



Material Safety Data

Product Name : HEAVY RPG

긴급전화번호 (Emerhency Telephone Number)
061 - 688 - 6140 (주간, Day)
061 - 688 - 6284 (야간, Night)

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

1. Product

- ☐ Product Name : HEAVY RPG
- ☐ UN NO. : 1268

2. Advisable use and Restriction

- ☐ Advisable use : Raw material for manufacturing C9 petroleum resin
- ☐ Restriction : Do not handle until all safety precautions have been read and understood.

3. Manufacturer information

- ☐ Manufacture company : YEOCHUN NCC
- ☐ Address: 2 Yeosusandan-3ro(205-6,Pyeongyeo-dong), Yeosu, Jeollanam-Do, Korea (555-210)
- ☐ Telephone: 82-61-688-6140 (Day) / 82-61-688-6284 (Night)

2. HAZARD IDENTIFICATION

1. Hazard classification

- FLAMMABLE LIQUIDS Category 2
- ACUTE TOXICITY(Inhalation:Vapours) Category 4
- SKIN CORROSION/IRRITATION Category 2
- SERIOUS EYE DAMAGE/EYE IRRITATION Category 2
- CARCINOGENICITY Category 1A
- GERM CELL MUTAGENICITY Category 1B
- REPRODUCTIVE TOXICITY Category 2
- SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE Category 2
- SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE Category 3(Respiratory tract irritation)
- SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE Category 1
- ASPIRATION HAZARD Category 1
- ACUTE AQUATIC HAZARD Category 1
- LONG-TERM AQUATIC HAZARD Category 1

2. Allocation label elements

- ☐ Symbol



○ Signal Word : Danger

○ Hazard statements

H225 Highly flammable liquid and vapour.

H304 May be fatal if swallowed and enters airways.

H315 Causes skin irritation.

H319 Causes serious eye irritation.

H332 Harmful if inhaled.

H335 May cause respiratory irritation.

H340 May cause genetic defects.

H350 May cause cancer.

H361 Suspected of damaging fertility or the unborn child

H371 May causes damage to the respiratory, central nervous system, and hematopoietic system.

H372 Cause damage to organs (lung) through prolonged or repeated exposure.

H400 Very toxic to aquatic life.

H410 Very toxic to aquatic life with long lasting effects.

○ Precautionary statements

– Prevention

P201 Obtain special instructions before use.

P202 Do not handle until all safety precautions have been read and understood.

P210 Keep away from heat/sparks/open flames/hot surfaces. – No smoking.

P233 Keep container tightly closed.

P240 Ground/bond container and receiving equipment.

P241 Use explosion-proof electrical/ventilating/lighting/ equipment.

P242 Use only non-sparking tools.

P243 Take precautionary measures against static discharge.

P260 Do not breathe dust/fume/gas/mist/vapours/spray.

P261 Avoid breathing dust/fume/gas/mist/vapours/spray.

P264 Wash thoroughly after handling.

P270 Do not eat, drink or smoke when using this product.

P271 Use only outdoors or in a well-ventilated area.

P273 Avoid release to the environment.

P280 Wear protective gloves/protective clothing/eye protection/face protection.

– Response

P301 + P310 IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P302 + P352 IF ON SKIN: Wash with plenty of soap and water.

P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.

P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.

P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

P308 + P311 IF exposed or concerned: Call a poison center/doctor.

P308 + P313 IF exposed or concerned: Get medical advice/attention.
 P312 Call a POISON CENTER or doctor/physician if you feel unwell.
 P314 Get medical advice/attention if you feel unwell.
 P321 Specific treatment (see on this label).
 P331 Do not induce vomiting.
 P332 + P313 If skin irritation occurs: Get medical advice/attention.
 P337 + P313 If eye irritation persists: Get medical advice/attention.
 P362 + P364 Take off contaminated clothing and wash it before reuse.
 P370 + P378 In case of fire: Use alcohol foam, carbon dioxide or water spray for extinction.
 P391 Collect spillage.

– Storage

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
 P403 + P235 Store in a well-ventilated place. Keep cool.
 P405 Store locked up.

