SAFETY DATA SHEET

Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58/EC & 1272/2008/EC Standards | MSDS Revision: 2.0 | MSDS Revision Date: 08/22/2012

1. PRODUCT IDENTIFICATION

1.1 Product Name:
DustALL™ DUST REMOVER SPRAY, (P/N CCS-2000), 10 oz. (284 g)

1.2 Chemical Name:
See ingredients listed in section 3

1.3 Synonyms:
152a Duster

1.4 Trade Names:
Difluoroethane

1.5 Product Use:
Dust Removing Spray

1.6 Manufacturer's Name:
CAIG Laboratories, Inc.

1.7 Manufacturer's Address:
12200 Thatcher Court, Poway, CA 92064-6876 USA

1.8 Emergency Phone:
CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-3887

1.9 Business Phone:
+1 (800)-224-4123

2. HAZARD IDENTIFICATION

2.1 Hazard Identification:
This product is classified as a HAZARDOUS SUBSTANCE but not as DANGEROUS GOODS according to the classification criteria of NOHSC: 1008(2004) and ADG Code (Australia).
Keep out of reach of children. WARNING. Contains gas under pressure; may explode if heated.
Hazard Statements (H): H280 – Contains gas under pressure; may explode if heated.
Precautionary Statements (P): P280 – Wear protective gloves and eye protection. P305+P351+P338 – IF IN EYES - Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. P410 + P403 – Protect from sunlight. Store in a well-ventilated place. P501 – Dispose of contents/container through licensed treatment, storage or disposal facility.

2.2 Routes of Entry:	Inhalation:	YES	Absorption:	YES	Ingestion:	NO

2.3 Effects of Exposure:

EYES:	**Possible irritation.**
SKIN:	**Possible irritation and dermatitis, frostbite like effect.**
INGESTION:	**Expected to be a low hazard for recommended handling.**
INHALATION:	**May be irritating to nose, throat and respiratory tact. Aspiration of small quantities of liquid into the lungs can cause tissue damage resulting in pulmonary edema and pneumonitis and Central Nervous System effects including dizziness, weakness, fatigue, nausea, headache and possible unconsciousness.**

2.4 Symptoms of Exposure:

EYES:	**Possible irritation.**
SKIN:	**Possible irritation and dermatitis. Frostbite like effect.**
INGESTION:	**Expected to be a low hazard for recommended handling.**
INHALATION:	**May be irritating to nose, throat and respiratory tact. Aspiration of small quantities of liquid into the lungs can cause tissue damage resulting in pulmonary edema and pneumonitis and Central Nervous System effects including dizziness, weakness, fatigue, nausea, headache and possible unconsciousness.**

2.5 Acute Health Effects:

EYES:	**May cause transient irritation.**
SKIN:	**May be slightly irritating to skin, causes frost bite like effect**
INGESTION:	**May be irritating to nose, throat and respiratory tact. Aspiration of small quantities of liquid into the lungs can cause tissue damage resulting in pulmonary edema and pneumonitis and Central Nervous System effects including dizziness, weakness, fatigue, nausea, headache and possible unconsciousness.**

2.6 Chronic Health Effects:
Prolonged or repeated Higher exposures may lead to irritation of nose, throat, and lungs with cough, difficulty breathing or shortness of breath, temporary alteration of the heart's electrical activity with irregular pulse, palpitations, or inadequate circulation.

2.7 Target Organs:
Eyes, Skin, Lungs

NA = Not Available; ND = Not Determined; NE = Not Established; C = Ceiling Limit; See Section 16 for Additional Definitions of Terms Used
NOTE: all WHMIS required information is included. It is located in appropriate sections based on the ANSI Z400.1-2010 format.

1. PRODUCT IDENTIFICATION – cont'd

3. COMPOSITION & INGREDIENT INFORMATION

CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	EXPOSURE LIMITS IN AIR (mg/m³) ACGIH ppm TLV	ACGIH ppm STEL	NOHSC ppm ES-TWA	NOHSC ppm ES-STEL	NOHSC ppm ES-PEAK	OSHA ppm PEL	OSHA ppm STEL	OSHA ppm IDLH	OTHER
1,1-DIFLUOROETHANE (R-152a)	75-37-6	KI1410000	200-866-1	100.0	NA	NA	NF	NF	NF	NA	NA	NA	1000 WEEL

4. FIRST AID MEASURES

4.1 First Aid:

EYES: Immediately flush eyes with plenty of running water for at least 15 minutes, lifting upper and lower lids, occasionally. If irritation persists, repeat flushing. Get medical attention.

