

4.4

4.5

Acute Health Effects:

Chronic Health Effects:

# **SAFETY DATA SHEET**

Page 1 of 5 SDS-E-FCF100PS

Prepa	ared to OSHA, ACC, ANSI, N	OHSC, WHMIS, 2	2001/58 & 1272/20	008/EC Standard	ls		SDS	Revisio	n: 1.0		SDS	Revisi	on Date	e: 2/2/2015
		1.	PRODUC <sup>1</sup>	F & COM	PANY	IDE	NTIF	FICA	TIOI	N				
1.1	Product Name:	FIBER C	LEANING	FLUID, P	ump	Spra	y, (F	P/N F	CF1	100P	<b>PS-2</b>	2), 50	0 mL	-
1.2	Chemical Name:	Aqueous Solu	tion											
.3	Synonyms:	NA												
1.4	Trade Names:	Fiber Cleaning Fluid; PN FCF100PS-2												
.5	Product Uses & Restrictions:	Cleaner for fiber optics												
1.6	Distributor's Name:	CAIG Laboratories, Inc.												
I.7 I.8	Distributor's Address:	12200 Thatcher Court, Poway, CA 92064-6876 USA  CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN XXXXX)												
	Emergency Phone:			527-3887 /	+1 (800	) 424	-9300	) (CC	N XX	XXX	)			
1.9	Business Phone / Fax:	+1 (800) 224-	4123											
			2. HA	ZARDS I	DENT	IFIC	ATIC	DN						
This product is classified as a HAZARDOUS SUBSTANCE but NOT as DANGEROUS GOODS according to the classification criteria of NOHSC: 1088 (2004) and ADG Code (Australia).  WARNING! CAUSES EYE IRRITATION. MAY CAUSE AN ALLERGIC SKIN REACTION.  Classification: Eye Irrit 2; Skin Irrit. 1B  Hazard Statements (H): H220 – Causes eye irritation. H317 – May cause an allergic skin reaction.  Precautionary Statements (P): P261 – Avoid breathing dust. P264 – Wash thoroughly after handling. P280 – Wear protective gloves. P302+P352 – IF ON SKIN: Wash with plenty of water. P333+P313 – If skin irritation or rash occurs get medical advice/attention. P305+P351+P338 – IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P321 – Specific treatment see this container label. P362+P364 – Take off contaminated clothing and was it before reuse. P337+P313 – If eye irritation persists: Get medical advice/attention. P501 - Dispose of contents/container to licenses treatment, storage and disposal facility (TSDF).  3. COMPOSITION & INGREDIENT INFORMATION  EXPOSURE LIMITS IN AIR (mg/m³)  ACGIH NOHSC OSHA						<u>!</u>								
								ES-	ES-	ES-				
	CAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	TLV	STEL	TWA NF	STEL NF	PEAK NF	PEL	STEL		OTHER
	YL NONAFLUORO- L ETHER	163702-07-6	NA	NA	20-80	750	NA	INF	INF	INF	NA	INA	NA	
1ETH	YL NONAFLUORO-	163702-08-7	NA	NA	20-80	750	NA	NF	NF	NF	NA	NA	NA	
ЗОВС	JTYL ETHER													
			4	FIRST All	D ME	\SUI	RFS							
4.1	First Aid:	Eyes: Skin: Inhalation:	If ingested, do IMMEDIATELY unconscious pe estimate of the swallowed. Splashes are rwater for at least Wash thorough least 15 minute Remove victim artificial respira	If the patier erson. Contact time at whith the time at whith the time at the time at 15 minutes by with soap a s. to fresh air at	nt is voming the near the near the mean the mean the mean the mean the near	ting, co rest Po aterial product per and In cas	ontinue oison C was i gets lower se of co	to offer control ingester in the lids, oc ontact, cult, ac	er wate Cente ed and eyes, ecasion immed	er or mer or looker or looker	nilk. cal er amou with flush	Never merger into of the copious of	give wancy number sulface sulf	vater or milk to mber. Provide bstance that wounts of lukewa
4.2	Effects of Exposure:		If product is sw											
	·	Eyes: Skin:	Moderately irrit watering. May be irritating some sensitive	ating to the eg g to skin. The individuals.	es. Syn	nptoms	of ov	erexpo	sure n	nay ind				
1 2	Symptoms of Oversimes.	+ <del></del> -	None expected				al' - '							
4.3	Symptoms of Overexposure:	Eyes: Skin:	Nausea, intestil Overexposure i Symptoms of s like symptoms.	n eyes may ca kin overexpos	ause redr sure may	ess, ito includ	ching a e redn	ind wat	ching,					
1 4	Acute Health Effects:		individuals.	<u> </u>										A daliffara alla a la

Non-irritating when used as directed. Moderate irritation to eyes and skin near affected areas. Additionally, high

Non-irritating when used as directed. Overexposure may trigger asthma-like symptoms in some sensitive individuals. May also induce skin sensitization and respiratory hypersensitivity. Possible allergic dermatitis.

concentrations of vapors can cause drowsiness, dizziness, headaches and nausea.



