

MATERIAL SAFETY DATA SHEET

Finished Product



Date Issued: 12/23/2002
MSDS No: 1665-A
Date Revised: 01/20/2012
Revision No: 9

Flux Remover AMS**1. PRODUCT AND COMPANY IDENTIFICATION****PRODUCT NAME:** Flux Remover AMS**GENERAL USE:** General Purpose Flux Remover**PRODUCT DESCRIPTION:** General Purposes Cleaner**PRODUCT CODE:** 1665/CAN/EUR-6S, 8S, 18S**ACTIVE INGREDIENT(S):** 3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca); 1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)**MANUFACTURER**

Techspray, L.P.
 1001 N.W. 1st Street
 P.O. Box 949
 Amarillo, TX 79107

Emergency Contact: Chemtrec**Emergency Phone:** 1-800-858-4043**Service Number:** 1-800-858-4043**24 HR. EMERGENCY TELEPHONE NUMBERS****CHEMTREC CCN#21858 (US Transportation) :**(800) 424 - 9300**CANUTEC (Canadian Transportation) :**(613) 996 - 6666**Emergency Phone :**(800) 858 - 4043**2. HAZARDS IDENTIFICATION****EMERGENCY OVERVIEW****PHYSICAL APPEARANCE:** Transparent, colorless liquid.**IMMEDIATE CONCERNS:** Vapors and/or aerosols which may be formed at elevated temperatures may be irritating to eyes and respiratory tract. Causes skin irritation. Harmful if swallowed.**POTENTIAL HEALTH EFFECTS****EYES:** Avoid contact with eyes; may cause redness, irritation and conjunctivitis.**SKIN:** Prolonged or repeated contact can result in defatting and drying of the skin which may result in skin irritation and dermatitis (rash).**INGESTION:** Harmful if swallowed --- contains small amounts of methanol.**INHALATION:** High concentrations in immediate area can displace oxygen and can cause dizziness, unconsciousness, and possibly death with longer exposure. Keep people away from such vapors without self-contained breathing apparatus.**SIGNS AND SYMPTOMS OF OVEREXPOSURE****EYES:** Liquid splashed in the eye may cause redness, irritation and conjunctivitis.**SKIN:** Prolonged exposure causes redness, pain, drying and cracking of the skin.**INGESTION:** For large amounts; abdominal pain, nausea and vomiting.**INHALATION:** High concentrations may lead to central nervous system effects (drowsiness, dizziness, nausea, headaches, paralysis and loss of consciousness).**ACUTE TOXICITY:** Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result.**3. COMPOSITION / INFORMATION ON INGREDIENTS**

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Chemical Name	Wt.%	CAS	EINECS
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	65 - 75	422-56-0	2070169
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	< 5	507-55-1	2080769
Methanol	3 - 9	67-56-1	200-659-6
Nitromethane	< 2	75-52-5	
1,1,1,2-Tetrafluoroethane	15 - 25	811-97-2	212-337-0
Carbon dioxide	2 - 5	124-38-9	

4. FIRST AID MEASURES

EYES: Immediately flush eyes with plenty of water. Get medical attention, if irritation persists.

SKIN: Immediately flush skin with plenty of water. Remove clothing. Get medical attention immediately. Wash clothing separately before reuse.

INGESTION: If swallowed, gently wipe or rinse the inside of the mouth with water. DO NOT induce vomiting. Sips of water may be given if person is fully conscious. Never give anything by mouth to an unconscious or convulsing person. Immediately contact a poison control center, emergency room or physician as further treatment may be necessary.

INHALATION: Remove to fresh air. If not breathing, give artificial respiration or give oxygen by trained personnel. Seek immediate medical attention.

5. FIRE FIGHTING MEASURES

FLASHPOINT AND METHOD: None : ASTM D-56 (Tag C.C.)

FLAMMABLE LIMITS: NA to NA

EXTINGUISHING MEDIA: Use alcohol foam, carbon dioxide, or water spray when fighting fires involving this material.

FIRE FIGHTING PROCEDURES: Use water spray to keep fire-exposed containers cool and to knock down vapors which may result from product decomposition.

FIRE FIGHTING EQUIPMENT: As in any fire, wear self-contained breathing apparatus pressure-demand, (MSHA/NIOSH approved or equivalent) and full protective gear.

HAZARDOUS DECOMPOSITION PRODUCTS: Toxic oxides of carbon and corrosive vapors of hydrogen chloride.

