

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 11/23/2015

Reviewed on 11/23/2015

* **1 Identification**

- **Product Identifier**
- **Trade name: HFC 1100LT Refrigerant Charge**
- **Relevant identified uses of the substance or mixture and uses advised against:** Refrigerant
- **Product Description** Chemical Classification: Mixture of Halocarbons, Hydrocarbon and Inert Gases
- **Details of the Supplier of the Safety Data Sheet:**
- **Manufacturer/Supplier:**
 Mullen & Toland Systems, Inc.
 1845 Piner Road
 Santa Rosa, CA. 95403
 Phone:(707) 569-7380
 Fax: (707) 569-7451
- **Emergency telephone number:** 707-569-7380

* **2 Hazard(s) Identification**

- **Classification of the substance or mixture:**



GHS02 Flame

Flam. Gas 1 H220 Extremely flammable gas.



GHS04 Gas cylinder

Press. Gas H280 Contains gas under pressure; may explode if heated.



GHS07

Skin Irrit. 2 H315 Causes skin irritation.

STOT SE 3 H335 May cause respiratory irritation.

Eye Irrit. 2B H320 Causes eye irritation.

- **Label elements:**

- **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

- **Hazard pictograms:**



GHS02



GHS04



GHS07

- **Signal word:** Danger

- **Hazard-determining components of labeling:**

Ethane

- **Hazard statements:**

Extremely flammable gas.

Contains gas under pressure; may explode if heated.

Causes skin and eye irritation.

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May cause respiratory irritation.

Precautionary statements:

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

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

Use only outdoors or in a well-ventilated area.

Wear protective gloves.

Wash thoroughly after handling.

If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do.

Continue rinsing.

Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).

IF INHALED: Remove person to fresh air and keep comfortable for breathing.

Call a POISON CENTER/doctor if you feel unwell.

If skin irritation occurs: Get medical advice/attention.

If eye irritation persists: Get medical advice/attention.

Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

Eliminate all ignition sources if safe to do so.

IF ON SKIN: Wash with plenty of water.

Take off contaminated clothing and wash it before reuse.

Store locked up.

Protect from sunlight. Store in a well-ventilated place.

Store in a well-ventilated place. Keep container tightly closed.

Dispose of contents/container in accordance with local/regional/national/international regulations.

Classification system:

NFPA ratings (scale 0 - 4)



HMS-ratings (scale 0 - 4)



Hazard(s) not otherwise classified (HNOC): None known

3 Composition/Information on Ingredients

Non-hazardous components:

CAS: 74-84-0 RTECS: KH 3800000	Ethane ⚠ Flam. Gas 1, H220; ⚠ Skin Irrit. 2, H315; STOT SE 3, H335; Press. Gas, H280; Eye Irrit. 2B, H320	15-35%
CAS: 75-73-0 RTECS: FG4920000	Carbon Tetrafluoride ⚠ Press. Gas, H280	15-35%
CAS: 7440-37-1 RTECS: CF 2300000	Argon ⚠ Press. Gas, H280; Simple Asphyxiant	15-35%
CAS: 690-39-1	Propane, 1,1,1,3,3,3-hexafluoro- ⚠ Press. Gas, H280; Simple Asphyxiant	15-35%
CAS: 431-89-0	Propane, 1,1,1,2,3,3,3-heptafluoro- ⚠ Press. Gas, H280; ⚠ Acute Tox. 4, H332	15-35%
CAS: 75-46-7 RTECS: PB6900000	Trifluoromethane ⚠ Press. Gas, H280	5-10%

(Contd. on page 3)

Safety Data Sheet (SDS)

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- **Chemical characterization: Mixtures**
- **Description:** Mixture of substances listed below with non-hazardous additions.
- **Dangerous Components:** Non-Regulated Material

* 4 First-Aid Measures

- **Description of first aid measures:**
- **After inhalation:**
Supply fresh air. If required, provide artificial respiration. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.
- **After skin contact:**
Immediately wash with water and soap and rinse thoroughly.
If skin irritation occurs, consult a doctor.
- **After eye contact:**
Rinse opened eye for at least 15 minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** If swallowed and symptoms occur, consult a doctor.
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed:** No further relevant information available.
- **Indication of any immediate medical attention and special treatment needed:**
No further relevant information available.