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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards

SDS Revision: 1.0

SDS Revision Date: 2/2/2015

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disorders of the HEALTH	skin conditions, and disorders	skin co	dermatitis, other		Pre-ex			dical Conditio	
FLAMMABILITY	,		•	target organs	CITO.	cposure:	ed by Exposure:	gravated by E	Agg
PHYSICAL HAZ									
PROTECTIVE E									
EYES									
EASURES	EFIGHTING MEASUR	REFIG	5. FIF						
This product is not flammable. However, if involved in a fire, this product may decompose at high temperatures to form toxic gases and decomposition products (e.g., CO, CO <sub>2</sub> , extreme conditions of heat: hydrogen fluoride; perfluoroisobutylene (PFIB); toxic vapor, gas, particulates)					tempe	Hazards:	olosion Hazards:	& Explosion	Fire
to cool unopened containers.	cal. Use water spray to cool uno	ical. Use	, CO <sub>2</sub> , Dry Chem	Water, Foam,	ds: Water	hods:	ning Methods:	inguishing Me	Exti
Fight fires as for surrounding materials. As in any fire, wear MSHA/NIOSH approved self-contained breathing apparatus (pressure-demand) and full protective gear. Keep containers cool until well after the fire is out. Use water spray to cool fire-exposed surfaces and to protect personal. Fight fire upwind. Avoid spraying water directly into storage containers because of danger of boil-over. Prevent runoff from fire control or dilution from entering sewers, drains, drinking water supply, or any natural waterway. Firefighters must use full bunker gear including NIOSH-approved positive pressure self-contained breathing apparatus to protect against potential hazardous combustion or decomposition products and oxygen deficiencies.					breath after ti fire up Preve any na pressu	dures:	g Procedures:	fighting Proce	Fire
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Dived in spill cleanup must wear ap	NTAL RELEASE ME			1	Defer			lle:	Spil
ppropriate personal protective equip Remove spilled material with absor e of properly in accordance with local,	oors and windows). Remove	doors an	entilation (open	Maximize ver	For <u>s</u> Maxin				
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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards SDS Revision: 1.0 SDS Revision Date: 2/2/2015

8. EXPOSURE CONTROLS & PERSONAL PROTECTION – cont'd No apron required when handling small quantities. When handling large quantities (e.g., ≥ 1 8.6 Body Protection: gallon), eye wash stations and deluge showers should be available. Upon completion of work activities involving large quantities of this product, wash any exposed areas thoroughly with soap and water. 9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Appearance: Clear colorless liquid Odor: 9.2 Slight ether odor 9.3 Odor Threshold: NA 9.4 NA 9.5 Melting Point/Freezing Point: -135 °C Initial Boiling Point/Boiling 9.6 61 °C Range: 9.7 Flashpoint: NA 9.8 Upper/Lower Flammability ND Vapor Pressure 9.9 202 mm Hg 9.10 Vapor Density: 8.6 9 11 Relative Density: 1.5 g/mL Solubility: 9.12 < 12 ppm 9.13 Partition Coefficient (log Pow): 3.9 9.14 Autoignition Temperature 405 °C 9.15 Decomposition Temperature: NA Viscosity 0.6 cPs Other Information: 9.17 VOC: 100% 10. STABILITY & REACTIVITY 10 1 Stability: This product is stable. 10.2 Hazardous Decomposition At elevated temperatures - extreme conditions of heat: hydrogen fluoride; perfluoroisobutylene (PFIB); toxic vapor, gas, Products: particulates. 10.3 Hazardous Polymerization: Will not occur. Conditions to Avoid: 10.4 Open flames, sparks and high heat, direct sunlight. 10.5 Incompatible Substances: Strong acids, strong bases, strong oxidizing agents. Avoid extreme heat and ignition sources. Store away from oxidizers. 11. TOXICOLOGICAL INFORMATION 11.1 Routes of Entry: Absorption: YES Ingestion: 11.2 Toxicity Data: This product has NOT been tested on animals to obtain toxicology data. Toxicology data, found in scientific literature, is available for some of the components of the product and is not presented in this document. Acute Toxicity: 11.3 Moderate irritation to eyes and skin near affected areas. Chronic Toxicity 11.4 This material may aggravate any pre-existing skin condition (e.g., dermatitis) Suspected Carcinogen: 11.5 11.6 Reproductive Toxicity: This product is not reported to produce reproductive toxicity in humans. Mutagenicity: This product is not reported to produce mutagenic effects in humans. Embryotoxicity: This product is not reported to produce embryotoxic effects in humans. Teratogenicity: This product is not reported to cause teratogenic effects in humans. Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. 11.7 Irritancy of Product: The product can cause allergic skin reactions (e.g., rashes, welts, dermatitis) upon prolonged or repeated exposure. Biological Exposure Indices: 11.8 Physician Recommendations: 11.9 Treat symptomatically. 12. ECOLOGICAL INFORMATION Environmental Stability 12.1 There is no specific data available for this product. Effects on Plants & Animals: 12.2 There are no specific data available for this product. 12.3 Effects on Aquatic Life There are no specific data available for this product; however, very large releases of this product may be harmful or fatal to overexposed aquatic life. 13. DISPOSAL CONSIDERATIONS Waste Disposal: 13.1 Products covered by this MSDS, in their original form, when disposed as waste, are considered non hazardous waste according to Federal RCRA regulations (40 CFR 261). Disposal should be in accordance with local, state and federal regulations. Dispose of in accordance with federal, state and local regulations. 13.2 Special Considerations: NA



