1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Name: MS-727
ODC-Free Heavy Duty Solvent & Flux Remover

Product Use: Cleaning Solvent & Flux Remover for electronic assemblies.

MANUFACTURER/DISTRIBUTOR:

Miller-Stephenson Chemical
55 Backus Ave
Danbury, Conn. 06810 USA
(203) 743-4447

Emergency Phone Number:
(800) 424-9300

2. HAZARDS IDENTIFICATION

Hazard classification
Serious Eye Damage/Irritation: Category 2A.
Specific Target Organ Toxicity (central nervous system): Category 3.

Label elements:
Signal word
Warning

Pictogram

Hazard Statements
Causes serious eye irritation.
May cause drowsiness and dizziness

Prevention Statements
Avoid breathing dust/fume/gas/mist/vapors/spray.
Wash thoroughly after handling.
Use only in a well-ventilated area.
Wear eye protection, protective clothing and protective gloves
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.
Call a POISON CENTER or doctor/physician if you feel unwell.
Store in a well-ventilated place. Keep container tightly closed.
Dispose of contents/ container to an approved waste disposal plant.

Other Hazards
Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Exposure may aggravate those with pre-existing eye, skin or respiratory conditions. Prolonged skin contact may defat the skin and produce dermatitis. Upon thermal decomposition, this material produces extremely toxic vapors, gases and particulates. Misuse or intentional inhalation abuse may lead to death without warning.

3. INGREDIENTS

Material (s)	CAS No.	Approximate %
Isopropyl Alcohol	67-63-0	10 – 15
1,2-Trans-dichloroethylene	156-60-5	40 – 45
Methyl Nonafluorobutyl Ether	163702-07-6	8 – 35
Methyl Nonafluoroisobutyl Ether	163702-08-7	8 – 35

4. FIRST AID MEASURES

Inhalation: Remove patient to fresh air. If not breathing, give artificial respiration. Give oxygen as necessary, if qualified personnel is available. Get medical attention if necessary.

Eye: Flush with large amounts of water for at least 15 minutes, lifting eyelids until no evidence of the chemical remains. Get medical attention. Remove contact lenses, if present and easy to do. Continue to rinse.

Skin: Wash skin with plenty of water for at least 15 minutes. Wash contaminated clothing before use. Get medical attention if necessary.

Oral: Do not induce vomiting without medical advice. Never give anything by mouth to an unconscious person. Call a physician.

Most important symptoms/effects, acute and delayed: Causes serious eye irritation. May cause skin irritation. Repeated exposure may cause skin dryness and cracking.

5. FIRE FIGHTING MEASURES

Flash Point: None **Method:** TCC

Suitable Extinguishing Media: Alcohol resistant foam, Dry chemical, Carbon dioxide (CO2)

Unsuitable extinguishing media: Do not use a heavy water stream. Use of heavy stream of water may spread fire.

Special hazards: The product is not flammable but may burn at high temperatures. Product is not explosive. Hazardous decomposition can occur when exposed to extreme heat. Hazardous decompositions products are Carbon monoxide and Carbon dioxide.

Special Fire Fighting Instruction: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Exposure to decomposition products may be a hazard to health.

Further information: Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Evacuate personnel to safe areas. Cool containers/tanks with water spray or fog. Do not allow run-off from the fire-fighting to enter drains or water sources. Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

6. ACCIDENTAL RELEASE MEASURES

Safeguards (Personnel): Evacuate personnel to safe area. Ventilate area, especially low or enclosed places where heavy vapors might collect. If using mechanical ventilation to disperse the vapors: Warning! The motor could be an ignition source and cause flammable gases or vapors in the spill area to burn. In case of insufficient ventilation, wear suitable respiratory equipment. Use appropriate personal protection equipment.

Environmental precautions: Prevent material from entering sewers, waterways, or low areas. Should not be released into the environment. Do not allow contact with soil, surface or ground water.

Spill Cleanup: Contain spillage, and then collect with inert material, (e.g. sand, earth, diatomaceous earth, vermiculite) and place in container for disposal according to local / national regulations.

7. HANDLING AND STORAGE

Handling: Use in a well-ventilated area to avoid breathing vapors. Vapors are heavier than air and accumulate in low areas. Use only with adequate ventilation. Use appropriate respiratory protection when ventilations is inadequate. When using do not eat, drink, or smoke. Avoid contact with skin, eyes or clothing. Wash thoroughly after handling. Avoid release to the environment.

