

# SAFETY DATA SHEET

## 1. Identification

<b>Product identifier</b>	<b>LPS® NoFlash NU</b>
<b>Other means of identification</b>	
<b>Part Number</b>	C04015
<b>Recommended use</b>	An aggressive non-flammable solvent blend for the removal of dirt, moisture, dust, flux and oxides from the internal components of electronic or precision equipment such as circuit boards, and the internal components of electronic devices used in factories and other industrial settings.
<b>Recommended restrictions</b>	None known.
<b>Manufacturer/Importer/Supplier/Distributor information</b>	
<b>Manufacturer</b>	
<b>Company name</b>	ITW Pro Brands
<b>Address</b>	4647 Hugh Howell Rd. Tucker, GA 30084
<b>Country</b>	(U.S.A.)
<b>In Case of Emergency</b>	Tel: +1 770-243-8800 1-800-424-9300 1-703-527-3887
<b>Website</b>	www.lpslabs.com
<b>E-mail</b>	lpssds@itwprobrands.com
<b>Supplier</b>	ITW Permatex Canada 1-35 Brownridge Road Halton Hills, ON, L7G 0C6 Canada 1-800-241-8334

## 2. Hazard(s) identification

<b>Physical hazards</b>	Gases under pressure	Liquefied gas
<b>Health hazards</b>	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Carcinogenicity	Category 2
	Reproductive toxicity	Category 1B
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
	Specific target organ toxicity, single exposure	Category 3 narcotic effects
	Specific target organ toxicity, repeated exposure	Category 2 (liver, Central Nervous System)
<b>Environmental hazards</b>	Not classified.	
<b>Label elements</b>		



<b>Signal word</b>	Danger
<b>Hazard statement</b>	Contains gas under pressure; may explode if heated. Causes skin irritation. Causes serious eye irritation. Suspected of causing cancer. May damage fertility or the unborn child. May cause respiratory irritation. May cause drowsiness or dizziness. May cause damage to organs (Liver, Central Nervous System) through prolonged or repeated exposure.
<b>Precautionary statement</b>	
<b>Prevention</b>	Obtain special instructions before use. Do not handle until all safety precautions have been read and understood. Do not breathe gas. Wash thoroughly after handling. Use only outdoors or in a well-ventilated area. Wear protective gloves/protective clothing/eye protection/face protection.

<b>Response</b>	If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Specific treatment (see this label). Take off contaminated clothing and wash before reuse. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell. If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention. If exposed or concerned: Get medical advice/attention.
<b>Storage</b>	Store in a well-ventilated place. Keep container tightly closed. Store locked up. Protect from sunlight.
<b>Disposal</b>	Dispose of contents/container in accordance with local/regional/national/international regulations.
<b>Other hazards</b>	None known.
<b>Supplemental information</b>	None.

### 3. Composition/information on ingredients

#### Mixtures

Chemical name	Common name and synonyms	CAS number	%
n-Propyl Bromide		106-94-5	60 - 70
Ethane, 1,1,1,2-tetrafluoro-(hfc-134a)		811-97-2	30 - 40
1-Propanol		71-23-8	1 - 5
1,2 Butylene Oxide		106-88-7	< 1
t-Butanol		75-65-0	< 1

All concentrations are in percent by weight (kg) unless ingredient is a gas. Gas concentrations are in percent by volume (l).

### 4. First-aid measures

<b>Inhalation</b>	Remove victim to fresh air and keep at rest in a position comfortable for breathing. For breathing difficulties, oxygen may be necessary. Call a physician if symptoms develop or persist.
<b>Skin contact</b>	Wash off with soap and water. Get medical attention if irritation develops and persists.
<b>Eye contact</b>	Immediately flush eyes with plenty of water for at least 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention if irritation develops and persists.
<b>Ingestion</b>	Call a physician or poison control center immediately. Only induce vomiting at the instruction of medical personnel. Never give anything by mouth to an unconscious person. If vomiting occurs, keep head low so that stomach content doesn't get into the lungs.
<b>Most important symptoms/effects, acute and delayed</b>	Skin irritation. Defatting of the skin. May cause redness and pain. Exposed individuals may experience eye tearing, redness, and discomfort. Symptoms of overexposure may be headache, dizziness, tiredness, nausea and vomiting. Irritating to mouth, throat, and stomach.
<b>Indication of immediate medical attention and special treatment needed</b>	Provide general supportive measures and treat symptomatically.
<b>General information</b>	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. Call a POISON CENTER or doctor/physician if you feel unwell.