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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards

SDS Revision: 1.0

SDS Revision Date: 2/2/2015

	14. TRANSPORTATION INFORMATION						
		mber, proper shipping name, hazard class & division, packing group) is shown for each mode of transport be required by 49 CFR, IATA/ICAO, IMDG and the CTDGR.	ation. Additional				
14.1	49 CFR (GND):	NOT REGULATED					
14.2	IATA (AIR):	NOT REGULATED					
14.3	IMDG (OCN):	NOT REGULATED					
14.4	TDGR (Canadian GND):	NOT REGULATED					
14.5	ADR/RID (EU):	NOT REGULATED					
14.6	SCT (MEXICO):	NOT REGULATED					
14.7	ADGR (AUS):	NOT REGULATED					
		15. REGULATORY INFORMATION					
15.1	SARA Reporting Requirements:	This product does not contain any substances subject to SARA Title III, section 313 reporting requirement	nts.				
15.2	SARA Threshold Planning Quantity:	There are no specific Threshold Planning Quantities for the components of this product.					
15.3	TSCA Inventory Status:	The components of this product are listed on the TSCA Inventory.					
15.4	CERCLA Reportable Quantity (RQ):	NA					
15.5	Other Federal Requirements:	This product complies with the appropriate sections of the Food and Drug Administration's 21 CFR Suba (Cosmetics).	chapter G,				
15.6	Other Canadian Regulations:	This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. The components of this product are listed on the DSL/NDSL. None of the components of this product are listed on the Priorities Substances List. WHMIS D2B (Other Toxic Effects)					
15.7	State Regulatory Information:	No ingredients in this product, present in a concentration of 1.0% or greater, are listed on any of the following state criteria lists: California Proposition 65 (CA65), Delaware Air Quality Management List (DE), Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI).					
15.8	The primary components of this product are not listed in Annex I of EU Directive 67/548/EEC:  Irritant (Xi). Risk Phrases: (R) 36/38 – Irritating to eyes and skin. Safety Phrases: (S) 2-24-25-28-45 – Keep out of reach of children. Avoid contact with skin. Avoid contact with eyes. After contact with skin wash with plenty of soap and water. In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).						
		16. OTHER INFORMATION					
16.1	Other Information:	WARNING! CAUSES EYE IRRITATION. MAY CAUSE AN ALLERGIC SKIN REACTION. Use Keep out of reach of children. Avoid contact with skin. Avoid contact with eyes. After contact with skin of soap and water. In case of accident or if you feel unwell seek medical advice immediately (show possible). KEEP LOCKED UP AND OUT OF REACH OF CHILDREN.	wash with plenty				
16.2	Terms & Definitions:	See last page of this Safety Data Sheet.					
16.3	Disclaimer:	This 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 is 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/					
16.5	Prepared by:	ShipMate, Inc. P.O. Box 787 Sisters, Oregon 97759-0787 USA Tel: +1 (310) 370-3600 Fax: +1 (310) 370-5700 http://www.shipmate.com					



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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards

SDS Revision: 1.0

SDS Revision Date: 2/2/2015

# **DEFINITION OF TERMS**

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

### **GENERAL INFORMATION:**

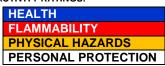
CAS No.	No.   Chemical Abstract Service Number				
EXPOSURE LIMITS IN AIR:					
ACGIH	American Conference on Governmental Industrial Hygienists				
С	Ceiling Limit				
ES	Exposure Standard (Australia)				
IDLH	Immediately Dangerous to Life and Health				
OSHA	U.S. Occupational Safety and Health Administration				
PEL	Permissible Exposure Limit				
STEL	Short-Term Exposure Limit				
TLV	Threshold Limit Value				
TWA	Time Weighted Average				

### 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

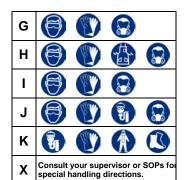
## HMIS-III HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

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



### PERSONAL PROTECTION RATINGS:

Α			
В			
С		THE SECOND SECON	
D		THE STATE OF THE S	
E			
F		THE STATE OF THE S	





Splash Goggles



















Airline Hood/Mask or SCBA

## OTHER STANDARD ABBREVIATIONS:

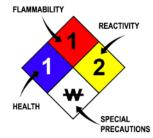
ML	Maximum Limit		
mg/m3	m3 milligrams per cubic meter		
NA	Not Available		
ND	Not Determined		
NE	Not Established		
NF	Not Found		
NR	No Results		
ppm	parts per million		
SCBA	Self-Contained Breathing Apparatus		

## NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

FLAMMABILITY LIMITS IN AIR:				
Autoignition	Minimum temperature required to initiate combustion in air with no other			
Temperature	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
₩	Use No Water
OX	Oxidizer
TREFOIL	Radioactive
	<u> </u>