– Disposal

P501 Dispose of contents/container to (in accordance with local/ regional/ national/ international regulation)

3. Other hazard information not included in hazard classification (NFPA)

Chemical Name	NFPA Level		
	Health	Flammability	Reactivity
SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC	2	1	0
STYRENE	2	3	2
BENZENE	1	3	0
TOLUENE	2	3	0
XYLENE	2	3	0
ETHYLBENZENE	2	3	0

3. INGREDIENT INFORMATION

Components	Common name	CAS No.	PCT(W%)
SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC	SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC	64742-94-5	61 ~ 71
STYRENE	STYRENE	100-42-5	10 ~ 20
BENZENE	BENZENE	71-43-2	1 ~ 5
TOLUENE	TOLUENE	108-88-3	2 ~ 6
XYLENE	XYLENE	1330-20-7	5 ~ 13
ETHYLBENZENE	ETHYLBENZENE	100-41-4	1 ~ 5

4. FIRST AID MEASURES

1. Following eye contact

- Get medical aid immediately.
- In case of contact with material, immediately flush eyes with running water for at least 15 minutes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Seek immediate medical assistance.

2. Following skin contact

- For hot product, immediately immerse in or flush the affected area with large amounts of cold water to dissipate heat.
- For minor skin contact, avoid spreading material on unaffected skin.
- Get medical aid immediately.
- In case of burns, immediately cool affected skin for as long as possible with cold water. Do not remove clothing if adhering to skin.
- In case of contact with material, immediately flush skin with running water for at least 15 minutes.
- In case of contact with substance, immediately flush skin or eyes with running water for at least 20 minutes.
- Launder contaminated clothing and shoes before re-use.
- Remove and isolate contaminated clothing and shoes.
- Seek immediate medical assistance.
- Wash skin with soap and water.

3. Following inhalation

- Administer oxygen if breathing is difficult.
- Give artificial respiration if victim is not breathing.
- Keep victim warm and quiet.
- Move to fresh air.
- Seek immediate medical assistance.

4. Following ingestion

- Get medical aid immediately.
- If unconscious but breathing, never give anything by mouth.
- Seek immediate medical assistance.

5. Advice to physician

- Do not apply drugs of the adrenaline ephedrine group.
- Ensure that medical personnel are aware of the material(s) involved and take precautions to protect themselves.

5. FIRE FIGHTING MEASURES

1. Suitable/Unsuitable extinguishing media

- Suitable extinguishing media
 - CO₂.
 - Dry chemical.
 - For mixtures containing alcohol or polar solvent: Alcohol-resistant foam.
 - Regular foam.

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- Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.
 - Use dry sand or earth to smother fire.
 - Water spray.
 - Unsuitable extinguishing media
 - Direct water.
 - High-pressure water.
2. Specific hazards arising from the chemical
- Pyrolytic product
 - Can decompose at high temperatures forming toxic gases.
 - During a fire, irritating and highly toxic gases may be generated by thermal decomposition or combustion.
 - Risk of fire and explosion
 - Can form explosive mixtures at temperatures at or above the flashpoint.
 - Containers may explode when heated.
 - Fire may produce irritating and/or toxic gases.
 - Flammable liquid and vapour.
 - HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
 - May ignited from heat, friction or contamination.
 - May violently polymerize and result in fire and explosion.
 - Runoff may create fire or explosion hazard.
 - Some may burn but none ignite readily.
 - Vapor explosion hazard indoors, outdoors or in sewers.
 - Vapors may form explosive mixtures with air.
 - Vapors may travel to source of ignition and flash back.
 - When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.
3. Special protective equipment for firefighters
- Cautions : Most of liquids are lighter than water.
 - Contact may cause burns to skin and eyes.
 - Dike fire-control water for later disposal; do not scatter the material.
 - Evacuate area and fight fire from a safe distance.
 - Fire involving Tanks: ALWAYS stay away from tanks engulfed in fire.
 - Fire involving Tanks: Cool containers with flooding quantities of water until well after fire is out.
 - Fire involving Tanks: Fight fire from maximum distance or use unmanned hose holders or monitor nozzles.
 - Fire involving Tanks: For massive fire, use unmanned hose holders or monitor nozzles; if this is impossible, withdraw from area and let fire burn.
 - Fire involving Tanks: Withdraw immediately in case of rising sound from venting safety devices or discoloration of tank.
 - Most vapors are heavier than air. They will spread along ground and collect in low or confined areas (sewers, basements, tanks).
 - Move containers from fire area if you can do it without risk.
 - Rescuers should put on appropriate protective gear.
 - Runoff may cause pollution.
 - Substance may be transported hot.
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6. ACCIDENTAL RELEASE MEASURES