### 5. Fire-fighting measures

<b>Suitable extinguishing media</b>	Powder. Alcohol resistant foam. Water spray. Carbon dioxide (CO <sub>2</sub> ).
<b>Unsuitable extinguishing media</b>	Do not use water jet as an extinguisher, as this will spread the fire.
<b>Specific hazards arising from the chemical</b>	Contents under pressure. Pressurized container may explode when exposed to heat or flame. Fire may produce irritating, corrosive and/or toxic gases. During fire, gases hazardous to health may be formed.
<b>Special protective equipment and precautions for firefighters</b>	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA.
<b>Fire fighting equipment/instructions</b>	In case of fire: Stop leak if safe to do so. Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Containers should be cooled with water to prevent vapor pressure build up. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
<b>Specific methods</b>	Use standard firefighting procedures and consider the hazards of other involved materials. Move containers from fire area if you can do so without risk. Cool containers exposed to flames with water until well after the fire is out. In the event of fire and/or explosion do not breathe fumes.
<b>General fire hazards</b>	Pressurized container may explode when exposed to heat or flame.

## 6. Accidental release measures

### Personal precautions, protective equipment and emergency procedures

Keep unnecessary personnel away. Keep people away from and upwind of spill/leak. Keep out of low areas. Wear appropriate protective equipment and clothing during clean-up. Avoid breathing gas. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained.

### Methods and materials for containment and cleaning up

Refer to attached safety data sheets and/or instructions for use. Eliminate all ignition sources (no smoking, flares, sparks, or flames in immediate area). Keep combustibles (wood, paper, oil, etc.) away from spilled material. Stop leak if you can do so without risk. Move the cylinder to a safe and open area if the leak is irreparable. Isolate area until gas has dispersed. Use water spray to reduce vapors or divert vapor cloud drift. Scoop up used absorbent into drums or other appropriate container. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water.

### Environmental precautions

Avoid release to the environment. Contact local authorities in case of spillage to drain/aquatic environment. Prevent further leakage or spillage if safe to do so. Avoid discharge into drains, water courses or onto the ground.

## 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. Pressurized container: Do not pierce or burn, even after use. Do not use if spray button is missing or defective. Do not spray on a naked flame or any other incandescent material. Do not smoke while using or until sprayed surface is thoroughly dry. Do not cut, weld, solder, drill, grind, or expose containers to heat, flame, sparks, or other sources of ignition. Do not re-use empty containers. Do not breathe gas. Avoid contact with eyes, skin, and clothing. Avoid contact during pregnancy/while nursing. Avoid prolonged exposure. Do not taste or swallow. When using, do not eat, drink or smoke. Use only in well-ventilated areas. Should be handled in closed systems, if possible. Wear appropriate personal protective equipment. Wash hands thoroughly after handling. Observe good industrial hygiene practices.

### Conditions for safe storage, including any incompatibilities

Pressurized container. Protect from sunlight and do not expose to temperatures exceeding 50°C/122 °F. Store locked up. Do not expose to heat or store at temperatures above 120°F/49°C as can may burst. Do not puncture, incinerate or crush. Do not handle or store near an open flame, heat or other sources of ignition. Store in original tightly closed container. Store in a well-ventilated place. Keep out of the reach of children.

## 8. Exposure controls/personal protection

### Occupational exposure limits

#### US. ACGIH Threshold Limit Values

Components	Type	Value
1-Propanol (CAS 71-23-8)	TWA	100 ppm
n-Propyl Bromide (CAS 106-94-5)	TWA	0.1 ppm
t-Butanol (CAS 75-65-0)	TWA	100 ppm

#### Canada. Alberta OELs (Occupational Health & Safety Code, Schedule 1, Table 2)

Components	Type	Value
1-Propanol (CAS 71-23-8)	STEL	984 mg/m <sup>3</sup>
		400 ppm
	TWA	492 mg/m <sup>3</sup>
t-Butanol (CAS 75-65-0)		200 ppm
	TWA	303 mg/m <sup>3</sup>
		100 ppm

#### Canada. British Columbia OELs. (Occupational Exposure Limits for Chemical Substances, Occupational Health and Safety Regulation 296/97, as amended)