### TOXICOLOGICAL INFORMATION:

LD <sub>50</sub>	Lethal Dose (solids & liquids) which kills 50% of the exposed animals
LC <sub>50</sub>	Lethal concentration (gases) which kills 50% of the exposed animal
ppm	Concentration expressed in parts of material per million parts
TD <sub>Io</sub>	Lowest dose to cause a symptom
TCLo	Lowest concentration to cause a symptom
TD <sub>io</sub> , LD <sub>io</sub> , & LD <sub>o</sub> or	Lowest dose (or concentration) to cause lethal or toxic effects
TC, TC <sub>o</sub> , LC <sub>lo</sub> , & LC <sub>o</sub>	
IARC	International Agency for Research on Cancer
NTP	National Toxicology Program
RTECS	Registry of Toxic Effects of Chemical Substances
BCF	Bioconcentration Factor
TLm	Median threshold limit
log K <sub>ow</sub> or log K <sub>oc</sub>	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			
NOHSC	National Occupational Health and Safety Commission (Australia)			
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)			
HMIS-III	National Paint & Coatings Association Hazardous Materials Identification System			

# WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

0	<b>(2)</b>	<b>(2)</b>		$\odot$	(4)			
Class A	Class B	Class C	Class D1	Class D2	Class D3	Class E	Class F	
Compressed	Flammable	Oxidizing	Toxic	Irritation	Infectious	Corrosive	Reactive	

# EC (67/548/EEC) INFORMATION:

F.		2	¥		<b>*</b>	X	×
С	E	F	N	0	Т	Xi	Xn
Corrosive	Explosive	Flammable	Harmful	Oxidizing	Toxic	Irritant	Harmful

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

			$\Diamond$			<b>\ODE</b>		
GHS01	GHS02	GHS03	GHS04	GHS05	GHS06	GHS07	GHS08	GHS09
Explosive	Flammable	Oxidizer	Pressurized	Corrosive	Toxic	Harmful Irritating	Health Hazard	Environment



Hazard Identification:

# **SAFETY DATA SHEET**

Page 1 of 6 SDS-E-CCS2005

Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards

SDS Revision: 3.1

SDS Revision Date: 2/19/2015

I.1 Product Name:	DUSTALL™ DUST REMOVER SPRAY, (P/N CCS-2005), 4.5 Oz. (127 g)
.2 Chemical Name:	Difluoroethane
I.3 Synonyms:	DustALL™
I.4 Trade Names:	DustALL™ Dust Remover Spray
1.5 Product Uses & Restrictions	Dust Removing Spray
I.6 Distributor's Name:	CAIG Laboratories, Inc.
1.7 Distributor's Address:	12200 Thatcher Court, Poway, CA 92064-6876 USA
I.8 Emergency Phone:	CHEMTREC: +1 (703) 527-3887 / +1 (800) 424-9300 (CCN XXXXX)
I.9 Business Phone / Fax:	+1 (800) 224-4123

# 2. HAZARDS IDENTIFICATION

This product is classified as a HAZARDOUS SUBSTANCE and as DANGEROUS GOODS

according to the classification criteria of NOHSC: 1088 (2004) and ADG Code (Australia).

DANGER! EXTREMELY FLAMMABLE GAS. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED.

Classification: Flam. Gas 1

Hazard Statements (H): H220 – Extremely flammable gas. H280 – Contains gas under pressure; may explode if heated.

Precautionary Statements (P): P210 – Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking. P251 – Do not pierce or burn, even after use. P410+P412 – Protect from sunlight. Do not expose to temperatures exceeding 50 °C / 122 °F. P332+P313 – If skin irritation occurs: get medical advice/attention. P377 – Leaking gas fire: Do not extinguish, unless leek can be stopped safely. P381 – Eliminate all ignition sources if safe to do so. P410+P403 – Protect from sunlight. Store in a well-ventilated place. P501 – Dispose of contents/container to a licensed treatment, storage or disposal facility (TSDF).



# 3. COMPOSITION & INGREDIENT INFORMATION

								EXPO	SURE LI	MITS IN	AIR (m	g/m³)	
					AC	HIE		NOHSC			OSHA		
					pp	m		ppm			ppm		
							ES-	ES-	ES-				
CHEMICAL NAME(S)	CAS No.	RTECS No.	EINECS No.	%	TLV	STEL	TWA	STEL	PEAK	PEL	STEL	IDLH	OTHER
4 4 DIELLIODOETHANE (D. 452A)	75-37-6	K14100000	200-866-1	60-100	1000	NA	1000	NF	NF	NA	NA	NA	
1, 1-DIFLUOROETHANE (R-152A)	Flam. Gas 1; Li	iq. Gas;H220, H2	80										