6. ACCIDENTAL RELEASE MEASURES

SMALL SPILL: Contain spill with dike to prevent entry into sewers.

LARGE SPILL: If this material is released into a work area, evacuate the area immediately.

GENERAL PROCEDURES: Dike area to contain spill. Take precautions as necessary to prevent contamination of ground and surface waters. Recover spilled material on adsorbent, such as sawdust or vermiculite, and sweep into closed containers for disposal. After all visible traces, including vapors, have been removed thoroughly wet vacuum the area. Do not flush to sewer. If area of spill is porous, remove as much contaminated earth, gravel, etc. as necessary and place in closed containers for disposal.

SPECIAL PROTECTIVE EQUIPMENT: Only personnel equipped with proper respiratory and skin/eye protection should be permitted in area. See Section 8 for details.

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GENERAL PROCEDURES: Use only in a well ventilated area.

HANDLING: Use with sufficient ventilation to keep employee exposure below recommended limits. Provide adequate ventilation for storage, handling and use, especially for enclosed or low spaces. Avoid contact of liquid with eyes and prolonged skin exposure. Do not allow product to contact open flame or electrical heating elements because dangerous decomposition products may form.

STORAGE: Store in a cool, well-ventilated area of low fire risk. Storage in subsurface locations should be avoided. If container temperature exceeds boiling point, cool the container before opening.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION**EXPOSURE GUIDELINES****OSHA HAZARDOUS COMPONENTS (29 CFR1910.1200)**

		EXPOSURE LIMITS					
		OSHA PEL		ACGIH TLV		Supplier OEL	
Chemical Name		ppm	mg/m ³	ppm	mg/m ³	ppm	mg/m ³
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	TWA	[1]	[1]	[1]	[1]	50* ppm [2]	[2]
	STEL	[1]	[1]	[1]	[1]		
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	TWA	[1]	[1]	[1]	[1]	400* ppm [2]	[2]
	STEL	[1]	[1]	[1]	[1]		
Methanol	TWA	S 200 ppm [3]	260 mg/m ³ [3]	S 200 ppm	262 mg/m ³	NL ppm	NL mg/m ³
	STEL	250 ppm	310 mg/m ³	250 ppm	328 mg/m ³	NL ppm	NL
Nitromethane	TWA	100 ppm	250 mg/m ³	20 ppm	50 mg/m ³		
1,1,1,2-Tetrafluoroethane	TWA	NE		NE		1,000 ppm [2]	[2]

OSHA TABLE COMMENTS:

1. NOT ESTABLISHED
2. * (AEL)=Acceptable Exposure Limit as established by the manufacture
3. S = Skin

ENGINEERING CONTROLS: Use process enclosures, local exhaust ventilation, or other engineering controls to control airborne levels below recommended exposure limits.

PERSONAL PROTECTIVE EQUIPMENT

EYES AND FACE: For normal conditions, wear safety glasses. Where there is reasonable probability of liquid contact, wear splash-proof goggles.

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SKIN: The glove(s) listed below may provide protection against permeation. Gloves of other chemically resistant materials may not provide adequate protection. Viton, Solvex, Butyl, Buna, Neoprene.

RESPIRATORY: A respiratory protection program that meets OSHA 1910.134 and ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirator's use.

OTHER USE PRECAUTIONS: Emergency shower and eyewash facility should be in close proximity.

9. PHYSICAL AND CHEMICAL PROPERTIES

Chemical Name	Boiling Point (°C)	Freezing Point (°C)	Solubility in Water	Specific Gravity
1,1,1,2-Tetrafluoroethane	-26.4	-101	NEGLIGIBLE	1.21

ODOR: Faint ethereal odor

APPEARANCE: Clear, Colorless liquid

PERCENT VOLATILE: 100 at 20°C (68°F)

VAPOR DENSITY: 7 (Air=1)

BOILING POINT: to 54°C (129°F)

FLASHPOINT AND METHOD: None : ASTM D-56 (Tag C.C.)

SOLUBILITY IN WATER: Insoluble

EVAPORATION RATE: > 1 (n-Butyl Acetate=1)

SPECIFIC GRAVITY: 1.550 (water=1)

(VOC): 4.780 % by weight (EPA)

Notes: 75% weight VOC (CARB)

COMMENTS: Product manufactured after 31 December 2007 conforms to California VOC requirements in Category Electronic Cleaner with a cap of 75%

10. STABILITY AND REACTIVITY

STABILITY: Stable.

