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SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier	
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Product name:	Difluoromethane (R32)
Trade name:	R32
Other Name:	HFC-32
Additional identification Chemical name:	Difluoromethane
Chemical formula: INDEX No. CAS-No. EC No. REACH Registration No.	CH2F2 - 75-10-5 200-839-4 01-2119471312-47

1.2 Relevant identified uses of the substance or mixture and uses advised against

	5
Identified uses:	Industrial and professional. Perform risk assessment prior to use. Refrigerant.
	Use as an Intermediate (transported, on-site isolated).
	Use for electronic component manufacture. Using gas alone or in mixtures for the calibration of analysis equipment.
	Formulation of mixtures with gas in pressure receptacles.
Uses advised against	Consumer use.

1.3 Details of the supplier of the safety data sheet

Supplier Linde Gas UAB Didlaukio g. 69 LT-08300 Vilnius, Lietuva

Telephone: + 370 52787788

E-mail: sds.ren@linde.com

1.4 Emergency telephone number: Poisons Control and Information Bureau, tel. +370 52 36 20 52



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SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Classification according to Regulation (EC)	No 1272/2008 as amended.
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Physical Hazards		
Flammable gas	Category 1	H220: Extremely flammable gas.
Gases under pressure	Liquefied gas	H280: Contains gas under pressure; may explode if heated.
2.2 Label Elements		
	<u>»</u>	
Signal Words:	Danger	
Hazard Statement(s):	H220: Extremely flammable gas. H280: Contains gas under pressure; may explode if heated.	
Precautionary Statement	S	
Prevention:	P210: Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.	
Response:	P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safely. P381: In case of leakage, eliminate all ignition sources.	
Storage:	P403: Store in a well-ventilated place.	
Disposal:	None.	
Supplemental label inform		contains fluorinated greenhouse gases
	Contact with evaporating liquid may cause frostbite or freezing of skin.	
2.3 Other hazards:		ing ilquiu illay cause hostolite of heezing of skill.



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SECTION 3: Composition/information on ingredients

3.1 Substances

Chemical name INDEX No.: CAS-No.: EC No.: REACH Registration No.: Purity: Trade name:	Difluoromethane - 75-10-5 200-839-4 01-2119471312-47 100% The purity of the substance in this section is used for classification only, and does not represent the actual purity of the substance as supplied, for which other documentation should be consulted. R32
SECTION 4: First aid measures	
General:	In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
4.1 Description of first aid measures	
Inhalation:	In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped.
Eye contact:	Rinse the eye with water immediately. Remove contact lenses, if present and easy to do. Continue rinsing. Flush thoroughly with water for at least 15 minutes. Get immediate medical assistance. If medical assistance is not immediately available, flush an additional 15 minutes.
Skin Contact:	Contact with evaporating liquid may cause frostbite or freezing of skin. In case of frostbite spray with water for at least 15 minutes. Apply a sterile dressing. Get medical attention.
Ingestion:	Ingestion is not considered a potential route of exposure.

4.2 Most important symptoms and effects, both acute and delayed: Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to rapid evaporative cooling.

4.3 Indication of any immediate medical attention and special treatment needed

Hazards:Respiratory arrest. Contact with liquefied gas can cause damage (frostbite) due to
rapid evaporative cooling.



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Treatment:

Thaw frosted parts with lukewarm water. Do not rub affected area. Get immediate medical advice/attention.

SECTION 5: Firefighting measures

General Fire Hazards:	Heat may cause the containers to explode.
5.1 Extinguishing media Suitable extinguishing media:	Water Spray or Fog. Dry powder. Foam.
Unsuitable extinguishing media:	Carbon Dioxide.
5.2 Special hazards arising from the substance or mixture:	No data available.
Hazardous Combustion Products:	If involved in a fire the following toxic and/or corrosive fumes may be produced by thermal decomposition: Hydrogen fluoride ; Carbon monoxide ; Carbonyl difluoride
5.3 Advice for firefighters Special fire fighting procedures:	In case of fire: Stop leak if safe to do so. Do not extinguish flames at leak because possibility of uncontrolled explosive reignition exists. Continue water spray from protected position until container stays cool. Use extinguishants to contain the fire. Isolate the source of the fire or let it burn out.
Special protective equipment for fire-fighters:	Firefighters must use standard protective equipment including flame retardant coat, helmet with face shield, gloves, rubber boots, and in enclosed spaces, SCBA. Guideline: EN 469 Protective clothing for firefighters. Performance requirements for protective clothing for firefighting. EN 15090 Footwear for firefighters. EN 659 Protective gloves for firefighters. EN 443 Helmets for fire fighting in buildings and other structures. EN 137 Respiratory protective devices - Self-contained opencircuit compressed air breathing apparatus with full face mask - Requirements, testing, marking.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures:	Evacuate area. Provide adequate ventilation. Consider the risk of potentially explosive atmospheres . In case of leakage, eliminate all ignition sources. Monitor the concentration of the released product. Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. EN 137 Respiratory protective devices - Self-contained open- circuit compressed air breathing apparatus with full face mask - Requirements,
	testing, marking.



