



Gabriel Performance Products

# Safety Data Sheet

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## Section 1 - Identification of the Substance/Mixture and of the Company

Date of SDS Revision: August 27, 2018

### 1.1 Product identifier

**Product Name:** VersaCure™ RAC-9969

**Description:** Aliphatic Amine Curing Agent

**Manufacturer/Supplier:** Gabriel Performance Products LLC

### 1.2 Relevant identified uses of the preparation and uses identified against

**Use:** Hardener for epoxy coatings

For professional/industrial use only.

### 1.3 Details of the supplier of the safety data sheet

**Gabriel Performance Products LLC**  
**388 South Main Street, Ste. 320**  
**Akron, OH 44311**

**Telephone:** (866)800-2436 **Fax:** (440)992-3204

**Web:** [www.gabrielchem.com](http://www.gabrielchem.com)

**Contact:** [regulatory@gabrielchem.com](mailto:regulatory@gabrielchem.com)

### 1.4 Emergency telephone number

CHEMTREC: (800)424-9300

(International): (703)527-3887

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## Section 2 - Hazards Identification

### 2.1 Classification of the substance/mixture

#### 2.1.1 Classification according to OSHA 29CFR1910.1200 and EU (EC) 1272/2008

Acute oral toxicity cat. 4	H302
Acute dermal toxicity cat. 4	H312
Skin corrosion cat. 1B	H314
Skin sensitization cat. 1	H317
Acute toxicity/inhalation cat. 4	H332
STOT-se/respiratory cat. 3	H335
Reproductive toxicity Cat. 1B	H360
STOT-re, cat. 1	H372
Aquatic toxicity, acute cat. 1	H400
Aquatic toxicity, chronic cat. 1	H410

### 2.2 Labeling elements

## 2.2.1 Labeling according to OSHA 29CFR1910.1200 and EU (EC) 1272/2008

**Signal Word: Danger**

**Hazard pictogram:**



### **Hazard statements**

H302 + H312 + H332 Harmful if swallowed, in contact with skin and if inhaled.  
H314 Causes severe skin burns and eye damage.  
H317 May cause an allergic skin reaction.  
H335 May cause respiratory irritation.  
H360 May damage fertility or the unborn child.  
H372 Causes damage to organs through prolonged or repeated exposure.  
H410 Very toxic to aquatic life with long lasting effects.

### **Precautionary statements**

P201 Obtain special instructions before use.  
P202 Do not handle until all safety precautions have been read and understood.  
P260 Do not breathe mist/vapors/spray.  
P264 Wash hands and skin contact areas thoroughly after handling.  
P270 Do not eat, drink or smoke when using this product.  
P271 Use only outdoors or in a well-ventilated area.  
P272 Contaminated work clothing should not be allowed out of the workplace.  
P273 Avoid release to the environment.  
P280 Wear protective gloves / eye protection / face protection.  
P308 + P313 If exposed or concerned: Get medical attention/advice.  
P310 Immediately call a POISON CENTER or doctor/physician.  
P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.  
P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.  
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses if present and easy to do - continue rinsing.  
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.  
P312 Call a POISON CENTER or doctor/physician if you feel unwell.  
P333 + P313 If skin irritation or rash occurs: Get medical advice/attention.  
P337 + P313 If eye irritation persists: Get medical advice/attention.  
P363 Wash contaminated clothing before reuse.  
P391 Collect spillage.  
P405 Store locked up  
P501 Dispose of contents/container through a waste management company authorized by the local government.

## **2.3 OSHA GHS classification**

This product is classified as hazardous as defined within the GHS OSHA Hazard Communication Standard 29CFR1910.1200.

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## **Section 3 - Composition / Information on Ingredients**