Components	Type	Value
1-Propanol (CAS 71-23-8)	TWA	100 ppm
n-Propyl Bromide (CAS 106-94-5)	TWA	10 ppm
t-Butanol (CAS 75-65-0)	TWA	100 ppm

#### Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)

Components	Type	Value
1-Propanol (CAS 71-23-8)	TWA	100 ppm

**Canada. Manitoba OELs (Reg. 217/2006, The Workplace Safety And Health Act)**

Components	Type	Value
n-Propyl Bromide (CAS 106-94-5)	TWA	0.1 ppm
t-Butanol (CAS 75-65-0)	TWA	100 ppm

**Canada. Ontario OELs. (Control of Exposure to Biological or Chemical Agents)**

Components	Type	Value
1-Propanol (CAS 71-23-8)	TWA	100 ppm
n-Propyl Bromide (CAS 106-94-5)	TWA	10 ppm
t-Butanol (CAS 75-65-0)	TWA	100 ppm

**Canada. Quebec OELs. (Ministry of Labor - Regulation respecting occupational health and safety)**

Components	Type	Value
1-Propanol (CAS 71-23-8)	STEL	614 mg/m3
		250 ppm
		TWA
t-Butanol (CAS 75-65-0)	TWA	492 mg/m3
		200 ppm
		303 mg/m3
		100 ppm

**Biological limit values** No biological exposure limits noted for the ingredient(s).

**Exposure guidelines****Canada - Quebec OELs: Skin designation**

1-Propanol (CAS 71-23-8)

Can be absorbed through the skin.

**Appropriate engineering controls**

Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.

**Individual protection measures, such as personal protective equipment****Eye/face protection**

Wear safety glasses with side shields (or goggles). Eye wash fountain and emergency showers are recommended.

**Skin protection****Hand protection**

Viton or nitrile rubber gloves are recommended.

**Other**

Wear appropriate chemical resistant clothing.

**Respiratory protection**

When workers are facing concentrations above the exposure limit they must use appropriate certified respirators. Chemical respirator with organic vapor cartridge.

**Thermal hazards**

Not applicable.

**General hygiene considerations**

When using, do not eat, drink or smoke. Avoid contact with clothing. Keep away from food and drink. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants.

**9. Physical and chemical properties****Appearance****Physical state**

Gas.

**Form**

Aerosol.

**Color**

Clear

**Odor**

Strong.

**Odor threshold**

Not established

**pH**

Not applicable

**Melting point/freezing point**

Not established

**Initial boiling point and boiling range**

158 °F (70 °C)

**Flash point**

< 73.4 °F (< 23.0 °C) Tag Closed Cup

**Evaporation rate**

6 BuAc

**Flammability (solid, gas)**

Not applicable.

## Upper/lower flammability or explosive limits

Flammability limit - lower (%) 4 %

Flammability limit - upper (%) 8 %

Explosive limit - lower (%) Not available.

Explosive limit - upper (%) Not available.

Vapor pressure > 100 mm Hg @20°C

Vapor density ~4.3 (air = 1)

Relative density Not available.

## Solubility(ies)

Solubility (water) 3 - 5 %

Partition coefficient (n-octanol/water) > 1

Auto-ignition temperature > 914 °F (> 490 °C)

Decomposition temperature Not established

Viscosity Not available.

## Other information

Heat of combustion 12 kJ/g

Percent volatile 100 %

Specific gravity 1.29 - 1.32 @20°C

VOC 70.1 % per US State and Federal Consumer Product Regulations

## 10. Stability and reactivity

**Reactivity** The product is stable and non-reactive under normal conditions of use, storage and transport.

**Chemical stability** Material is stable under normal conditions.

**Possibility of hazardous reactions** No dangerous reaction known under conditions of normal use.

**Conditions to avoid** Avoid heat, sparks, open flames and other ignition sources. Contact with incompatible materials.

**Incompatible materials** Aluminum. Alkali earth metals. Alkaline metals.

**Hazardous decomposition products** Carbon oxides. Hydrogen bromide. Hydrogen fluoride.

## 11. Toxicological information

### Information on likely routes of exposure

**Inhalation** Irritating to respiratory system. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea.

**Skin contact** Causes skin irritation.

**Eye contact** Causes serious eye irritation.

**Ingestion** May cause discomfort if swallowed. However, ingestion is not likely to be a primary route of occupational exposure.