* 5 Fire-Fighting Measures

- **Extinguishing media:**
- **Suitable extinguishing agents:** CO2, sand, extinguishing powder. Do not use water.
- **For safety reasons unsuitable extinguishing agents:** Water with full jet
- **Special hazards arising from the substance or mixture:**
If incinerated, product will release the following toxic fumes: Carbon Oxides and Hydrofluoric acid gas.
- **Advice for firefighters:**
CAUTION: Cylinders that are exposed to heat from a fire may rupture or burst and release contents. When involved in a fire, this material may decompose and produce hydrofluoric acids, and toxic hydrogen fluoride and carbonyl halide gases.
- **Protective equipment:**
As in any fire, wear self-contained breathing apparatus pressure-demand (NIOSH approved or equivalent) and full protective gear to prevent contact with skin and eyes.

* 6 Accidental Release Measures

- **Personal precautions, protective equipment and emergency procedures:**
Keep people at a distance and stay upwind.
Wear protective equipment. Keep unprotected persons away.
Ensure adequate ventilation
- **Environmental precautions:**
Inform respective authorities in case of seepage into water course or sewage system.
Do not allow to enter sewers/ surface or ground water.
- **Methods and material for containment and cleaning up:** Ensure adequate ventilation.
- **Reference to other sections:**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

(Contd. on page 4)

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 11/23/2015

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Trade name: HFC 1100LT Refrigerant Charge

* **7 Handling and Storage**

- **Handling**
- **Precautions for safe handling:**
Ensure good ventilation/exhaustion at the workplace.
Open and handle receptacle with care.
- **Information about protection against explosions and fires:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
- **Conditions for safe storage, including any incompatibilities:**
Store away from strong acids, strong reducing agents and strong oxidizing agents.
- **Storage**
- **Requirements to be met by storerooms and receptacles:** Store in a cool location.
- **Information about storage in one common storage facility:** Not required.
- **Further information about storage conditions:**
No further relevant information available..
Do not gas tight seal receptacle.
Store in cool, dry conditions in well sealed receptacles.
Protect from heat and direct sunlight.
- **Specific end use(s):** No further relevant information available.

* **8 Exposure Controls/Personal Protection**

- **Additional information about design of technical systems:** No further data; see section 7.
- **Control parameters:**
All ventilation should be designed in accordance with OSHA standard (29 CFR 1910.94). Use mechanical (general) ventilation for storage areas. Use appropriate ventilation as required to keep Exposure Limits in Air below TLV & PEL limits.

· Components with occupational exposure limits:	
74-84-0 Ethane	
TLV	Refer to Appendix F in TLVs and BEIs book
7440-37-1 Argon	
TLV	see App. F, Simple asphyxiant
431-89-0 Propane, 1,1,1,2,3,3,3-heptafluoro-	
TWA	1000 ppm (manufacturerer determined)

- **Additional information:** The lists that were valid during the creation of this SDS were used as basis.
- **Exposure controls:**
- **Personal protective equipment:**
- **General protective and hygienic measures:**
Keep away from foodstuffs, beverages and feed.
Immediately remove all soiled and contaminated clothing and wash before reuse.
Wash hands before breaks and at the end of work.
Avoid contact with the eyes and skin.
- **Breathing equipment:** Not required.
- **Protection of hands:**



Protective gloves

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Issue date 11/23/2015

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The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.
 Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.
 Select glove material based on penetration times, rates of diffusion and degradation.

· **Material of gloves:**

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer. As the product is a preparation of several substances, the resistance of the glove material cannot be calculated in advance and has therefore to be checked prior to the application.

· **Penetration time of glove material:**

The exact break-through time has to be determined and observed by the manufacturer of the protective gloves.