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6.2 Environmental P	recautions:	Prevent further leakage or spillage if safe to do so.	
6.3 Methods and ma containment and		Provide adequate ventilation. Eliminate sources of igni	ition.
6.4 Reference to oth	er sections:	Refer to sections 8 and 13.	
SECTION 7: Handling	g and storage:		
containment and cleaning up: 6.4 Reference to other sections: SECTION 7: Handling and storage: 7.1 Precautions for safe handling:		Only experienced and properly instructed persons shot pressure. Use only properly specified equipment which its supply pressure and temperature. Purge system wit or nitrogen) before gas is introduced and when system Purge air from system before introducing gas. Contained contained flammable or explosive substances, must no carbon dioxide. Assess the risk of a potentially explosive need for suitable equipment i.e. explosion-proof. Take against static discharges. Keep away from ignition sou discharges). Provide electrical earthing of equipment a usable in explosive atmospheres. Use non-sparking too handling instructions. The substance must be handled industrial hygiene and safety procedures. Ensure the c (or is regularly) checked for leaks before use. Protect of damage; do not drag, roll, slide or drop. Do not remove by the supplier for the identification of the container of containers, even for short distances, use appropriate et truck, fork truck etc. Secure cylinders in an upright posi- valves when not in use. Provide adequate ventilation. container must be prevented. Do not allow backfeed in suckback of water, acid and alkalis. Keep container bel- ventilated place. Observe all regulations and local requ- of containers. When using do not eat, drink or smoke. S local/regional/national/international regulations. Ne electrical heating devices to raise the pressure of a cor- protection caps in place until the container has been se or bench or placed in a container stand and is ready for should be reported immediately to the supplier Close c- use and when empty, even if still connected to equipm repair or modify container valves or safety relief device caps or plugs and container caps where supplied as soo disconnected from equipment. Keep container valve o contaminates particularly oil and water. If user experie operating container valve discontinue use and contact transfer gases from one container to another. Container should be in place.	h is suitable for this product, th dry inert gas (e.g. helium h is placed out of service. ers, which contain or have obtic inerted with liquid ve atmosphere and the precautionary measures rces (including static and electrical equipment ols. Refer to supplier's in accordance with good complete system has been containers from physical e or deface labels provided ontents. When moving equipment eg. trolley, hand ition at all times, close all Suck back of water into the not the container. Avoid low 50°C in a well uirements regarding storage Store in accordance with ver use direct flame or ntainer. Leave valve ecured against either a wall r use. Damaged valves container valve after each nent. Never attempt to es. Replace valve outlet on as container is utlets clean and free from ences any difficulty supplier. Never attempt to



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7.2 Conditions for	safa staraga	All electrical equipment in the storage areas	should be compatible with the rick of

including any incompatibilities:	a potentially explosive atmosphere. Segregate from oxidant gases and other oxidants being stored. Containers should not be stored in conditions likely to encourage corrosion. Stored containers should be periodically checked for general conditions and leakage. Container valve guards or caps should be in place. Store containers in location free from fire risk and away from sources of heat and ignition. Keep away from combustible material.
7.3 Specific end use(s):	None.

SECTION 8: Exposure controls/personal protection

8.1 Control Parameters

Occupational Exposure Limits

None of the components have assigned exposure limits.

