

SAFETY DATA SHEET

1. Product and Company Identification

Product identifier	Rx11-Flush Cylinders (4300-15, 4300-26)
Other means of identification	Not available
Recommended use	Solvent cleaner for flushing AC and refrigeration systems
Recommended restrictions	None known.
Manufacturer	Nu-Calgon 2008 Altom Court St. Louis, MO 63146 US Phone: 314-469-7000 / 800-554-5499 Emergency Phone: 1-800-424-9300 (CHEMTREC)

2. Hazards Identification

Physical hazards	Gases under pressure	Liquefied gas
Health hazards	Acute toxicity, oral	Category 4
	Skin corrosion/irritation	Category 2
	Serious eye damage/eye irritation	Category 2A
	Specific target organ toxicity, single exposure	Category 3 respiratory tract irritation
Environmental hazards	Not classified.	
OSHA defined hazards	Not classified.	
Label elements		



Signal word	Warning
Hazard statement	Contains gas under pressure; may explode if heated. Causes serious eye irritation. Causes skin irritation. Harmful if swallowed. May cause respiratory irritation.

Precautionary statement

Prevention	Wash thoroughly after handling. Wear eye/face protection. Wear protective gloves. Do not eat, drink or smoke when using this product. Avoid breathing gas. Use only outdoors or in a well-ventilated area.
Response	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. If on skin: Wash with plenty of water. Specific treatment (see this label). If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse. If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth. If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
Storage	Protect from sunlight. Store in a well-ventilated place. Keep container tightly closed. Store locked up.
Disposal	Dispose of contents/container in accordance with local/regional/national/international regulations.

Hazard(s) not otherwise classified (HNOC)	None known.
Supplemental information	20% of the mixture consists of component(s) of unknown acute oral toxicity.

3. Composition/Information on Ingredients

Mixture

Chemical name	Common name and synonyms	CAS number	%
(E)-1,2-Dichloroethene		156-60-5	40 - 70
Ethane, 1,1,1,2-tetrafluoro-		811-97-2	10 - 30
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro-		138495-42-8	10 - 30

Chemical name	Common name and synonyms	CAS number	%
Butane, 1,1,1,3,3-pentafluoro-		406-58-6	5 - 10

Composition comments US GHS: The exact percentage (concentration) of composition has been withheld as a trade secret in accordance with paragraph (i) of §1910.1200.

4. First Aid Measures

Inhalation	If inhaled: Remove person to fresh air and keep comfortable for breathing. Call a poison center/doctor if you feel unwell.
Skin contact	If on skin: Wash with plenty of water. If skin irritation occurs: Get medical advice/attention. Take off contaminated clothing and wash it before reuse.
Eye contact	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.
Ingestion	If swallowed: Call a poison center/doctor if you feel unwell. Rinse mouth.
Most important symptoms/effects, acute and delayed	Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain.
Indication of immediate medical attention and special treatment needed	Provide general supportive measures and treat symptomatically. In case of shortness of breath, give oxygen. Keep victim warm. Keep victim under observation. Symptoms may be delayed.
General information	Ensure that medical personnel are aware of the material(s) involved, and take precautions to protect themselves. In the case of accident or if you feel unwell, seek medical advice immediately (show the label where possible). Show this safety data sheet to the doctor in attendance. Do not puncture or incinerate container. Do not store at temperatures above 49°C.

5. Fire Fighting Measures

Suitable extinguishing media	Treat for surrounding material.
Unsuitable extinguishing media	None known.
Specific hazards arising from the chemical	Contents under pressure. Pressurized container may explode when exposed to heat or flame. Cool containers with flooding quantities of water until well after fire is out. Firefighters should wear a self-contained breathing apparatus.
Special protective equipment and precautions for firefighters	Firefighters should wear full protective clothing including self contained breathing apparatus.
Fire-fighting equipment/instructions	In case of fire: Stop leak if safe to do so. Move containers from fire area if you can do so without risk. Cool containers with flooding quantities of water until well after fire is out. For massive fire in cargo area, use unmanned hose holder or monitor nozzles, if possible. If not, withdraw and let fire burn out.
Specific methods	Cool containers exposed to flames with water until well after the fire is out.
Hazardous combustion products	May include and are not limited to: Oxides of carbon.
Explosion data	
Sensitivity to mechanical impact	Not available.
Sensitivity to static discharge	Not applicable.

