## 1. CHEMICAL PRODUCT/COMPANY IDENTIFICATION

**Name:** MS-772
Vertrel MCA Plus
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 2B.
Specific Target Organ Toxicity (single exposure): Category 3.

**Label elements:**
**Signal word**
Warning
**Pictogram**

**Hazard Statements**
Causes eye irritation.
May cause drowsiness or dizziness.

**Prevention Statements**
Avoid breathing dust/fume/gas/mist/vapors/spray.
Wash skin thoroughly after handling.
Use only outdoors or in a well-ventilated area.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing.
Call a POISON CENTER or doctor/ physician if you feel unwell
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.
Store in a well-ventilated place. Keep container tightly closed.
Dispose of contents/ container to an approved waste disposal plant.

**Other Hazards**
In use, may form flammable/explosive vapor-air mixture. Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Rapid evaporation of the product may cause frostbite. Misuse or intentional inhalation abuse may lead to death without warning symptoms, due to cardiac effects.

## 3. INGREDIENTS

| Material (s) | CAS No. | Approximate % |
|---|---|---|
| 1,1,1,2,2,3,4,5,5,5-Decafluoropentane | 138495-42-8 | 50 - 70 |
| Trans,1,2-Dichloroethylene | 156-60-5 | 30 - 50 |
| Cyclopentane | 287-92-3 | 1 - 5 |
| Pentane | 109-66-0 | < 1 |

## 4. FIRST AID MEASURES

**Inhalation:** If inhaled, remove to fresh air. Get medical attention if symptoms occur.

**Eye:** Immediately flush eyes with plenty of water for at least 15 minutes. If easy to do, remove contact lenses. Continue to rinse. Get medical attention.

**Skin:** Immediately flush skin with plenty of water. Remove contaminated clothing and shoes. Wash clothing before use. Thoroughly clean shoes before reuse. Get medical attention.

**Oral:** If swallowed, do not induce vomiting. Rinse mouth thoroughly with water. Never give anything by mouth to an unconscious person. Get medical attention.

**Most important symptoms/effects, acute and delayed:** May cause cardiac arrhythmia.
Skin contact may provoke the following symptoms: Dermatitis, Discomfort, Pain, Redness, Rash, Itching, Swelling of tissue, Eye damage
Eye contact may provoke the following symptoms: Irritation, Pain, Tearing, Swelling of tissue, Redness, Impairment of vision, Discomfort
Inhalation may provoke the following symptoms: Eye damage
Effects of breathing high concentrations of vapor may include: Tiredness, Drowsiness, Central nervous system effects, Convulsions
Adverse effects from repeated inhalation may include central nervous system effects
Ingestion may provoke the following symptoms: Lack of coordination, Narcosis, Eye damage
Aspiration may cause pulmonary edema and pneumonitis.
Causes eye irritation.
May cause drowsiness or dizziness.

**Notes to Physician:** 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. Method: ASTM D 93

**Suitable Extinguishing Media:** Water spray, Alcohol-resistant foam, Dry chemical, Carbon dioxide (CO2)

**Unsuitable extinguishing media:** None known.

**Special hazards:** Vapors may form explosive mixture with air. Exposure to combustion products may be hazardous to health. Hazardous combustion products: Hydrogen fluoride, Carbonyl fluoride, Carbon oxides, Chlorine compounds.

**Special protective equipment for fire-fighters:** In the event of fire, wear self-contained breathing apparatus. Use personal protective equipment.

**Specific extinguishing methods:** Use extinguishing measures that are appropriate to local circumstances and the surrounding environment. Evacuate personnel to safe areas. Cool containers with water spray. Remove undamaged containers from fire area if it is safe to do so.

## 6. ACCIDENTAL RELEASE MEASURES

**Personal precautions, protective equipment and emergency procedures:** 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. Use personal protective equipment.

