for humans, and proposed a group TDI of 0.1 ìg Sn (kg Bw and d)-1.

Section 3 - COMPOSITION / INFORMATION ON INGREDIENTS

NAME	CAS RN	%
dibutyltin oxide	818-08-6	100

Section 4 - FIRST AID MEASURES

SWALLOWED

- Give a slurry of activated charcoal in water to drink. NEVER GIVE AN UNCONSCIOUS PATIENT WATER TO DRINK.
- At least 3 tablespoons in a glass of water should be given.

EYE

If this product comes in contact with the eyes

- Immediately hold eyelids apart and flush the eye continuously with running water.
- Ensure complete irrigation of the eye by keeping eyelids apart and away from eye and moving the eyelids by occasionally lifting the upper and lower lids.

SKIN

If skin contact occurs

- Immediately remove all contaminated clothing, including footwear
- Flush skin and hair with running water (and soap if available).

INHALED

- If fumes or combustion products are inhaled remove from contaminated area.
- Lay patient down. Keep warm and rested.

NOTES TO PHYSICIAN

■ Scanty animal data indicate that BAL may be useful against dialkyl but not trialkyl organotin compounds. D-penicillamine is thought to be inactive.

Section 5 - FIRE FIGHTING MEASURES

Vapour Pressure (mmHG)	Not available.
Upper Explosive Limit (%)	Not available
Specific Gravity (water=1)	Not available.

Lower Explosive Limit (%)	Not available

EXTINGUISHING MEDIA

- Foam.
- Dry chemical powder.

FIRE FIGHTING

- Alert Emergency Responders and tell them location and nature of hazard.
- Wear full body protective clothing with breathing apparatus.

When any large container (including road and rail tankers) is involved in a fire, consider evacuation by 800 metres in all directions.

GENERAL FIRE HAZARDS/HAZARDOUS COMBUSTIBLE PRODUCTS

- Combustible solid which burns but propagates flame with difficulty.
- Avoid generating dust, particularly clouds of dust in a confined or unventilated space as dusts may form an explosive mixture with air, and any source of ignition, i.e. flame or spark, will cause fire or explosion. Dust clouds generated by the fine grinding of the solid are a particular hazard; accumulations of fine dust may burn rapidly and fiercely if ignited.

Combustion products include carbon monoxide (CO), carbon dioxide (CO2), metal oxides, other pyrolysis products typical of burning organic material.
May emit poisonous fumes.

FIRE INCOMPATIBILITY

Avoid contamination with oxidizing agents i.e. nitrates, oxidizing acids,chlorine bleaches, pool chlorine etc. as ignition may result.

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Section 6 - ACCIDENTAL RELEASE MEASURES

MINOR SPILLS

- Remove all ignition sources.
- Clean up all spills immediately.
- Avoid contact with skin and eyes.
- Control personal contact by using protective equipment.
- Use dry clean up procedures and avoid generating dust.
- Place in a suitable, labelled container for waste disposal.

MAJOR SPILLS

- Clear area of personnel and move upwind.
- Alert Emergency Responders and tell them location and nature of hazard.

Section 7 - HANDLING AND STORAGE

PROCEDURE FOR HANDLING

- Avoid all personal contact, including inhalation.
- Wear protective clothing when risk of exposure occurs.

Empty containers may contain residual dust which has the potential to accumulate following settling. Such dusts may explode in the presence of an appropriate ignition source.

- Do NOT cut, drill, grind or weld such containers.
- In addition ensure such activity is not performed near full, partially empty or empty containers without appropriate workplace safety authorisation or permit.

RECOMMENDED STORAGE METHODS

Glass container.

- Lined metal can, Lined metal pail/drum
- Plastic pail

For low viscosity materials

- Drums and jerricans must be of the non-removable head type.
- Where a can is to be used as an inner package, the can must have a screwed enclosure.

All inner and sole packagings for substances that have been assigned to Packaging Groups I or II on the basis of inhalation toxicity criteria, must be hermetically sealed.

STORAGE REQUIREMENTS

- Store in original containers.
- Keep containers securely sealed.

