Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

* **1 Identification**

· **Product identifier**
· Trade name: **KBond VIVID Knife Grade**
· Article number: Vinyl Ester Resin Adhesive
· Application of the substance / the mixture: Reaction resin

· Details of the supplier of the safety data sheet
· Manufacturer/Supplier:

InnoChem LLC
6300 Button Gwinnett Dr
Atlanta, GA 30340
Phone: 770-409-8789
Fax: 770-409-9096
e-mail info@innochemllc.com

· Information department: Laboratory
· Emergency telephone number: Refer to Manufacturer / Supplier

* **2 Hazard(s) identification**

· **Classification of the substance or mixture**


GHS02 Flame

Flam. Liq. 3 H226 Flammable liquid and vapor.


GHS08 Health hazard

Carc. 2 H351 Suspected of causing cancer.
Repr. 2 H361 Suspected of damaging fertility or the unborn child.
STOT RE 1 H372 Causes damage to the hearing organs through prolonged or repeated exposure.


GHS07

Skin Irrit. 2 H315 Causes skin irritation.
Eye Irrit. 2A H319 Causes serious eye irritation.
STOT SE 3 H335 May cause respiratory irritation.

· **Label elements**
· GHS label elements: The product is classified and labeled according to the Globally Harmonized System (GHS).
· Hazard pictograms


GHS02 GHS07 GHS08

· Signal word: Danger
· Hazard-determining components of labeling: styrene
· Hazard statements
H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.
H335 May cause respiratory irritation.
H372 Causes damage to the hearing organs through prolonged or repeated exposure.
· Precautionary statements
P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

(Contd. on page 2)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 1)

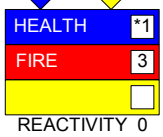
P260	Do not breathe vapours.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	If on skin (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P305+P351+P338	If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P314	Get medical advice/attention if you feel unwell.
P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/container in accordance with local/ regional/national/international regulations.

· **Classification system:**
· NFPA ratings (scale 0 - 4) Health = 1



Fire = 3
Reactivity = 0

· HMIS-ratings (scale 0 - 4)



Health = *1
Fire = 3
Reactivity = 0

· **Other hazards** During processing and product hardening the network generator is released as fume. Consequently, take care for adequate air conditioning and for fume exhaustion on request.

· Results of PBT and vPvB assessment
· PBT: Not applicable.
· vPvB: Not applicable.

* **3 Composition/information on ingredients**

· **Chemical characterization: Mixtures**
· Description: Mixture of the substances listed below with nonhazardous additions.

· Dangerous components:

CAS: 100-42-5 EINECS: 202-851-5 Index number: 601-026-00-0	styrene Flam. Liq. 3, H226 Carc. 2, H351; Repr. 2, H361; STOT RE 1, H372; Asp. Tox. 1, H304 Acute Tox. 4, H332; Skin Irrit. 2, H315; Eye Irrit. 2A, H319; STOT SE 3, H335	25-50%

· Additional information: For the wording of the listed hazard phrases refer to section 16.

* **4 First-aid measures**

· **Description of first aid measures**
· General information: Take affected persons out into the fresh air.
Position and transport stably on side.
Immediately remove any clothing soiled by the product.
Symptoms of poisoning may even occur after several hours; therefore medical observation for at least 48 hours after the accident.
· After inhalation: Supply fresh air. If required, provide artificial respiration. Keep patient warm.
Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
· After skin contact: If skin irritation continues, consult a doctor.
Immediately wash with water and soap and rinse thoroughly.
· After eye contact: Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
· After swallowing: If symptoms persist consult doctor.

(Contd. on page 3)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 2)

· Information for doctor: With reference to section 2 the formulation contains styrene in the indicated mass concentration range. Styrene fumes will preferably be incorporated by inhalation via respiratory tract, skin resorption is currently considered as an inferior way of incorporation. In case of inhalation styrene is absorbed in a 60-
90% range. Distribution in organism occurs rapidly, the maximum blood concentration can be analyzed after one hour after incorporation. Styrene exposition affects skin, mucous membranes, and central nervous system (CNS).
Acute damages / risks to health:
In case of styrene poisoning mainly damages to and interactions with central nervous system (CNS) arise. In concentration ranges above 200 ml/m3 symptoms such as fatigue, nausea, imbalance and prolonged response times are observed.
Chronical health risks:
Effects at central and peripheral nervous system and respiratory tract are evident in literature.
Main health risks are:
- prolonged response times
- reduced cognitive performance, partial amnesia
- retardation of nervous impulse transition speed
- disturbances of pulmonary function

· Most important symptoms and effects, both acute and delayed: Breathing difficulty
Headache
Dizziness
Coughing
Nausea

· Danger: Danger of impaired breathing.