**Symptoms related to the physical, chemical and toxicological characteristics** Irritating to eyes, respiratory system and skin. Symptoms may include stinging, tearing, redness, swelling, and blurred vision. May cause redness and pain. Vapors have a narcotic effect and may cause headache, fatigue, dizziness and nausea. Behavioral changes. Narcosis. Decrease in motor functions.

### Information on toxicological effects

**Acute toxicity** Narcotic effects. May cause respiratory irritation.

Components	Species	Test Results
1,2 Butylene Oxide (CAS 106-88-7)		
<u>Acute</u>		
<b>Dermal</b>		
LD50	Rabbit	1500 - 2950 mg/kg, 24 Hours

Components	Species	Test Results
1-Propanol (CAS 71-23-8)		
<b><u>Acute</u></b>		
<b>Dermal</b>		
LD50	Rabbit	4032 mg/kg, 24 Hours
<b>Oral</b>		
LD50	Rat	1870 mg/kg
n-Propyl Bromide (CAS 106-94-5)		
<b><u>Acute</u></b>		
<b>Dermal</b>		
LD50	Rat	> 2000 mg/kg, 24 Hours
<b>Oral</b>		
LD50	Rat	> 2000 mg/kg
t-Butanol (CAS 75-65-0)		
<b><u>Acute</u></b>		
<b>Oral</b>		
LD50	Rat	3.5 g/kg
<b>Skin corrosion/irritation</b>	Causes skin irritation.	
<b>Serious eye damage/eye irritation</b>	Causes serious eye irritation.	
<b>Respiratory or skin sensitization</b>		
<b>Canada - Alberta OELs: Irritant</b>		
1-Propanol (CAS 71-23-8)	Irritant	
<b>Respiratory sensitization</b>	Not a respiratory sensitizer.	
<b>Skin sensitization</b>	This product is not expected to cause skin sensitization.	
<b>Germ cell mutagenicity</b>	No data available to indicate product or any components present at greater than 0.1% are mutagenic or genotoxic.	
<b>Carcinogenicity</b>	Suspected of causing cancer.	
<b>ACGIH Carcinogens</b>		
1-Propanol (CAS 71-23-8)	A4 Not classifiable as a human carcinogen.	
n-Propyl Bromide (CAS 106-94-5)	A3 Confirmed animal carcinogen with unknown relevance to humans.	
t-Butanol (CAS 75-65-0)	A4 Not classifiable as a human carcinogen.	
<b>Canada - Manitoba OELs: carcinogenicity</b>		
1-Propanol (CAS 71-23-8)	Not classifiable as a human carcinogen.	
n-Propyl Bromide (CAS 106-94-5)	Confirmed animal carcinogen with unknown relevance to humans.	
t-Butanol (CAS 75-65-0)	Not classifiable as a human carcinogen.	
<b>IARC Monographs. Overall Evaluation of Carcinogenicity</b>		
1,2 Butylene Oxide (CAS 106-88-7)	2B Possibly carcinogenic to humans.	
n-Propyl Bromide (CAS 106-94-5)	2B Possibly carcinogenic to humans.	
<b>US. National Toxicology Program (NTP) Report on Carcinogens</b>		
n-Propyl Bromide (CAS 106-94-5)	Reasonably Anticipated to be a Human Carcinogen.	
<b>Reproductive toxicity</b>	May damage fertility or the unborn child.	
<b>Specific target organ toxicity - single exposure</b>	May cause respiratory irritation. May cause drowsiness or dizziness.	
<b>Specific target organ toxicity - repeated exposure</b>	May cause damage to organs (Liver, Central Nervous System) through prolonged or repeated exposure.	
<b>Aspiration hazard</b>	Not an aspiration hazard.	
<b>Chronic effects</b>	May cause damage to organs through prolonged or repeated exposure.	
<b>Further information</b>	Symptoms may be delayed.	
<b>12. Ecological information</b>		
<b>Ecotoxicity</b>	Harmful to aquatic life with long lasting effects.	