1. Health considerations and protective equipment

- A vapor suppressing foam may be used to reduce vapors.
- All equipment used when handling the product must be grounded.
- All equipment used when handling the product must be grounded.
- Clean up spills immediately, observing precautions in Protective Equipment section.
- Cover with plastic sheet to prevent spreading.
- Do not touch damaged containers or spilled material unless wearing appropriate protective clothing.
- Do not touch or walk through spilled material.
- ELIMINATE all ignition sources (no smoking, flares, sparks or flames in immediate area).
- Please note that materials and conditions to be avoided.
- Stop leak if you can do it without risk.
- The very fine particles can cause a fire or explosion, eliminate all ignition sources.
- Ventilate the contaminated area.

2. Environmental precautions

- Keep out of waterways.
- Prevent entry into waterways, sewers, basements or confined areas.

3. For cleaning up

- Absorb or cover with dry earth, sand or other non-combustible material and transfer to containers.
- Absorb spill with inert material (e.g., dry sand or earth), then place in a chemical waste container.
- Absorb the liquid and scrub the area with detergent and water.
- Dike and collect water used to fight fire.
- Large Spill: Dike far ahead of liquid spill for later disposal.
- Small Spill: Absorb with earth, sand or other non-combustible material and transfer to containers for later disposal.
- Small Spill: Flush area with flooding quantities of water.
- Use clean non-sparking tools to collect absorbed material.
- With clean shovel place material into clean, dry container and cover loosely; move containers from spill area.

7. HANDLING AND STORAGE

1. Precautions for safe handling

- Avoid any skin and eye contact when insert undiluted solution. Wash ... thoroughly after handling.
- Caution: Dangerous fire hazard when exposed to heat, or flame, sparks.
- Use adequate machine for prevention when package handling.
- Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)

2. Conditions for safe storage (including any incompatibilities)

- Choose a place that can be protected from strong oxidizers and acid.
- Drum Handling: Must work at safe place., Loading more than 3 stack is prohibited.
- Store containers: AVOID the place where can be damage and contamination.
- Store in a cool/low-temperature, well-ventilated {dry} place {away from heat and ignition sources}

8. EXPOSURE CONTROLS AND PERSONAL PROTECTION

1. Exposure exposure limits, Biological exposure standard :

Components	Occupational exposure	ACGIH	Biological standard
SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC	No data available	No data available	No data available
STYRENE	TWA : 20ppm STEL : 40ppm	TWA 20 ppm STEL 40 ppm	Mandelic acid + phenylglyoxylic acid 600 mg / g crea
BENZENE	TWA : 0.5ppm STEL : 2.5ppm	TWA 0.5 ppm STEL 2.5 ppm	Based on 1ppm. Muconic acid 1 mg / g crea
TOLUENE	TWA : 50ppm STEL : 150ppm	TWA 20 ppm	Humic acid 2.5 g / g crea
XYLENE	TWA : 100ppm STEL : 150ppm	TWA 100 ppm STEL 150 ppm	Urinary methyl methanoate 1.5 g / g creatinine (collected at the end of the work)
EHTYLBENZENE	TWA : 100ppm STEL : 125ppm	TWA 20 ppm	Sum of urinary mandelic acid and phenylglyoxylic acid 0.15 g / g creatinine (collected at the end of the work)

2. Appropriate engineering controls

- If user operations generate dust, fume, or mist, use ventilation to keep exposure to airborne contaminants below the exposure limit.
- Use adequate general or local exhaust ventilation to keep airborne concentrations below the permissible exposure limits.
- Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

3. Personal protection equipment

○ Respiratory protection

- If high frequency of use or exposure, wear air respirator.

○ Eye protection

- Facilities storing or utilizing this material should be equipped with an eyewash facility and a safety shower.
- Provide emergency showers and eyewash.
- Wear face shield to protect eyes from scattering dust or hazardous liquid.
- Wear suitable protective goggles and face shields.