· Indication of any immediate medical attention and special treatment needed: If swallowed, gastric irrigation with added, activated carbon.

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5 Fire-fighting measures

· **Extinguishing media**

· Suitable extinguishing agents: CO2, extinguishing powder or water spray. Fight larger fires with water spray or alcohol resistant foam.

· For safety reasons unsuitable extinguishing agents: Water with full jet

· **Special hazards arising from the substance or mixture** Formation of toxic gases is possible during heating or in case of fire.
In case of fire, the following can be released:
Carbon monoxide (CO)
Nitrogen oxides (NOx)
In certain fire conditions, traces of other toxic gases cannot be excluded.

· **Advice for firefighters**

· Protective equipment: Wear self-contained respiratory protective device.
Do not inhale explosion gases or combustion gases.
Wear fully protective suit.
Mount respiratory protective device.

· **Additional information** Dispose of fire debris and contaminated fire fighting water in accordance with official regulations.
Collect contaminated fire fighting water separately. It must not enter the sewage system.

(Contd. on page 4)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 3)

6 Accidental release measures

· **Personal precautions, protective equipment and emergency procedures** Ensure adequate ventilation
Keep away from ignition sources
Use respiratory protective device against the effects of fumes/dust/aerosol.
Wear protective equipment. Keep unprotected persons away.

· **Environmental precautions:** Do not allow product to reach sewage system or any water course.
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.

· **Methods and material for containment and cleaning up:** Dispose of the collected material according to regulations.
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.

· **Reference to other sections** See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

*

7 Handling and storage

· **Handling:**

· Precautions for safe handling Keep receptacles tightly sealed.
Store in cool, dry place in tightly closed receptacles.
Keep away from heat and direct sunlight.
Ensure good interior ventilation, especially at floor level. (Fumes are heavier than air).
Use only in well ventilated areas.
Ensure good ventilation/exhaustion at the workplace.

· Information about protection against explosions and fires: Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.

· **Conditions for safe storage, including any incompatibilities**

· Storage:

· Requirements to be met by storerooms and receptacles: Store only in the original receptacle.
Prevent any seepage into the ground.

· Information about storage in one common storage facility: Store away from oxidizing agents.
Store away from foodstuffs.

· Further information about storage conditions: Store receptacle in a well ventilated area.
Keep receptacle tightly sealed.

· Storage class: 3

· **Specific end use(s)** No further relevant information available.

*

8 Exposure controls/personal protection

· **Additional information about design of technical systems:** No further data; see item 7.

(Contd. on page 5)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 4)

· **Control parameters**

· Components with limit values that require monitoring at the workplace:

100-42-5 styrene

PEL	Long-term value: 100 ppm Ceiling limit value: 200; 600* ppm *5-min peak in any 3 hrs
REL	Short-term value: 425 mg/m³, 100 ppm Long-term value: 215 mg/m³, 50 ppm
TLV	Short-term value: 170 mg/m³, 40 ppm Long-term value: 85 mg/m³, 20 ppm BEI

· Ingredients with biological limit values:

100-42-5 styrene

BEI	400 mg/g creatinine Medium: urine Time: end of shift Parameter: Mandelic acid plus phenylglyoxylic acid (nonspecific) 0.2 mg/L Medium: venous blood Time: end of shift Parameter: Styrene (semi-quantitative)

· Additional information: The lists that were valid during the creation were used as basis.

· **Exposure controls**

· Personal protective equipment:

· General protective and hygienic measures:
Do not eat, drink, smoke or sniff while working.
Use skin protection cream for skin protection.
Clean skin thoroughly immediately after handling the product.
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing.
Wash hands before breaks and at the end of work.
Do not inhale gases / fumes / aerosols.
Avoid contact with the eyes and skin.

· Breathing equipment:
Short term filter device:
Filter A/P2
In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use respiratory protective device that is independent of circulating air.