# 4. FIRST AID MEASURES

4.1	First Aid:	Ingestion:  Eyes:	If ingested, do not induce vomiting. If product has been swallowed, drink plenty of water or milk IMMEDIATELY. If the patient is vomiting, continue to offer water or milk. Never give water or milk to an unconscious person. Contact the nearest Poison Control Center or local emergency number. Provide an estimate of the time at which the material was ingested and the amount of the substance that was swallowed.  Splashes are not likely; however, if product gets in the eyes, flush with copious amounts of lukewarm water for at least 15 minutes lifting upper and lower lids, occasionally. If irritation persist repeat flushing.
		Skin: Inhalation:	Get medical attention.  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, be gently warming affected area. If irritation, redness or swelling persists, contact a physician immediately.  Remove victim to fresh air at once. If breathing difficult, administer oxygen. If breathing stops give
			artificial respiration. Keep person warm, quiet and get medical attention.
4.2	Effects of Exposure:	Ingestion:	If product is swallowed, may cause nausea, vomiting and/or diarrhea.
		Eyes:	Moderately irritating to the eyes. Symptoms of overexposure may include redness, itching, irritation and watering.
		Skin:	May be irritating to skin. The product can cause allergic skin reactions (e.g., rashes, welts, dermatitis) in some sensitive individuals.
		Inhalation:	None expected.
4.3	Symptoms of Overexposure:	Ingestion:	Nausea, intestinal discomfort, vomiting and/or diarrhea.
		Eyes:	Overexposure in eyes may cause redness, itching and watering.
		Skin:	Symptoms of skin overexposure may include redness, itching, and irritation of affected areas. Frostbite like symptoms. The product can cause allergic skin reactions (e.g., rashes, welts, dermatitis) in some individuals.
4.4	Acute Health Effects:		itation to eyes and skin near affected areas. Additionally, high concentrations of vapors can cause dizziness, headaches and nausea. Frostbite like effect to skin.
4.5	Chronic Health Effects:		e may trigger asthma-like symptoms in some sensitive individuals. May also induce skin sensitization and persensitivity. Possible allergic dermatitis.
4.6	Target Organs:	_ , , ,	Respiratory System.



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Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards

SDS Revision: 3.1

SDS Revision Date: 2/19/2015

Prepa	ared to USHA, ACC, ANSI, I	NOHSC, WHMIS, 2001/58 & 1272/2008/E	C Standards		SDS K	evision: 3.	.1	1 202	Revision D	ate: 2/19/20	)15
		4. FIRST	AID MEAS	SURE	S – co	nt'd					
4.7	Medical Conditions Aggravated by Exposure:	Pre-existing dermatitis, other sk target organs (eyes, skin, and res Note to Physicians: Because or hythm, cathecholamine drugs, s with special caution only in situation	in conditions, piratory systen f possible dis uch as epinepl	and disc n). turbance nrine, sh	orders of some of some of card ould be use	the HE FL/	AMMA YSICA OTEC	BILITY L HAZ TIVE E		ENT	0 4 3 B
		5. FIRE	FIGHTING	MEA	SURE	S					
5.1	Fire & Explosion Hazards:	Level 3 Aerosol (NFPA 30B). Accontainers to prevent possible be aerosols are bursting, stay clear However, if involved in a fire, this (e.g., CO, HF - hydrogen fluoride	erosols may bu bursting. Aero ar until burstir product may d ).	rst at ten sols may ng is con ecompos	nperatures be proje mplete. se at high	above 1 ctile haz This protemperat	ards wl duct is ures to	nen bur not fla	sting. If mmable.		
5.2	Extinguishing Methods: Firefighting Procedures:	Water, Foam, CO <sub>2</sub> , Dry Chemical Fight fires as for surrounding mat breathing apparatus (pressure-de after the fire is out. Use water s fire upwind. Avoid spraying wate Prevent runoff from fire control of any natural waterway. Firefighte pressure self-contained breathing decomposition products and oxyg	erials. As in aremand) and fu pray to cool firer directly into or dilution from ers must use fu g apparatus to	ny fire, wo il protect e-expose storage of entering all bunke protect a	ear MSHA ive gear. ed surface containers sewers, r gear inc	/NIOSH and Keep controls and to becaused drains, didding NI	approve ontaine protect of dar rinking IOSH-a	rs cool personates of be been been been been been been been	until well al. Fight poil-over. upply, or positive	0	0
		6. ACCIDEN	TAI PELI	EVSE	MEAS	HIDES	2				
		Equipment. Plastic or rubber glossmall Spills: Wear appropriate protection material such as vermiculite or sometimes of the such as vermiculite or sometimes water or a material such (e.g., plastic brooms, shovels, du Large Spills: Keep incompatible or release. Isolate immediate has be done with minimal risk. Wear Sweep up material using non-splastic container.	rotective equip and to soak up as "speedy dr istpans) and pla materials (e.g. azard area and appropriate pr	oment incoment incoment of the pro- y" to soan ace into a , organic keep ur otective e	cluding gloduct any lik up mate a metal or such as authorized	oves and quid and rial. Swe plastic co oil) away d personic including	protecti place i eep up ontainer from s nel out g respira	ive eyevento a comaterial control in the control in	vear. Us ontainer for using no ay upwind Stop sp otection a	e a non-co or later dis n-sparking I and away ill or releas s conditior	ombustible posal. Do g materials of from spill se if it can as warrant.
		7. HANDLING	& STOR	AGF II	VEORI	ИАТІС	N				
7.1	Work & Hygiene Practices:	Do not eat, drink or smoke who container(s). When used as into contact is possible. Wash uninte	en handling the	is productional pr	ct. Conte	nts unde	er press				
7.2	Storage & Handling:	Use and store in a cool, dry, we sunlight. Avoid temperatures about damage. To avoid unintentional states and the store in a cool, dry, we suppose the store in a cool, dry, and the store in a cool, dry,	ell-ventilated love 120 °F. Ke	cation (e	e.g., local from inco	exhaust mpatible	ventilat substar				
7.3	Special Precautions:	Clean all spills promptly.									
		8. EXPOSURE CONT	ROLS &	PERS	ONAL	PRO	ГЕСТ	ION			
8.1	Exposure Limits: ppm (mg/m³)	CHEMICAL NAME(S)  1, 1-DIFLUOROETHANE (R-152A)	ACGIH TLV STEL 1000 NA	ES- TWA 1000	NOHSC ES- STEL NF	ES- PEAK NF	PEL NA	STEL NA	IDLH NA	OTHER	
8.2	Ventilation & Engineering Controls:	General mechanical (e.g., fans) exhaust ventilation to effectively product. Ensure appropriate dec	or natural ven	tilation is prevent l	s sufficien ouildup of	t when the vapors	his prod or mist	duct is i genera	n use. l ted from	the handli	ing of this
8.3	Respiratory Protection:	No special respiratory protection instances where fumes or vapor needed, use only protection auth the Canadian Standard Z94.4-93	is required un ors of this pro orized by 29 C	nder typi duct are FR §191	cal circum generate 0.134, app	nstances d, and r olicable U	of use espirato J.S. stat	or hand ory prote e regula	dling. In ection is	Wash state	<u> </u>
8.4	Eye Protection:	Avoid eye contact. None require when handling or using large qua	d under norma	al conditi					be used		
8.5	Hand Protection:	None required under normal co sensitive individuals. When handl impervious plastic gloves.	ing large quan	tities (e.g	., ≥ 1 gallo	on (3.8 L)	)), wear	rubber,	nitrile or		
8.6	Body Protection:	No apron required when handling eye wash stations and deluge s involving large quantities of this p	howers should	be avai	lable. Up	on comp	letion o	of work	activities		