DNEL-Values

UNEL VOIDES				
Critical component	Туре	Value	Remarks	
Difluoromethane	Workers - Inhalation,	7035	Repeated dose toxicity	
	Systemic, long-term	mg/m3		

PNEC-Values

Critical component	Туре	Value	Remarks
Difluoromethane	Aquatic (freshwater)	0,142 mg/l	-
	Sediment (freshwater)	0,534	-
		mg/kg	

8.2 Exposure controls

Appropriate engineering controls:

Consider a work permit system e.g. for maintenance activities. Ensure adequate air ventilation. Provide adequate general and local exhaust ventilation. Keep concentrations well below lower explosion limits. Gas detectors should be used when quantities of flammable gases or vapours may be released. Provide adequate ventilation, including appropriate local extraction, to ensure that the defined occupational exposure limit is not exceeded. Systems under pressure should be regularly checked for leakages. Product to be handled in a closed system. Only use permanent leak tight installations (e.g. welded pipes). Take precautionary measures against static discharges.



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Individual protection measures, such as personal protective equipment

General information:	A risk assessment should be conducted and documented in each work area to assess the risks related to the use of the product and to select the PPE that matches the relevant risk. The following recommendations should be considered. Keep self contained breathing apparatus readily available for emergency use. Personal protective equipment for the body should be selected based on the task being performed and the risks involved. Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment. Do not eat, drink or smoke when using the product.
Eye/face protection:	Safety eyewear, goggles or face-shield to EN166 should be used to avoid exposure to liquid splashes. Wear eye protection to EN 166 when using gases. Guideline: EN 166 Personal Eye Protection.
Skin protection Hand Protection:	Wear working gloves while handling containers Guideline: EN 388 Protective gloves against mechanical risks.
Body protection:	Wear fire resistant or flame retardant clothing. Guideline: ISO/TR 2801:2007 Clothing for protection against heat and flame General recommendations for selection, care and use of protective clothing.
Other:	Wear safety shoes while handling containers Guideline: ISO 20345 Personal protective equipment - Safety footwear.
Respiratory Protection:	Not required.
Thermal hazards:	No precautionary measures are necessary.
Hygiene measures:	Specific risk management measures are not required beyond good industrial hygiene and safety procedures. Do not eat, drink or smoke when using the product.
Environmental exposure controls:	For waste disposal, see section 13 of the SDS.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	
Physical state:	Gas
Form:	Liquefied gas
Color:	Colorless
Odor:	Odorless
Odor Threshold:	Odor threshold is subjective and is inadequate to warn of over exposure.



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pH:	Not applicable.
Melting Point:	-136 °C Experimental result, Supporting study
Boiling Point:	-51,6 °C (1.013 hPa) Experimental result, Supporting study
Sublimation Point:	Not applicable.
Critical Temp. (°C):	78,5 °C
Flash Point:	Not applicable to gases and gas mixtures.
Evaporation Rate:	Not applicable to gases and gas mixtures.
Flammability (solid, gas):	Flammable Gas
Flammability Limit - Upper (%):	33,4 %(V) Experimental result, Supporting study
Flammability Limit - Lower (%):	14 %(V)
Vapor pressure:	No reliable data available.
Vapor density (air=1):	1,8
Relative density:	1,1 (Reference material: Water)
Solubility(ies) Solubility in Water: Partition coefficient (n-octanol/water): Autoignition Temperature: Decomposition Temperature: Viscosity Kinematic viscosity: Dynamic viscosity: Explosive properties: Oxidizing properties:	280 g/l 0,2 530 °C Experimental result, Key study Not known. No data available. No data available. Not applicable. Not applicable.
9.2 Other information:	Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level.
Molecular weight:	52 g/mol (CH2F2)

SECTION 10: Stability and reactivity

10.1 Reactivity:	No reactivity hazard other than the effects described in sub-section below.
10.2 Chemical Stability:	Stable under normal conditions.
10.3 Possibility of hazardous reactions:	Can form a potentially explosive atmosphere in air. May react violently with oxidants.
10.4 Conditions to avoid:	Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.
10.5 Incompatible Materials:	Air and oxidizers. For material compatibility see latest version of ISO-11114.