### 3.1 Substances

Not applicable

### 3.2 Mixtures

<u>Component</u>	<u>Concentration</u>
N-(2-Aminoethyl)piperazine CAS No. 140-31-8 EINECS No. 205-411-0 GHS/CLP: Acute tox. (oral) 4 - H302; Acute tox. (dermal) 3 - H311; Skin corros. 1B - H314; Eye damage 1 - H318; Skin sens. 1 - H317; Repr. Tox. 2 - H361fd; STOT-re 1 - H372; Aquatic acute 3 - H402; Aquatic chronic 3 - H412	40-50%
4,4'-Isopropylidenediphenol (Bisphenol-A) CAS No. 80-05-7 EINECS No. 201-245-8 GHS/CLP: Acute tox. (oral) 5 - H303; Skin irrit. 3 - H316; Skin sens. 1 - H317; Eye damage 1 - H318; STOT-se(resp.) 3 - H335; Repr. tox. 1B - H360; STOT-re 2 - H373; Aquatic acute 2 - H401; Aquatic chronic 2 - H411	25-30%
4-Nonylphenol, branched CAS No. 84852-15-3 EINECS No. 284-325-5 GHS/CLP: Acute tox. (oral) 4 - H302; Skin corros. 1B - H314; Eye damage 1 - H318; Repr. tox. 2 - H361; Aquatic acute 1 - H400; Aquatic chronic 1 - H410	10-15%
Benzyl alcohol CAS No. 100-51-6 EINECS No. 202-859-9 GHS/CLP: Acute tox. (oral) 4 - H302; Acute tox. (dermal) 4 - H312; Acute tox. (inhal.: vapor) 4 - H332; Eye irritation 2A - H319; Aquatic acute 2 - H401	5-15%
Dimethylamino(methyl)phenol CAS No. 25338-55-0 EINECS No. 246-866-5 GHS/CLP: Acute tox. (oral) 4 - H302; Acute tox. (dermal) 4 - H312; Skin corros. 1B - H314; Acute tox. (inhal.: vapor) 4 - H332	<5%

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## Section 4 - First Aid Measures

### 4.1 Description of First Aid measures

General advice: consult a physician; show this SDS to doctor in attendance.

**In the event of skin contact:** Rinse immediately with plenty of water; remove contaminated clothing; wash thoroughly with soap and water for at least 15 minutes. If irritation, rash or other adverse effects develop, get immediate medical attention.

**In the event of eye contact:** Bathe the eye with running water for at least 15 minutes, lifting upper and lower eyelids. Get medical attention immediately.

**In the event of swallowing:** Do NOT induce vomiting unless advised by a physician. Rinse out mouth with water. Get medical attention immediately.

**In the event of exposure by inhalation:** Move person to fresh air and keep at rest in a position comfortable for breathing; if breathing is irregular, provide artificial respiration; if there are breathing difficulties, administer oxygen; get medical attention immediately.

### 4.2 Most important symptoms and effects, both acute and delayed

Harmful in contact with skin, if swallowed or if inhaled; can cause severe skin burns and eye damage; may damage fertility or the unborn child; causes organ damage (respiratory tract). Pre-existing liver disorders, kidney disorders, asthma, allergies and eye disease may be aggravated by overexposure.

#### **4.3 Indication of any immediate medical attention and special treatment needed**

Treat symptomatically.

Eye wash stations and emergency showers should be available.

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## **Section 5 - Fire Fighting Measures**

### **5.1 Extinguishing media**

Carbon dioxide, alcohol resistant foam, dry chemical, water fog; use water spray to cool fire-exposed containers.

### **5.2 Special hazards arising from the substance or mixture**

Vapors may form explosive mixtures with air. Containers may explode when heated; explosive vapor hazards may exist indoors, outdoors or in sewers. Fire may produce irritating, corrosive and/or toxic gases including carbon monoxide and carbon dioxide and low molecular weight hydrocarbons.

**5.3 Advice for fire fighters:** Use protective fire fighting clothing and positive pressure self-contained breathing apparatus to protect against potential harmful and/or irritating fumes. If area is heavily exposed to fire and if conditions permit, let fire burn itself out since water may increase the area contaminated. Move containers from fire area if you do it without risk. Dike fire control water for later disposal; prevent runoff from entering drains. Do not use high volume water jet on the fire as this may spread the area of the fire.

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## **Section 6 - Accidental Release Measures**

### **6.1 Personal precautions, protective equipment and emergency procedures**

Isolate area; ensure adequate ventilation; remove all sources of ignition; use appropriate personal protection equipment; avoid breathing mist, vapors, spray; avoid contact with skin, eyes and clothing; keep unnecessary and unprotected personnel from entering the involved area. Local authorities should be advised if significant spillages cannot be contained.

### **6.2 Environmental precautions:**

Halt the flow of material as soon as practical using appropriate barriers; turn containers leak-side up to stop the escape of liquid. This material is a water pollutant and should be prevented from contaminating soil or from entering sewerage and drainage systems and bodies of water.