○ Hand protection

- Wear Non-moisture permeable chemical resistance protective gloves(latex, nitrile rubber, PC) for prevent skin contact.
- Wear insulated gloves.

- Wear suitable protective gloves.
- Body protection
 - Wear suitable protective clothing.
 - When contact is likely wear chemical resistant, oil and grease resistant, non-moisture permeable shoes and clothes.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	Dark brown liquid
Odour	Solvents smell
Odour threshold	No data available
pH Values	N/A
Melting point/freezing point	-50℃
Initial boiling point and boiling range	80 ~ 220℃
Flash point	2℃
Evaporation rate	No data available
Flammability(solid, gas)	Flammable liquid
Upper/lower flammability or explosive limits	1.0 ~ 6.6 Vol %
Vapour pressure	Less than 1 kPa (25 °C)
Solubility(ies)	No data available
Vapor Densities	3.8 (Air = 1)
Relative density	0.93(60/60°F)
n-octanol/water partition coefficient	No data available
Auto ignition temperature	No data available
Decomposition temperature	No data available
Viscosity	1 cSt and above (20℃)
Molecular weight(mass)	109.8

10. STABILITY AND REACTIVITY

1. Stability and hazardous reactivity

- Can form explosive mixtures at temperatures at or above the flashpoint.
- Containers may explode when heated.
- Fire may produce irritating and/or toxic gases.
- Fire may produce irritating, corrosive and/or toxic gases.
- Flammable liquid and vapour.
- HIGHLY FLAMMABLE: Will be easily ignited by heat, sparks or flames.
- May cause toxic effects if inhaled.
- May violently polymerize and result in fire and explosion.
- When heated, vapors may form explosive mixtures with air: indoors, outdoors and sewers explosion hazards.

- Runoff may create fire or explosion hazard.
 - Some liquids produce vapors that may cause dizziness or suffocation.
 - Some may burn but none ignite readily.
 - Stable under normal temperatures and pressures.
 - Vapor explosion hazard indoors, outdoors or in sewers.
 - Vapors may form explosive mixtures with air.
2. Conditions to avoid
- Ignition source(heat, spark, flame, etc.).
3. Materials to avoid
- Combustibles, reducing material.
 - Irritating and/or toxic gas.
4. Hazardous decomposition products
- Corrosive/toxic fume.
 - Irritating, corrosive and/or toxic gas.

11. TOXICOLOGICAL INFORMATION

1. Exposure route information

- ☐ Oral, Dermal, Inhalation exposure is possible since Volatile liquid.

2. Health hazard information

- ※ No data of the product. thus data was described by the product component.

☐ Acute toxicity

● Oral PRODUCT : N/A (ATE mix > 2000 mg/kg)

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A / LD50 > 5000 mg/kg Rat
- STYRENE : N/A / LD50 5000 mg/kg Rat
- BENZENE : N/A / LD50 4700 mg/kg Mouse
- TOLUENE : N/A / LD50 5580 mg/kg Rat (EU Method B.1)
- XYLENE : N/A / LD50 3580 mg/kg Rat
- EHTYLBENZENE : N/A / LD50 3500 mg/kg Rat

● Dermal PRODUCT : N/A (ATE mix > 2000 mg/kg)

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A / LD50 > 2000 mg/kg Rabbit
- STYRENE : N/A / LD50 > 2000 mg/kg Rat
- BENZENE : N/A / LD50 > 8260 mg/kg Rat
- TOLUENE : N/A / LD50 > 5000 mg/kg Rabbit
- XYLENE : Category 4 / LD50 1100 mg/kg Rat
- EHTYLBENZENE : N/A / LD50 15400 mg/kg Rabbit

● Inhalation-Gases PRODUCT : N/A

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A
- STYRENE : N/A
- BENZENE : N/A
- TOLUENE : N/A
- XYLENE : N/A
- EHTYLBENZENE : N/A

● Inhalation-Vapours PRODUCT : Category 4 (ATE mix = 15.23 mg/L)

