



1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

Name: MS-797
Vertrel XMS Plus
Heavy Duty Solvent & Flux Remover
DPMS V0201B

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

Acute toxicity (Oral): Category 4
Serious Eye Damage/Irritation: Category 2B.
Specific Target Organ Toxicity (single exposure): Category 1
Specific Target Organ Toxicity (single exposure): Category 3

Label elements:

Signal word
Danger

Pictograms



Hazard Statements

Harmful if swallowed.
Causes eye irritation.
May cause respiratory irritation.
May cause drowsiness or dizziness.
Causes damage to organs (Central nervous system, Eyes)

Precautionary Statements

Avoid breathing dust/fume/gas/mist/vapors/spray.

Wash skin thoroughly after handling.

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

Use in a well-ventilated area.

IF SWALLOWED: Call a POISON CENTER or doctor/ physician if you feel unwell.

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

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

IF exposed: Call a POISON CENTER or doctor/ physician.

Rinse mouth.

If eye irritation persists: Get medical advice/ attention.

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. Prolonged skin contact may defat the skin and produce dermatitis. Effects of breathing high concentrations of vapor may include: May cause cardiac arrhythmia. Misuse or intentional inhalation abuse may lead to death without warning.

3. INGREDIENTS

<u>Material (s)</u>	<u>CAS No.</u>	<u>Approximate %</u>
1,1,1,2,2,3,4,5,5,5-Decafluoropentane(HFC-43-10mee)	138495-42-8	49 - 52
Trans,1,2-Dichloroethylene	156-60-5	42 - 44
Methanol	67-56-1	3 - 5
Cyclopentane	287-92-3	1 - 3
Nitromethane	75-52-5	0.05 - 0.15

4. FIRST AID MEASURES

Inhalation: Remove patient to fresh air, lie down. Keep patient warm and at rest. 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 warm water after contact. 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. Give 2 glasses of water. If vomiting occurs, lean victim forward to reduce the risk of aspiration. Call a physician.

Most important symptoms/effects, acute and delayed: Dizziness

Notes to Physician: Do not give adrenaline or similar drugs. Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with special caution.

5. FIRE FIGHTING MEASURES

Flammability: This product is not flammable. Does not flash using ASTM D 93.

Upper Explosion limit, % by Vol.: no data available **Lower Explosion limit, % by Vol.:** 5.0%

Suitable Extinguishing Media: Water spray, Water mist, Dry chemical, Carbon dioxide (CO₂)

Unsuitable extinguishing media: No applicable data available.

Special hazards: Fire or intense heat may cause violent rupture of packages. The product is not flammable. Vapors may form flammable mixture with air. Hazardous combustion products: Hydrogen fluoride Fluorinated hydrocarbons Carbonyl fluoride Carbon oxides Hydrogen chloride

Special Fire Fighting Instruction: In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment. Wear neoprene gloves during cleaning up work after a fire. 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. 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. In case of insufficient ventilation, wear suitable respiratory equipment.

Environmental precautions: If containers rupture, 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 non-combustible absorbent 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.

Storage Conditions: Store tightly sealed in a clean, dry place, and well ventilated place. Do not store in temperatures that exceed 125°F/52°C, because the containers could leak or rupture from pressure and expansion. Protect from freezing temperatures. If solvent is stored below -10°C (14°F), mix prior to use

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

<u>Exposure Limits:</u>	<u>TLV (ACGIH)</u>	<u>PEL (OSHA)</u>	<u>AEL (DuPont)</u>
1,1,1,2,2,3,4,5,5,5-Decafluoropentane	Not Established	Not Established	200 ppm, 8 & 12 Hr. TWA 400 ppm, Ceiling
Trans,1,2-Dichloroethylene	200 ppm, TWA	200 ppm, 8 Hr. TWA	200 ppm, 8 & 12 Hr. TWA
Methanol	200 ppm, TWA	200 ppm, 8 Hr. TWA	200 ppm, 8 & 12 Hr. TWA, Skin
Cyclopentane	600 ppm, TWA	600 ppm, 8 Hr. TWA	600 ppm, 8 & 12 Hr. TWA
Nitromethane	20 ppm, TWA	100 ppm, 8 Hr. TWA	10 ppm, 8 & 12 Hr. TWA

* AEL is DuPont's Acceptable Exposure Limit. Where governmentally imposed occupational exposure limits which is lower than the AEL are in effect, such limits shall take precedence.