· **Eye protection:**



Tightly sealed goggles

· **Body protection:**



Protective work clothing

* 9 Physical and Chemical Properties

· **Information on basic physical and chemical properties**

· **General Information**

· **Appearance:**

Form: Compressed gas

Color: Clear, colorless

· **Odor:** Recognizable

· **Odor threshold:** Not determined.

· **pH-value:** Acidic

· **Change in condition**

Melting point/Melting range: Not determined.

Boiling point/Boiling range: -185 °C (-301 °F)

· **Flash point:** 32 °C (90 °F)

· **Flammability (solid, gaseous):** Not determined.

· **Ignition temperature:** 510 °C (950 °F)

· **Decomposition temperature:** Not determined.

· **Auto igniting:** Product is not self-igniting.

· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapor mixtures are possible.

· **Explosion limits:**

Lower: 3.0 Vol %

Upper: 15.5 Vol %

(Contd. on page 6)

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 11/23/2015

Reviewed on 11/23/2015

Trade name: HFC 1100LT Refrigerant Charge

- **Vapor pressure @ 20 °C (68 °F):** 453.3 hPa (340 mm Hg)
- **Density:**
 - Relative density:** Not determined.
 - Vapor density:** Not determined.
 - Evaporation rate:** Not applicable.
- **Solubility in / Miscibility with:**
 - Water:** Not miscible or difficult to mix.
- **Partition coefficient (n-octanol/water):** Not determined.
- **Viscosity:**
 - Dynamic:** Not determined.
 - Kinematic:** Not determined.
- **Solvent content:**
 - Organic solvents:** 0.0 %
- **Other information:** How to Detect This Substance (Warning Properties): The gas is not visible, however, rapidly released gases may cause the formation of a vapor cloud. The gas may be odorless or have a faintly sweet or slight ether-like odor.

* 10 Stability and Reactivity

- **Reactivity:** Stable under normal conditions.
- **Chemical stability:** Stable under normal conditions.
- **Thermal decomposition / conditions to be avoided:** No decomposition if used according to specifications.
- **Possibility of hazardous reactions:** No dangerous reactions known.
- **Conditions to avoid:** Heat, flame and ignition sources.
- **Incompatible materials:**
 - POWDERED ALUMINUM AND ACTIVE METALS are not compatible with this gas product and may produce violent reactions.
 - POLYSTYRENE is not compatible with this gas product and may produce violent reactions.
 - ALKALINE EARTH METALS like calcium, magnesium, sodium, potassium, lithium, and barium are not compatible with this gas and may produce violent reactions.
 - EARTH METALS like silver, brass, bronze and copper may enhance the decomposition of this gas at elevated temperatures.
 - OXIDIZERS may produce fire and explosion hazards.
- **Hazardous decomposition products:** Carbon Oxides and Hydrofluoric acid gas.

* 11 Toxicological Information

- **Information on toxicological effects:** The toxicity of this product is unknown.
- **Acute toxicity:**
- **Primary irritant effect:**
- **On the skin:** Irritant to skin and mucous membranes.
- **On the eye:** Irritating effect.
- **Additional toxicological information:**
 - The product shows the following dangers according to internally approved calculation methods for preparations:
 - Irritant
- **Carcinogenic categories:**
- **IARC (International Agency for Research on Cancer):**
 - Group 1 - Carcinogenic to humans
 - Group 2A - Probably carcinogenic to humans

(Contd. on page 7)

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 11/23/2015

Reviewed on 11/23/2015

Trade name: HFC 1100LT Refrigerant Charge

- Group 2B - Possibly carcinogenic to humans
- Group 3 - Not classifiable as to its carcinogenicity to humans
- Group 4 - Probably not carcinogenic to humans

None of the ingredients are listed.

· **NTP (National Toxicology Program):**

None of the ingredients are listed.

· **OSHA-Ca (Occupational Safety & Health Administration):**

None of the ingredients are listed.

