tok TOKYO OHKA KOGYO CO., LTD.

MATERIAL SAFETY DATA SHEET

STRIPPER 104

1. PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: **STRIPPER 104**
CREATION DATE: August 8, 2000
REVISION DATE: January 1, 2006
MSDS PREPARED BY: Manufacturing Technology Division, Safety Control Section, TOK

JAPAN
SUPPLIER: TOKYO OHKA KOGYO CO., LTD.
SECTION: Manufacturing Technology Division, Safety Control Section
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USA
SUPPLIER: TOKYO OHKA KOGYO AMERICA, INC.
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EMERGENCY RESPONSE: +1-800-424-9300 (CHEMTREC for U.S.A.)
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2. COMPOSITION / INFORMATION ON INGREDIENTS

SIMPLE/MIXTURE: Mixture
CHEMICAL NAME (GENERIC NAME): None
SYNONYM (S): None
INGREDIENT AND COMPOSITION:

INGREDIENTS	wt%	CHEMICAL FORMULA	CAS NO.
Dimethylsulfoxide	60	$(CH_3)_2SO$	67-68-5
N-Methyl-2-pyrrolidone	40	C_5H_9NO	872-50-4

OSHA REGULATORY STATUS:
This material is classified as hazardous under OSHA regulations.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Colorless, combustible liquid with a characteristic odor.
Harmful by inhalation.
Irritating to eyes, respiratory system and skin.

POTENTIAL HEALTH EFFECTS:

SKIN CONTACT:

Contact causes skin irritation. Prolonged skin contact may cause cracking or other damages on skin (such as dermatitis).

EYE CONTACT:

Contact causes eye irritation.

INHALATION:

Causes irritation of the nose or the respiratory tract, and may cause headache, nausea, vomit, dizziness, or unconsciousness. It may also decrease the central nervous system function.

INGESTION:

May nauseate and causes pain in esophagus and stomach if swallowed.

4. FIRST AID MEASURES

SKIN CONTACT:

Wash the affected part with plenty of running water and mild soap.
If irritation continues, immediately take the patient to a physician for examination and treatment.

EYE CONTACT:

Immediately rinse the eyes with running water to wash off the chemical completely.
Immediately take the patient to a physician for examination and treatment.

INHALATION:

Move the patient at once to fresh air.
Immediately take the patient to a physician for examination and treatment.

INGESTION:

Rinse the mouth with water.
Immediately take the patient to a physician for examination and treatment.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES:

MATERIAL	FLASH POINT	IGNITON POINT	EXPLOSION LIMIT
Product	88℃	Not available	Not available
Dimethylsulfoxide	95℃	304℃	3.0~42.0 vol%
N-Methyl-2-pyrrolidone	95℃	346℃	1.0~11.8 vol%

EXTINGUISHING MEDIA:

Dry sand, foam, carbon dioxide, or dry chemical powder extinguisher.

FIRE FIGHTING INSTRUCTIONS:

Shut off fuel as much as possible.
Dry chemical or carbon dioxide should be used for small fires.
Evacuate unnecessary personnel to safe area.

Fire fighters should wear proper protective clothing.
Foam should be effective for large fires.
When sprayed, water should be effective for cooling and protection of the fire fighters. However, use of water may expand the fire.

6. ACCIDENTAL RELEASE MEASURES

Evacuate the leeward personnel.
Ventilate the area.
Quickly shut off all ignition sources.
Equip extinguishers in case of ignition.
Wear proper protective clothings.
When the leak is small, wipe it with cloths. Leave the cloth in the draft, and burn it off after solvent has evaporated.
When the leak is large, try to stop the flow with cloths, and collect the spilt solution in an empty container as much as possible.
Prevent spilt solution from entering sewers, watercourses, rivers, or fields.

7. HANDLING AND STORAGE

HANDLING:
Be careful in handling the container, and protect it from damages.
Wear proper protective clothings.
Use only in the well-ventilated area.
Seal the container after handling.
Avoid contact with oxidizing agents or reductants.
Shut off all sources of ignition.
The electric facility should be explosion proof.
Ground.
When moving the solution through pipings, ground the metallic part of the apparatuses, pipings and containers to prevent generation of electrostatic charges.
Pay attention to ventilation. This vapor is heavier than air, and easily stays at low position.
Do not use direct heater or immersion heater for heating, and watch out when fire is used.
Solution should not remain in piping when it is not used.
Water facility should be installed at every place where the solution is used. It should facilitate measures in case of adhesion or contact with eyes.
Do not bring contaminated protective tools, such as gloves, to the lounge.
Be careful of personal health after handling.