### **6.3 Methods and material for containment and cleaning up**

Soak up with sand, earth, diatomaceous earth or other suitable inert absorbent material; collect into suitable waste disposal containers. Reuse uncontaminated material when possible. Wash spillage site with large amounts of water. Dispose of in accordance with applicable local and federal environmental control laws and regulations.

### **6.4 Reference to other sections**

For more information on exposure controls, personal protection and disposal, review data in section 8 and section 13 of this SDS.

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## Section 7 - Handling and Storage

### 7.1 Precautions for safe handling

Ensure adequate ventilation. Prevent inhalation of vapor, ingestion, and contact with skin, eyes and clothing. Keep containers closed when not in use. Precautions apply to empty containers as well. Do not eat, drink or smoke in the work area. Wash thoroughly after handling. Personal protective equipment must also be worn during maintenance or repair of mixers, reactors or other equipment containing the material.

### 7.2 Conditions for safe storage, including any incompatibilities

Store in a cool, dry area with adequate ventilation. Store away from foodstuffs and all incompatible material. Keep container tightly closed when not in use.

**Incompatibilities:** Do not store together with strong oxidizing agents.

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## Section 8 - Exposure Controls / Personal Protection

### 8.1 Control parameters

**Occupational exposure limits:** None established for product as a whole  
AIHA WEEL for Benzyl alcohol: 10 ppm (45 mg/m<sup>3</sup>) (as 8-hr TWA)

#### 8.1.2 Recommended monitoring procedures

If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment. Reference can be made to European Standard EN 689 for methods for the assessment of exposure by inhalation to chemical agents for the determination of hazardous substances.

### 8.2 Exposure Controls:

Follow good industrial workplace practices; do not eat, drink or smoke while handling; wash hands before breaks and at end of workshift; follow recommendations in this SDS.

#### 8.2.1 Appropriate engineering controls

Ensure adequate ventilation through local exhaust to control airborne concentrations.

#### 8.2.2 Individual protection measures, such as personal protective equipment

##### 8.2.2.1 Eye/face protection

Wear tight-fitting chemical safety goggles and/or face shield to prevent eye contact. Refer to OSHA Standard 29CFR1910.133 and European Standard EN166.

##### 8.2.2.2 Skin protection

Wear impervious clothing as necessary to protect against product contact. Necessity for boots, apron, face shield, etc. will be dependent on any hazards presented in the work process. Refer to CFR1910.132 and CFR1910.136 for OSHA approved standards on protective clothing and footwear.

##### 8.2.2.3 Respiratory protection

Although no exposure limits have been established, respiratory protection may be of use if any respiratory irritation or discomfort is noted; if the material is processed at elevated temperatures without adequate ventilation, it may be necessary to wear an air-purifying respirator with organic vapor cartridge; respirator use should follow the guidelines of an established respiratory protection program in compliance with 29CFR1910.134.

#### 8.2.2.4 Hand protection

Use impervious nitrile, neoprene, butyl rubber or other suitable chemical-resistant gloves. When prolonged or frequently repeated contact may occur, glove material should have a breakthrough time that exceeds 480 minutes (breakthrough rating = 6); when only brief contact is expected, a glove with a lesser breakthrough rating (rating 2 = >30 minutes) may be suitable. Note the requirements of Standard EN 374.

**Other Protective Equipment:** The type and degree of personal protective equipment appropriate will depend on the specific work operation. Eye wash stations and emergency showers should be available. Inspect and replace personal protective equipment at regular intervals; use professional care in their selection, use and care

#### 8.3 Environmental exposure controls

Observe all precautions to prevent contamination of soil and waterways.

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## Section 9 - Physical and Chemical Properties

### 9.1 Information on basic physical and chemical properties

#### 9.1.1 General information:

**Appearance:** Liquid

**Color:** Light yellow

**Type of Odor:** Ammoniacal

**Odor Threshold:** No data available

#### 9.1.2 Important health, safety and environmental information:

**Boiling Point:** >200°C (>392°F)

**Melting Point:** No data available

**Flammability Classification:** Combustible IIIB

**Flash Point:** >100°C (>212°F)

**Autoignition Temperature:** No data available

**Decomposition Temperature:** No data available

**Flammability Limits (lower/upper):** No data available

**Vapor Pressure:** <1 mm Hg @ 21°C

**Vapor Density (Air=1):** >1

**Evaporation Rate (BuAc=1):** <1

**Octanol/Water Partition Coefficient:** No data available

**Specific Gravity:** 1.05

**Bulk Density:** 8.75 lbs/gal

**Water Solubility:** Partially soluble

**pH:** (alkaline)

**Viscosity:** Not determined

**Explosive Properties:** Not explosive

**Oxidizing Properties:** Not determined

**Molecular Formula:** (mixture)

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## Section 10 - Stability and Reactivity

### 10.1 Stability and Reactivity

#### 10.1 Reactivity

No dangerous reaction is known under normal use and storage conditions.