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10.6 Hazardous Decomposition Products:	Under normal conditions of storage and use, hazardous decomposition products should not be produced.
SECTION 11: Toxicological informa	ation
General information:	May produce irregular heart beat and nervous symptoms.
11.1 Information on toxicological e	ffects
Acute toxicity - Oral Product	Based on available data, the classification criteria are not met.
Acute toxicity - Dermal Product	Based on available data, the classification criteria are not met.
Acute toxicity - Inhalation Product	Based on available data, the classification criteria are not met.
Repeated dose toxicity Difluoromethane	NOAEL (Rat(Female, Male), Inhalation, 28 d): 49.500 ppm(m) Inhalation Experimental result, Supporting study
Skin Corrosion/Irritation Product	Based on available data, the classification criteria are not met.
Serious Eye Damage/Eye Irrita Product	tion Based on available data, the classification criteria are not met.
Respiratory or Skin Sensitizatio Product	on Based on available data, the classification criteria are not met.
Germ Cell Mutagenicity Product	Based on available data, the classification criteria are not met.
Carcinogenicity Product	Based on available data, the classification criteria are not met.
Reproductive toxicity Product	Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity Product	- Single Exposure Based on available data, the classification criteria are not met.
Specific Target Organ Toxicity Product	- Repeated Exposure Based on available data, the classification criteria are not met.



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Aspiration Hazard Product

Not applicable to gases and gas mixtures..

Other Relevant Toxicity Information

Difluoromethane

on Cardiac sensitisation threshold limit >350000 ppm Beagle (dog)LOAEC

Cardiac sensitisation threshold limit 350000 ppm Beagle (dog)NOAEC

Light hydrocarbons like this one have been associated with cardiac sensitization in abuse situations. Hypoxia or the injection of adrenaline-like substances enhances these effects.

SECTION 12: Ecological information

12.1 Toxicity	
Acute toxicity Product	No ecological damage caused by this product.
Acute toxicity - Fish Difluoromethane	LC 50 (Pimephales promelas, 96 h): 1.405 mg/l Remarks: QSAR QSAR, Supporting study
Acute toxicity - Aquatic Invertel Difluoromethane	brates EC 50 (Daphnia magna, 48 h): 1.573 mg/l Remarks: QSAR QSAR, Supporting study
Toxicity to Aquatic Plants Difluoromethane	EC 50 (Alga, 96 h): 142 mg/l
12.2 Persistence and Degradability Product	Not applicable to gases and gas mixtures
Biodegradation Difluoromethane	5 % (28 d) Detected in water. Experimental result, Key study



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12.3 Bioaccumulat Product	ive potential	The subject product is expected to biodegrade long periods in an aquatic environment.	and is not expected to persist for
12.4 Mobility in so Product	il	Because of its high volatility, the product is unl pollution.	ikely to cause ground or water
12.5 Results of PBT and vPvB assessment Product		Not classified as PBT or vPvB.	
12.6 Other adverse	e effects:		
Global Warmi	ng Potential	Global warming potential: 675 Contains fluorinated greenhouse gase quantities may contribute to the greenhouse e quantities, refer to container label.	
Difluorome	ethane	EU. F-Gases Subject to Emission Limits/Reporti 517/2014/EU on FGGs - Global warming potential: 675 Annex 1: Fluor in Point 1 of Article 2; Section 1:Hydrofluorocar	inated greenhouse gases referred to

SECTION 13: Disposal considerations

13.1 Waste treatment methods

General information:	Do not discharge into any place where its accumulation could be dangerous. Consult supplier for specific recommendations. Do not discharge into areas where there is a risk of forming an explosive mixture with air. Waste gas should be flared through a suitable burner with flash back arrestor.
Disposal methods:	Refer to the EIGA code of practice (Doc.30 "Disposal of Gases", downloadable at http://www.eiga.org) for more guidance on suitable disposal methods. Dispose of container via supplier only. Discharge, treatment, or disposal may be subject to national, state, or local laws.
European Waste Codes Container:	14 06 01*: chlorofluorocarbons, HCFC, HFC



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SECTION 14: Transport information

ADR

1 1 1	 4.1 UN Number: 4.2 UN Proper Shipping Name: 4.3 Transport Hazard Class(es) Class: Label(s): Hazard No. (ADR): Tunnel restriction code: 4.4 Packing Group: 4.5 Environmental hazards: 	UN 3252 DIFLUOROMETHANE 2 2.1 23 (B/D) - Not applicable
1	4.6 Special precautions for user:	-
RID		
1 1 1 1	 4.1 UN Number: 4.2 UN Proper Shipping Name 4.3 Transport Hazard Class(es) Class: Label(s): 4.4 Packing Group: 4.5 Environmental hazards: 4.6 Special precautions for user: 	UN 3252 DIFLUOROMETHANE 2 2.1 - Not applicable -
1 1 1 1 1	 4.1 UN Number: 4.2 UN Proper Shipping Name: 4.3 Transport Hazard Class(es) Class: Label(s): EmS No.: 4.4 Packing Group: 4.5 Environmental hazards: 4.6 Special precautions for user: 	UN 3252 DIFLUOROMETHANE 2.1 2.1 F-D, S-U - Not applicable -



