



## SAFETY DATA SHEET

### 1. IDENTIFICATION OF THE SUBSTANCE OR MIXTURE AND OF THE MANUFACTURER

#### PRODUCT IDENTIFIER

PRODUCT NAME : Acrylonitrile (AN)

#### OTHER IDENTIFIER

CAS NO. : 107-13-1

UN NO. : 1093

EC / EINECS NO. : 203-466-5

RTECS NO. : AT5250000

EC INDEX : 608-003-00-4

#### OTHER RECOMMENDATION FOR USAGE

Data not applicable.

#### MANUFACTURER DATA

NAME : PTT Asahi Chemical Company Limited.

ADDRESS : Marketing & Sales Dept. 555/1, Energy Complex, Building A,  
8th Floor, Vibhavadi-Rangsit Road, Chatuchak, Bangkok 10900  
THAILAND.

TELEPHONE NUMBER : +66-(0)2791-2405

#### EMERGENCY TELEPHONE NUMBER

EMERGENCY TELEPHONE NUMBER : +66-(0)3897-4800

ADDRESS : 8 Phangmuang Chapoh 3-1 Road , Huaypong,  
Muang , Rayong 21150 THAILAND.

### 2. HAZARDS IDENTIFICATION

#### GHS CLASSIFICATION :

##### PHYSICAL HAZARD

- Flammable Liquids : Category 2

##### HEALTH HAZARDS

- Acute Toxicity
  - Oral : Category 3
  - Skin : Category 2
  - Inhalation (Vapor) : Category 2

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- Skin Corrosion / Irritation : Category 2 , Irritation
- Serious Eye Damage / Eye Irritation : Category 2A , Irritation
- Respiratory or skin sensitization
  - Skin Sensitizer : Category 1
- Germ Cell Mutagenicity : Category 2
- Carcinogenicity : Category 2
- Reproductive Toxicity : Category 2
- Specific target organ toxicity following Single exposure
  - Nervous system, Liver : Category 1
  - Anesthesia effect, Irritation to respiratory tract : Category 3
- Specific target organ toxicity following Repeated exposure
  - Nervous system, Respiratory system, Blood system, Testicle, Kidney, Liver : Category 1

### ENVIRONMENTAL HAZARDS

- Acute Toxicity to the aquatic environment : Category 2

### GHS LABEL ELEMENTS :



SIGNAL WORD : Danger

### HAZARD STATEMENT :

- Flammable Liquid/Vapor
- Harmful if swallowed (Oral)
- Fatal in contacted with skin (Dermal)
- Fatal if inhaled (Vapor)
- Skin irritation
- Serious eye irritation
- May cause an allergic skin reaction

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- Suspected of causing Genetic Disorder
- Suspected of causing cancer
- Suspected of damaging fertility and the unborn child
- Causes damage to internal organs (nervous system, liver)
- May cause respiratory irritation, drowsiness and dizziness if inhaled
- Causes damage to organs through prolonged or repeated exposure (nervous system, respiratory system, blood circulatory system, testicle, kidney, liver)
- Toxic to aquatic life

### PRECAUTIONARY STATEMENTS :

#### [Prevention]

- Do not handle until all safety precautions have been read and understood.
- Keep away from heat/spark. No smoking. Ground / bond equipment to prevent static electricity.
- Use explosion-proof electrical/ventilating/lighting equipments.
- Wear appropriate protective equipments to avoid the exposure of substance to skin, eye or inhalation.
- Use only outdoors or in a well-ventilated place.
- Do not eat, drink, or smoke when using this product.
- Avoid contact during pregnancy/while nursing.
- Wash hand thoroughly after handling. Contaminated work clothing should not be allowed out the workplace.
- Avoid release to the environment.

#### [Response]

- In case of fire : Wear protective mask and use dry chemical, foam, and CO<sub>2</sub>.
- IF INHALED : Remove victim to fresh air and keep at rest and get medical attention immediately.
- IF ON SKIN : Wash with plenty of water. Take off contaminated clothing. Get medical attention.
- IF IN EYES : Rinse cautiously for more than 15 minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Get medical attention.
- IF SWALLOWED : Induce vomiting and get medical attention immediately. If the victim is unconscious, never give anything by mouth.