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
- STYRENE : Category 4 / LC50 11.8 mg/L/4h Rat
- BENZENE : N/A / LC50 44.5 mg/L/4h Rat
- TOLUENE : N/A / LC50 28.1 mg/L/4h Rat
- XYLENE : Category 4 / LC50 11 mg/L/4h Rat
- EHTYLBENZENE : Category 4 / LC50 17.8 mg/L/4h Rat
- Inhalation-Dust/mist PRODUCT : No data
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
 - STYRENE : N/A
 - BENZENE : N/A
 - TOLUENE : N/A
 - XYLENE : N/A
 - EHTYLBENZENE : N/A
- SKIN CORROSION/IRRITATION PRODUCT : Category 2
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A / Not irritating Rabbit
 - STYRENE : Category 2 / Irritating Rabbit
 - BENZENE : Category 2 / Normal Irritating 20mg/24h Rabbit, Weak Irritating 15mg/24h Rabbit
 - TOLUENE : Category 2 / Irritating Rabbit
 - XYLENE : Category 2 / Moderately irritating Rabbit
 - EHTYLBENZENE : Category 2 / Moderately irritating Rabbit
- SERIOUS EYE DAMAGE/EYE IRRITATION PRODUCT : Category 2
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A / Not irritating Rabbit
 - STYRENE : Category 2 / Irritating Rabbit
 - BENZENE : Category 2 / Normal Irritating 88mg Rabbit, Strong Irritating 2mg/24h Rabbit
 - TOLUENE : Category 2 / Irritating Rabbit
 - XYLENE : Category 2 / Moderately irritating Rabbit
 - EHTYLBENZENE : Category 2 / Slightly irritating Rabbit
- RESPIRATORY SENSITIZATION PRODUCT : No data
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
 - STYRENE : No data
 - BENZENE : No data
 - TOLUENE : No data
 - XYLENE : No data
 - EHTYLBENZENE : No data
- SKIN SENSITIZATION PRODUCT : N/A
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A / Not sensitising Guinea pig
 - STYRENE : N/A / Not sensitising Guinea pig
 - BENZENE : N/A / Not sensitising Guinea pig
 - TOLUENE : N/A / Not sensitising Guinea pig
 - XYLENE : N/A / Not sensitising(OECD TG 429) Mouse
 - EHTYLBENZENE : No data
- CARCINOGENICITY PRODUCT : Category 1A
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
 - OSHA : No data
 - Notice of Employment and Labor : No data

- NTP : No data
- IARC : No data
- EU CLP : No data
- ACGIH : No data
- STYRENE : Category 2 / 2
 - OSHA : No data
 - Notice of Employment and Labor : No data
 - NTP : No data
 - IARC : 2B
 - EU CLP : No data
 - ACGIH : A4
- BENZENE : Category 1A / 1A
 - OSHA : No data
 - Notice of Employment and Labor : No data
 - NTP : K
 - IARC : 1
 - EU CLP : 1A
 - ACGIH : A1
- TOLUENE : No data
 - OSHA : No data
 - Notice of Employment and Labor : No data
 - NTP : No data
 - IARC : 3
 - EU CLP : No data
 - ACGIH : A4
- XYLENE : No data
 - OSHA : No data
 - Notice of Employment and Labor : No data
 - NTP : No data
 - IARC : 3
 - EU CLP : No data
 - ACGIH : A4
- EHTYLBENZENE : Category 2 / 2
 - OSHA : No data
 - Notice of Employment and Labor : No data
 - NTP : No data
 - IARC : No data
 - EU CLP : No data
 - ACGIH : A3
- GERM CELL MUTAGENICITY PRODUCT : Category 1B
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A / Negative Mouse
 - STYRENE : Category 2 / Test results for returning stools using bacteria in test tubes (OECD TG 471) are positive
 - BENZENE : Category 1B / Positive Rat
 - TOLUENE : N/A / Negative Mouse lymphoma cells
 - XYLENE : N/A / Results of return stool test using bacteria in vitro : Negative (OECD TG 471)
 - EHTYLBENZENE : N/A / Results of genotoxicity test using Lymphoma L5178Y cell : Negative Mouse