Storage Conditions: Store tightly sealed in a clean, dry place, and well ventilated place. Do not store in temperatures that exceed 125^{O}F/52^{O}C. Avoid strong acids, strong bases and strong oxidizers.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Exposure Limits:	TWA (ACGIH)	TWA (OSHA)	TWA (AIHA)
Isopropyl Alcohol	200 ppm	400 ppm	
1,2-Trans-Dichoroethylene	200 ppm	200 ppm	
Methyl Nonafluorobutyl Ether	Not Established	Not Established	750ppm
Methyl Nonafluoroisobutyl Ether	Not Established	Not Established	750 ppm

Respiratory Protection: Avoid breathing vapors, mists or spray. Use with sufficient ventilation especially for enclosed or low places. Vapors are heavier than air and can cause suffocation by reducing oxygen. In poorly ventilated areas, use an approved self-contained breathing apparatus.

Eye Protection: Avoid eye contact. Use chemical goggles or safety glasses with side shields.

Skin Protection: Avoid contact with skin. Use gloves impervious to this material when prolonged or frequently repeated contact occurs.

9. PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 113^{O}F/45^{O}C

Density: 1.22 gm/cc at 70^{O}F/21^{O}C

Vapor Density (Air=1): >1

pH Information: Neutral

Form: Liquid

Color: Clear-Colorless

Percent Volatile by Volume: 100%

Vapor Pressure: 450 mmHg

Solubility in H_2O: Slight

Evaporation Rate (CC14=1): N.A.

Appearance: Clear

Odor: Slight alcohol odor

10. STABILITY AND REACTIVITY

Stability: Stable at normal temperatures and storage conditions.

Chemical stability: No decomposition if stored and applied as directed.

Possibility of hazardous reactions: Hazardous polymerization will not occur.

Material and Conditions to Avoid: Direct sunlight. Extremely high and low temperatures. Strong acids, Strong bases and Strong oxidizers.

Decomposition: This product can be decomposed by high temperatures (flame, glowing metal surfaces, etc.) forming Hydrogen Fluoride, Hydrogen Chloride, Perfluoroisobutylene (PFIB), Toxic vapors and gases.

11. TOXICOLOGICAL INFORMATION

Animal Data

Methyl Nonafluorobutyl Ether

Acute Toxicity
Ingestion: LD50 > 5,000 mg/kg, Rat
Inhalation: LC50 > 1,000 mg/l, 4 h, Rat

Skin Corrosion/Irritation: No significant irritation in Rabbits
Serious Eye Damage/Irritation: No significant irritation in Rabbits
Sensitization Skin: Not sensitizing in Guinea pigs
Sensitization Respiratory: Data not available or insufficient for classification
Germ Cell Mutagenicity: In vitro and In vivo – Not Mutagenic
Carcinogenicity: Data not available or insufficient for classification
Reproductive and/or Developmental Toxicity: Not toxic to female or male reproduction in rats. Some positive developmental data exist, but the data are not sufficient for classification.
Repeated Dose Toxicity: In Rats, some positive data exists, on the following organs: Liver, bone, nails and/or hair and Endocrine System, but not sufficient for classification.
Single Dose Toxicity: In Dogs, some positive data exists on the nervous system, but not sufficient for classification.
Aspiration Hazard: Not an aspiration hazard

Methyl Nonafluoroisobutyl Ether

Acute Toxicity
Ingestion: LD50 > 5,000 mg/kg, Rat
Inhalation: LC50 > 1,000 mg/l, 4 h, Rat

Skin Corrosion/Irritation: No significant irritation in Rabbits
Serious Eye Damage/Irritation: No significant irritation in Rabbits
Sensitization Skin: Not sensitizing in Guinea pigs
Sensitization Respiratory: Data not available or insufficient for classification
Germ Cell Mutagenicity: In vitro and In vivo - Not Mutagenic
Carcinogenicity: Data not available or insufficient for classification
Reproductive and/or Developmental Toxicity: Not toxic to female or male reproduction in rats. Some positive developmental data exist, but the data are not sufficient for classification.
Repeated Dose Toxicity: In Rats, some positive data exists, on the following organs: Liver, bone, nails and/or hair and Endocrine System, but not sufficient for classification.
Single Dose Toxicity: In Dogs, some positive data exists on the nervous system, but not sufficient for classification.
Aspiration Hazard: Not an aspiration hazard