13 1

13.2

Waste Disposal:

Special Considerations:

Page 3 of 6 SAFETY DATA SHEET SDS-E-CCS2005 Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards SDS Revision Date: 2/19/2015 9. PHYSICAL & CHEMICAL PROPERTIES 9.1 Appearance: Aerosol, clear spray 92 Odor: Odorless 9.3 Odor Threshold: NA 9.4 NA 9.5 Melting Point/Freezing Point: -108 °C ( -162 °F) Initial Boiling Point/Boiling 9.6 -26.5 °C (-15.7 °F) Range: 9.7 Flashpoint: NA 9.8 Upper/Lower Explosive Limits: LEL: 4.32% v/v; UEL: 17.35% v/v Vapor Pressure: 9.9 NA 9.10 Vapor Density 2.28 (air = 1.0)9.11 Relative Density: 1.21 g/mg3 at 25 °C (68 °F) 9.12 Solubility: 3,200 g/l at 21 °C (70 °F) 9.13 Partition Coefficient (log Pow): NA 9.14 Autoignition Temperature: 440 °C (824 °F) at 1,009.0 - 1,017.0 hPa (756.8 - 762.8 mmHg) Decomposition Temperature: 9.15 NA 9.16 Viscosity: NA Other Information: 9.17 NA 10. STABILITY & REACTIVITY Stability: Stable under normal conditions; unstable with heat or contamination. 10.1 10.2 Hazardous Decomposition Oxides of carbon (CO, CO<sub>2</sub>), nitrogen (NO<sub>x</sub>) and sulfur (SO<sub>2</sub>). Products: 10.3 Hazardous Polymerization: Will not occur. 10.4 Conditions to Avoid Open flames, sparks, high heat, incompatible substances and direct sunlight. 10.5 Incompatible Substances: Avoid extreme heat and ignition sources. Store away from oxidizers. 11. TOXICOLOGICAL INFORMATION Inhalation: YES Absorption: YES Ingestion: YES 11.1 Routes of Entry: 11.2 Toxicity Data: This product has NOT been tested on animals to obtain toxicology data. Toxicology data, found in scientific literature, is available for some of the components of the product. Acute Toxicity: 11.3 Moderate irritation to eyes and skin near affected areas. Additionally, high concentrations of vapors can cause drowsiness, dizziness, headaches and nausea. 114 Chronic Toxicity: This material may aggravate any pre-existing skin condition (e.g., dermatitis). 11.5 Suspected Carcinogen: No. 11.6 Reproductive Toxicity: This product is not reported to produce reproductive toxicity in humans Mutagenicity: This product is not reported to produce mutagenic effects in humans. Embryotoxicity: This product is not reported to produce embryotoxic effects in humans. Teratogenicity: This product is not reported to cause teratogenic effects in humans. Reproductive Toxicity: This product is not reported to cause reproductive effects in humans. Irritancy of Product: 11.7 The product can cause allergic skin reactions (e.g., rashes, welts, dermatitis) upon prolonged or repeated exposure. Biological Exposure Indices: 11.8 NE 11.9 Physician Recommendations: Treat symptomatically. 12. ECOLOGICAL INFORMATION 12 1 Environmental Stability There is no specific data available for this product. 122 Effects on Plants & Animals: There are no specific data available for this product. 12.3 Effects on Aquatic Life There are no specific data available for this product; however, very large releases of this product may be harmful or fatal to overexposed aquatic life.