#### [Storage]

- Keep container tightly closed and locked up. Store in dry, cool and well-ventilated place. Protect from sunlight.

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### [Disposal]

- Entrust the dispose of contents/containers to authorized waste management firms in accordance with local/regional/national/international regulations.
- Wash empty contaminated containers and entrust to dispose in accordance with the standards of local authority and related regulations/laws.

### OTHER HAZARDS OUTSIDE THE GHS CLASSIFICATION :

In case of dispose by incineration process, the temperature of incineration has to be higher than 900°C since it may cause the occurrence of Hydrogen Cyanide Gas.

## 3. COMPOSITION / INFORMATION ON INGREDIENTS

CHEMICAL IDENTITY	: Acrylonitrile
COMMON NAME / SYNONYM	: Vinyl Cyanide , Cyanoethylene , Propenenitrile
CHEMICAL FORMULA	: C <sub>2</sub> H <sub>3</sub> CN
MOLEULAR WEIGHT	: 53.06
CAS NO. and OTHER IDENTIFIER	
CAS NO.	: 107-13-1
UN NO.	: 1093
EC / EINECS NO.	: 203-466-5
IMPURITIES AND STABILIZING ADDITIVES	: Stabilizing Agent

## 4. FIRST-AID MEASURES

INHALATION	: Move the victim to fresh air. Keep warm by blanket and rest in a position comfortable for breathing. Get medical attention immediately. If breathing stopped or breathing difficulties, loosen the buttons and rest in a position comfortable for breathing and give artificial respiration.
SKIN CONTACT	: Take off all contaminated clothing and shoes. Wash the affected skin with plenty of soap and water. Get medical attention immediately.



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**EYE CONTACT** : Rinse cautiously with flowing water for more than 15 minutes.  
Get medical attention immediately. Remove contact lenses, if present and easy to do, and continue rinsing.

**INGESTION** : Induce vomiting. Get medical attention immediately.  
If the victim is unconscious, never give anything by mouth.

### SIGNIFICANT SYMPTOMS :

**EYE** : Causes serious eye damage.  
**SKIN** : Causes skin irritation. May cause an allergic skin reaction.  
**INHALATION** : May cause respiratory irritation.  
**DIGESTION** : May cause burns to mouth, throat and stomach.

### PRECAUTIONS FOR INDIVIDUAL PERFORMING EMERGENCY MEASURES :

- Never give an artificial respiration by mouth-to-mouth. Use specific tools to give artificial respiration.
- Wear protective gloves or respirator.

### PRECAUTION FOR MEDICAL TREATMENT :

- When seeking medical attention by a doctor, provide this SDS and other information regarding this material.
- If inhaled Acrylonitrile , call a POISON CENTER or doctor/physician.

## 5. FIRE-FIGHTING MEASURES

**EXTINGUISHING MEDIA** : Dry Chemical Power, AFFF, CO<sub>2</sub>

**PROHIBITED EXTINGUISHING MEDIA** : Water spray in cylindrical shape.

### SPECIFIC HAZARDS WHEN IGNITED :

- Easy to ignite if in contact with heat/spark/fire.
- May cause the explosion of container if heated.
- May release irritating / toxic / corrosive gases in case of fire.
- May release flammable liquid/vapor.



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### SPECIAL PROTECTION EQUIPMENT AND PRECAUTIONS FOR FIRE FIGHTER:

- Fire fighting shall be done from upwind side.
- Fire fighter must wear appropriate fire fighting suit and equipment.

(Refer to ITEM 8 : EXPOSURE CONTROL / PERSONAL PROTECTION)

## 6. ACCIDENTAL RELEASE MEASURES

### PERSONAL PRECAUTIONS , PROTECTION EQUIPMENTS AND EMERGENCY RESPONSE :

- Enclose the released area and control of the entrance into the area.
- Evacuate area to upwind and limit the entry of non-essential personnel.
- Wear appropriate Protection Equipments or avoid eye or skin contact / breathing.