6. Accidental Release Measures

Personal precautions, protective equipment and emergency procedures	Keep unnecessary personnel away. Keep out of low areas. Keep people away from and upwind of spill/leak. Wear appropriate protective equipment and clothing during clean-up. Do not touch damaged containers or spilled material unless wearing appropriate protective clothing. Avoid breathing gas. Ensure adequate ventilation. Local authorities should be advised if significant spillages cannot be contained. For personal protection, see section 8 of the SDS.
Methods and materials for containment and cleaning up	Extinguish all flames in the vicinity. Stop the flow of material, if this is without risk. Isolate area until gas has dispersed. Dike far ahead of spill for later disposal. Use water spray to reduce vapors or divert vapor cloud drift. Prevent entry into waterways, sewer, basements or confined areas. Following product recovery, flush area with water. For waste disposal, see section 13 of the SDS.
Environmental precautions	Prevent further leakage or spillage if safe to do so. Do not contaminate water. Avoid discharge into drains, water courses or onto the ground.

7. Handling and Storage

Precautions for safe handling	Use only with adequate ventilation. Do not taste or swallow. Avoid breathing gas. Avoid contact with eyes, skin and clothing. Avoid prolonged exposure. Wear appropriate personal protective equipment. Observe good industrial hygiene practices. When using, do not eat, drink or smoke. Wash thoroughly after handling. Use good industrial hygiene practices in handling this material.
Conditions for safe storage, including any incompatibilities	Store locked up. Keep container tightly closed. Store in a cool, dry place out of direct sunlight. Store in a well-ventilated place. Store away from incompatible materials (see Section 10 of the SDS). Keep out of reach of children. Do not store at temperatures above 49 °C (120.2°F). Keep away from heat, open flames or other sources of ignition.

8. Exposure Controls/Personal Protection

Occupational exposure limits

US. OSHA Table Z-1 Limits for Air Contaminants (29 CFR 1910.1000)

Components	Type	Value
(E)-1,2-Dichloroethene (CAS 156-60-5)	PEL	790 mg/m3 200 ppm

US. ACGIH Threshold Limit Values

Components	Type	Value
(E)-1,2-Dichloroethene (CAS 156-60-5)	TWA	200 ppm

US. NIOSH: Pocket Guide to Chemical Hazards

Components	Type	Value
(E)-1,2-Dichloroethene (CAS 156-60-5)	TWA	790 mg/m3 200 ppm

US. AIHA Workplace Environmental Exposure Level (WEEL) Guides

Components	Type	Value
Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2)	TWA	4240 mg/m3 1000 ppm

Biological limit values	No biological exposure limits noted for the ingredient(s).
Appropriate engineering controls	Good general ventilation (typically 10 air changes per hour) should be used. Ventilation rates should be matched to conditions. If applicable, use process enclosures, local exhaust ventilation, or other engineering controls to maintain airborne levels below recommended exposure limits. If exposure limits have not been established, maintain airborne levels to an acceptable level.
Individual protection measures, such as personal protective equipment	
Eye/face protection	Wear safety glasses with side shields (or goggles).
Skin protection	
Hand protection	Rubber gloves. Confirm with a reputable supplier first.
Other	Wear appropriate chemical resistant clothing. As required by employer code.
Respiratory protection	In case of insufficient ventilation, wear suitable respiratory equipment. Where exposure guideline levels may be exceeded, use an approved NIOSH respirator.
Thermal hazards	Not applicable.
General hygiene considerations	When using, do not eat, drink or smoke. Wash hands and face before breaks and immediately after handling the product. Always observe good personal hygiene measures, such as washing after handling the material and before eating, drinking, and/or smoking. Routinely wash work clothing and protective equipment to remove contaminants. When using do not eat or drink.

9. Physical and Chemical Properties

Appearance	Clear
Physical state	Gas.
Form	Liquefied gas.
Color	Colorless
Odor	slight ether
Odor threshold	Not available.
pH	Not available.
Melting point/freezing point	Not available.