SKIN: Wash thoroughly with soap and water. In case of contact, immediately flush skin with plenty of water for at least 15 minutes. Treat for frostbite if necessary, by gently warming affected area.

INGESTION: Ingestion is not considered a potential route of exposure. If ingested call physician or poison control center immediately. Do no induce vomiting. Rinse mouth with water. Aspiration of material into lungs due to vomiting may cause chemical pneumonitis which can be fatal.

INHALATION: Remove affected person to fresh air. If breathing if difficult, administer oxygen. If breathing stops give artificial respiration. Keep person warm, quiet and get medical attention.

Notes to Physicians: Because of possible disturbances of cardiac rhythm, catecholamine drugs, such as epinephrine, should be used with special caution only in situations of emergency life support.

4.2 Medical Conditions Aggravated by Exposure:
None reported by the manufacturer.

HEALTH	0
FLAMMABILITY	4
PHYSICAL HAZARDS	3
PROTECTIVE EQUIPMENT	B

EYES | SKIN

5. FIREFIGHTING MEASURES

5.1 Flashpoint & Method:
< -50 °C (-58 °F)

5.2 Autoignition Temperature:
454 °C (849 °F)

5.3 Flammability Limits: Lower Explosive Limit (LEL): **3.9** Upper Explosive Limit (UEL): **16.9**

5.4 Fire & Explosion Hazards:
Flammable gas. Use water spray to cool cans. R-152a fire decomposition by-products will include hydrofluoric acid, and possibly carbonyl fluoride. Avoid contact with these materials, which are toxic and irritating. Evacuate personnel immediately in the event of a fire involving R-152a.

5.5 Extinguishing Methods:
Dry chemical, foam, carbon dioxide, and water fog.

5.6 Firefighting Procedures:
Keep containers cool until well after the fire is out. If gas exiting container ignites, stop flow of gas. Do not put out the fire unless leak can be stopped immediately. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway. Firefighters should wear full-face, self-contained breathing apparatus (MSHA/NIOSH approved or the equivalent) and impervious clothing. HAZCHEM 2(Y)E, HIN 223

6. ACCIDENTAL RELEASE MEASURES

6.1	Spills: **Secure spill area, remove or minimize all sources of ignition, and maximize ventilation. Stop spill or leak at source if safely possible. Deny entry to all unprotected individuals. Individuals involved in the cleanup must wear appropriate personal protective equipment. Recover free liquid or cover with inert absorbent material and place into appropriate container(s) for disposal. If necessary, dike well ahead of the spill to prevent runoff into drains, sewers or any natural waterway or drinking supply. Contact appropriate local and/or provincial authorities for assistance and/or reporting requirements.**

7. HANDLING & STORAGE INFORMATION

7.1	Work & Hygiene Practices: **Use with sufficient ventilation. Avoid breathing high concentrations of vapors and avoid liquid contact with skin or eyes. Observe good industrial hygiene practices. Wash thoroughly with soap and water after handling and before eating, drinking or smoking.**
7.2	Storage & Handling: **Store in a cool, dry place. Keep away from excessive heat. Do not heat above 52 °C (125 °F).**
7.3	Special Precautions: **Keep out of reach of children. Do not take internally. Do not get in eyes. Readily available emergency first aid, and spill response equipment are highly recommended. Keep away from excessive heat. Do not heat above 52 °C (125 °F).**

8. EXPOSURE CONTROLS & PERSONAL PROTECTION

8.1	Ventilation & Engineering Controls: **General ventilation is required with this product.**
8.2	Respiratory Protection: **A respiratory protection program that meets ANSI Z88.2 requirements must be followed whenever workplace conditions warrant a respirators use.**
8.3	Eye Protection: **Safety glasses with side shields should be used. If splashing is anticipated, splash goggles and face-shield are recommended.**
8.4	Hand Protection: **Where contact is likely, impervious gloves are recommended. Do not wear rings, watches, or jewelry that could entrap the material against the skin.**
8.5	Body Protection: **None required under normal conditions.**