**Environmental precautions:** Discharge into the environment must be avoided. Prevent further leakage or spillage if safe to do so. Prevent spreading over a wide area (e.g.by containment or barriers). Retain and dispose of contaminated wash water. Local authorities should be advised if significant spillages cannot be contained.

**Spill Cleanup**: Contain spillage, and then collect with inert 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:** If sufficient ventilation is unavailable, use local exhaust ventilation. Use only in an area equipped with explosion-proof exhaust ventilation, if advised by assessment of the local exposure potential. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Do not eat, drink, or smoke. Do not swallow. Avoid contact with skin, eyes, or clothing. Wash thoroughly after handling.

**Storage Conditions**: Store in a clean, dry, well-ventilated place. Do not store near sources of ignition, heat, in direct sunlight or where temperatures exceed 46°C (115°F). Take care to prevent spills, waste and minimize release to the environment.

## 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

| Exposure Limits: | TLV (ACGIH) | PEL (OSHA) |
|---|---|---|
| 1,1,1,2,2,3,4,5,5,5-Decafluoropentane | Not Established | Not Established |
| Trans,1,2-Dichloroethylene | 200 ppm, TWA | 200 ppm, TWA |
| Cyclopentane | 600 ppm, TWA | 600 ppm, TWA |
| n-Pentane | 1000 ppm, TWA | 1000 ppm, TWA |

**Respiratory Protection:** General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazardous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.

**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 (eg. Viton) when prolonged or frequently repeated contact occurs. For special applications, we recommend clarifying the resistance to chemicals of the afore mentioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the product. Change gloves often.

**Hygiene measures:** Do not eat, drink or smoke when using this product. Do not breathe vapors or spray mist. Avoid contact with skin, eyes, or clothing.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

**Boiling Point:** 100°F/38°C

**Percent Volatile by Volume:** 100

**Density:** 1.33 g/cc @ 77°F/25°C

**Vapor Pressure:** 460 mmHg @ 77°F/25°C

**Vapor Density (Air=1):** 4.7

**Solubility in $H_2O$:** Slightly soluble

**pH Information:** N.A.

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

**Form:** Liquid

**Appearance:** Clear & Colorless

**Color:** Colorless

**Odor:** Ether-like

## 10. STABILITY AND REACTIVITY

**Reactivity:** Not classified as a reactivity hazard.

**Chemical stability:** Stable under normal conditions.

**Possibility of hazardous reactions:** Vapors may form explosive mixture with air. In use may form flammable /explosive vapor-air mixture.

**Material and Conditions to Avoid:** None known.

**Decomposition:** No hazardous decomposition products are known.

## 11. TOXICOLOGICAL INFORMATION

**1,1,1,2,2,3,4,5,5,5-Decafluoropentane**

**Information on likely routes of exposure:** Inhalation, Skin contact, Ingestion, Eye contact
**Acute Oral:** LD50: > 5000 mg/kg in rats
**Acute Inhalation (vapor):** 4 hour LC50: 114 mg/l in rats
**Acute Dermal:** LD50: > 5000 mg/kg in rats
**Skin Corrosion/Irritation:** No skin irritation in rabbits.
**Serious Eye Irritation/ Eye Irritation:** No eye irritation in rabbits.
**Skin Sensitization:** No skin sensitization in Guinea pigs.
**Respiratory Sensitization:** Not classified based on available information.
**Germ Cell Mutagenicity:** Weight of evidence does not support classification as a germ cell mutagen.
**Carcinogenicity:** Not classified based on available information.
**Reproductive toxicity:** Weight of evidence does not support classification as a germ cell mutagen.

**STOT-single exposure:** Not classified based on available information.
**STOT-repeated exposure:** No significant health effects observed in animals at concentrations of 1mg/l/6h/d or less.
**Aspiration toxicity**: Not classified based on available information.