(refer to ITEM 8 EXPOSURE CONTROL / PERSONAL PROTECTION)

- Avoid eye or skin contact/breathing.

**ENVIRONMENTAL PRECAUTIONS** : Avoid discharge to sewers or natural waters.

### METHOD OF CONTAINMENT AND CLEANING UP :

- For small spill, absorb with dry sand / chemical absorbent and clean up. Place in an appropriate waste disposal container and close tightly.
- For large spill, dike with dry sand / chemical absorbent and divert the spill to safe area then collect.
- Clean up the contaminated area after collected.

### SECONDARY FIRE PREVENTION :

- Extinguish all potential ignition sources from area immediately.
- Prevent the release into the sewage system , ground water pit , and basement or into any closed construction.

## 7. HANDLING AND STORAGE

### SAFE HANDLING PRECAUTION :

- Wear appropriate protective clothing.

(refer to ITEM 8 EXPOSURE CONTROLS / PERSONAL PROTECTION)

- Remove potential ignition sources, static electricity, sparks, flame in vicinity.

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- Take the safety measures to prevent static electrical accidents. Use electro-conductive suit and shoes.
- Store in closed container. Place in well-ventilated place, or place with General Ventilation System or Local Exhaust Ventilation.
- Beware the release of mist or vapor.
- Do not handle violently such as striking against the container until it collapses or falls. Handle and manage the empty containers in the same manner.
- Wash hand thoroughly after handling. Take of contaminated clothing.
- Do not eat, drink, or smoke when handle.

### SAFETY MEASURE FOR STORAGE :

- Install lighting and ventilation equipments in storage since it is the storage and workplace of hazardous substance. Take the safety measures to prevent the penetration to the ground.
- Store in closed container. Keep in cool and well-ventilated place. Protect from sunlight to avoid polymerization.
- Store in Carbon Steel / SUS-304 / Polyethylene/ glass container.
- Container for transportation should be Metal Drum Can or Tank Lorry. In case of large amount, use Chemical Tanker.
- Store under each country's regulations.

INCOMPATIBILITY : Keep away from Acid, Alkali, and Oxidizing substances.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### CONTROL PARAMETER :

ACGIH TLV- TWA : 2 ppm ( 4.3 mg/m<sup>3</sup>)

Japan Society for Occupational Health (Version Y2010) : 2 ppm (4.3 mg/m<sup>3</sup>) Skin Absorption.

### ENGINEERING PROTECTION CONTROL :

- Use explosion-proof electrical/ventilating/lighting equipments.
- Take the safety measures to prevent static electrical accidents.
- In case of closed area or indoors, the sources of vapor should be sealed or closed tightly, or Local Exhaust Ventilator should be installed.

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- Provide Emergency shower, hand washing, eye washing at the vicinity and indicate the location by signs remarkable.

### PERSONAL PROTECTIVE EQUIPMENTS :

- Respiratory Protection : Gas Mask (Canister must be a type of organic gasses or Hydrogen Cyanide). In case of high concentration, use air-supplied respirator such as air-line mask or SCBA.
- Eye Protection : Goggles , Face Protection.
- Protective Glove , Clothing : Rubber Gloves (Butyl Rubber) and impermeable and electrostatic-proof chemical suit and long rubber boot.



## 9. PHYSICAL AND CHEMICAL PROPERTIES

- PHYSICAL STATE : Colorless Transparent Liquid
- ODOR : Slight pungent
- ODOR THRESHOLD LIMIT : 8.8 ppm<sup>21)</sup>
- pH : 6.0 – 7.5 (5% Solution)
- MELTING POINT / FREEZING POINT : -84°C
- INITIAL BOILING POINT AND BOILING RANGE : 77°C
- FLASH POINT : 0°C (Opened) -1°C (Closed)
- EVAPORATION RATE : 4.54 (Butyl acrylate=1)<sup>22)</sup>
- FLAMMABILITY (SOLID,GAS) : Not applicable
- UPPER/LOWER FLAMMABILITY OR EXPLOSIVE LIMIT : LEL 3 vol.% UEL 17 vol.%
- VAPOR PRESSURE : 11 kPa (20°C)
- VAPOR DENSITY (AIR = 1) : 1.83 (Calculation)
- RELATIVE DENSITY (WATER = 1) : 0.806 (20°C/4°C)



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SOLUBILITY : 7.3 g / water 100 ml (20°C)  
Mixing with organic solvent such as Acetone and Ester.