· Protection of hands:
After use of gloves apply skin-cleaning agents and skin cosmetics.
Preventive skin protection by use of skin-protecting agents is recommended.
The protection gloves to be used have to comply with the specifications of the directive 89/686/EC and the directive derived decree EN374, respectively, e.g. the above listed protection glove type. The mentioned permeation times´ data were generated and verified with material samples of the recommended protection glove type in the scope of laboratory anylyses of the company KCL GmbH in compliance with EN374.
This recommendation refers exclusively to the material safety data sheet referenced product delivered by Akemi and the indicated field of application. In case of product dilution or in case of mixture with different substances or chemicals, and in condition of EN374 deviation the producer of CE-approved protection gloves must be contacted for detailed information (e.g., KCL GmbH, Germany, 36124 Eichenzell, internet: http://www.kcl.de).

(Contd. on page 6)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 5)



Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves: Fluorocarbon rubber (Viton)
The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material can not be calculated in advance and has therefore to be checked prior to the application.

· Penetration time of glove material: Value for the permeation: Level 6, 480 min
The exact break trough time has to be found out by the manufacturer of the protective gloves and has to be observed.

· For the permanent contact gloves made of the following materials are suitable:
Fluorocarbon rubber (Viton)
Vitoject (KCL, Art_No. 890)

· As protection from splashes gloves made of the following materials are suitable:
Fluorocarbon rubber (Viton)
Vitoject (KCL, Art_No. 890)
Nitrile rubber, NBR
Camatril (KCL, 730, 731, 732, 733)
Butyl rubber, BR
Butoject (KCL, Art_No. 897, 898)

· Not suitable are gloves made of the following materials:
Natural rubber, NR
Leather gloves
Strong gloves

· Eye protection:



Tightly sealed goggles

· Body protection: Protective work clothing

* **9 Physical and chemical properties**

· **Information on basic physical and chemical properties**
· General Information
· Appearance:
Form: Fluid
Color: Yellow
· Odor: Aromatic

· Change in condition
Melting point/Melting range: Undetermined.
Boiling point/Boiling range: 145 °C (293 °F)

· Flash point: 31 °C (88 °F)

· Ignition temperature: 480 °C (896 °F)

· Auto igniting: Product is not selfigniting.

(Contd. on page 7)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 6)

· Danger of explosion:	Product is not explosive. However, formation of explosive air/vapor mixtures are possible.
· Explosion limits:	
Lower:	1.2 Vol %
Upper:	8.9 Vol %
· Vapor pressure at 20 °C (68 °F):	6 hPa (5 mm Hg)
· Density:	Not determined.
· Specific gravity at 20 °C (68 °F):	1.16 g/cm³ (9.68 lbs/gal)
· Solubility in / Miscibility with	
Water:	Not miscible or difficult to mix.
· Viscosity:	
Dynamic:	Not determined.
Kinematic:	Not determined.
· Solvent content:	
Organic solvents:	31.4 %
Solids content:	68.0 %
· **Other information**	No further relevant information available.

10 Stability and reactivity

· **Reactivity**	No further relevant information available.
· Chemical stability	
· Thermal decomposition / conditions to be avoided:	No decomposition if used and stored according to specifications.
· **Possibility of hazardous reactions**	Exothermic polymerization. Reacts with strong oxidizing agents. Reacts with strong alkali. Reacts with strong acids. Reacts with peroxides and other radical forming substances.
· **Conditions to avoid**	No further relevant information available.
· **Incompatible materials:**	No further relevant information available.
· **Hazardous decomposition products:**	Hydrogen chloride (HCl) Nitrogen oxides (NOx) Carbon monoxide and carbon dioxide Possible in traces.

*
11 Toxicological information

· **Information on toxicological effects**
· Acute toxicity:

· LD/LC50 values that are relevant for classification:

ATE (Acute Toxicity Estimates)		
Oral	LD50	15932 mg/kg (rat)
Dermal	LD50	5279 mg/kg
Inhalative	LC50/4 h	37.6 mg/l (rat)

100-42-5 styrene		
Oral	LD50	5000 mg/kg (rat)
Dermal	LD50	>2000 mg/kg (rat) (OECD-Prüfrichtlinie 402)

(Contd. on page 8)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 7)

Inhalative	LC50/4h	9.5 mg/m3 (mouse)
	LC50/4 h	11.8 mg/l (rat)
	NOAEC	4.34 mg/l (rat)

· Primary irritant effect:
· on the skin: Irritant to skin and mucous membranes.
· on the eye: Irritating effect.
· Sensitization: Sensitization possible through skin contact.