13. DISPOSAL CONSIDERATIONS

regulations. Dispose of in accordance with federal, state and local regulations.

U.S. EPA RCRA Hazardous Waste Code: D001 (Characteristic - Ignitability)

Products covered by this MSDS, in their original form, when disposed as waste, are considered non hazardous waste according to Federal RCRA regulations (40 CFR 261). Disposal should be in accordance with local, state and federal



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#### Prepared to OSHA, ACC, ANSI, NOHSC, WHMIS, 2001/58 & 1272/2008/EC Standards SDS Revision Date: 2/19/2015 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. 49 CFR (GND): UN1030, 1,1-DIFLUOROETHANE, 2.1 (LTD QTY, IP VOL ≤ 120 mL); or CONSUMER COMMODITY, ORM-D (IP VOL ≤ 0.12 L) – until 12/31/2020. Outer packaging must be marked "INSIDE CONTAINERS COMPLY WITH PRESCRIBED REGULATIONS" 14.2 IATA (AIR): UN1030, 1,1-DIFLUOROETHANE, 2.1 This product is FORBIDDEN for transport on passenger aircraft. IMDG (OCN): 14.3 UN1030, 1,1-DIFLUOROETHANE, 2.1 (LTD QTY, IP VOL ≤ 120 mL) TDGR (Canadian GND): 14.4 UN1030, 1,1-DIFLUOROETHANE, 2.1 (LTD QTY, IP VOL ≤ 120 mL) 14.5 ADR/RID (EU): UN1030, 1,1-DIFLUOROETHANE, 2.1 (LTD QTY, IP VOL ≤ 120 mL) 14.6 SCT (MEXICO): UN1030, 1,1-DIFLOROETANO, 2.1 (CANTIDADA LIMITADA, IP VOL ≤ 120 mL) 14.7 ADGR (AUS): UN1030, 1,1-DIFLUOROETHANE, 2.1 (LTD QTY, IP VOL ≤ 120 mL) 15. REGULATORY INFORMATION SARA Reporting 15.1 This product does not contain any substances subject to SARA Title III, section 313 reporting requirements. Requirement 15.2 SARA Threshold Planning There are no specific Threshold Planning Quantities for the components of this product. 15.3 TSCA Inventory Status: The components of this product are listed on the TSCA Inventory. CERCLA Reportable Quantity 15.4 NA (RQ): 15.5 Other Federal Requirements: NA 15.6 Other Canadian Regulations: This product has been classified according to the hazard criteria of the Controlled Products Regulations (CPR) and the SDS contains all of the information required by the CPR. components of this product are listed on the DSL/NDSL. None of the components of this product are listed on the Priorities Substances List. WHMIS Class A, B5 (Compressed Gas, Flammable Aerosol) 15.7 State Regulatory Information: Difluoroethane can be found on the following state criteria lists: Massachusetts Hazardous Substances List (MA) and New Jersey Right-to-Know List (NJ). No other ingredients in this product, present in a concentration of 1.0% or greater, are listed on any of the following state criteria lists: California Proposition 65 (CA65), Delaware Air Quality Management List (DE), Florida Toxic Substances List (FL), Massachusetts Hazardous Substances List (MA), Michigan Critical Substances List (MI), Minnesota Hazardous Substances List (MN), New Jersey Right-to-Know List (NJ), New York Hazardous Substances List (NY), Pennsylvania Right-to-Know List (PA), Washington Permissible Exposures List (WA), Wisconsin Hazardous Substances List (WI). Other Requirements: The primary component of this product is listed in Annex I of EU Directive 67/548/EEC: 1,1-Difluoroethane: Extremely Flammable, Harmful (F+, Xi). Risk Phrases (R): R12-37-65-67 Extremely flammable. Irritating to respiratory system. Harmful: may cause lung damage if swallowed. Vapors may cause drowsiness or dizziness. Safety Phrases (S): S2-7-9-16-24/25-26-33-45-53 - Keep out of the reach of children. Keep container tightly closed. Keep container in a well-ventilated place. Keep away from sources of ignition - No smoking. Avoid contact with skin and eyes. In case of contact with eyes, rinse immediately with plenty of water and seek medical advice. Take precautionary measures against static discharges. In case of accident or if you feel

unwell seek medical advice immediately (show the label where possible). Avoid exposure - obtain

WARNING! Overexposure may cause dizziness and loss of concentration. At higher levels, CNS depression and cardiac arrhythmia may result from exposure. Vapors displace air and can cause

special instructions before use.

asphyxiation in confined spaces.