POLYMERIZATION: Will not occur.

CONDITIONS TO AVOID: Stable. However, may decompose if heated.

HAZARDOUS DECOMPOSITION PRODUCTS: When exposed to high temperatures or flames this product may form hydrochloric and hydrofluoric acids - possibly carbonyl halides.

INCOMPATIBLE MATERIALS: Oxidizing agents, alkalies and bases.

11. TOXICOLOGICAL INFORMATION

ACUTE

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Chemical Name	ORAL LD ₅₀ (rat)	DERMAL LD ₅₀ (rabbit)	INHALATION LC ₅₀ (rat)
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	> 5000 mg/kg	> 2000 mg/kg	37300 ppm
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	> 5000 mg/kg	> 2000 mg/kg	36800 ppm
Methanol	6.2 to 12.98 mg/kg	16 g/kg	64000 ppm
1,1,1,2-Tetrafluoroethane			> 500000 ppm

EYES: Moderately to severely irritating**DERMAL LD₅₀:** Mildly to moderately irritating.**ORAL LD₅₀:** Slight to very low toxicity.**INHALATION LC₅₀:** Slight to very low toxicity.**SKIN EFFECTS:** Based on human exposure reports, prolonged and repeated skin contact with Methanol has produced toxic effects including vision effects and death.**CARCINOGENICITY**

Chemical Name	NTP Status	IARC Status	OSHA Status	Other
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	NOT LISTED	NOT LISTED	NOT LISTED	
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	NOT LISTED	NOT LISTED	NOT LISTED	
Methanol	NOT LISTED	NOT LISTED	NOT LISTED	
Nitromethane	Group 2	GROUP 2B		ACGIH Group A3
1,1,1,2-Tetrafluoroethane	NOT LISTED	NOT LISTED	NOT LISTED	

TERATOGENIC EFFECTS: Test results indicate this compound/mixture is not teratogenic.

GENERAL COMMENTS: Data from acute toxicity studies indicate that HCFC-225ca and HCFC-225cb have very low acute toxicity. Neither isomer causes eye irritation nor dermal toxicity in standardized tests; skin application of both isomers at high doses (2,000 mg/kg body weight) produces no adverse effects. Therefore, the dermal LD50s are greater than 2,000 mg/kg body weight. Oral administration of either isomer at high doses (5,000 mg/kg body weight) does not cause any mortality and the oral LD50s are greater than 5,000 mg/kg body weight. Both isomers also have very low acute inhalation toxicity as measured by the concentration that cause 50% mortality in experimental animals. In 28-day inhalation studies with rat, the activity and responsiveness of the animals was reduced at 5,000 ppm or greater for each isomer. Toxicity was otherwise confined to the liver; liver enlargement and induction of peroxisomes was seen following treatment with either of the isomers. HCFC-225ca was more potent than HCFC-225cb in eliciting these liver effects. In a 90-day study of HCFC-225ca/HCFC-225cb mixture (45/55%) with rat, toxic effects were observed in the liver; liver enlargement and induction of peroxisomes. In a 28-day study with marmoset, exposure to HCFC-225ca at 1,000 ppm caused effects on the liver, such as slight fat deposition associated with changes in serum biochemical parameters. In the same study, exposure to HCFC-225cb at 5,000 ppm caused somnolence during exposure and an increase of cytochrome P-

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450, indicative of an adaptive response to HCFC-225cb. However, no liver enlargement was seen and virtually no peroxisome induction was observed in either isomer.

12. ECOLOGICAL INFORMATION

ENVIRONMENTAL DATA: There is limited information available on the environmental fate and effects of this material. The primary environmental concern for release is the impact on aquatic and terrestrial species. Due care should be taken to avoid the accidental release of this material into the environment.

ECOTOXICOLOGICAL INFORMATION: Invertebrate toxicity: LC50 (30 min) Photobacterium phosphoreum = 1540 ppm Microtoxicity test.

13. DISPOSAL CONSIDERATIONS

DISPOSAL METHOD: Recover by distillation or remove to permitted waste disposal facility. Comply with Federal, State and Local regulations.

FOR LARGE SPILLS: Contaminated sawdust, vermiculite, or porous surfaces must be disposed of in a permitted hazardous waste management facility. Recovered liquids may be reprocessed or incinerated or must be treated in a permitted hazardous waste management facility.

GENERAL COMMENTS: Dispose of in a manner consistent with federal, state, and local regulations.