· Experience with humans: After incorporation and inhalation styrene predominantly will be metabolized in the organism to mandelic and phenylglyoxylic acid and matabolites will pass through urine excretion.

· Additional toxicological information: The product shows the following dangers according to internally approved calculation methods for preparations:
Harmful
Irritant

· Carcinogenic categories

· IARC (International Agency for Research on Cancer)		
100-42-5	styrene	2B

· NTP (National Toxicology Program)		
100-42-5	styrene	R

· OSHA-Ca (Occupational Safety & Health Administration)
None of the ingredients is listed.

* **12 Ecological information**

· **Toxicity**

· Aquatic toxicity:

100-42-5 styrene	
EC50/96h	0.15-6.2 mg/l (Pseudokirchneriella subcapitata)
EC50	500 mg/l (BES) (ISO Vorschrift 8192-1986 E)
	5.5 mg/l (Photobac. phosphoreum)
IC50/72h	4.9 mg/l (green alge)
	1.4 mg mg/l (selenastrum capricornutum)
IC5/8d	> 200 mg/l (Scenedesmus quadricauda)
EC10/16h	72 mg/l (pseudomonas putida)
EC50/16h	> 72.0 mg mg/l (pseudomonas putida)
EC50/8d	> 200 mg/l (Scenedesmus quadricauda)
EC50/72u	>1-<10 mg/l (green alge)
EC20/0.5h	140 mg/l (BES) (OECD 209)
EC10	0.28 mg/l (Pseudokirchneriella subcapitata) (EPA OTS 797.1050)
EC50/48h	0.56 mg/l (green alge)
	4.7 mg/l (daphnia magna)
EC50/72h	0.46-4.9 mg/l (Pseudokirchneriella subcapitata)
LC50/96h	>1-<10 mg/l (piscis)
	25.0 mg/l (lem)
	3.24-4.99 mg/l (pimephales promelas)
	4.02 mg/l (Pimephales promelas)
	58.75-95.32 mg/l (poecilia reticulata)
LC50/72h	4.9 mg/l (green alge)

(Contd. on page 9)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBOND VIVID Knife Grade

(Contd. of page 8)

· **Persistence and degradability** No further relevant information available.
· **Behavior in environmental systems:**
· Bioaccumulative potential No further relevant information available.
· Mobility in soil No further relevant information available.
· **Additional ecological information:**
· General notes: Water hazard class 2 (Self-assessment): hazardous for water
· **Results of PBT and vPvB assessment**
· PBT: Not applicable.
· vPvB: Not applicable.
· **Other adverse effects** No further relevant information available.

13 Disposal considerations

· **Waste treatment methods**
· Recommendation: Must not be disposed of together with household garbage. Do not allow product to reach sewage system.

· **Uncleaned packagings:**
· Recommendation: Empty contaminated packagings thoroughly. They can be recycled after thorough and proper cleaning.
· Recommended cleansing agent: Alcohol

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14 Transport information

· **UN-Number**
· DOT, ADR, IMDG, IATA UN1866

· **UN proper shipping name**
· DOT Resin solution
· ADR 1866 Resin solution, special provision 640E
· IMDG, IATA RESIN SOLUTION

· **Transport hazard class(es)**

· DOT



· Class 3 Flammable liquids
· Label 3

· ADR



· Class 3 (F1) Flammable liquids
· Label 3

· IMDG, IATA



· Class 3 Flammable liquids
· Label 3

(Contd. on page 10)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 9)

· **Packing group**
· DOT, ADR, IMDG, IATA III

· **Environmental hazards:**
· Marine pollutant: No

· **Special precautions for user** Warning: Flammable liquids
· Danger code (Kemler): -
· EMS Number: F-E,S-E
· Stowage Category A

· **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code** Not applicable.