Section 8 - EXPOSURE CONTROLS / PERSONAL PROTECTION

EXPOSURE CONTROLS

Source	Material	TWA ppm	TWA mg/m³	STEL ppm	STEL mg/m³	Peak ppm	Peak mg/m³	TWA F/CC	Notes
US - Alaska Limits for Air Contaminants	dibutyltin oxide (Tin oxide (as Sn))		2						
Canada - Northwest Territories Occupational Exposure Limits (English)	dibutyltin oxide (Tin, inorganic compounds, except SnH and SnO (as Sn))		2		4				
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	dibutyltin oxide (Tin, inorganic compounds, (as Sn) (except SnH4 and SnO2))	-	2	-	4				
US - Minnesota Permissible Exposure Limits (PELs)	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1						
US NIOSH Recommended Exposure Limits (RELs)	dibutyltin oxide (Tin (organic compounds, as Sn))		0.1						[*Note The REL applies to all organic tin compounds except Cyhexatin.]; [skin]

US OSHA Permissible Exposure Levels (PELs) - Table Z1	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1				
US - Idaho - Limits for Air Contaminants	dibutyltin oxide (Tin (organic compounds) as (Sn))		0.1				
US - Vermont Permissible Exposure Limits Table Z-1-A Final Rule Limits for Air Contaminants	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1				
US - Vermont Permissible Exposure Limits Table Z-1-A Transitional Limits for Air Contaminants	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1				
US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1				
Canada - Saskatchewan Occupational Health and Safety Regulations - Contamination Limits	dibutyltin oxide (Tin, (as Sn) organic compounds)		0.1		0.2		Skin
US - Washington Permissible exposure limits of air contaminants	dibutyltin oxide (Tin (as Sn) - Organic compounds)		0.1		0.3		
Canada - Yukon Permissible Concentrations for Airborne Contaminant Substances	dibutyltin oxide (Tin, organic compounds (as Sn) - Skin)	-	0.1	-	0.2		
US - Hawaii Air Contaminant Limits	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1		0.2		
Canada - Nova Scotia Occupational Exposure Limits	dibutyltin oxide (Tin - Organic compounds (as Sn))		0.1		0.2		
Canada - Northwest Territories Occupational Exposure Limits	dibutyltin oxide (Tin, organic4 compounds2 (as Sn) - Skin)		0.1		0.2		

(English)					
US - Alaska Limits for Air Contaminants	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1		
Canada - British Columbia Occupational Exposure Limits	dibutyltin oxide (Tin - Organic compounds, as Sn)		0.1	0.2	Skin
Canada - Alberta Occupational Exposure Limits	dibutyltin oxide (Tin, as Sn Organic compounds)		0.1	0.2	
US - California Permissible Exposure Limits for Chemical Contaminants	dibutyltin oxide (Tin, organic compounds, as Sn)		0.1	0.2	
Canada - Ontario Occupational Exposure Limits	dibutyltin oxide (Organic compounds, as Sn / Composés organiques, en Sn)		0.1		Skin (organic compounds) / Peau (composés organiques)
US ACGIH Threshold Limit Values (TLV)	dibutyltin oxide (Tin - Organic compounds (as Sn))		0.1	0.2	
Canada - Prince Edward Island Occupational Exposure Limits	dibutyltin oxide (Tin - Organic compounds (as Sn))		0.1	0.2	
US - Oregon Permissible Exposure Limits (Z-1)	dibutyltin oxide (Tin (organic compounds))	-	0.1		
Canada - Quebec Permissible Exposure Values for Airborne Contaminants (English)	dibutyltin oxide (Tin Organic compounds (as Sn))		0.1	0.2	
US - Wyoming Toxic and Hazardous Substances Table Z1 Limits for Air Contaminants	dibutyltin oxide (Tin, organic compounds (as Sn))		0.1		

PERSONAL PROTECTION




RESPIRATOR

• Particulate dust filter. (AS/NZS 1716 & 1715, EN 1432000 & 1492001, ANSI Z88 or national equivalent)

EYE

- Safety glasses with side shields.
- Chemical goggles.

HANDS/FEET

Wear chemical protective gloves, eg. PVC.

Suitability and durability of glove type is dependent on usage. Important factors in the selection of gloves include

- frequency and duration of contact,
- chemical resistance of glove material,
- glove thickness and
- dexterity

Select gloves tested to a relevant standard (e.g. Europe EN 374, US F739, AS/NZS 2161.1 or national equivalent).

- When prolonged or frequently repeated contact may occur, a glove with a protection class of 5 or higher (breakthrough time greater than 240 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- When only brief contact is expected, a glove with a protection class of 3 or higher (breakthrough time greater than 60 minutes according to EN 374, AS/NZS 2161.10.1 or national equivalent) is recommended.
- Contaminated gloves should be replaced.

Gloves must only be worn on clean hands. After using gloves, hands should be washed and dried thoroughly. Application of a non-perfumed moisturiser is recommended.

OTHER

- Overalls.
- Eyewash unit.

ENGINEERING CONTROLS

- Local exhaust ventilation is required where solids are handled as powders or crystals; even when particulates are relatively large, a certain proportion will be powdered by mutual friction.
- Exhaust ventilation should be designed to prevent accumulation and recirculation of particulates in the workplace.

Section 9 - PHYSICAL AND CHEMICAL PROPERTIES

PHYSICAL PROPERTIES

Does not mix with water.