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		16. OTHER INFORMATION
16.1	Other Information:	DANGER! EXTREMELY FLAMMABLE GAS. CONTAINS GAS UNDER PRESSURE; MAY EXPLODE IF HEATED. Keep away from heat, hot surface, sparks, open flames and other ignition sources. No smoking. Do not pierce or burn, even after use. Protect from sunlight. Do not expose to temperatures exceeding 50 °C / 122 °F. If skin irritation occurs: get medical advice/attention. Leaking gas fire: Do not extinguish, unless leek can be stopped safely. Eliminate all ignition sources if safe to do so. Protect from sunlight. Store in a well-ventilated place. Use only as directed. After contact with skin wash with plenty of warm water. In case of accident or if you feel unwell seek medical advice immediately (show the label where possible). If skin irritation occurs: get medical advice/attention. KEEP LOCKED UP AND OUT OF REACH OF CHILDREN.
16.2	Terms & Definitions:	See last page of this Safety Data Sheet.
16.3	Disclaimer:	This 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 is 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/
16.5	Prepared by:	ShipMate, Inc. P.O. Box 787 Sisters, Oregon 97759-0787 USA Tel: +1 (310) 370-3600 Fax: +1 (310) 370-5700 http://www.shipmate.com



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SDS Revision: 3.1

SDS Revision Date: 2/19/2015

# **DEFINITION OF TERMS**

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

### **GENERAL INFORMATION:**

CAS No.	Chemical Abstract Service Number						
EXPOSURE	EXPOSURE LIMITS IN AIR:						
ACGIH	American Conference on Governmental Industrial Hygienists						
С	Ceiling Limit						
ES	Exposure Standard (Australia)						
IDLH	Immediately Dangerous to Life and Health						
OSHA	U.S. Occupational Safety and Health Administration						
PEL	Permissible Exposure Limit						
STEL	Short-Term Exposure Limit						
TLV	Threshold Limit Value						
TWA	Time Weighted Average						

### 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 hody

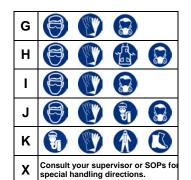
## HMIS-III HEALTH, FLAMMABILITY & REACTIVITY RATINGS:

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



### PERSONAL PROTECTION RATINGS:

Α			
В			
С		THE SECOND SECON	
D		THE SECOND SECON	
Е			
F			

























Airline Hood/Mask or SCBA

## OTHER STANDARD ABBREVIATIONS:

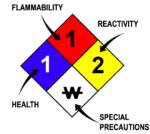
ML	Maximum Limit
mg/m3	milligrams per cubic meter
NA	Not Available
ND	Not Determined
NE	Not Established
NF	Not Found
NR	No Results
ppm	parts per million
SCBA	Self-Contained Breathing Apparatus

## NATIONAL FIRE PROTECTION ASSOCIATION: NFPA

FLAMMABILITY LIMITS IN AIR:							
<u> </u>							
Temperature	Minimum temperature required to initiate combustion in air with no other source of ignition						
LEL							
LEL							
explode or ignite in the presence of an ignition source							
UEL	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 <sub>50</sub>	Lethal Dose (solids & liquids) which kills 50% of the exposed animals				
LC <sub>50</sub>	Lethal concentration (gases) which kills 50% of the exposed animal				
ppm	Concentration expressed in parts of material per million parts				
TD <sub>Io</sub>	Lowest dose to cause a symptom				
TCLo	Lowest concentration to cause a symptom				
TD <sub>Io</sub> , LD <sub>Io</sub> , & LD <sub>o</sub> or	Lowest dose (or concentration) to cause lethal or toxic effects				
TC, TC <sub>o</sub> , LC <sub>lo</sub> , & LC <sub>o</sub>					
IARC	International Agency for Research on Cancer				
NTP	National Toxicology Program				
RTECS	Registry of Toxic Effects of Chemical Substances				
BCF	Bioconcentration Factor				
TLm	Median threshold limit				
log Kow or log Koc	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
NOHSC	National Occupational Health and Safety Commission (Australia)
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)
HMIS-III	National Paint & Coatings Association Hazardous Materials Identification System

# WORKPLACE HAZARDOUS MATERIALS IDENTIFICATION (WHMIS) SYSTEM:

0	<b>(2)</b>	<b>(2)</b>		$\odot$	<b>®</b>		
Class A	Class B	Class C	Class D1	Class D2	Class D3	Class E	Class F
Compressed	Flammable	Oxidizing	Toxic	Irritation	Infectious	Corrosive	Reactive

# EC (67/548/EEC) INFORMATION:

F.		2	¥		<b>*</b>	X	×
С	E	F	N	0	Т	Xi	Xn
Corrosive	Explosive	Flammable	Harmful	Oxidizing	Toxic	Irritant	Harmful

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

			$\Diamond$			<b>\limits</b>		
GHS01	GHS02	GHS03	GHS04	GHS05	GHS06	GHS07	GHS08	GHS09
Explosive	Flammable	Oxidizer	Pressurized	Corrosive	Toxic	Harmful Irritating	Health Hazard	Environment