· **Transport/Additional information:**

· ADR
· Excepted quantities (EQ) Code: E1
Maximum net quantity per inner packaging: 30 ml
Maximum net quantity per outer packaging: 1000 ml

· IMDG
· Limited quantities (LQ) 5L
· Excepted quantities (EQ) Code: See SP340

· **UN "Model Regulation":** UN 1866 RESIN SOLUTION, SPECIAL PROVISION 640E, 3, III

*

15 Regulatory information

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

· Section 355 (extremely hazardous substances):
None of the ingredient is listed.

· Section 313 (Specific toxic chemical listings):

100-42-5	styrene

· TSCA (Toxic Substances Control Act):

100-42-5	styrene
59130-70-0	octadecyl 2-ethylhexanoate

· Proposition 65

· Chemicals known to cause cancer:
None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for females:
None of the ingredients is listed.

· Chemicals known to cause reproductive toxicity for males:
None of the ingredients is listed.

· Chemicals known to cause developmental toxicity:
None of the ingredients is listed.

· Cancerogenity categories

· EPA (Environmental Protection Agency)
None of the ingredients is listed.

· TLV (Threshold Limit Value established by ACGIH)

100-42-5	styrene	A4

· MAK (German Maximum Workplace Concentration)

100-42-5	styrene	5

(Contd. on page 11)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

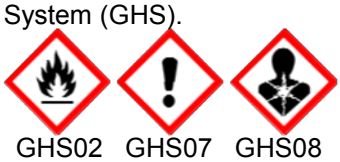
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· NIOSH-Ca (National Institute for Occupational Safety and Health)

None of the ingredients is listed.

· GHS label elements — The product is classified and labeled according to the Globally Harmonized System (GHS).

· Hazard pictograms



GHS02 GHS07 GHS08

· Signal word — Danger

· Hazard-determining components of labeling: styrene

· Hazard statements
H226 Flammable liquid and vapor.
H315 Causes skin irritation.
H319 Causes serious eye irritation.
H351 Suspected of causing cancer.
H361 Suspected of damaging fertility or the unborn child.
H335 May cause respiratory irritation.
H372 Causes damage to the hearing organs through prolonged or repeated exposure.

· Precautionary statements

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260	Do not breathe vapours.
P280	Wear protective gloves/protective clothing/eye protection/face protection.
P303+P361+P353	If on skin (or hair): 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.
P314	Get medical advice/attention if you feel unwell.
P405	Store locked up.
P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P403+P235	Store in a well-ventilated place. Keep cool.
P501	Dispose of contents/container in accordance with local/ regional/national/international regulations.

· National regulations:

· Information about limitation of use: Employment restrictions concerning young persons must be observed. Employment restrictions concerning pregnant and lactating women must be observed.

· Water hazard class: Water hazard class 2 (Self-assessment): hazardous for water.

· VOC USA 313.8 g/l / 2.62 lb/gl

· **Chemical safety assessment:** A Chemical Safety Assessment has not been carried out.

*

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

· **Department issuing SDS:** Laboratory

· Date of preparation / last revision 01/30/19

· Abbreviations and acronyms:
RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)
ICAO: International Civil Aviation Organisation
ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)
IMDG: International Maritime Code for Dangerous Goods
DOT: US Department of Transportation

(Contd. on page 12)

Safety Data Sheet
acc. to OSHA HCS

Printing date 01/30/20 Reviewed on 01/30/20

Trade name: KBond VIVID Knife Grade

(Contd. of page 11)

IATA: International Air Transport Association
ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
LC50: Lethal concentration, 50 percent
LD50: Lethal dose, 50 percent
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
BEI: Biological Exposure Limit
Flam. Liq. 3: Flammable liquids – Category 3
Acute Tox. 4: Acute toxicity – Category 4
Skin Irrit. 2: Skin corrosion/irritation – Category 2
Eye Irrit. 2A: Serious eye damage/eye irritation – Category 2A
Carc. 2: Carcinogenicity – Category 2
Carc. 2: Carcinogenicity – Category 2
Repr. 2: Reproductive toxicity – Category 2
STOT SE 3: Specific target organ toxicity (single exposure) – Category 3
STOT RE 1: Specific target organ toxicity (repeated exposure) – Category 1
Asp. Tox. 1: Aspiration hazard – Category 1

· International Product Registration

Status

AUS (Australian Inventory of Chemical Substances, AICS)
CDN (Canadian Domestic Substances List, DSL)
ROK (Korean Existing Chemical Inventory, ECI)