14. TRANSPORT INFORMATION**DOT (DEPARTMENT OF TRANSPORTATION)**

PROPER SHIPPING NAME: CONSUMER COMMODITY ORM-D

UN/NA NUMBER: N/A

PACKING GROUP: N/A

ROAD AND RAIL (ADR/RID)

KEMLER NUMBER: UN1950

HAZARD CLASS: 2.2

AIR (ICAO/IATA)

SHIPPING NAME: CONSUMER COMMODITY ID8000

UN/NA NUMBER: N/A

PACKING GROUP: N/A

VESSEL (IMO/IMDG)

SHIPPING NAME: AEROSOLS IN LIMITED QUANTITIES OF CLASS 2

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15. REGULATORY INFORMATION**UNITED STATES**

SARA TITLE III (SUPERFUND AMENDMENTS AND REAUTHORIZATION ACT)

311/312 HAZARD CATEGORIES: IMMEDIATE / DELAYED

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Flux Remover AMS**EPCRA SECTION 313 SUPPLIER NOTIFICATION**

Chemical Name	Wt. %	CAS
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	65 - 75	422-56-0
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	< 5	507-55-1
Methanol	3 - 9	67-56-1

TITLE III NOTES: Not listed as an Extremely Hazardous Substance.

CERCLA (COMPREHENSIVE RESPONSE, COMPENSATION, AND LIABILITY ACT)

CERCLA REGULATORY: Releases to air, land, or water which exceed the RQ must be reported to the National Response Center [(800)424-8802] and to your Local Emergency Planning Committee.

Chemical Name	Wt. %	CERCLA RQ
Methanol	3 - 9	5000 lbs.

TSCA (TOXIC SUBSTANCE CONTROL ACT)

Chemical Name	CAS
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	422-56-0
1,3-Dichloro-1,1,2,2,3-pentafluoropropane (HCFC-225cb)	507-55-1
Methanol	67-56-1
1,1,1,2-Tetrafluoroethane	811-97-2

TSCA REGULATORY: This product is listed on the TSCA Inventory.

CLEAN AIR ACT

Chemical Name	Wt. %	CAS
3,3-Dichloro-1,1,1,2,2-pentafluoropropane (HCFC-225ca)	65 - 75	422-56-0
1,1,1,2-Tetrafluoroethane	15 - 25	811-97-2

CALIFORNIA PROPOSITION 65: This product does not contain any chemicals known to the State of California to cause cancer.

CANADA

WHMIS (WORKPLACE HAZARDOUS MATERIALS INFORMATION SYSTEM): This MSDS has been prepared according to the hazard criteria of the Controlled Products Regulations (CPR) and the MSDS contains all of the information required by the CPR.

WHMIS CLASS: Class A, Class D2B.

GENERAL COMMENTS: Product manufactured after 31 December 2007 conforms to California VOC requirements in Category Electronic Cleaner with a cap of 75%

COMMENTS WARNING: Contains 1,1,1,2-tetrafluoroethane (HFC-134a), a greenhouse gas which may contribute to global warming.

16. OTHER INFORMATION

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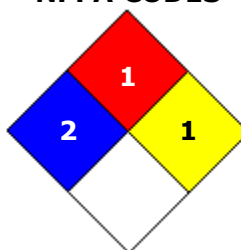
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Flux Remover AMS**APPROVED BY:** Pierce A. Pillon **TITLE:** Chemist**PREPARED BY:** Steve Cook**REVISION SUMMARY:** This MSDS replaces the 07/20/2010 MSDS. Revised: **Section 14: ROAD AND RAIL** (ADR/RID).**HMIS RATING**

HEALTH	<input type="checkbox"/>	2
FLAMMABILITY	<input type="checkbox"/>	1
PHYSICAL HAZARD	<input type="checkbox"/>	1
PERSONAL PROTECTION	<input type="checkbox"/>	

NFPA CODES**DATA SOURCES:** Code of Federal Regulations (CFR) The Sigma-Aldrich Library of Regulatory and Safety Data
OSHA Hazard Communication Standard (29CFR1910.1200) Various Federal, State and Local Regulations**GENERAL STATEMENTS:** This MSDS was reviewed on 29 Nov. 2006.**MANUFACTURER DISCLAIMER:** To the best of our knowledge, the information contained herein is accurate. However, neither Tech Spray, L.P., or any of its subsidiaries assumes any liability whatsoever for the accuracy or completeness of the information contained herein. Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards which exist.