STORAGE:
Keep the container sealed, and store in a dark place. (See the original label on the container for our storage recommendation.)
Keep away all sources of ignition.
Do not overheat.
Do not let it evaporate without a reason.

Store in well-ventilated area.

OTHERS:

Follow all national and local regulations.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

ENGINEERING CONTROLS:

When handling, try to use closed apparatuses, equipment or partial ventilator.

PERSONAL PROTECTIVE EQUIPMENT:

RESPIRATORY PROTECTOR: Chemical cartridge respirator with cartridge to protect against the organic vapor.

Airline respirator.

EYE PROTECTOR: Chemical goggles.

HAND, SKIN AND BODY PROTECTOR: Gloves and clothing to cover the whole body.

EXPOSURE GUIDELINES:

INGREDIENTS	ACGIH TLV	OSHA PEL
Dimethylsulfoxide	None established	None established
N-Methyl-2-pyrrolidone	None established	None established

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless liquid

ODOR: Characteristic odor

SPECIFIC GRAVITY: 1.07 (d25@4)

BOILING POINT: Not available

SOLIDIFYING POINT: -2.0~-1.5°C

RELATIVE VAPOR DENSITY: Not available

SOLUBILITY IN WATER: Soluble

VAPOR PRESSURE: Not available

pH: Not available

10. STABILITY AND REACTIVITY

STABILITY: Stable at normal temperatures and pressure.

CONDITION TO AVOID: Avoid heat, flames, sparks and other sources of ignition.

MATERIALS TO AVOID: Oxidizing agents and reductants.

HAZARDOUS DECOPOSITION PRODUCTS: Emit carbon monoxide when burned with insufficient oxygen.

HAZARDOUS POLYMERIZATION: Will not polymerize.

11. TOXICOLOGICAL INFORMATION (Only data for each component is available.)

Dimethylsulfoxide

ACUTE TOXICITY:

Oral LD50 (rat): 14500 mg/kg
Oral LD50 (mouse): 7920 mg/kg
Intraperitoneal LD50 (rat): 8200 mg/kg
Intraperitoneal LD50 (mouse): 2500 mg/kg
Intravenous LD50 (rat): 5360 mg/kg
Intravenous LD50 (mouse): 3100 mg/kg

SUBCHRONIC TOXICITY AND CHRONIC TOXICITY:

Gavage rat (45 day) 5000 mg/kg/day caused a slight loss in body weight, liver cell necrosis and inflammation with irritation of the portal spaces.

MUTAGENIC EFFECT:

Salmonella typhimurium TA97, TA98, TA100, TA1535, TA1537, TA1538 with and without metabolic activation negative.

CARCINOGENIC EFFECT:

No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.

TERATOGENIC EFFECT:

Intraperitoneal rat 10 g/kg/day on days 6-12 of gestation caused development effects to the central nervous system and musculoskeletal system, including anencephalia, malformed limbs and celosomia.

Intraperitoneal mouse, lowest toxic dose 5500 mg/kg on day 10 of gestation caused developmental effects to the musculo-skeletal system.

N-methyl-2-pyrrolidone

ACUTE TOXICITY:

Oral LD50 (rat): 3914 mg/kg
Oral LD50 (mouse): 5130 mg/kg
Intraperitoneal LD50 (rat): 2472 mg/kg
Intraperitoneal LD50 (mouse): 3050 mg/kg
Skin LD50 (rabbit): 8000 mg/kg
Intravenous LD50 (rat): 80500 ug/kg
Intravenous LD50 (mouse): 54500 ug/kg

SUBCHRONIC TOXICITY AND CHRONIC TOXICITY:

Rats were exposed at concentrations of 0.0 to 1.0 mg/l N-methyl-2-pyrrolidone for 6 hours/day for 4 weeks. At 1.0 mg/l, rats exhibited lethargy, respiratory difficulty, and excessive mortality. Rats in this group were found to have pneumonia, bone marrow hypoplasia, and atrophy of lymph tissue. Surviving rats were able to reverse the lesions following two weeks of recovery. At doses of 0.1 mg/l and 0.5 mg/l, the animals did not exhibit any abnormalities.