#### 10.2 Stability

Stable under normal use and storage conditions.

#### 10.3 Possibility of hazardous reactions

Mixtures with strongly acidic and strongly alkaline materials may produce an exothermic reaction.

#### 10.4 Conditions to avoid

Avoid elevated temperatures and sources of ignition.

#### 10.5 Incompatible materials

Acids, oxidizing agents, hypochlorite. Product will slowly corrode copper, aluminum, zinc and galvanized surfaces. Reaction with peroxides may result in violent decomposition of the peroxide possibly creating an explosion. Mixture of the product with acids generates heat sufficient to produce boiling material which poses a splashing/splattering hazard. Do not mix with nitrites or other nitrosating agents which may lead to the formation of potentially carcinogenic nitrosamines.

#### 10.6 Hazardous decomposition products

Thermal decomposition will generate carbon monoxide, carbon dioxide, oxides of nitrogen, nitric acid, ammonia, aldehydes, flammable hydrocarbon fragments.

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## Section 11 - Toxicological Information

### 11.1 Information on toxicological effects

**Acute Oral Toxicity:** LD50(rat): 1967 mg/kg (ATE)

**Acute Dermal Toxicity:** LD50(rat): 1322 mg/kg (ATE)

**Acute Inhalation Toxicity:** LC50 (rat)(4-hr): >5000 mg/m<sup>3</sup> (Benzyl alcohol)

**Skin Corrosion/Irritation: Draize Test:** Corrosive; rabbit/skin: 500 mg/24-hr, severe

**Serious Eye Damage/Irritation: Draize Test:** Rabbit/eye: 100 mg, severe

**Skin Sensitization (guinea pig):** Sensitizer; may cause an allergic reaction

**Germ Cell Mutagenicity:** Animal testing on Nonylphenol indicate possible mutagen; tests on bacterial and mammalian cell cultures did not show mutagenic effects. There are no known adverse effects on human health.

Data for Bisphenol-A component: cyt-ham-ovr: 400 umol/L; dna-rat-ork: 800 mg/kg/4D-C; dnd-mus-oth: 100 mg/L/3H (-S9).

**Carcinogenicity:** Data for Bisphenol-A component: orl-mus TDLo: 86.5 g/kg/103W-C; orl-rat TDLo: 36 g/kg/103W-C. Not listed as a carcinogen by OSHA, NTP or IARC.

**Reproductive Toxicity:** May damage fertility or the unborn child. Avoid exposure to woman during early pregnancy.

High doses of BPA given orally and by injection to laboratory animals have produced slight effects on certain reproductive endpoints, such as enlargement of the uterus; the effects on reproduction have been seen only at doses that produced significant toxicity to the parent animals. There is no evidence of reproductive toxicity in humans.

scu-mus TDLo: 14 ug/kg (11-17D preg)

ork-mus TDLo: 437 mg/kg (multigeneration)

ipr-rat TDLo: 1275 mg/kg (1-15D preg)

**Specific Target Organ Toxicity - single exposure (STOT-se):** May cause damage to organs (respiratory system).

**Specific Target Organ Toxicity - repeated exposure (STOT-re):** AEP causes damage to the respiratory tract through prolonged or repeated exposure if inhaled. Bisphenol-A may cause damage to organs through prolonged or repeated exposure (liver, kidney, respiratory system).

**Aspiration Hazard:** Aspiration may produce corrosive effects to the lungs.

**Potential Health Effects:**

**Skin Contact:** Corrosive; harmful in contact with skin; severe skin irritant; may cause burns; may cause sensitization by skin contact. Product absorbed through skin may cause CNS effects such as nausea, headache, dizziness, confusion and breathing difficulties.

**Eye Contact:** Severe eye irritant; may cause painful burns and tissue scarring. May cause chemical conjunctivitis and corneal damage.

**Ingestion:** Harmful if swallowed; may cause dizziness, drowsiness, nausea, CNS depression; may cause damage to the digestive tract. Severe overexposure can result in respiratory failure.