Initial boiling point and boiling range	105.8 °F (41 °C)
Pour point	Not available.
Specific gravity	Not available.
Partition coefficient (n-octanol/water)	Not available.
Flash point	Not flammable
Evaporation rate	Not available.
Flammability (solid, gas)	Not applicable.
Upper/lower flammability or explosive limits	
Flammability limit - lower (%)	> 5
Flammability limit - upper (%)	< 14.4
Explosive limit - lower (%)	Not available.
Explosive limit - upper (%)	Not available.
Vapor pressure	284 mm Hg
Vapor density	3.4 (air = 1)
Relative density	Not available.
Solubility(ies)	0.4 g/100g H2O @ 20°C
Auto-ignition temperature	Not available.
Decomposition temperature	Not available.
Viscosity	Not available.
Other information	
Percent volatile	100 %
VOC (Weight %)	697 g/l

10. Stability and Reactivity

Reactivity	Powdered metal. This product may react with strong alkalis.
Possibility of hazardous reactions	No dangerous reaction known under conditions of normal use.
Chemical stability	Stable under recommended storage conditions.
Conditions to avoid	Heat, open flames, static discharge, sparks and other ignition sources.
Incompatible materials	Strong oxidizing agents. Alkalis.
Hazardous decomposition products	May include and are not limited to: Oxides of carbon. Hydrogen fluoride.

11. Toxicological Information

Routes of exposure	Inhalation. Ingestion. Skin contact. Eye contact.	
Information on likely routes of exposure		
Ingestion	Harmful if swallowed.	
Inhalation	Prolonged inhalation may be harmful. May cause irritation to the respiratory system.	
Skin contact	Causes skin irritation.	
Eye contact	Causes serious eye irritation.	
Symptoms related to the physical, chemical and toxicological characteristics	Symptoms may include stinging, tearing, redness, swelling, and blurred vision. Skin irritation. May cause redness and pain.	
Information on toxicological effects		
Acute toxicity	Harmful if swallowed. May cause respiratory irritation.	
Components	Species	Test Results
(E)-1,2-Dichloroethene (CAS 156-60-5)		
Acute		
<i>Dermal</i>		
LD50	Rabbit	5000 mg/kg
<i>Inhalation</i>		
LC50	Mouse	21723 ppm, 6 Hours

Components	Species	Test Results
<i>Oral</i> LD50	Mouse	2220 mg/kg
	Rat	1235 mg/kg
Butane, 1,1,1,3,3-pentafluoro- (CAS 406-58-6)		
Acute		
<i>Inhalation</i> LC50	Rat	100000 ppm, 4 hours
<i>Oral</i> LD50	Rat	> 2000 mg/kg
Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2)		
Acute		
<i>Inhalation</i> LC50	Rat	> 500000 ppm
<i>Oral</i> LD50	Not available	
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8)		
Acute		
<i>Dermal</i> LD50	Rabbit	> 5000 mg/kg
<i>Inhalation</i> LC50	Rat	11100 ppm, 4 hours
<i>Oral</i> LD50	Rat	> 5000 mg/kg
Skin corrosion/irritation	Causes skin irritation.	
Exposure minutes	Not available.	
Erythema value	Not available.	
Oedema value	Not available.	
Serious eye damage/eye irritation	Causes serious eye irritation.	
Corneal opacity value	Not available.	
Iris lesion value	Not available.	
Conjunctival reddening value	Not available.	
Conjunctival oedema value	Not available.	
Recover days	Not available.	
Respiratory or skin sensitization		
Respiratory sensitization	Not available.	
Skin sensitization	Prolonged or repeated exposure can cause drying, defatting and dermatitis.	
Germ cell mutagenicity	Non-hazardous by WHMIS/OSHA criteria.	
Mutagenicity	Non-hazardous by WHMIS/OSHA criteria.	
Carcinogenicity	No ingredients listed by IARC, ACGIH, NTP or OSHA.	
Reproductive toxicity	Non-hazardous by WHMIS/OSHA criteria.	
Teratogenicity	Non-hazardous by WHMIS/OSHA criteria.	
Specific target organ toxicity - single exposure	Respiratory tract irritation.	
Specific target organ toxicity - repeated exposure	Not classified.	
Aspiration hazard	Not likely, due to the form of the product.	
Chronic effects	Prolonged inhalation may be harmful. Non-hazardous by WHMIS/OSHA criteria.	
Further information	Not available.	
Name of Toxicologically Synergistic Products	Not available.	