**Trans-1,2-Dichloroethylene**

**Acute Oral:** LD50: 7902 mg/kg in rats. Method: OECD Test Guideline 420
**Acute Dermal:** LD50: > 5,000 mg/kg in rabbits. Method: OECD Test Guideline 402
**Acute Inhalation:** 4 hour LC50: 95.5 mg/l in rats. Test atmosphere: vapor. Method: OECD Test Guideline 403
**Skin Corrosion/Irritation:** Mild skin irritation in rabbits. Method: OECD Test Guideline 404
**Serious Eye Irritation/ Eye Irritation:** Eye irritation in rabbits. Reversing within 7 days. Method: OECD Test Guideline 405
**Skin Sensitization:** Not classified based on available information.
**Respiratory Sensitization:** Not classified based on available information.
**Germ Cell Mutagenicity:** In vitro and In vivo – Not Mutagenic. Weight of evidence does not support classification as a germ cell mutagen.
**Carcinogenicity:** Not classified based on available information.
**Reproductive toxicity:** Embryo-fetal development: Negative in rat by inhalation. Method: OECD Test Guideline 414
**STOT-single exposure:** May cause drowsiness and dizziness.
**STOT-repeated exposure:** No significant health effects observed in animals at concentrations of 250 ppmV/6h/d or less by inhalation.
**Aspiration toxicity:** Not classified based on available information.

**Cyclopentane**

**Acute Oral:** LD50: > 5,000mg/kg, Rat. Method: OECD Test Guideline 423
**Acute Inhalation (vapor):** 4 hour LC50: > 25.3 mg/l, Rat**.** Method: OECD Test Guideline 403
**Skin Corrosion/Irritation:** No skin irritation in rabbits. Repeated exposure may cause skin dryness or cracking.
**Serious Eye Irritation/ Eye Irritation:** No eye irritation in rabbits. Method: OECD Test Guideline 405
**Skin sensitization:** Does not cause skin sensitization. Guinea pig. Maximization Test.
**Respiratory Sensitization:** Not classified based on available information.
**Germ Cell Mutagenicity:** Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay). Rat. Inhalation (vapor). Negative.
**Carcinogenicity:** Not classified based on available information.
**Reproductive toxicity:** Effects on fertility: Two-generation reproduction toxicity study. Rat. Inhalation. Negative.
Embryo-fetal development. Ingestion. Rat. Method: OECD Test Guideline 414. Negative.
**STOT-single exposure:** May cause drowsiness or dizziness.
**STOT-repeated exposure:** Not classified based on available information.
**Aspiration toxicity:** The substance or mixture is known to cause human aspiration toxicity hazards or must be regarded as if it causes a human aspiration toxicity hazard.

**Pentane**

**Acute Oral:** LD50: > 2,000mg/kg, Rat. Method: OECD Test Guideline 401. The substance or mixture has not acute oral toxicity.
**Acute Inhalation (vapor):** 4 hour LC50: > 20 mg/l, Rat. Method: OECD Test Guideline 403.
**Skin Corrosion/Irritation:** No skin irritation in rabbits. Repeated exposure may cause skin dryness or cracking.
**Serious Eye Irritation/ Eye Irritation:** No eye irritation in rabbits. Method: OECD Test Guideline 405
**Skin sensitization:** Does not cause skin sensitization. Guinea pig. Maximization Test.
**Respiratory Sensitization:** Not classified based on available information.
**Germ Cell Mutagenicity:** Mammalian erythrocyte micronucleus test (in vivo cytogenetic assay). Rat. Inhalation (vapor). Negative.
**Carcinogenicity:** Not classified based on available information.
**Reproductive toxicity:** Effects on fertility: Two-generation reproduction toxicity study. Rat. Inhalation (vapor). Negative.
Embryo-fetal development. Rat. Ingestion. Method: OECD Test Guideline 414. Negative.

**STOT-single exposure:** May cause drowsiness or dizziness.
**STOT-repeated exposure:** Not classified based on available information.
**Aspiration toxicity:** The substance or mixture is known to cause human aspiration toxicity hazards or must be regarded as if it causes a human aspiration toxicity hazard.

