MSDS Information

Section 1. CHEMICAL PRODUCT SECTION
Product Name: Asahiklin 225
Product Number: 1663 AEROSOL
General Use: Replacement CFC Precison Cleaning applications.
Product Description:
MANUFACTURER: Tech Spray, Inc. For Chemical Emergency, Spill, Leak, Fire
P.O. Box 949 Exposure, or Accident Call CHEMTREC
Amarillo, TX 79105-0949 DAY OR NIGHT 1-800-424-9300.
PHONE: 806/372-8523
FAX: 806/372-8750

Section 2. COMPOSITION / INFORMATION ON INGREDIENTS
C.A.S. Number Weight %
3,3-Dichloro-1,1,1,2,2-pentafluoropropane 422-56-0 32-42
(HCFC-225ca)
1,3-Dichloro-1,1,2,2,3-pentafluoropropane 507-55-1 40-50
(HCFC-225cb)
1,1,1,2-Tetrafluoroethane 811-97-2 18-23
Carbon Dioxide 124-38-9 1-2

OSHA HAZARDOUS COMPONENTS (29 CFR 1910.1200):

Section 3. HAZARD IDENTIFICATION
Emergency Overview:
Potential Health Effects:
INHALATION: Major route of exposure. Vapor is heavier than air and can cause suffocation by reducing the available oxygen for breathing. Breathing high concentrations of vapor may cause light-headedness, giddiness, shortness of breath, confusion, and may lead to narcosis, cardiac irregularities, or unconsciousness. Inhalation of high concentrations in a closely confined area may be fatal.

EYES: Liquid contact may irritate eyes.

SKIN: Not a corrosive however, repeated or prolonged exposure may irritate skin.

INGESTION: No specific intervention is indicated as the compound is not likely to be hazardous by ingestion. Consult a physician if necessary. Do not induce vomiting because the hazard of aspirating the material into the lungs is considered greater than swallowing it.

HCFC-225ca and HCFC-225cb
Carcinogenicity : NTP- NE, IARC Monographs- NE, OSHA Regulated- NE

See Toxicology Section

Section 4. FIRST AID MEASURES
Inhalation:
Move to fresh air in case of accidental inhalation of vapors. If victim has stopped breathing, give artificial respiration. Call for
prompt medical attention.

Eye Contact:
Flush eyes with large amounts of water for 15 minutes or until irritation subsides. If irritation persists, get medical attention.

Skin Contact:
Remove contaminated clothing (including shoes) and wash before reuse. Flush with large amounts of water. Use soap if available. If irritation persists, seek medical attention.

Ingestion:
Do not induce vomiting unless directed by a physician. If conscious and alert, give two glasses of water. Seek medical attention immediately.

Section 5. FIRE FIGHTING MEASURES
Flash Point & Method: NON-FLAMMABLE (TCC method)
Flammable Limits: LEL: None UEL: None
Autoignition Temperature:
GENERAL HAZARD:
Containers can build pressure and burst in fire situations.
FIRE FIGHTING INSTRUCTIONS:
Fire fighters should wear self contained, positive-pressure breathing apparatus and avoid contact with fumes which could contain hydrochloric and hydrofluoric acid.
FIRE FIGHTING EQUIPMENT:
Water, foam, dry chemical, carbon dioxide.
HAZARDOUS COMBUSTION PRODUCTS:
Smoke, fumes and oxides of carbon.

Section 6. ACCIDENTAL RELEASE MEASURES
LAND SPILL:
Evacuate area. Ventilate area well and avoid breathing vapors. Vapor concentration will be highest along floor and in low lying areas. Pick up liquid on suitable absorbent and store in sealed metal containers. Shut off fire sources. Workers should wear proper equipment to work in clean up area. Unprotected personnel should move upwind.
WATER SPILL:

Section 7. HANDLING AND STORAGE
STORAGE TEMPERATURE: Ambient
STORAGE PRESSURE: Atmospheric

GENERAL:
Keep container closed when not in use. Store in cool, well ventilated place out of direct sunlight and away from incompatible materials. (See STABILITY AND REACTIVITY Section 10.) Follow all MSD Sheet and Label warnings even after container is emptied.