○ REPRODUCTIVE TOXICITY PRODUCT : Category 2

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
- STYRENE : Category 2 / In pregnant hamsters, maternal toxicity, such as death, confusion, weight loss, etc., was observed at high concentrations on a single exposure for eight days.
- BENZENE : N/A / A one-generation reproduction study produced no evidence of toxicity, body weight, and/or altered reproductive performance. Rat
- TOLUENE : Category 2 / Embryonic developmental toxicity and hypnotic formation indicated.
- XYLENE : Category 2 / Suspected to cause damage to fetal or reproductive capacity.
- EHTYLBENZENE : N/A / Maternal toxicity was observed only at 1000 ppm, and included increased liver, kidney, and spleen weight changes Rat

○ SPECIFIC TARGET ORGAN TOXICITY SINGLE EXPOSURE PRODUCT : Category 2, Category 3(Respiratory tract irritation)

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
- STYRENE : Category 3(Respiratory tract irritation) / Respiratory system stimulation, central nervous system effects, lung stimulation. Target organs: central nervous system.
- BENZENE : Category 1 / In humans, skin irritation occurs, bronchitis, laryngitis, bronchitis, and massive bleeding from the lungs. ※ Target organ : Respiratory, central nervous system, hematopoietic system
- TOLUENE : Category 3(Narcotic effects) / Causes action on the central nervous system, fatigue, sleepiness, dizziness, irritation in the respiratory system, excitement, vomiting, suppression of the central nervous system, mental disorder, and walking abnormalities. Causes irritation in the eyes, nose, and throat. Causing anesthesia in experimental animals. Target organ: central nervous system.
- XYLENE : Category 3(Respiratory tract irritation), Category 3(Narcotic effects) / Reported dizziness in humans, significant awakening, progress, and anesthesia in experimental animals. Effects of mild irritation on the eyes and the palate and slight central nervous system when exposed to 100 ppm(442 mg/m³) in humans
- EHTYLBENZENE : Category 3(Respiratory tract irritation) / Causing the effects of the central nervous system and airway stimuli in experimental animals.

○ SPECIFIC TARGET ORGAN TOXICITY REPEATED EXPOSURE PRODUCT : Category 1

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
- STYRENE : Category 1 / The results of repeated oral toxicity test using a mouse show the effect on epithelial cells at the end of the trachea in three mice above "100 mg/kg bw/day", Significant increase in frequency of s-phrase cells in terminal trachea in 100 or 200 mg/kg group. (NOAEL=10 mg/kg bw/day)
- BENZENE : Category 1 / Repeat oral administration of BENZENE to rats is associated with adverse effects in the hematopoietic system. Rat
- TOLUENE : Category 2 / Affecting the central nervous system, liver, hearing, kidneys and lungs, etc.
- XYLENE : Category 2 / Prolonged or repeated exposure can cause damage to the central nervous system.
- EHTYLBENZENE : Category 2 / 13 weeks of repeated oral toxicity test using rats showed haematological changes, increased hepatic weight and changes in the hyperplasia of central lobe liver cell hypertrophy. NOAEL=75 mg/kg bw/day, OECD TG408, GLP, ECHA

○ ASPIRATION HAZARD PRODUCT : Category 1

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Category 1 / Aspiration of a petroleum distillate results in chemical pneumonitis. Human
- STYRENE : Category 1 / Aspiration of styrene into the lung can cause pulmonary edema and hemorrhage.

- BENZENE : Category 1 / The direct aspiration of liquid BENZENE into the lungs causes immediate pulmonary oedema and haemorrhage at the site of contact with the pulmonary tissue. Human
- TOLUENE : Category 1 / Acute renal failure and severe myocardial urinary tract are observed in humans due to inhalation.
- XYLENE : Category 1 / Light petroleum products such as xylene cause severe aspiration pneumonitis
- EHTYLBENZENE : Category 1 / If this liquid is swallowed, aspiration into the lungs may result in chemical pneumonitis.