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: 100°F/38°C

Percent Volatile by Volume: 100

Density: 1.34 g/cc @ 77°F/25°C

Vapor Pressure: 477 mmHg @ 77°F/25°C

Vapor Density (Air=1): 4.3

Solubility in H₂O: 15 g/l

pH Information: Neutral

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

Form: Liquid

Appearance: Clear & Colorless

Color: Colorless

Odor: Ether-like

10. STABILITY AND REACTIVITY

Stability: Stable at normal temperatures and storage conditions.

Chemical stability: Product is chemically stable. No decomposition if stored and applied as directed.

Possibility of hazardous reactions: No applicable data available.

Material and Conditions to Avoid: Open flames and high temperatures. Alkali or alkaline earth metals. Powder metals. Powdered metal salts, Nitrogen oxides (NO_x), Acids, bases and strong oxidizing agents, Oxygen.

Decomposition: This product can be decomposed by high temperatures (flame, glowing metal surfaces, etc.) forming Fluorinated hydrocarbons, Hydrogen fluoride, Carbon dioxide, Carbon monoxide, Hydrogen chloride gas, Carbonyl fluoride.

11. TOXICOLOGICAL INFORMATION

Animal Data

1,1,1,2,2,3,4,5,5,5-Decafluoropentane (HFC-43-10mee)

Inhalation: 4 hour LC50: 114mg/l in rats, Central nervous system effects, Convulsions

Oral: LD50: > 5,000 mg/kg in rats

Dermal: LD50: > 5,000 mg/kg in rabbits

Skin Irritation: No skin irritation, rabbit

Eye Irritation: No eye irritation, rabbit

Skin Sensitization: Did not cause sensitization on laboratory animals., guinea pig

Repeated dose toxicity: Inhalation, rat

No toxicologically significant effects were found.

Mutagenicity: Animal testing showed no mutagenic effects.

Reproductive toxicity: Animal testing showed no reproductive toxicity.

Teratogenicity: Animal testing showed no developmental toxicity.

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

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

Methanol

Inhalation Acute toxicity: 3mg/l, animals (unspecified species)

Target Organs: Central nervous system, Eye, Central nervous system effects, narcosis, eye effects.

Dermal Acute toxicity: 300 mg/kg in rabbits (unspecified species)

Target Organs: Central nervous system, Eye, Central nervous system effects, narcosis, eye effects.

Oral Acute Toxicity: 100 mg/kg, animals (unspecified species)

Target Organs: Central nervous system, Eye, Central nervous system effects: narcosis, eye effects

Skin irritation: Slight or no irritation, Rabbit

Eye irritation: Slight irritation, Rabbit

Skin sensitization: Did not cause sensitization on laboratory animals, Guinea pig

Carcinogenicity: Not classifiable as a human carcinogen. Overall weight evidence indicates that the substance is not carcinogenic.

Mutagenicity: Animal testing did not show any mutagenic effects.

Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Overall weight of evidence indicates that the substance is not mutagenic.

Did not cause genetic damage in animals.

Genetic damage in cultured mammalian cells was observed in some laboratory tests but not in others.

Genetic damage in cultured bacterial cells was observed in some laboratory tests but not in others.

Reproductive Toxicity: No toxicity or reproduction. Evidence suggests the substance is not a reproductive toxin in animals.

Teratogenicity: Evidence suggests the substance is not a developmental toxin in animals.