9. PHYSICAL & CHEMICAL PROPERTIES

9.1	Density:	**0.90 g/cc at 22 °C (77 °F) Liquid**
9.2	Boiling Point:	**> 25 °C (> 13 °F)**
9.3	Melting Point:	**NA**
9.4	Evaporation Rate:	**ND**
9.5	Vapor Pressure:	**87 psia at 25 °C (77 °F)**
9.6	Molecular Weight:	**NA**
9.7	Appearance & Color:	**Clear colorless gas**
9.8	Odor Threshold:	**Slight ethereal**
9.9	Solubility:	**.028 % w/w @ 2 °C (77 °F) (87 psia)**
9.10	pH	**13.0-14.0**
9.11	Viscosity:	**NA**
9.12	Coefficient Oil/Water Distribution:	**NA**
9.13	Additional Information:	**NA**

10. STABILITY & REACTIVITY

10.1	Stability: **Stable, under normal conditions.**
10.2	Hazardous Decomposition Products: **Decomposition products are hazardous. This material can be decomposed by high temperatures (open flames, glowing metal surfaces, etc.) forming hydrofluoric acid and possibly carbonyl fluoride.**
10.3	Hazardous Polymerization: **Will not occur.**
10.4	Conditions to Avoid: **Open flames, glowing metal surfaces, extremes of temperature and direct sunlight.**
10.5	Incompatible Substances: **Alkali or alkaline earth metals- powdered Al, Zn, Be, etc.**

11. TOXICOLOGICAL INFORMATION

11.1	Toxicity Data: **No general or specific toxicity data has been reported by the manufacturer other than the information presented in Section 2. However, good personal hygiene practices, such as washing any skin contact areas and removing contaminated clothing, are recommended. R-152a has not been tested for skin and eye irritancy, or for animal sensitization. Ingestion of single high doses of R-152a caused weight loss and lethargy.**	
11.2	Acute Toxicity: **See section 2.5**	
11.3	Chronic Toxicity: **See section 2.6**	
11.4	Suspected Carcinogen: **No**	
11.5	Reproductive Toxicity:	
	Mutagenicity:	**This product is not expected to cause mutagenic effects in humans.**
	Embryotoxicity:	**This product is not expected to cause embryotoxic effects in humans.**
	Teratogenicity:	**This product is not expected to cause teratogenic effects in humans.**
	Reproductive Toxicity:	**This product is not expected to cause reproductive harm in humans.**
11.6	Irritancy of Product: **NA**	
11.7	Biological Exposure Indices: **NA**	
11.8	Physician Recommendations: **Treat symptomatically.**	

12. ECOLOGICAL INFORMATION

12.1	Environmental Stability: **The manufacturer has not reported any detailed studies on the environmental fate of the material. However, prudent practice would dictate the material not be allowed to enter the environment.**
12.2	Effects on Plants & Animals: **The manufacturer has not reported any animal or plant effects**
12.3	Effects on Aquatic Life: **The manufacturer has not reported any aquatic life effects.**

13. DISPOSAL CONSIDERATIONS

13.1	Waste Disposal: **Dispose of in accordance with local & state or provincial hazardous waste laws.**
13.2	Special Considerations: **If the material is unsuitable for recycling or reclamation, enclosed-controlled incineration is recommended unless otherwise prohibited by local ordinance.**

14. TRANSPORTATION INFORMATION

The basic description (ID Number, proper shipping name, hazard class & division, packing group) is shown for each mode of transportation. Additional descriptive information may be required by 49 CFR, IATA/ICAO, IMDG and the CTDGR.

14.1	49 CFR (GND): **CONSUMER COMMODITY, ORM-D*, DOT-SP 11516 – * authorized until 01/01/2014** **UN1030, DIFLUORETHANE, 2.1**
14.2	IATA (AIR): **UN1030, DIFLUORETHANE, 2.1 - CARGO AIRCRAFT ONLY**
14.3	IMDG (OCN): **UN1030, DIFLUORETHANE, 2.1**
14.4	TDGR (Canadian GND): **UN1030, DIFLUORETHANE, 2.1**
14.5	ADR/RID (EU): **UN1030, DIFLUORETHANE, 2.1**
14.6	SCT (MEX): **UN1030, DIFLORETHANE, 2.1**
14.6	ADGR (AUS): **UN1030, DIFLUORETANO, 2.1**
14.7	ADGR (AUS): **UN1030, DIFLUORETHANE, 2.1**