12. ECOLOGICAL INFORMATION

1. Aquatic toxicity PRODUCT

- ACUTE AQUATIC HAZARD : Category 1, LONG-TERM AQUATIC HAZARD : Category 1

● Fish

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : LC50 45 mg/L/96h Fish(Pimephales promelas)
- STYRENE : LC50 10 mg/L/96h Fish(Pimephales promelas) (OECD Guideline 203, GLP)
- BENZENE : LC50 5.3 mg/L/96h Fish(Oncorhynchus mykiss)
- TOLUENE : LC50 5.5 mg/L/96h Fish(Oncorhynchus kisutch)
- XYLENE : LC50 2.6 mg/L/96h Fish (OECD Guideline 203)
- EHTYLBENZENE : LC50 5.1 mg/L/96h Fish

● Crustacea

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : EC50 0.95 mg/L/48h Aquatic invertebrates(Daphnia magna)
- STYRENE : EC50 4.7 mg/L/48h Aquatic invertebrates(Daphnia magna) (OECD TG 202, GLP)
- BENZENE : EC50 10 mg/L/48h Aquatic invertebrates(Daphnia magna)
- TOLUENE : LC50 3.78 mg/L Aquatic invertebrates(Ceriodaphnia dubia)
- XYLENE : LC50 3.6 mg/L/24h (OECD TG202)
- EHTYLBENZENE : EC50 1.8 ~ 2.4 mg/L/48h Mysidopsis bahia

● Aquatic algae

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : EC50 2.5 mg/L/72h Aquatic algae(Skeletonema costatum)
- STYRENE : EC50 4.9 mg/L/72h Aquatic algae(Selenastrum capricornutum) (EPA OTS 797.1050, GLP)
- BENZENE : EC50 32 mg/L/72h Aquatic algae(Selenastrum capricornutum)
- TOLUENE : EC50 29 mg/L/72h Aquatic algae(Selenastrum capricornutum)
- XYLENE : EC50 1.3 mg/L/48h (OECD TG201, GLP)
- EHTYLBENZENE : NOEL 0.96 mg/L/7d Ceriodaphnia dubia

2. Persistence and degradation

● Degradation

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
- STYRENE : No data
- BENZENE : Decomposed in anaerobic condition
- TOLUENE : Not adsorbed by sediment in the water system; evaporated or biodegradable. BOD: 80% (20 days)
- XYLENE : No data
- EHTYLBENZENE : No data

- n-octanol water partition coefficient

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : 2.9 ~ 6.1 log Kow
- STYRENE : 2.95 log Kow
- BENZENE : 2.13 log Kow
- TOLUENE : log Kow 2.73
- XYLENE : 3.15 log Kow
- EHTYLBENZENE : 3.15 log Kow

3. Bioaccumulative potential

- Bioaccumulation

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : 130 ~ 159
- STYRENE : 74
- BENZENE : 43.2 BCF ~ 5.88 BCF
- TOLUENE : BCF 90 Fish(*Leuciscus idus melanotus*)
- XYLENE : 25.9 (*Oncorhynchus mykiss*)
- EHTYLBENZENE : 1 (BCF)

- Biodegradation

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : 39 (%) 28 day
- STYRENE : 100 % 28 day (ISO DIS 9408 aerobic biodegradation test, GLP)
- BENZENE : 50 % 28 day (Decomposed in anaerobic condition)
- TOLUENE : 80 % 20 day
- XYLENE : 90 % 28 day (OECD TG301F, GLP)
- EHTYLBENZENE : 70 ~ 80 % 28 day (ISO 14593 CO2 headspace test, GLP)

4. Mobility in soil

- Soil adsorption coefficient(Koc)

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : No data
- STYRENE : 352 Koc
- BENZENE : 134.1 Koc (QSAR)
- TOLUENE : No data
- XYLENE : 537 Koc (log Koc=2.73)
- EHTYLBENZENE : (log koc= 2.41, measured)

5. Other adverse effects

- Hazardous to ozone layer

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : N/A
- STYRENE : N/A
- BENZENE : LONG-TERM AQUATIC HAZARD Category 2 / NOEC 0.8 mg/L/32h Fish(*Pimephales promelas*)
- TOLUENE : N/A
- XYLENE : N/A
- EHTYLBENZENE : N/A

- Others

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : LONG-TERM AQUATIC HAZARD Category 1
- STYRENE : No data
- BENZENE : LONG-TERM AQUATIC HAZARD Category 3

- TOLUENE : No data
- XYLENE : No data
- EHTYLBENZENE : LONG-TERM AQUATIC HAZARD Category 3

13. DISPOSAL CONSIDERATIONS

1. Disposal methods

- Separating oil and water / Burning oil components / remaining water is treated in the water pollution control facilities.
- Dispose of container and unused contents in accordance with all applicable regulations.