**Inhalation:** May be harmful if inhaled; severe respiratory tract irritant; may cause central nervous system effects: nausea, headache, dizziness, mental confusion, breathing difficulties; may cause damage to contacted tissue and produce scarring.

**Chronic Health Effects:**

In a 13-week feeding study rats fed 800 mg/kg Benzyl alcohol exhibited CNS depression, and histopathological changes in the brain, thymus and skeletal musculature; the NOAEL (no observable adverse effect level) was established as 400 mg/kg. A 2-year feeding study with rats and mice produced no evidence of carcinogenicity. May impair fertility.

An 90-day animal feeding study with Bisphenol-A showed histopathological changes in the liver and kidney of rats administered 180 mg/kg/day; however, these effects were reversible when exposure was discontinued.

Rabbit feeding studies with Aminoethylpiperazine (AEP) showed positive for developmental toxicity at an oral dose of 150 mg/kg/day. Conclusion: suspected of damaging fertility or the unborn child if swallowed.

**Additional Information:**

RTECS No. TK8050000 (Aminoethylpiperazine)

RTECS No. SL6300000 (Bisphenol-A)

RTECS No. SM5650000 (Nonylphenol)

RTECS No. DN3150000 (Benzyl alcohol)

RTECS No. GV5020833 (Dimethylamino(methyl)phenol)

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## Section 12 - Ecological Information

### 12.1 Toxicity

#### 12.1.1 Acute/prolonged toxicity to fish

LC50 (Pimephales promelas)(96-hr): 0.83 mg/l (ATE)

#### 12.1.2 Acute/prolonged toxicity to aquatic invertebrates

EC50 (Daphnia magna)(48-hr): 0.22 mg/l (ATE)

#### 12.1.3 Acute/prolonged toxicity to aquatic plants

LC50 (Algae)(72-hr): 0.34 mg/l (ATE)

#### 12.1.4 Toxicity to bacteria, to soil dwelling organisms and to terrestrial plants

No data available



#### **12.1.5 Chronic toxicity to aquatic organisms**

Long lasting adverse effects to aquatic organisms.

#### **12.1.6 General effect**

Very toxic to aquatic life with long lasting effects.

#### **12.2 Persistence and degradability**

Not readily biodegradable.

#### **12.3 Bioaccumulative potential**

Moderate potential to bioaccumulate

#### **12.4 Mobility in soil**

No data available; do not allow product to enter soil/subsoil.

#### **12.5 Results of PBT and vPvB assessment (EC reg. 453/2010)**

Product not classified as Persistent, Bioaccumulative and Toxic

Product not classified as very Persistent or very Bioaccumulative

#### **12.6 German WGK classification**

WGK = 3 (self-classification)

#### **12.7 Other adverse effects**

No other adverse effects are identified.

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## **Section 13 - Disposal Considerations**

### **13.1 Waste treatment methods**

**Disposal:** Do not dump to ground, sewers or watercourses. Incinerate or otherwise dispose of in compliance with all applicable federal, state and local environmental control laws and regulations. Waste characterization according to RCRA guidelines and compliance with applicable laws are the responsibility solely of the waste generator.

**Container Disposal:** Containers should be drained of all residual product prior to disposal.

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## **Section 14 - Transport Information**

### **14.1 Shipping description**

#### **DOT Proper Shipping Description:**

UN2735 Amines, liquid, corrosive, n.o.s. (Aminoethylpiperazine, Dimethylamino(methyl)phenol, Nonylphenol)

Hazard Class 8 PG III

ERG No. 153

#### **IMDG:**

UN2735 Amines, liquid, corrosive, n.o.s. (Aminoethylpiperazine, Dimethylamino(methyl)phenol, Nonylphenol)

Hazard Class 8 PG III

**EmS No.** F-A, S-B

**Marine Pollutant:** Yes

**IATA:**

UN2735 Amines, liquid, corrosive, n.o.s. (Aminoethylpiperazine, Dimethylamino(methyl)phenol, Nonylphenol)

Hazard Class 8 PG III

EmS No. F-A, S-B

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## Section 15 - Regulatory Information

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

**SARA Title III Section 311/312 (40CFR370):** Acute health hazard, chronic health hazard

**SARA Title III Section 313 (40CFR372):** Product contains: 25-30% Bisphenol A and 10-15% 4-Nonylphenol

**TSCA 12(b) (40CFR707, subpart D):** Product contains 4-Nonylphenol subject to TSCA Section 12(b) export notification requirements.