15. REGULATORY INFORMATION

15.1	SARA Reporting Requirements: **This product contains "DYMEL" 152a, which is subject to the SARA 311 and 312 reporting requirements.**
15.2	SARA Threshold Planning Quantity: **NA**
15.3	TSCA Inventory Status: **All chemical substances of this product are listed on the TSCA inventory or are otherwise exempt from inventory status.**
15.4	CERCLA Reportable Quantity (RQ): **NA**
15.5	Other Federal Requirements: **R-152a is a flammable gas as defined by OSHA in 29CFR 1910.1200(c). Use of this product may require compliance with 29CFR 1910.119, Process Safety Management of Highly Hazardous Chemicals.**
15.6	Other Canadian Regulations **All chemical substances of this product are listed on the CEPA DSL/NDSL or are exempt from list requirements. This product has been classified according to the hazard criteria of the CPR and the MSDS contains all of the information required by the CPR.**
15.7	State Regulatory Information: **Difluoroethane can be found on the following state criteria lists: Massachusetts Hazardous Substances List, New Jersey Right-to-Know List, and Pennsylvania Hazardous Substances List. Difluoroethane is not listed on the California Proposition 65 list.**
15.8	67/548/EEC (European Union) Requirements: **The primary component of this product is not listed in Annex I of EU Directive 67/548/EEC.** **Keep out of reach of children. WARNING. Contains gas under pressure; may explode if heated.** **Hazard Statements (H): H280 – Contains gas under pressure; may explode if heated.** **Precautionary Statements (P): P280 – Wear protective gloves and eye protection. P305+P351+P338 – IF IN EYES - Rinse continuously with water for several minutes. Remove contact lenses if present and easy to do – continue rinsing. P410 + P403 – Protect from sunlight. Store in a well-ventilated place. P501 – Dispose of contents/container through licensed treatment, storage or disposal facility.**

16. OTHER INFORMATION

16.1	Other Information: **NA**	
16.2	Terms & Definitions: **See last page of this MSDS.**	
16.3	Disclaimer: **This Material Safety Data Sheet is offered pursuant to OSHA's Hazard Communication Standard, 29 CFR §1910.1200. Other government regulations must be reviewed for applicability to this product. To the best of ShipMate's & CAIG Laboratories, Inc.'s knowledge, the information contained herein is reliable and accurate as of this date; however, accuracy, suitability or completeness are not guaranteed and no warranties of any type, either expressed or implied, are provided. The information contained herein relates only to the specific product(s). If this product(s) is combined with other materials, all component properties must be considered. Data may be changed from time to time. Be sure to consult the latest edition.**	
16.4	Prepared for: **CAIG Laboratories, Inc.** **12200 Thatcher Court** **Poway, CA 92064-6876** **Tel: +1 (800) CAIG-123 (244-4123)** **Fax: +1 (858) 486-8398 fax** **http://www.caig.com/**	CAIG LABORATORIES, INC.
16.5	Prepared by: **ShipMate, Inc.** **PO Box 787** **Sisters, OR 97759** **Phone: +1 (310) 370-3600** **Fax: +1 (310) 370-5700** **e-mail: shipmate@shipmate.com**	ShipMate® Dangerous Goods Training & Consulting

DEFINITION OF TERMS

A large number of abbreviations and acronyms appear on a MSDS. Some of these that are commonly used include the following:

GENERAL INFORMATION:

CAS No.	Chemical Abstract Service Number

EXPOSURE LIMITS IN AIR:

ACGIH	American Conference on Governmental Industrial Hygienists
TLV	Threshold Limit Value
OSHA	U.S. Occupational Safety and Health Administration
PEL	Permissible Exposure Limit
IDLH	Immediately Dangerous to Life and Health

FIRST AID MEASURES:

CPR	Cardiopulmonary resuscitation - method in which a person whose heart has stopped receives manual chest compressions and breathing to circulate blood and provide oxygen to the body.