2. Precautions (including disposal of contaminated container of package)

- Do not allow spill material to enter sewers, storm water drains, soil, etc.
- Empty containers may explode and residues can be ignited when pressured, cut, weld, heated.
- Empty containers may rupture when pressured.
- Empty containers recycled under environmental laws.
- Wear an appropriate Personal protection. (See Exposure Controls/Personal Protection section.)

14. TRANSPORT INFORMATION

1. UN No : 1268

2. Proper shipping name : PETROLEUM DISTILLATES, N.O.S. or PETROLEUM PRODUCTS, N.O.S

3. Class or division : 3

4. Packing group : III

5. Marine pollutant : Established

6. Special safety response for transportation or transportation measure :

- ☐ Emergency measures in case of fire : F-E
- ☐ Emergency measures in the effluent : S-E

15. REGULATORY INFORMATION

● EU Classification (CLASSIFICATION) PRODUCT : Not established

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Xn; R65
- STYRENE : R10 Xn; R20 Xi; R36/38
- BENZENE : F; R11 Xi; R36/38 Carc.Cat.1; R45 Muta.Cat.2; R46 T; R48/23/24/25 Xn; R65
- TOLUENE : F; R11 Xi; R38 Xn; R48/20-65 Repr.Cat.3; R63 R67
- XYLENE : R10 Xn; R20/21 Xi; R38
- EHTYLBENZENE : F; R11 Xn; R20

● EU Classification (Risk Phrases) PRODUCT : Not established

- SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : R65
- STYRENE : R10, R20, R36/38
- BENZENE : R11, R36/38, R45, R46, R48/23/24/25, R65
- TOLUENE : R11, R38, R48/20-65, R63, R67
- XYLENE : R10, R20/21, R38
- EHTYLBENZENE : R11, R20

- EU Classification (Safety Phrases) PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : S:(2)-23-24-62
 - STYRENE : S:(2)-23
 - BENZENE : S:53-45
 - TOLUENE : S:(2)-36/37-46-62
 - XYLENE : S:(2)-25
 - EHTYLBENZENE : S:(2)-16-24/25-29
- 2006/507/EC PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Not established
 - STYRENE : Not established
 - BENZENE : Not established
 - TOLUENE : Not established
 - XYLENE : Not established
 - EHTYLBENZENE : Not established
- 689/2008/EC PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Not established
 - STYRENE : Not established
 - BENZENE : Severe restriction as an industrial chemical for public use (except motor fuels subject to Directive 98/70/EC)
 - TOLUENE : Not established
 - XYLENE : Not established
 - EHTYLBENZENE : Not established
- Designation, Reportable Quantities, and Notification PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Not established
 - STYRENE : 1000 lb final RQ; 454 kg final RQ
 - BENZENE : 10 lb final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule); 4.54 kg final RQ (received an adjusted RQ of 10 lbs based on potential carcinogenicity in an August 14, 1989 final rule)
 - TOLUENE : 1000 lb final RQ; 454 kg final RQ
 - XYLENE : 100 lb final RQ; 45.4 kg final RQ
 - EHTYLBENZENE : 1000 lb final RQ; 454 kg final RQ
- Emergency Planning and Notification PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Not established
 - STYRENE : Not established
 - BENZENE : Not established
 - TOLUENE : Not established
 - XYLENE : Not established
 - EHTYLBENZENE : Not established
- Toxic Chemical Release Reporting – Community Right-to-Know PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Not established
 - STYRENE : 0.1 % de minimis concentration
 - BENZENE : 0.1 % de minimis concentration
 - TOLUENE : 1.0 % de minimis concentration
 - XYLENE : 1.0 % de minimis concentration
 - EHTYLBENZENE : 0.1 % de minimis concentration

- Process Safety Management of Highly Hazardous Chemicals PRODUCT : Not established
 - SOLVENT NAPHTHA, PETROLEUM, HEAVY AROMATIC : Not established
 - STYRENE : Not established
 - BENZENE : Not established
 - TOLUENE : Not established
 - XYLENE : Not established
 - EHTYLBENZENE : Not established

16. OTHER INFORMATION

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4. Other

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.