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IATA

14.1 UN Number: 14.2 Proper Shipping Name: 14.3 Transport Hazard Class(es):	UN 3252 Refrigerant gas R 32
Class:	2.1
Label(s):	2.1
14.4 Packing Group:14.5 Environmental hazards:14.6 Special precautions for user: Other information	– Not applicable –
Passenger and cargo aircraft:	Forbidden.
Cargo aircraft only:	Allowed.

14.7 Transport in bulk according to Annex II of MARPOL and the IBC Code: Not applicable

Additional identification: Avoid transport on vehicles where the load space is not separated from the driver's compartment. Ensure vehicle driver is aware of the potential hazards of the load and knows what to do in the event of an accident or an emergency. Before transporting product containers ensure that they are firmly secured. Ensure that the container valve is closed and not leaking. Container valve guards or caps should be in place. Ensure adequate air ventilation.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture:

EU. Directive 2012/18/EU (SEVESO III) on major accident hazards involving dangerous substances, as amended.:

Classification	Lower-tier Requirements	Upper-tier Requirements
P2. Flammable gas	10 t	50 t

National Regulations

Council Directive 89/391/EEC on the introduction of measures to encourage improvements in the safety and health of workers at work Directive 89/686/EEC on personal protective equipment Directive 2014/34/EU on equipment and protective systems intended for use in potentially explosive atmospheres (ATEX) Only products that comply with the food regulations (EC) No. 1333/2008 and (EU) No. 231/2012 and are labelled as such may be used as food additives. This Safety Data Sheet has been produced to comply with Regulation (EU) 2015/830.

15.2 Chemical safety assessment: CSA has been carried out.



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SECTION 16: Other information

Revision Information:	Not relevant.			
Key literature references and sources for data:	Various sources of data have been used in the compilation of this SDS, they include but are not exclusive to: Agency for Toxic Substances and Diseases Registry (ATSDR) (http://www.atsdr.cdc.gov/). European Chemical Agency: Guidance on the Compilation of Safety Data Sheets. European Chemical Agency: Information on Registered Substances http://apps.echa.europa.eu/registered/registered-sub.aspx#search European Industrial Gases Association (EIGA) Doc. 169 Classification and Labelling guide. International Programme on Chemical Safety (http://www.inchem.org/) ISO 10156:2010 Gases and gas mixtures - Determination of fire potential and oxidizing ability for the selection of cylinder valve outlets. Matheson Gas Data Book, 7th Edition. National Institute for Standards and Technology (NIST) Standard Reference Database Number 69. The ESIS (European chemical Substances 5 Information System) platform of the former European Chemical Substances 5 Information System) platform of the former European Chemical Substances 5 Information System) platform of the former European Chemical Substances 5 Information System) platform of the forxer European Chemical Substances 5 Information System) platform of the forxer European Chemical Substances 5 Information System) platform of the forxer European Chemical Industry Council (CEFIC) ERICards. United States of America's National Library of Medicine's toxicology data network TOXNET (http://toxnet.nlm.nih.gov/index.html) Threshold Limit Values (TLV) from the American Conference of Governmental Industrial Hygienists (ACGIH). Substance specific information from suppliers. Details given in this document are believed to be correct at the time of publication.			
Wording of the H-statements in section 2 and 3				
	H220 Extremely flammable gas.H280 Contains gas under pressure; may explode if heated.			
Classification according to Regulation (EC) No 1272/2008 as amended.				
	Flam. Gas 1, H220 Press. Gas Liq. Gas, H280			
Other information:	Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out. Ensure adequate air ventilation. Ensure all national/local regulations are observed. Ensure equipment is adequately earthed. Whilst proper care has been taken in the preparation of this document, no liability for injury or damage resulting from its use can be accepted. ASHRAE: A2L			
Last revised date: Disclaimer:	23.03.2020 This information is provided without warranty. The information is believed to be correct. This information should be used to make an independent determination of the methods to safeguard workers and the environment.			



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