Section 8. EXPOSURE CONTROL / PERSONAL PROTECTION
Engineering Controls:
(X) Local Exhaust ventilation acceptable.
(X) Mechanical ventilation recommended.
( ) Use explosion-proof ventilation equipment.
(X) Do not use in confined spaces without mechanical ventilation equipment.
See section 2 for component exposure guidelines.

Personal Protection:
RESPIRATOR:
If concentrations are over the exposure limit and are known, air purifying respirator with Organic Vapor Cartridges may be acceptable. Refer to cartridges for acceptable levels. If concentrations are over exposure limit and are unknown, use a supplied air respirator.

HAND PROTECTION:
- (X) Gloves recommended
- (X) Solvex
- (X) Neoprene
- (X) Butyl
- ( ) Buna
- ( ) Natural Latex
- ( ) Cotton/Jersey

EYE PROTECTION:
- (X) Safety Glasses
- ( ) Chemical Goggles
- ( ) Full Face Shield

OTHER RECOMMENDATIONS:
- ( ) Rubber Boots
- ( ) Splash-proof chemical resistant suit/apron

Section 9. PHYSICAL AND CHEMICAL PROPERTIES

Density................. 1.55       pH......................... NA
Boiling Point........... 54°C / 129°F  % Volatile.................... 100
Freezing Point......... -131°C       % Solids...................... 0
Vapor Density (Air=1):.. 7.0          Evaporation Rate (H2O=1)... >1
Solubility in Water..... < 1          Viscosity.................. N/A
Molecular Weight........ N/A          Physical State............. LIQUID
Non-Exempt VOC (g/l)... 0             Odor........................ NIF
Appearance: Clear water-white mobile liquid with mild odor.

Section 10. STABILITY AND REACTIVITY

GENERAL:
STABLE

INCOMPATIBLE MATERIALS AND CONDITIONS TO AVOID:
- Contact with open flame, heat.
- Reactive alkali metals, strong acids & bases.

HAZARDOUS DECOMPOSITION:
- Hydrogen chloride, phosgene, chlorine, carbon dioxide, and carbon monoxide.

Section 11. TOXICOLOGICAL INFORMATION

RESULTS OF COMPONENT TOXICITY TEST PERFORMED:
3,3-Dichloro-1,1,1,2,3-pentafluoropropane
- Inhalation 4 hour LC50: 37,300 ppm in rats
- Oral LD50: > 5g/kg in rats
- Ames Essay: Negative
- Chromosome aberration: Negative
- With CHL: Negative
- Unscheduled DNA Synthesis: Negative

1,3-Dichloro-1,1,2,2,3-pentafluoropropane
- Inhalation 4 hour LC50: 36,800 ppm in rats
- Oral LD50: > 5g/kg in rats
- Ames Essay: Negative
- Chromosome aberration: Negative
- With CHL: Negative
- Unscheduled DNA Synthesis: Negative

Neither HCFC-225ca or HCFC-225cb causes eye irritation and dermal toxicity. In 28-day inhalation studies with rat, the activity and responsiveness of the animals was reduced at 5,000ppm or greater with each isomer. Toxicity was otherwise confined to the liver; liver enlargement and induction of peroxisomes was seen following treatment with either isomer. HCFC-225ca was more potent then HCFC-225cb in eliciting these liver effects.
In 28-day study with marmoset, exposure to HCFC-225ca at 1000ppm 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 5,000ppm caused somnolence during exposure and an increase of cytochrome P-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.

The compounds do not produce genetic damage in bacterial cell cultures or with CHL; however, in one study with mammalian cell cultures (human lymphocytes) HCFC-225ca caused damage while HCFC-225cb elicited a marginal response.

HUMAN EXPERIENCE:
Information not available.

Section 12. ECOLOGICAL INFORMATION
FURTHER INFORMATION:
The HCFC molecule has an ODP of .03 The Tetrafluoroethane does not deplete the ozone.

Section 13. DISPOSAL CONSIDERATIONS
RCRA 40 CFR 261 Classification:
Federal, State, and Local laws governing disposal of materials can differ. Ensure proper disposal compliance with proper authorities before disposal.