PARTITION COEFFICIENT : N-OCTANOL / WATER : log Pow = 0.25 (Measurement) 0.21 (Estimation)

AUTO-IGNITION TEMPERATURE : 481°C

DECOMPOSITION TEMPERATURE : Data not available.

VISCOSITY : 0.34 mPa • s

### 10. STABILITY AND REACTIVITY

REACTION : Strong reaction if in contact with strong acids, alkalis, oxidizing agents.

STABILITY : Stable when added Polymerization Inhibitor.

POSSIBILITY OF HAZARDOUS REACTION :

- Become extreme reaction by Double-Bond Polymerization Monomer.
- If there was polymerization reaction caused by sunlight/strong acid/strong alkali, it has a possibility of explosion.

CONDITIONS TO AVOID : High temperature, sunlight.

INCOMPATIBLE MATERIALS : Strong oxidizing agents, acids, alkalis.

HAZARDOUS DECOMPOSITION PRODUCTS : Overheat may cause hazardous decomposition such as Nitrogen Oxide, Hydrogen Cyanide.

### 11. TOXICOLOGICAL INFORMATION

ACUTE TOXICITY :

- Oral - Rat LD<sub>50</sub> (Median Lethal Dose) = 72 ~ 186 mg/kg. <sup>2)</sup>
- Dermal - Rat LD<sub>50</sub> (Median Lethal Dose) = 148 ~ 282 mg/kg. <sup>2)</sup>  
- Rabbit LD<sub>50</sub> (Median Lethal Dose) = 200 ~ 226 mg/kg. <sup>2)</sup>
- Inhale(vapor) - Rat LC<sub>50</sub> (Median Lethal Concentration) = 0.54 mg/L/4h. <sup>2)</sup> = 248 ppm/4h

SKIN CORROSION / IRRITATION : Found rash, edema, tissue necrosis on rabbit's skin. <sup>2)</sup>

SERIOUS EYE DAMAGE / IRRITATION : It has a report of eye irritation such as Corneal opacity, conjunctiva irritation from the examination with rabbit. <sup>2)4)</sup>

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**RESPIRATORY OR SKIN SENSITIZATION** : Positive data for Maximisation Test on marmot. <sup>2) 4)</sup>

Maximisation test = Test to determine the skin allergy reaction.

**GERM CELL MUTAGENICITY (MUTATION) :**

- In vitro : Positive data, based on Metabolic Activity when took some sample out, are reported in many examinations e.g. Reversion Testing, Chromosomal Aberration Testing, Gene Mutation Testing, Sister Chromatid Exchange Testing. In vivo : Positive data is reported in Unscheduled DNA Synthesis on rat's liver and the experiment on Drosophilidae. <sup>2)</sup>
- In vivo = experiment that is done in the body of a living organism.
- In vitro = experiment that is done in a laboratory vessel or other controlled experimental environment.

**CARCINOGENICITY** : Acrylonitrile is ranked as IARC = 2B , ACGIH = A3 , NTP = R

- IARC (International Agency for Research on Cancer)  
2B = Possibly carcinogenic to humans.
- ACGIH (American Conference of Governmental Industrial Hygienists) ,  
A3 = Animal Carcinogen with Unknown Relevance to Humans.
- NTP (National Toxicology Program) ,  
R = Reasonably Anticipated To Be Human Carcinogens.