**TSCA Chemical Action Plan (40CFR721):** Product contains 4-Nonylphenol subject to TSCA/SNUR requirements, Section 5; any use other than as an intermediate or as an epoxy cure catalyst would constitute a significant new use requiring notification to EPA.

**CERCLA Status (40CFR302):** 55-Gallon drum containers of this product contain no components at levels which could require reporting under this statute. (The RQ for Bisphenol A is 5000 lbs.)

(Release of a hazardous substance into the environment in an amount that equals or exceeds its reportable quantity (RQ) requires notification to the National Response Center at 800-424-8802.)

**RCRA Status (40CFR261):** Not listed


**OSHA/NTP/IARC Carcinogen Status:** Not listed

**TSCA Inventory Status:** Reported/included

**Canadian DSL Status:** Reported/included

**Canadian WHMIS Status:** D1A, D2A, D2B, E

**Chemicals Known to the State of California to Cause Cancer or Reproductive Toxicity:**

 **WARNING:** This product can expose you to chemicals including Bisphenol A which is known to the State of California to cause cancer, birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).

### REACH Annex XIV (SVHC)

Nonylphenol, branched is listed as a Substance of Very High Concern (SVHC) by ECHA (European Chemicals Agency); use restrictions may apply within the EU.

Bisphenol A is listed as a Substance of Very High Concern (SVHC) by ECHA (European Chemicals Agency); use restrictions may apply within the EU

### REACH Annex XVII (Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles)

Current legislation should be reviewed for applicable restrictions.

**REACH Status (EC 1907/2006):** This material has been registered, pre-registered or is otherwise exempted from registration under the Registration, Evaluation and Authorization of Chemical Substances.

### Chemical safety assessment

Not available

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## Section 16 - Other Information

**HMIS ratings:**

Health:	3
Flammability:	1
Physical Hazard:	0

(Personal protective equipment selection is best assigned by the user after performing a hazard assessment on the product as it is to be used in the specific work process.)

### **National chemical inventories**

All components of this product are listed on the following chemical substance inventories:

TSCA (USA)  
DSL (Canada)  
EINECS (Europe)  
ENCS (Japan)  
ECL (Korea)  
AICS (Australia)  
PICCS (Philippines)  
NZIoC (New Zealand)  
IECSC (China)

### **Abbreviations**

ACGIH American Conference of Governmental Industrial Hygienists  
ADR International carriage of dangerous goods by Road  
AICS Australian Inventory of Chemical Substances  
BfR Bundesinstitut für Risikobewertung recommendations for food contact materials  
BCF Bioconcentration Factor  
CERCLA Comprehensive Environmental Response, Compensation and Liability Act  
CLP Classification, Labeling and Packaging regulation  
DOT Department of Transportation  
DSL Domestic Substances List  
EINECS European Inventory of Existing Chemical Substances  
ECL Existing Chemicals List (Korea)  
ENCS Existing and New Chemical Substances Inventory (Japan)  
EN 689 Workplace atmospheres – Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy  
ERG Emergency Response Guide  
GHS Globally Harmonized System  
HMIS Hazardous Materials Information System  
IARC International Agency for Research on Cancer  
IATA International Air Transport Association  
ICAO International Civil Aviation Organization  
IDLH Immediately Dangerous to Life and Health  
IMDG International Maritime Dangerous Goods  
LD50 Lethal dose to 50% of test animal population  
MAK Maximale Arbeitsplatz Konzentration  
NOAEL No observable adverse effect level  
NTP National Toxicology Program  
OEL Occupational Exposure Limit  
OSHA Occupational Safety & Health Administration  
PBT Persistent, Bioaccumulative and Toxic  
vPvB Very Persistent and Very Bioaccumulative  
PEL Permissible exposure limit  
PICCS Philippine Inventory of Commercial Chemical Substances  
PNEC Predicted No Effect Concentration  
REACH Registration, evaluation and authorization of chemical substances  
RID International carriage of dangerous goods by Rail  
SARA Superfund Amendments and Reauthorization Act  
STEL Short Term Exposure Limit  
SVHC Substance of Very High Concern  
TLV Threshold Limit Value

TSCA Toxic Substances Control Act  
TWA Time Weighted Average  
VOC Volatile organic compound  
WGK Wassergefährdungsklasse (Water Hazard Class)  
WHMIS Workplace Hazardous Material Identification System

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