*** 12 Ecological Information**

- **Toxicity:** The hazards for the aquatic environment are unknown.
- **Aquatic toxicity:** No further relevant information available.
- **Persistence and degradability:** No further relevant information available.
- **Behavior in environmental systems:**
- **Bioaccumulative potential:** No further relevant information available.
- **Mobility in soil:** No further relevant information available.
- **Additional ecological information:**
- **General notes:**
Do not allow undiluted product or product that has not been neutralized to reach ground water, water course or sewage system.
- **Results of PBT and vPvB assessment:**
- **PBT:** Not applicable.
- **vPvB:** Not applicable.
- **Other adverse effects:** No further relevant information available.

*** 13 Disposal Considerations**

- **Waste treatment methods:**
- **Recommendation:**
Must not be disposed of together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packagings:**
- **Recommendation:** Disposal must be made according to official regulations.

*** 14 Transport Information**

- **UN-Number:**
- **DOT, ADR, IMDG, IATA** UN1954
- **UN proper shipping name:**
- **DOT, IATA** Compressed gas, flammable, n.o.s.
- **ADR** UN1954 Compressed gas, flammable, n.o.s.
- **IMDG** COMPRESSED GAS, FLAMMABLE, N.O.S.
- **Transport hazard class(es):**
- **DOT**



- **Class:** 2.1

(Contd. on page 8)

Safety Data Sheet (SDS)

OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

Issue date 11/23/2015

Reviewed on 11/23/2015

Trade name: HFC 1100LT Refrigerant Charge

· **Label:** 2.1(2.2)

· **ADR**

· **Class:** 2.1 1F
 · **Label:** 2.1/2.2

· **IMDG**



· **Class:** 2.1
 · **Label:** 2.1,2.2

· **IATA**



· **Class:** 2.1
 · **Label:** 2.1 (2.2)

· **Packing group:**
 · **DOT, ADR, IMDG, IATA** Non-Regulated Material
 · **Environmental hazards:** Not applicable.
 · **Special precautions for user:** Not applicable.
 · **Danger code (Kemler):** 23
 · **EMS Number:** F-D,S-U
 · **Stowage Category** D
 · **Stowage Code** SW2 Clear of living quarters.
 · **Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code:** Not applicable.
 · **Transport/Additional information:**

· **DOT**
 · **Quantity limitations:** On passenger aircraft/rail: Forbidden
 On cargo aircraft only: 150 kg

· **ADR**
 · **Excepted quantities (EQ):** Code: E0
 Not permitted as Excepted Quantity

· **IMDG**
 · **Limited quantities (LQ):** 0
 · **Excepted quantities (EQ):** Code: E0
 Not permitted as Excepted Quantity
 · **UN "Model Regulation":** UN 1954 COMPRESSED GAS, FLAMMABLE, N.O.S., 2.1/2.2
(Contd. on page 9)

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OSHA HazCom Standard 29 CFR 1910.1200(g) and GHS Rev 03.

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Trade name: HFC 1100LT Refrigerant Charge

* 15 Regulatory Information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture:**
- **SARA (Superfund Amendments and Reauthorization):**

· **Section 355 (extremely hazardous substances):**

None of the ingredients are listed.

· **Section 313 (Specific toxic chemical listings):**

None of the ingredients are listed.

· **TSCA (Toxic Substances Control Act):**

All ingredients are listed.

· **California Proposition 65:**

· **Chemicals known to cause cancer:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for females:**

None of the ingredients are listed.

· **Chemicals known to cause reproductive toxicity for males:**

None of the ingredients are listed.

· **Chemicals known to cause developmental toxicity:**

None of the ingredients are listed.

· **Carcinogenic categories:**

· **EPA (Environmental Protection Agency):**

None of the ingredients are listed.

· **TLV (Threshold Limit Value established by ACGIH):**

None of the ingredients are listed.

· **NIOSH-Ca (National Institute for Occupational Safety and Health):**

None of the ingredients are listed.

· **GHS label elements**

The product is classified and labeled according to the Globally Harmonized System (GHS).

· **Hazard pictograms:**



GHS02 GHS04 GHS07

· **Signal word:** Danger

· **Hazard-determining components of labeling:**

Ethane

· **Hazard statements:**

- Extremely flammable gas.
- Contains gas under pressure; may explode if heated.
- Causes skin and eye irritation.
- May cause respiratory irritation.