12. Ecological Information

Ecotoxicity	See below		
Components		Species	Test Results
(E)-1,2-Dichloroethene (CAS 156-60-5)			
Aquatic			
Fish	LC50	Bluegill (<i>Lepomis macrochirus</i>)	120 - 160 mg/l, 96 hours
Persistence and degradability	No data is available on the degradability of this product.		
Bioaccumulative potential	No data available.		
Mobility in soil	No data available.		
Mobility in general	Not available.		
Other adverse effects	No other adverse environmental effects (e.g. ozone depletion, photochemical ozone creation potential, endocrine disruption, global warming potential) are expected from this component.		

13. Disposal Considerations

Disposal instructions	Consult authorities before disposal. This material and its container must be disposed of as hazardous waste. Do not allow this material to drain into sewers/water supplies. Do not contaminate ponds, waterways or ditches with chemical or used container. Dispose of contents/container in accordance with local/regional/national/international regulations.
Local disposal regulations	Dispose in accordance with all applicable regulations.
Hazardous waste code	The waste code should be assigned in discussion between the user, the producer and the waste disposal company.
US RCRA Hazardous Waste U List: Reference	
(E)-1,2-Dichloroethene (CAS 156-60-5)	U079
Waste from residues / unused products	Dispose of in accordance with local regulations. Empty containers or liners may retain some product residues. This material and its container must be disposed of in a safe manner (see: Disposal instructions).
Contaminated packaging	Empty containers should be taken to an approved waste handling site for recycling or disposal. Since emptied containers may retain product residue, follow label warnings even after container is emptied.

14. Transport Information

U.S. Department of Transportation (DOT)

Basic shipping requirements:

UN number	UN1956
Proper shipping name	Compressed gas, n.o.s. (Tetrafluoroethane)
Hazard class	2.2
Packaging exceptions	306, 307

Transportation of Dangerous Goods (TDG - Canada)

Basic shipping requirements:

UN number	UN1956
Proper shipping name	COMPRESSED GAS, N.O.S. (Tetrafluoroethane)
Hazard class	2.2

IATA/ICAO (Air)

Basic shipping requirements:

UN number	UN1956
Proper shipping name	Compressed gas, n.o.s. (Tetrafluoroethane)
Hazard class	2.2
ERG code	2L

IMDG (Marine Transport)

Basic shipping requirements:

UN number	UN1956
Proper shipping name	COMPRESSED GAS, N.O.S. (Tetrafluoroethane)
Hazard class	2.2
EmS	F-C, S-V

DOT



IATA; IMDG; TDG



15. Regulatory Information

Canadian federal regulations This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the SDS contains all the information required by the Controlled Products Regulations.

Canada CEPA Schedule I: Listed substance

Butane, 1,1,1,3,3-pentafluoro- (CAS 406-58-6)	Listed.
Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2)	Listed.
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8)	Listed.

Canada SNAc Reporting Requirements: Listed substance/Publication date

Butane, 1,1,1,3,3-pentafluoro- (CAS 406-58-6)	Listed. 11/29/2006
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8)	Listed. 11/29/2006

Canada WHMIS Ingredient Disclosure: Threshold limits

(E)-1,2-Dichloroethene (CAS 156-60-5)	1 %
---------------------------------------	-----

WHMIS status Controlled

WHMIS classification Class A - Compressed Gas, Class D - Division 2B

WHMIS labeling



US federal regulations This product is a "Hazardous Chemical" as defined by the OSHA Hazard Communication Standard, 29 CFR 1910.1200.

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: De minimis concentration

(E)-1,2-Dichloroethene (CAS 156-60-5)	1.0 %
---------------------------------------	-------

US EPCRA (SARA Title III) Section 313 - Toxic Chemical: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5)	Listed.
---------------------------------------	---------

TSCA Section 12(b) Export Notification (40 CFR 707, Subpt. D)

Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8)	1.0 % One-Time Export Notification only.
--	--

US CWA Section 307(a)(1) Toxic Pollutants: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5)	Listed.
---------------------------------------	---------

CERCLA Hazardous Substance List (40 CFR 302.4)

(E)-1,2-Dichloroethene (CAS 156-60-5)	Listed.
---------------------------------------	---------

US - CAA Mandatory Reporting of GHGs: Global warming potential (100 year)

Butane, 1,1,1,3,3-pentafluoro- (CAS 406-58-6)	794
Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2)	1300
Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8)	1300

Lead Air Act (CAA) Section 112(r) Accidental Release Prevention (40 CFR 68.130)

Not regulated.