Trans-1,2-Dichloroethylene

Oral: LD50: 7902 mg/kg in rats
Dermal: LD50: > 5,000 mg/kg in rabbits
Inhalation: 4 hour LC50: 95.6 mg/l in rats
Target Organs: Central nervous system depression
Skin Corrosion/Irritation: Minimal irritation in Rabbits
Serious Eye Damage/Irritation: Moderate irritation in Rabbits
Sensitization Skin: Data not available or insufficient for classification
Sensitization Respiratory: Data not available or insufficient for classification
Germ Cell Mutagenicity: In vitro and In vivo - Not Mutagenic
Carcinogenicity: Data not available or insufficient for classification
Reproductive and/or Developmental Toxicity: Not toxic to female or male reproduction in rats. Some positive developmental data exist, but the data are not sufficient for classification.
Repeated Dose Toxicity: In Rats, some positive data exists, on the following organs: kidney and/or bladder, blood and liver, but not sufficient for classification.
Single Dose Toxicity: In Human, some positive data exists causing central nervous system depression and respiratory irritation, but not sufficient for classification.
Aspiration Hazard: Not an aspiration hazard

Isopropyl Alcohol

Acute Toxicity
Ingestion: LD50, Rat 4,700 - 5,800 mg/kg. Approximate. Lethal Dose, Human 100 ml
Skin Absorption
LD50, Rabbit 13,000 mg/kg
Inhalation
LC50, 8 h, Vapor, Rat, female 19,000 ppm
Sensitization Skin
Did not demonstrate the potential for contact allergy in mice.
Repeated Dose Toxicity
In animals, effects have been reported on the following organs: Liver. Kidney. Kidney effects have been observed in male rats. These effects are believed to be species specific and unlikely to occur in humans. Observations in animals include: Lethargy.
Chronic Toxicity and Carcinogenicity Inhalation:
Did not cause cancer in laboratory animals.
Developmental Toxicity
Isopropanol has been toxic to the fetus in laboratory animals at doses toxic to the mother.
Reproductive Toxicity
In animal studies, did not interfere with reproduction.
Genetic Toxicology
In vitro genetic toxicity studies were negative. Animal genetic toxicity studies were negative

12. ECOLOGICAL INFORMATION

Aquatic Toxicity:

Methyl Nonafluorobutyl Ether
Methyl Nonafluoroisobutyl Ether

Test Organism	Test Type	Result
Fathead Minnow (Pimephales promelas)	96 hours LC 50	> 7.9 mg/L
Green algae (Selenastrum capricornutum)	96 hours Inhibitory Conc. 50%	> 8.9 mg/L
Water flea (Daphnia magna)	48 hours Effect Conc. 50%	>10 mg/L

Trans-1,2-Dichloroethylene

96 hour LC50 in bluegill sunfish: 74 mg/l
48 hour LC50 in Daphnia magna: 79mg/l
96 hour EC50 in green algae: 798mg/l

Isopropyl Alcohol

Material is practically non-toxic to aquatic organisms on an acute basis (LC50/EC50/EL50/LL50 >100 mg/L in the most sensitive species tested).
Fish Acute & Prolonged Toxicity
LC50, fathead minnow (Pimephales promelas), flow-through, 96 h: 9,640 - 10,400 mg/l
Aquatic Invertebrate Acute Toxicity
EC50, water flea Daphnia magna, 48 h, immobilization: 7,550 - 13,299 mg/l
Aquatic Plant Toxicity
EC50, alga Scenedesmus sp., Growth rate inhibition, 72 h: > 1,000 mg/l
Toxicity to Micro-organisms
EC50; activated sludge, respiration inhibition: > 1,000 mg/l

13. DISPOSAL CONSIDERATIONS

If recycling is not practicable, dispose of in compliance with local regulations. Remove to a permitted waste disposal facility. The product should not be allowed to enter drains, water courses or the soil.

14. TRANSPORT INFORMATION

U.S. DOT
Not Regulated

IATA
Not Regulated

IMDG
Not Regulated

15. REGULATORY INFORMATION

U.S. Federal Regulations

TSCA: All ingredients are listed in TSCA inventory.

16. OTHER INFORMATION

NPCA-HMIS Ratings:

Health	- 2
Flammability	- 1
Reactivity	- 0

Personal Protective rating to be supplied by user depending on the conditions

FOR INDUSTRIAL USE ONLY

REVISION DATE: APRIL 2015