**REPRODUCTIVE TOXICITY :**

When administering the substance 25 mg/kg to female rat during 6<sup>th</sup> to 15<sup>th</sup> day of pregnancy, the toxic effect in mother and deformity in offspring was found. Besides, when exposed by inhalation at 80 ppm, teratogenesis was found but teratogenesis was not found at 40 ppm. <sup>1) 2)</sup>

**SPECIFIC TARGET ORGAN TOXICITY FOLLOWING SINGLE EXPOSURE :**

It has a report of "Mild Jaundice, Convulsion" "Effect to central nervous system and liver" "Irritation to eyes/nose/throat, numbness, unconscious, breathing stop" in human. Therefore, it is assumed that nervous system and liver are target organs and respiratory irritation is shown. For the effect on nervous system, as some case has an effect temporarily before recovering so it has been used to create an anesthetic as well. <sup>2) 4) 15)</sup>

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### SPECIFIC TARGET ORGAN TOXICITY FOLLOWING REPEATED EXPOSURE :

It has a record of “disease symptoms on central nervous system such as anxiety, headache, nervous prostration” “pain in eyes, nose, throat, respiratory tract” “decreasing of Hemoglobin concentration/red blood cells/white blood cells, Immunosuppression” in human. It has a record about “Localized inflammation of the respiratory mucous membrane, Bleeding in marrow of liver and spleen, localized necrosis of liver, swelling of kidney, atrophy of adrenal cortex” in tested animal. <sup>15)</sup>

ASPIRATION HAZARD : Data not available.

## 12. ECOLOGICAL INFORMATION

### ECOLOGICAL TOXICITY :

- Fish : Fathead Minnow  $LC_{50}$  (Median Lethal Concentration) = 8.4 mg/L/96h <sup>2) 4)</sup>
- Crustacea : Daphnia  $LC_{50}$  (Median Lethal Concentration) = 7.5~10 mg/L/48h <sup>2) 4)</sup>
- Waterweeds : Scenedesmus  $EC_{50}$  (Median Effective Concentration) = 3.1 mg/L/72h <sup>2) 4)</sup>

### PERSISTENCE / DEGRADABILITY

- Biodegradation is favorable. <sup>1) 2) 4)</sup>
- Decomposition Ratio 41~74 % (2 weeks, BOD Value). <sup>2) 4)</sup>
- Degradable to Acrylamide by several species of bacteria. Acrylamide is degradable by germs in atmosphere easily.

### BIOACCUMULATIVE POTENTIAL :

Accumulation In Body : From the Partition Coefficient and Decomposition, it can be assumed that the Accumulation in Body is low.

MOBILITY IN THE SOIL : Data not available.

OTHER ADVERSE EFFECTS : Data not available.

## 13. DISPOSAL CONSIDERATIONS

### WASTE RESIDUES :

- Dispose the residue in accordance with the standards of local authority and related regulations/laws.



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- Entrust the dispose to authorized waste management firms in accordance with local / regional / national / international regulations.
- In case of entrusted waste management firms, inform the hazard information, toxicity of substance sufficiently.
- This product can be incinerated but has to be done at temperature exceeding 900°C to prevent the occurrence of Hydrogen Cyanide (HCN)
- In case of dilute solution, it can be biodegraded by Activated Sludge Treatment.

### CONTAMINATED CONTAINERS/PACKAGES :

- In case of empty container (e.g. drum can), discharge the liquid remaining inside and wash the contaminated container with water or steam before disposal.
- Wear appropriate protective equipments.

(refer to ITEM 8 EXPOSURE CONTROLS / PERSONAL PROTECTION)

## 14. TRANSPORT INFORMATION

UN NUMBER : 1093 (Stabilized)  
UN PROPER SHIPPING NAME : Acrylonitrile , Stabilized  
TRANSPORT HAZARD CLASS : 3 (Flammable Liquid)  
Sub Risk : 6.1  
PACKING GROUP : I  
MARINE POLLUTION CATEGORY : Category Y (MARPOL Annex II)  
TRANSPORT WITH LARGE CONTAINER : Data not applicable.

### SPECIAL PRECAUTION :

Acrylonitrile is flammable liquid and hazardous. Transportation and liquid loading must be done under the statutes determined in Hazardous Substance Act, Transport Act, etc.