Toxic or noxious vapours/gas.

State	DIVIDED SOLID	Molecular Weight	248.94
Melting Range (°F)	>300	Viscosity	Not Applicable
Boiling Range (°F)	Decomposes.	Solubility in water (g/L)	Immiscible
Flash Point (°F)	Not available	pH (1% solution)	Not applicable.
Decomposition Temp (°F)	Not Available	pH (as supplied)	Not applicable
Autoignition Temp (°F)	534	Vapour Pressure (mmHG)	Not available.
Upper Explosive Limit (%)	Not available	Specific Gravity (water=1)	Not available.
Lower Explosive Limit (%)	Not available	Relative Vapor Density (air=1)	8.6

Volatile Component (%vol)	Not available.	Evaporation Rate	Not Applicable

APPEARANCE
Powder; does not mix with water.

Section 10 - CHEMICAL STABILITY

CONDITIONS CONTRIBUTING TO INSTABILITY
- Presence of incompatible materials.
- Product is considered stable.

STORAGE INCOMPATIBILITY
- Avoid strong acids, bases.

Avoid reaction with oxidizing agents.

For incompatible materials - refer to Section 7 - Handling and Storage.

Section 11 - TOXICOLOGICAL INFORMATION

dibutyltin oxide

TOXICITY AND IRRITATION
DIBUTYLTIN OXIDE
unless otherwise specified data extracted from RTECS - Register of Toxic Effects of Chemical Substances.

TOXICITY	IRRITATION
Oral (rat) LD50 44.9 mg/kg	Skin (rabbit) 500 mg/24h - Mild
	Eye (rabbit) 100 mg/24h -Moderate

Asthma-like symptoms may continue for months or even years after exposure to the material ceases. This may be due to a non-allergenic condition known as reactive airways dysfunction syndrome (RADS) which can occur following exposure to high levels of highly irritating compound. Key criteria for the diagnosis of RADS include the absence of preceding respiratory disease, in a non-atopic individual, with abrupt onset of persistent asthma-like symptoms within minutes to hours of a documented exposure to the irritant. A reversible airflow pattern, on spirometry, with the presence of moderate to severe bronchial hyperreactivity on methacholine challenge testing and the lack of minimal lymphocytic inflammation, without eosinophilia, have also been included in the criteria for diagnosis of RADS. RADS (or asthma) following an irritating inhalation is an infrequent disorder with rates related to the concentration of and duration of exposure to the irritating substance. Industrial bronchitis, on the other hand, is a disorder that occurs as result of exposure due to high concentrations of irritating substance (often particulate in nature) and is completely reversible after exposure ceases. The disorder is characterised by dyspnea, cough and mucus production.
The material may produce severe irritation to the eye causing pronounced inflammation. Repeated or prolonged exposure to irritants may produce conjunctivitis.
The material may cause skin irritation after prolonged or repeated exposure and may produce on contact skin redness, swelling, the production of vesicles, scaling and thickening of the skin.
Flaccid paralysis, general anaesthesia and somnolence recorded.

CARCINOGEN

Tin - Organic compounds (as Sn)	US ACGIH Threshold Limit Values (TLV) - Carcinogens	Carcinogen Category	A4
dibutyltin oxide	US - Rhode Island Hazardous Substance List	IARC	
TWAPPM~	US - Maine Chemicals of High Concern List	Carcinogen	A4

SKIN

dibutyltin oxide	US - Washington Permissible exposure limits of air contaminants - Skin	Skin	X
dibutyltin oxide	US ACGIH Threshold Limit Values (TLV) - Skin	Skin Designation	Yes

dibutyltin oxide	US AIHA Workplace Environmental Exposure Levels (WEELs) - Skin	Notes	
dibutyltin oxide	US NIOSH Recommended Exposure Limits (RELs) - Skin	Skin	Yes
dibutyltin oxide	US - California OEHHA/ARB - Acute Reference Exposure Levels and Target Organs (RELs) - Skin	Skin	X
dibutyltin oxide	US - California OEHHA/ARB - Chronic Reference Exposure Levels and Target Organs (CRELs) - Skin	Skin	X
dibutyltin oxide	US - Tennessee Occupational Exposure Limits - Limits For Air Contaminants - Skin	Skin Designation	X
dibutyltin oxide	Canada - British Columbia Occupational Exposure Limits - Skin	Notation	Skin
dibutyltin oxide	US - Minnesota Permissible Exposure Limits (PELs) - Skin	Skin Designation	X
dibutyltin oxide	US - Hawaii Air Contaminant Limits - Skin Designation	Skin Designation	X
dibutyltin oxide	US OSHA Permissible Exposure Levels (PELs) - Skin	Skin Designation	X
dibutyltin oxide	US - Oregon Permissible Exposure Limits (Z2) - Skin	Skin	X
dibutyltin oxide	US - California Permissible Exposure Limits for Chemical Contaminants - Skin	Skin	X
dibutyltin oxide	US - California Permissible Exposure Limits for Chemical Contaminants - Skin	Skin	S
dibutyltin oxide	Canada - Alberta Occupational Exposure Limits - Skin	Substance Interaction	1

Section 12 - ECOLOGICAL INFORMATION

Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
This material and its container must be disposed of as hazardous waste.
Avoid release to the environment.
Refer to special instructions/ safety data sheets.