Clean Air Act (CAA) Section 112 Hazardous Air Pollutants (HAPs) List

Not regulated.

US CAA Section 612 SNAP Program: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.
 Butane, 1, 1,1,3,3-pentafluoro- (CAS 40 6-58-6) Listed.
 Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2) Listed.
 Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8) Listed.

US CAA VOCs with Negligible Photochemical Activity: Listed substance

Butane, 1,1,1,3,3-pentafluoro- (CAS 406-58-6) Listed.
 Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2) Listed.
 Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8) Listed.

Superfund Amendments and Reauthorization Act of 1986 (SARA)

Hazard categories Immediate Hazard - Yes
 Delayed Hazard - Yes
 Fire Hazard - No
 Pressure Hazard - No
 Reactivity Hazard - No

SARA 302 Extremely hazardous substance No

SARA 311/312 Hazardous chemical No

SARA 313 (TRI reporting)

Chemical name	CAS number	% by wt.
(E)-1,2-Dichloroethene	156-60-5	40 - 70

Other federal regulations

Safe Drinking Water Act (SDWA) Not regulated.

Food and Drug Administration (FDA) Not regulated.

US state regulations

California Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65): This material is not known to contain any chemicals currently listed as carcinogens or reproductive toxins.

US - California Hazardous Substances (Director's): Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US - California Proposition 65 - Carcinogens & Reproductive Toxicity (CRT): Listed substance

Not listed.

US - Illinois Chemical Safety Act: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US - Louisiana Spill Reporting: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US - Minnesota Haz Subs: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.
 Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2) Listed.

US - New Jersey RTK - Substances: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US - New York Release Reporting: Hazardous Substances: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US - Texas Effects Screening Levels: Listed substance

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.
 Butane, 1, 1,1,3,3-pentafluoro- (CAS 406-58-6) Listed.
 Ethane, 1,1,1,2-tetrafluoro- (CAS 811-97-2) Listed.
 Pentane, 1,1,1,2,2,3,4,5,5,5-decafluoro- (CAS 138495-42-8) Listed.

US. Massachusetts RTK - Substance List

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US. Pennsylvania RTK - Hazardous Substances

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

US. Rhode Island RTK

(E)-1,2-Dichloroethene (CAS 156-60-5) Listed.

Inventory status

Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Domestic Substances List (DSL)	Yes

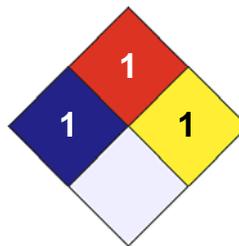
Country(s) or region	Inventory name	On inventory (yes/no)*
Canada	Non-Domestic Substances List (NDSL)	No
United States & Puerto Rico	Toxic Substances Control Act (TSCA) Inventory	Yes

*A "Yes" indicates that all components of this product comply with the inventory requirements administered by the governing country(s)

16. Other Information

LEGEND	
Severe	4
Serious	3
Moderate	2
Slight	1
Minimal	0

HEALTH	/ 1
FLAMMABILITY	1
PHYSICAL HAZARD	1
PERSONAL PROTECTION	X



Disclaimer

The information in the sheet was written based on the best knowledge and experience currently available. Information contained herein was obtained from sources considered technically accurate and reliable. While every effort has been made to ensure full disclosure of product hazards, in some cases data is not available and is so stated. Since conditions of actual product use are beyond control of the supplier, it is assumed that users of this material have been fully trained according to the requirements of all applicable legislation and regulatory instruments. No warranty, expressed or implied, is made and supplier will not be liable for any losses, injuries or consequential damages which may result from the use of or reliance on any information contained in this document.

Issue date

05-February-2015

Effective date

01-February-2015

Expiry date

01-February-2018

Further information

For an updated SDS, please contact the supplier/manufacturer listed on the first page of the document.

Prepared by

Nu-Calgon Technical Service Phone: (314) 469-7000

Other information

This Safety Data Sheet was prepared to comply with the current OSHA Hazard Communication Standard (HCS) adoption of the Globally Harmonized System of Classification and Labeling of Chemicals (GHS).
This SDS conforms to the ANSI Z400.1/Z129.1-2010 Standard.