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### 15. REGULATORY INFORMATION

COMPLY WITH EACH COUNTRY'S REGULATIONS:

THAILAND REGULATION :

- Thai Hazardous Substance Act B.E.2535 (1992) : Classified as type 3 hazardous substance.  
Type 3 hazardous substance is that of which the production, import, export, or having in possession must obtain a permit.
- Hazardous Substance No. 18 (refer to Notification of the Ministry of the Interior Subject for Safe Work with Hazardous Substance B.E.2534 (1991))

CLASSIFICATION ACCORDING TO REGULATION (EC) :

HAZARD PICTOGRAMS :



RISK PHRASES

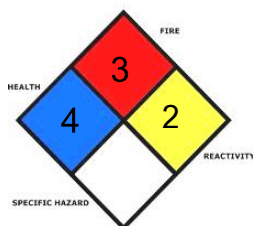
: R11 - highly flammable  
R45 - May cause cancer.  
R23/24/25 - Toxic by inhalation, in contact with skin and if swallowed.  
R37/38 - Irritating to respiratory system and skin.  
R41 - Risk of serious damage to eyes.  
R43 - May cause sensitization by skin contact.  
R51/53 - Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

SAFETY PHRASES

: S2 - Keep out of the reach of children.  
S24 - Avoid contact with skin.  
S37 - Wear suitable gloves.

NFPA CLASSIFICATION

: Health 4, Fire 3, Reactivity 2



NFPA 704

## 16. OTHER INFORMATION

### REFERENCE MATERIALS

- 1) "Japan Existing Chemical Safety (Hazard) Assessment Sheet (1997)" (Chemical Evaluation and Research Institute)
- 2) "CERI Risk Assessment (2006)" (Chemical Evaluation and Research Institute)
- 3) "Environmental Risk Assessment for Chemical Substances Volume 2 (2003) and Volume 3(2004)"  
Department of Energy, Environmental Risk Assessment Section
- 4) "Initial Risk Assessment for Chemical Substances Ver.10 (2005)" New Energy and Industrial Technology  
Development Organization (NEDO)
- 5) "EHC 28 1983" IPCS (International Program on Chemical Safety)
- 6) European Union Risk Assessment Report (2004)"
- 7) Japan Society for Occupational Health (Ver.2010)
- 8) ACGIH (Ver.2011)
- 9) Disaster Prevention Guideline for Chemistry and Chemical Industry Issue II The Chemical Society of Japan
- 10) Acrylonitrile Management Guideline (1992) Japan Chemical Fiber Association
- 11) Hazardous Chemical Data Book Tokyo Fire Department
- 12) Safety Data Sheet No.6 (Japan Petrochemical Industry Association)
- 13) Hazardous Chemical Handbook (Gunter Hommel)
- 14) Chemical Products 15710 (The Chemical Daily, Issue 2010)
- 15) NITE (National Institute of Technology and Evaluation) GHS Classification Public Result
- 16) The Promotion of international Regulation and Measure for Chemical Substances (The research about GHS  
Classification of Specified Substance controlled by Law and candidate substance) Mitsubishi Techno-  
Research Corporation (2008, March)
- 17) "GHS Classification Guidance for Enterprises" Ministry of Economy, Trade, and Industry (March 2010)
- 18) "JIS Z 7252 (2009) Classification of Chemicals based on GHS" Japanese Standard Association (JIS)
- 19) "JIS Z 7250 (2010) Information and Items of Safety Data Sheet for Chemical Substance" Japanese Standard  
Association (JIS)
- 20) Notification of Ministry of Industrial , Subject Classification and Communication of Hazardous Substances  
(The government Gazette , Issue 2012)
- 21) Measurement of Odor Threshold by Triangle Odor Bag Method (2002) by Japan Environmental Sanitation  
Center



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22) U.S. Department of Health and Human Services(1988)

23) AN Safety Data Sheet , AsahiKASEI (2011)

### THE USE OF INFORMATION IN SDS :

This safety data sheet (SDS) has been created based on the latest available materials and data, and has been revised to reflect new information. The warning and cautions in this SDS assume normal usage. Special or unique usage of this product should be conducted according to appropriate safety measures. This SDS contains adequate warnings by our company, but we do not purport to guarantee all contents.

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