Section 14. TRANSPORTATION INFORMATION
U.S. DOT Information
Proper Shipping Name: CONSUMER COMMODITY ORM-D
Hazard Class: N/A
Packaging Group: N/A
UN Number: N/A
Limitations: N/A

IATA
Proper Shipping Name: CONSUMER COMMODITY ID8000
Hazard Class: 9
Packaging Group: N/A
UN Number: ID8000
Limitations: NEEDS CLASS 9 LABEL

IMO
Proper Shipping Name: AEROSOLS IN LIMITED QUANTITIES OF CLASS 2
Class: 2
UN Number: UN1950
Packaging Group: N/A
EMS:2-13
MFAG:350
Marine Pollutant: N/A
Canadian TDG: N/A
IMDG Page: 2102

Section 15. REGULATORY INFORMATION
UNITED STATES FEDERAL REGULATIONS:

CERCLA/SUPERFUND, 40 CFR 117, 302:
SARA SUPERFUND AND REAUTHORIZATION ACT OF 1986
TITLE III Sections 302, 311, 312 and 313:
Section 302 - Extremely hazardous substances (40 CFR 355):
--- None of the chemicals are Section 302 hazards ---

Section 311/312 - Material Safety Data Sheet Requirements (40 CFR 370)
( ) By our hazard evaluation, this product is non-hazardous.
By our hazard evaluation, this product is hazardous. It should be reported under the following EPA hazard.

- Immediate (acute) health hazard
- ( ) Delayed (chronic) chronic health hazard
- ( ) Sudden release of pressure hazard
- ( ) Reactive hazard
- ( ) Flammable Hazard

Section 313 - List of Toxic Chemicals (40 CFC 372)
This product contains the following chemicals (at levels of 1% or greater) which are found on the 313 list of Toxic Chemicals.

<table>
<thead>
<tr>
<th>CHEMICAL</th>
<th>C.A.S. NUMBER</th>
<th>WEIGHT %</th>
</tr>
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<tbody>
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<td>507-55-1</td>
<td>40-50</td>
</tr>
</tbody>
</table>

TOXIC SUBSTANCE CONTROL ACT (TSCA): All substances are TSCA Listed.

RESOURCE CONSERVATION AND RECOVERY ACT (RCRA 40 CFR 261) Subpart C & D: Refer to Section 11. for RCRA classification.

FEDERAL WATER POLLUTION CONTROL ACT, CLEAN WATER ACT, 40 CFR 401.15 (FORMERLY SECTION 307), 40 CFR 116 (FORMERLY SECTION 311)
This product contains the following chemicals which are listed:

| CHEMICAL | C.A.S. NUMBER | WEIGHT % |

CLEAN AIR ACT: HCFC-225ca and HCFC-225cb are listed as SNAP acceptable substitutes for CFCs in solvent cleaning applications

This product is a Class II compound as such shipping container requires HCFC warning label.

STATE REGULATIONS:
CALIFORNIA PROPOSITION 65:
This product contains the following ingredients which appear on the California proposition 65 list:

| CHEMICAL | C.A.S. NUMBER | WEIGHT % |
--- None of the chemicals are on the Proposition 65 list ---

INTERNATIONAL REGULATIONS:
CANADA WHIMS: NIF
EUROPE EINECS NUMBERS:
3,3-Dichloro-1,1,1,2,2-pentafluoropropane 2070169
1,3-Dichloro-1,1,2,2,3-pentafluoropropane 2080769

Section 16. OTHER INFORMATION
LABEL INFORMATION:
European risk and Safety Phrases: S2, S24/25, R20/22
European Symbols Needed: HARMFUL
Canadian WHIMS Symbols: NIF

NFPA HAZARD RATING:
(0) Fire   (2) Health   (1) Reactivity

REVISION DATES, SECTIONS, REVISED BY:
09-NOV-95, CONVERTED TO ANSI STANDARD, B. RIFFEL
15-JLY-96, UPDATED SECTION 15, B. RIFFEL
27-MAR-98, UPDATED SECTION 16, R. PRICHARD
29-APR-98, UPDATED SECTION 3, B. RIFFEL
04-OCT-01, Reviewed All, UPDATED SECTION 16, D. SLOAN
1-NOV-01, Reviewed, S. Redline

ABBREVIATIONS USED IN THIS DOCUMENT:
NE - Not Established, NA - Not Applicable, NIF - No Information Found
REFERENCES:
Code of Federal Regulations (CFR)
The Sigma-Aldrich Library of Regulatory and Safety Data
Chemical Guide and OSHA Hazard Communication Standard
Various Federal, State & Local Regulations

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