MUTAGENIC EFFECT:

The mutation test was performed microorganisms. No mutagenic activity was observed with N-methyl-2-pyrrolidone.

CARCINOGENIC EFFECT:

No carcinogenic effects were noted in OSHA, EPA, EU, NTP, IARC, and ACGIH.

TERATOGENIC EFFECT:

Dermal dosage to pregnant rats at 75, 237, and 270 mg/kg/day, during days 6 to 15 of gestation resulted in maternal toxicity at the highest dose. This level of exposure resulted in fewer live

fetuses, increase in resorption sites, and skeletal abnormalities in the fetuses. At lower doses, no maternal or embryonic effects were noted.
Group of rats were exposed to 0.1, or 0.36 mg/l of N-methyl-2-pyrrolidone for 6 hours a day on days 6 through 15 of gestation. Maternal toxicity, neither clinical symptom nor pathological damage, was observed except for sporadical lethargy and irregular respiration found in some rats on first three days of exposure. No fetal aberration was observed in organs and skeletons.

12. ECOLOGICAL INFORMATION (Only data for each component is available.)

Dimethylsulfoxide
BIODEGRADABILITY: Lower or Not Biodegradable.
FISH TOXICITY:
Exposure of coho salmon to 1% v/v solution for 100 day caused no adverse effects.
OTHER INFORMATION ON ECOTOXICITY
Octanol/Water Partition Coefficient: -2.03
BOD: No relevant information found.
COD: No relevant information found.

N-methyl-2-pyrrolidone
BIODEGRADABILITY: Biodegradable
FISH TOXICITY:
LC50 (Bluegill sunfish): 832 mg/l
LC50 (Trout): 3048 mg/l
OTHER INFORMATION ON ECOTOXICITY
Octanol/Water Partition Coefficient: No relevant information found.
BOD: BOD_5 1300 ppm (0.1 wt% solution)
COD: COD_{Mn} 340 ppm (0.1 wt% solution)

13. DISPOSAL CONSIDERATIONS

All excess material must be collected and transferred to a professional waste disposal company for incineration.
Carefully review information in - **7.HANDLING & STORAGE**.
Comply with all national and local regulations.

14. TRANSPORT INFORMATION

U.S. Department of Transportation (DOT):
PROPER SHIPPING NAME: Combustible liquid, n.o.s.
HAZARD CLASS: Combustible Liquids
IDENTIFICATION NUMBER: NA1993
PACKING GROUP: III
Keep away from incompatibilities and all sources of ignition.
Follow all national and local regulations.

15. REGULATORY INFORMATION

U.S. REGULATION:

TSCA (Toxic Substances Control Act):

Each individual component of the subject product is listed on TSCA Inventory of Existing Chemical Substances.

CERCLA (Comprehensive Emergency Response, Compensation, and Liability Act):

HAZARDOUS SUBSTANCES: Not regulated

SARA TITLE III (Superfund Amendments and Reauthorization Act):

SECTION 302 EXTREMELY HAZARDOUS SUBSTANCES: Not regulated

SECTION 311/312 HAZARD CATEGORIES:

Acute: Yes

Chronic: No

Fire: Yes

Reactive: No

Sudden release: No

SECTION 313 TOXIC CHEMICALS: N-Methyl-2-pyrrolidone

STATE REGULATIONS:

CALIFORNIA PROPOSITION 65:

Known to the state of California to cause the following:

N-Methyl-2-pyrrolidone / Developmental toxicity (June 15, 2001)

16. OTHER INFORMATION

NFPA RATINGS:

HEALTH=2, FIRE=2, REACTIVITY=0 (SCALE 0-4)

MSDS STATUS:

Revised Section 1.

REFERENCE:

1. HSDB
2. RTECS
3. The Dictionary of Substance and Their Effects (The Royal Society of Chemistry)
4. Material Safety Data Sheet (of the raw material manufacturer)