## 12. ECOLOGICAL INFORMATION

**1,1,1,2,2,3,4,5,5,5-Decafluoropentane**

96 hour LC50 in Oncorhynchus mykiss (rainbow trout): 13.9 mg/l
96 hour LC50 in Pimephales promelas (fathead minnow): 27.2 mg/1
96 hour LC50 in Danio rerio (zebra fish): 13 mg/l
48 hour LC50 in Daphnia magna (Water flea): 11.7 mg/l
72 hour EC50 in Pseudokirchneriella subcapitata (Green algae): >120 mg/l
21 days NOEC in Daphnia magna (Water flea): 1.72 mg/l

**Biodegradability:** Not readily biodegradable.
**Bioaccumulative potential:** Bioaccumulation is unlikely.
**Mobility in soil:** No data available

**Trans-1,2-Dichloroethylene**

96 hour LC50 in Lepomis marochirus (Bluegill sunfish): 135 mg/l. Based on data from similar materials.
48 hour EC50 in Daphnia magna (Water flea): 220 mg/l. Method: EPA-660/3-75-009
48 hour EbC50 in Pseudokirchneriella subcapitata (Green algae): 36.36 mg/l. Method: OECD Test Guideline 201

**Biodegradability:** Not readily biodegradable. Method: OECD Test Guideline 301D
**Bioaccumulative potential:** Partition coefficient: n-octanol/water: log Pow: 2.06

**Cyclopentane:**

48 hour EC50 in Daphnia magna (Water flea): 10.5 mg/l
96 hour LC50 in Oncorhynchus kisutch (coho salmon): > 100 mg/l

**Biodegradability:** Not readily biodegradable. 0% Biodegradation in 28 days. Method: OECD Test Guideline 301F
**Bioaccumulative potential:** Partition coefficient: n-octanol/water: log Pow: 3

**Pentane**

48 hour EC50 in Daphnia magna (Water flea): 2.7 mg/l
96 hour LC50 in Oncorhynchus mykiss (rainbow trout): 4.26 mg/l
72 hour ErC50 in Scenedesmus capricornutum (fresh water algae): 10.7 mg/l. Method: OECD Test Guideline 201

**Biodegradability:** Readily biodegradable. 87% Biodegradation in 28 days.
**Bioaccumulative potential:** Partition coefficient: n-octanol/water: log Pow: 3.45

## 13. DISPOSAL CONSIDERATIONS

If recycling is not practicable, dispose of in compliance with local regulations. Remove to a permitted waste disposal facility.

## 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.

1,1,1,2,2,3,4,5,5,5-Decafluoropentane (CAS# 138495-42-8) - The United States Environmental Protection Agency has established a Significant New Use Rule (SNUR; 40 CFR 721.5645) for this product. This product contains one or more substances which requires export notification under TSCA Section 12(b) and 40 CFR Part 707 Subpart D.

**CERCLA Reportable Quantity:** trans-Dichloroethylene, 156-60-5: Component RQ is 1000 lbs

**SARA 304 Extremely Hazardous Substances Reportable Quantity:** This material does not contain any components with a section 304 EHS RQ.

**SARA 302 Extremely Hazardous Substances Threshold Planning Quantity:** This material does not contain any components with a section 302 EHS RQ.

**SARA 311/312 Hazards:** Serious eye damage or eye irritation. Specific target organ toxicity (single or repeated exposure)

**SARA 313:** This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

**State Regulations (U.S.)**

**California Proposition 65**: This product does not contain any chemicals known to the State of California to cause cancer and/or birth defects or other reproductive defects.

## 16. OTHER INFORMATION

**NPCA-HMIS Ratings:**

| | |
|---|---|
| Health | - 1 |
| Flammability | - 0 |
| Reactivity | - 0 |

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

**FOR INDUSTRIAL USE ONLY**

**REVISION DATE: FEBRUARY 2022**

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.