· **Precautionary statements:**

Keep away from heat/sparks/open flames/hot surfaces. No smoking.

(Contd. on page 10)

Safety Data Sheet (SDS)

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Avoid breathing dust/fume/gas/mist/vapors/spray.
 Use only outdoors or in a well-ventilated area.
 Wear protective gloves.
 Wash thoroughly after handling.
 If in eyes: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
 Specific treatment (see supplementary first aid instructions on this Safety Data Sheet).
 IF INHALED: Remove person to fresh air and keep comfortable for breathing.
 Call a POISON CENTER/doctor if you feel unwell.
 If skin irritation occurs: Get medical advice/attention.
 If eye irritation persists: Get medical advice/attention.
 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.
 Eliminate all ignition sources if safe to do so.
 IF ON SKIN: Wash with plenty of water.
 Take off contaminated clothing and wash it before reuse.
 Store locked up.
 Protect from sunlight. Store in a well-ventilated place.
 Store in a well-ventilated place. Keep container tightly closed.
 Dispose of contents/container in accordance with local/regional/national/international regulations.

· National regulations:

The product is subject to be classified according with the latest version of the regulations on hazardous substances.

· State Right to Know:

CAS: 74-84-0 RTECS: KH 3800000	Ethane ⚠ Flam. Gas 1, H220; ⚠ Skin Irrit. 2, H315; STOT SE 3, H335; Press. Gas, H280; Eye Irrit. 2B, H320	15-35%
CAS: 75-73-0 RTECS: FG4920000	Carbon Tetrafluoride ⚠ Press. Gas, H280	15-35%
CAS: 7440-37-1 RTECS: CF 2300000	Argon ⚠ Press. Gas, H280; Simple Asphyxiant	15-35%
CAS: 690-39-1	Propane, 1,1,1,3,3,3-hexafluoro- ⚠ Press. Gas, H280; Simple Asphyxiant	15-35%
CAS: 431-89-0	Propane, 1,1,1,2,3,3,3-heptafluoro- ⚠ Press. Gas, H280; ⚠ Acute Tox. 4, H332	15-35%
CAS: 75-46-7 RTECS: PB6900000	Trifluoromethane ⚠ Press. Gas, H280	5-10%

All ingredients are listed.

· Chemical safety assessment: A Chemical Safety Assessment has not been carried out.

16 Other Information

The information and recommendations in this safety data sheet are, to the best of our knowledge, accurate as of the date of issue. Nothing herein shall be deemed to create warranty, expressed or implied, and shall not establish a legally valid contractual relationship. It is the responsibility of the user to determine applicability of this information and the suitability of the material or product for any particular purpose.

· Date of preparation / last revision: 11/23/2015 / -

· Abbreviations and acronyms:

ADR: The European Agreement concerning the International Carriage of Dangerous Goods by Road
 ADN: The European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
 IMDG: International Maritime Code for Dangerous Goods
 DOT: US Department of Transportation
 IATA: International Air Transport Association

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Issue date 11/23/2015

Reviewed on 11/23/2015

Trade name: HFC 1100LT Refrigerant Charge

ACGIH: American Conference of Governmental Industrial Hygienists
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
CAS: Chemical Abstracts Service (division of the American Chemical Society)
NFPA: National Fire Protection Association (USA)
HMIS: Hazardous Materials Identification System (USA)
PBT: Persistent, Bioaccumulative and Toxic
vPvB: very Persistent and very Bioaccumulative
NIOSH: National Institute for Occupational Safety
OSHA: Occupational Safety & Health
TLV: Threshold Limit Value
PEL: Permissible Exposure Limit
REL: Recommended Exposure Limit
Flam. Gas 1: Flammable gases, Hazard Category 1
Press. Gas: Gases under pressure: Liquefied gas
Skin Irrit. 2: Skin corrosion/irritation, Hazard Category 2
Eye Irrit. 2B: Serious eye damage/eye irritation, Hazard Category 2B
STOT SE 3: Specific target organ toxicity - Single exposure, Hazard Category 3

· * **Data compared to the previous version altered.**

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