HAZARDOUS MATERIALS IDENTIFICATION SYSTEM: HMIS

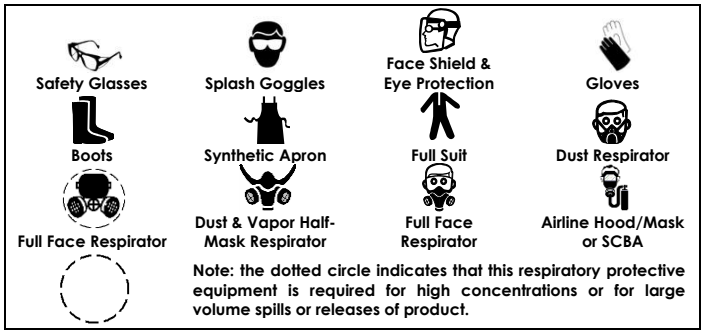
HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard

HEALTH
FLAMMABILITY
PHYSICAL HAZARDS
PERSONAL PROTECTION

PERSONAL PROTECTION RATINGS:

A	
B	
C	
D	
E	
F	
G	
H	
I	
J	
K	
X	**Consult your supervisor or SOPs for special handling directions.**



Note: the dotted circle indicates that this respiratory protective equipment is required for large volume spills or releases of product.

OTHER STANDARD ABBREVIATIONS:

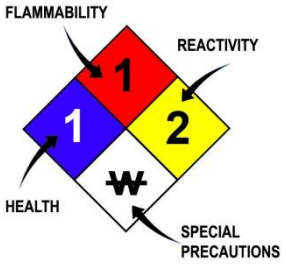
NA	Not Available
NR	No Results
NE	Not Established
ND	Not Determined
ML	Maximum Limit
SCBA	Self-Contained Breathing Apparatus

NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

FLAMMABILITY LIMITS IN AIR:	
Autoignition Temperature	Minimum temperature required to initiate combustion in air with no other source of ignition
LEL	Lower Explosive Limit - lowest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source
UEL	Upper Explosive Limit - highest percent of vapor in air, by volume, that will explode or ignite in the presence of an ignition source

HAZARD RATINGS:

0	Minimal Hazard
1	Slight Hazard
2	Moderate Hazard
3	Severe Hazard
4	Extreme Hazard
ACD	Acidic
ALK	Alkaline
COR	Corrosive
W	Use No Water
OX	Oxidizer
TREFOIL	Radioactive



TOXICOLOGICAL INFORMATION:

LD_{50}	Lethal Dose (solids & liquids) which kills 50% of the exposed animals s
LC_{50}	Lethal concentration (gases) which kills 50% of the exposed animal
ppm	Concentration expressed in parts of material per million parts
TD_{lo}	Lowest dose to cause a symptom
TCLo	Lowest concentration to cause a symptom
TD_{lo}, LD_{lo}, & LD_o or TC, TC_o, LC_{lo}, & LC_o	Lowest dose (or concentration) to cause lethal or toxic effects
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
RTECS	Registry of Toxic Effects of Chemical Substances
BCF	Bioconcentration Factor
TL_m	Median threshold limit
log K_{OW} or log K_{OC}	Coefficient of Oil/Water Distribution

REGULATORY INFORMATION:

WHMIS	Canadian Workplace Hazardous Material Information System
DOT	U.S. Department of Transportation
TC	Transport Canada
EPA	U.S. Environmental Protection Agency
DSL	Canadian Domestic Substance List
NDSL	Canadian Non-Domestic Substance List
PSL	Canadian Priority Substances List
TSCA	U.S. Toxic Substance Control Act
EU	European Union (European Union Directive 67/548/EEC)
WGK	Wassergefährdungsklassen (German Water Hazard Class)

WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

A	B	C	D1	D2	D3	E	F
Compressed	Flammable	Oxidizing	Toxic	Irritation	Infectious	Corrosive	Reactive

EC (67/548/EEC) INFORMATION:

C	E	F	N	O	T+	Xi	Xn
Corrosive	Explosive	Flammable	Harmful	Oxidizing	Toxic	Irritant	Harmful

CLP/GHS (1272/2008/EC) PICTOGRAMS:

GHS01	GHS02	GHS03	GHS04	GHS05	GHS06	GHS07	GHS08	GHS09
Explosive	Flammable	Oxidizer	Pressurized	Corrosive	Toxic	Harmful Irritating	Health Hazard	Environment