Components	Species	Test Results
1-Propanol (CAS 71-23-8)		
<b>Aquatic</b>		
Crustacea	EC50	Water flea (Daphnia magna) 3339 - 3977 mg/l, 48 hours
Fish	LC50	Bleak (Alburnus alburnus) 3000 - 4000 mg/l, 96 hours
n-Propyl Bromide (CAS 106-94-5)		
<b>Aquatic</b>		
Fish	LC50	Fathead minnow (Pimephales promelas) 67.3 mg/l, 96 hours
t-Butanol (CAS 75-65-0)		
<b>Aquatic</b>		
Crustacea	EC50	Water flea (Daphnia magna) 4607 - 6577 mg/l, 48 hours
Fish	LC50	Fathead minnow (Pimephales promelas) 6130 - 6700 mg/l, 96 hours

**Persistence and degradability** Not inherently biodegradable.

**Bioaccumulative potential** Not available.

**Partition coefficient n-octanol / water (log Kow)**

LPS® NoFlash NU	> 1
1-Propanol	0.25
Ethane, 1,1,1,2-tetrafluoro-(hfc-134a)	1.06
n-Propyl Bromide	2.1
t-Butanol	0.35

**Mobility in soil** Readily absorbed into soil.

**Other adverse effects** None known.

### 13. Disposal considerations

**Disposal instructions** Consult authorities before disposal. Contents under pressure. Do not puncture, incinerate or crush. Dispose of contents/container in accordance with local/regional/national/international regulations.

**Local disposal regulations** Dispose in accordance with all applicable regulations.

**Hazardous waste code** Not regulated.

**Waste from residues / unused products** Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions). Avoid discharge into water courses or onto the ground.

**Contaminated packaging** Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied. Do not re-use empty containers.

### 14. Transport information

#### TDG

<b>UN number</b>	UN1950
<b>UN proper shipping name</b>	AEROSOLS, non-flammable
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.2
<b>Subsidiary risk</b>	-
<b>Packing group</b>	Not available.
<b>Environmental hazards</b>	No.
<b>Special precautions for user</b>	Not available.

#### IATA

<b>UN number</b>	UN1950
<b>UN proper shipping name</b>	Aerosols, non-flammable
<b>Transport hazard class(es)</b>	
<b>Class</b>	2.2
<b>Subsidiary risk</b>	-
<b>Packing group</b>	Not available.
<b>Environmental hazards</b>	No.
<b>ERG Code</b>	2L
<b>Special precautions for user</b>	Not available.

**Other information**

**Passenger and cargo aircraft** Allowed with restrictions.  
**Cargo aircraft only** Allowed with restrictions.

**IMDG**

**UN number** UN1950  
**UN proper shipping name** AEROSOLS, non-flammable  
**Transport hazard class(es)**  
**Class** 2.2  
**Subsidiary risk** -  
**Label(s)** 2.2  
**Packing group** Not available.  
**Environmental hazards**  
**Marine pollutant** No.  
**EmS** F-D, S-U  
**Special precautions for user** Not available.

**Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code** Not applicable.

IATA; IMDG; TDG

**15. Regulatory information**

**Canadian regulations** This product has been classified in accordance with the hazard criteria of the CPR and the SDS contains all the information required by the CPR.

**Canada. Excluded VOCs. Guidelines for Volatile Organic Compounds in Consumer Products. CEPA 1999. Environment Canada, as amended**

Ethane, 1,1,1,2-tetrafluoro-(hfc-134a) (CAS 811-97-2)

**Controlled Drugs and Substances Act**

Not regulated.

**Export Control List (CEPA 1999, Schedule 3)**

Not listed.

**Greenhouse Gases**

Ethane, 1,1,1,2-tetrafluoro-(hfc-134a) (CAS 811-97-2)

**Precursor Control Regulations**

Not regulated.

**International regulations**

The product is classified and labelled in accordance with EC directives or respective national laws. This Safety Data Sheet complies with the requirements of Regulation (EC) No 1907/2006. Young people under 18 years old are not allowed to work with this product according to EU Directive 94/33/EC on the protection of young people at work. Pregnant women should not work with the product, if there is the least risk of exposure.

**Stockholm Convention**

Not applicable.

**Rotterdam Convention**

Not applicable.

**Kyoto protocol**

Not applicable.

**Montreal Protocol**

Not applicable.



**Basel Convention**

Not applicable.