Section 13 - DISPOSAL CONSIDERATIONS

Disposal Instructions
All waste must be handled in accordance with local, state and federal regulations.
¦ Puncture containers to prevent re-use and bury at an authorized landfill.
Legislation addressing waste disposal requirements may differ by country, state and/ or territory. Each user must refer to laws operating in their area. In some areas, certain wastes must be tracked.
A Hierarchy of Controls seems to be common - the user should investigate:

- Reduction
- Reuse
- Recycling
- Disposal (if all else fails)

This material may be recycled if unused, or if it has not been contaminated so as to make it unsuitable for its intended use. Shelf life considerations should also be applied in making decisions of this type. Note that properties of a material may change in use, and recycling or reuse may not always be appropriate.
DO NOT allow wash water from cleaning equipment to enter drains. Collect all wash water for treatment before disposal.

- Recycle wherever possible.
- Consult manufacturer for recycling options or consult Waste Management Authority for disposal if no suitable treatment or disposal facility can be identified.

Section 14 - TRANSPORTATION INFORMATION

DOT:

Symbols:	None	Hazard class or Division:	6.1
Identification Numbers:	UN3146	PG:	II
Label Codes:	6.1	Special provisions:	IB8, IP2, IP4, T3, TP33
Packaging: Exceptions:	153	Packaging: Non-bulk:	212
Packaging: Exceptions:	153	Quantity limitations: Passenger aircraft/rail:	25 kg
Quantity Limitations: Cargo aircraft only:	100 kg	Vessel stowage: Location:	A
Vessel stowage: Other:	40	S.M.P.:	Severe

Hazardous materials descriptions and proper shipping names:
Organotin compounds, solid, n.o.s.

Air Transport IATA:

ICAO/IATA Class:	6.1	UN/ID Number:	3146
Packing Group:	II	Special provisions:	A3
		Cargo Only	
		Packing Instructions:	676
Maximum Qty/Pack:	100 kg	Passenger and Cargo	
Passenger and Cargo		Packing Instructions:	Y644
Maximum Qty/Pack:	25 kg	Passenger and Cargo Limited Quantity	
Passenger and Cargo Limited Quantity		Packing Instructions:	669
Maximum Qty/Pack:	1 kg		

Shipping Name: ORGANOTIN COMPOUND, SOLID, N.O.S. *(CONTAINS DIBUTYLTIN OXIDE)

Maritime Transport IMDG:

IMDG Class:	6.1	IMDG Subrisk:	P
UN Number:	3146	Packing Group:	II
EMS Number:	F-A,S-A	Special provisions:	43 274
Limited Quantities:	500 g	Marine Pollutant:	Yes

Shipping Name: ORGANOTIN COMPOUND, SOLID, N.O.S.(contains dibutyltin oxide)

Section 15 - REGULATORY INFORMATION

dibutyltin oxide (CAS: 818-08-6) is found on the following regulatory lists;
"Canada Domestic Substances List (DSL)","Canada Ingredient Disclosure List (SOR/88-64)","Canada

Toxicological Index Service - Workplace Hazardous Materials Information System - WHMIS (English)","International Council of Chemical Associations (ICCA) - High Production Volume List","US EPA High Production Volume Program Chemical List","US Toxic Substances Control Act (TSCA) - Chemical Substance Inventory"

Section 16 - OTHER INFORMATION

LIMITED EVIDENCE

■ Skin contact may produce health damage*.
■ Inhalation may produce serious health damage*.
■ Cumulative effects may result following exposure*.
■ May produce discomfort of the eyes*.
* (limited evidence).

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■ Classification of the preparation and its individual components has drawn on official and authoritative sources as well as independent review by the Chemwatch Classification committee using available literature references.
A list of reference resources used to assist the committee may be found at:
www.chemwatch.net/references.

■ The (M)SDS is a Hazard Communication tool and should be used to assist in the Risk Assessment. Many factors determine whether the reported Hazards are Risks in the workplace or other settings. Risks may be determined by reference to Exposures Scenarios. Scale of use, frequency of use and current or available engineering controls must be considered.

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