Cyclopentane

Oral: LD50: >5,000mg/kg, rat

Skin Sensitization: Did not cause sensitization on laboratory animals., guinea pig

Repeated dose toxicity: Inhalation, rat, vapor

No toxicologically significant effects were found.

Mutagenicity: Tests on bacterial or mammalian cell cultures did not show mutagenic effects. Animal testing showed no mutagenic effects.

Reproductive toxicity: Animal testing showed no reproductive toxicity.

Teratogenicity: Animal testing showed no developmental toxicity.

Nitromethane

Dermal: LD50: > 2,000 mg/kg , rabbit

Oral: LD50: 1,210 mg/kg , rat

Inhalation: 4 h Acute toxicity (estimate): 14.9 mg/l , rat

Target Organs: Respiratory system, Central nervous system

Vapor: Respiratory effects, Bloody nasal discharge, Central nervous system effects, Lethargy, Convulsions

Skin irritation: No skin irritation, rabbit

Eye irritation: Mild eye irritation, rabbit

Skin sensitization: Does not cause skin sensitisation., multiple species

Repeated dose toxicity: Inhalation., multiple species

Target Organs: Blood, Thyroid, Respiratory system, altered hematology, altered blood chemistry, Thyroid effects, Respiratory effects

Carcinogenicity: Suspected human carcinogens.

Mutagenicity: Animal testing did not show any mutagenic effects.

Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Reproductive toxicity: Suspected human reproductive toxicant.

Experiments have shown reproductive toxicity effects in male and female laboratory animals.

Abnormal sperm. Abnormal oestrus cycle.

12. ECOLOGICAL INFORMATION

HFC-43-10mee:

96 hour LC50 in fathead minnows: 27.2 mg/l

96 hour LC50 in rainbow trout: 13.9 mg/l

48 hour LC50 in Daphnia magna: 11.7 mg/l

72 hour EC50 in green algae: > 120 mg/l

Trans-1,2-Dichloroethylene

96 hour LC50 in bluegill sunfish: 74 mg/l

48 hour LC50 in Daphnia magna: 79 mg/l

96 hour EC50 in green algae: 798 mg/l

Methanol

96 hour LC50 – Flathead minnow: 28,100 mg/l

48 hour EC50 – Daphnia (water flea): > 10,000 mg/l

96 hour LC50 – Green algae (Selenastrum carpicornutum): 22,000 mg/l

Cyclopentane

96 hour LC50 in rainbow trout: 4.26 mg/l

72 hour EC50 in fresh water algae: 10.7 mg/l

48 hour EC50 in Daphnia magna (water flea): 2.3 mg/l

Nitromethane:

96 hour LC50 in fathead minnows: 1710 mg/L
48 hour LC50 in Daphnia magna (green algae): 100 mg/L
72 hour EC50 in green algae: 36 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.

1,1,1,2,2,3,4,5,5-DECAFLUOROPENTANE (CAS# 138495-42-8) is controlled by TSCA Section 5, Significant New Use Rule (SNUR; 40 CFR 721.5645) The approved uses are: precision and general cleaning, carrier fluid, displacement drying, printed circuit board cleaning, particulate removal, film cleaning, process medium, heat transfer fluid (dielectric and non-dielectric), and test fluid. Processors and users of this substance must also comply with the applicable general SNUR requirements set forth in 40 CFR 721 subpart A, including export notification requirements if applicable (40 CFR 721.20), and the applicable record keeping requirements set forth at 40 CFR 721.125.

SARA 313 Regulated Chemicals: Trans-dichloroethylene, Methanol

State Regulations (U.S.)

California Proposition 65: This product contains chemicals known to the State of California to cause cancer and/or birth defects or other reproductive harm.

16. OTHER INFORMATION

NPCA-HMIS Ratings:

Health - 2
Flammability - 1
Reactivity - 1

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

FOR INDUSTRIAL USE ONLY

REVISION DATE: MARCH 2015

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. Final determination of suitability of any material is the sole responsibility of the user.