**International Inventories**

<b>Country(s) or region</b>	<b>Inventory name</b>	<b>On inventory (yes/no)*</b>
Australia	Australian Inventory of Chemical Substances (AICS)	Yes
Canada	Domestic Substances List (DSL)	Yes
Canada	Non-Domestic Substances List (NDSL)	No
China	Inventory of Existing Chemical Substances in China (IECSC)	Yes
Europe	European Inventory of Existing Commercial Chemical Substances (EINECS)	Yes
Europe	European List of Notified Chemical Substances (ELINCS)	No
Japan	Inventory of Existing and New Chemical Substances (ENCS)	Yes
Korea	Existing Chemicals List (ECL)	Yes
New Zealand	New Zealand Inventory	Yes
Philippines	Philippine Inventory of Chemicals and Chemical Substances (PICCS)	Yes
Taiwan	Taiwan Toxic Chemical Substances (TCS)	Yes
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

\*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

A "No" indicates that one or more components of the product are not listed or exempt from listing on the inventory administered by the governing country(s).

**16. Other information**

<b>Issue date</b>	05-26-2016
<b>Revision date</b>	04-26-2018
<b>Version #</b>	04
<b>Further information</b>	HMIS® is a registered trade and service mark of the NPCA.

## References

ACGIH  
EPA: AQUIRE database  
NLM: Hazardous Substances Data Base  
US. IARC Monographs on Occupational Exposures to Chemical Agents  
Korea. Accidental Release Prevention Substances (Presidential Decree of Toxic Chemical Control Law, Executive Order No. 19203)  
Korea. Dangerous Substances Threshold Quantity (Presidential Decree of Dangerous Substances Safety Management Act No. 18406, Schedule 1)  
Korea. Harmful Substances Prohibited from Manufacturing (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 29)  
Korea. Harmful Substances Requiring Permission for Manufacture or Use (Presidential Decree on the Industrial Safety and Health Act (No. 13053), Article 30)  
Korea. Non-Toxic Chemicals List (National Institute of Environment Research (NIER) Public Notice No. 1997-10, as amended)  
Korea. Observational Chemicals (Ministerial Decree of TCCL Article 6)  
Korea. OELs. Regulation for Permitted Concentration of Hazardous Substances (Ministry of Labor (MOL) Public Notice No. 1986-45, as amended)  
Korea. Prohibited Chemical Substances (TCCL Article 11)  
Korea. Regulated volatile organic compounds (VOCs) (MOE Notice No. 2001-36, March 8, 2001, as amended)  
Korea. Restricted Chemical Substances (TCCL Article 11)  
Korea. Toxic Chemical Control Law (TCCL), Existing Chemicals Inventory (KECI)  
Korea. Toxic Chemical Control Law (TCCL), pre-1997 List  
Korea. Toxic Chemicals (TCCL Article 10)  
Korea. Toxic Release Inventory (TRI) Chemicals (TCCL Article 14)  
Taiwan. Dangerous Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)  
Taiwan. Industrial Precursor Chemicals (Categories and Regulations Governing Inspection and Declaration of Industrial Precursor Chemicals, MOEA Decree No. 87, as amended)  
Taiwan. OELs. (Standards on Workplace Atmosphere of Dangerous and Hazardous Materials)  
Taiwan. Toxic Chemical Substances (TCS) (List of Toxic Chemical Substances announced by the Environmental Protection Administration)  
Taiwan. Toxic Materials (Rules on Hazard Communication of Dangerous Materials and Toxic Materials)  
HSDB® - Hazardous Substances Data Bank  
IARC Monographs. Overall Evaluation of Carcinogenicity  
National Toxicology Program (NTP) Report on Carcinogens  
ACGIH Documentation of the Threshold Limit Values and Biological Exposure Indices  
Japan Society for Occupational Health, Recommendation of Occupational Exposure Limits  
GOST 30333-2007 - Chemical production safety passport. General requirements  
JIS Z 7252:2009 Classification of chemicals based on "Globally Harmonized System of Classification and Labelling of Chemicals (GHS)"  
JIS Z 7253:2012 Hazard communication of chemicals based on GHS – Labelling and Safety Data Sheet (SDS)  
Japan Chemical Industry Association (JCIA) GHS Guideline, June 2012

## Disclaimer

This safety data sheet was prepared in accordance with JIS Z 7253:2012. Additional information is given in the Material Safety Data Sheet. The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information given is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and is not to be considered a warranty or quality specification. The information relates only to the specific material designated and may not be valid for such material used in combination with any other materials or in any process, unless specified in the text.

## Revision information

Physical and chemical properties: Flammability (solid, gas)  
GHS: Qualifiers