

Version 9.0	Revision Date: 07/27/2021	•••	DS Number: 324787-00043	Date of last issue: 04/14/2021 Date of first issue: 02/27/2017			
SECTIO	SECTION 1. IDENTIFICATION						
Pro	oduct name	:	Freon™ 23 (R-23	Freon™ 23 (R-23) Refrigerant			
SE	S-Identcode	:	13000000131	13000000131			
Ма	nufacturer or supplier's	deta	ails				
Co	mpany name of supplier	:	The Chemours Company FC, LLC				
Ad	Address		1007 Market Street Wilmington, DE 19801 United States of America (USA)				
Те	Telephone		1-844-773-CHEM (outside the U.S. 1-302-773-1000)				
En	Emergency telephone		Medical emergency: 1-866-595-1473 (outside the U.S. 1-302-773-2000) ; Transport emergency: +1-800-424-9300 (outside the U.S. +1-703-527-3887)				
Re	commended use of the	cher	nical and restricti	ons on use			
Re	Recommended use		Refrigerant				
Re	Restrictions on use		For professional	and industrial installation and use only.			

SECTION 2. HAZARDS IDENTIFICATION

GHS classification in accordance with the OSHA Hazard Communication Standard (29 CFR 1910.1200)				
Gases under pressure	:	Liquefied gas		
Simple Asphyxiant				
GHS label elements				
Hazard pictograms	:	\sim		
Signal Word	:	Warning		
Hazard Statements	:	H280 Contains gas under pressure; may explode if heated. May displace oxygen and cause rapid suffocation.		
Precautionary Statements	:	Storage: P410 + P403 Protect from sunlight. Store in a well-ventilated place.		



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Other hazards

Vapors are heavier than air and can cause suffocation by reducing oxygen available for breathing. Misuse or intentional inhalation abuse may cause death without warning symptoms, due to cardiac effects.

Rapid evaporation of the product may cause frostbite.

SECTION 3. COMPOSITION/INFORMATION ON INGREDIENTS

Substance / Mixture	:	Substance
Substance name	:	Trifluoromethane
CAS-No.	:	75-46-7

Components

Chemical name	CAS-No.	Concentration (% w/w)
Trifluoromethane#	75-46-7	100

Voluntarily-disclosed non-hazardous substance

SECTION 4. FIRST AID MEASURES

General advice	:	In the case of accident or if you feel unwell, seek medical ad- vice immediately. When symptoms persist or in all cases of doubt seek medical advice.
If inhaled	:	If inhaled, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.
In case of skin contact	:	Thaw frosted parts with lukewarm water. Do not rub affected area. Get medical attention immediately.
In case of eye contact	:	Get medical attention immediately.
If swallowed	:	Ingestion is not considered a potential route of exposure.
Most important symptoms and effects, both acute and delayed		May cause cardiac arrhythmia. Other symptoms potentially related to misuse or inhalation abuse are Cardiac sensitization Anaesthetic effects Light-headedness Dizziness confusion Lack of coordination Drowsiness Unconsciousness Gas reduces oxygen available for breathing. Contact with liquid or refrigerated gas can cause cold burns and frostbite.



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II Prote	ection of first-aiders	:	No special precau	itions are necessary for first aid responders.		
Notes	Notes to physician		Because of possible disturbances of cardiac rhythm, ca- techolamine drugs, such as epinephrine, that may be used in situations of emergency life support should be used with spe- cial caution.			
SECTION	5. FIRE-FIGHTING ME	ASL	IRES			
Suita	ble extinguishing media	:	Not applicable Will not burn			
Unsu medi	itable extinguishing a	:	Not applicable Will not burn			
Spec fightii	ific hazards during fire ng	:		bustion products may be a hazard to health. rises there is danger of the vessels bursting por pressure.		
Haza ucts	rdous combustion prod-	:	No hazardous cor	nbustion products are known		
Spec ods	ific extinguishing meth-	:	cumstances and t Fight fire remotely Use water spray t	measures that are appropriate to local cir- he surrounding environment. due to the risk of explosion. o cool unopened containers. ged containers from fire area if it is safe to do		
	ial protective equipment e-fighters	:	necessary.	ed breathing apparatus for firefighting if rective equipment.		

SECTION 6. ACCIDENTAL RELEASE MEASURES

Personal precautions, protec- tive equipment and emer- gency procedures	:	Evacuate personnel to safe areas. Avoid skin contact with leaking liquid (danger of frostbite). Ventilate the area. Follow safe handling advice (see section 7) and personal pro- tective equipment recommendations (see section 8).
Environmental precautions	:	Avoid release to the environment. Prevent further leakage or spillage if safe to do so. Retain and dispose of contaminated wash water.
Methods and materials for containment and cleaning up	:	Ventilate the area. Local or national regulations may apply to releases and dispo- sal of this material, as well as those materials and items em- ployed in the cleanup of releases. You will need to determine which regulations are applicable. Sections 13 and 15 of this SDS provide information regarding certain local or national requirements.



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SECTION	7. HANDLING AND ST	ror.	AGE				
Techr	Technical measures		: Use equipment rated for cylinder pressure. Use a backflow preventative device in piping. Close valve after each use and when empty.				
Local	/Total ventilation	:	Use only with adequate ventilation.				
Advice on safe handling		:	Avoid breathing gas. Handle in accordance with good industrial hygiene and safety practice, based on the results of the workplace exposure as- sessment Wear cold insulating gloves/ face shield/ eye protection. Valve protection caps and valve outlet threaded plugs must remain in place unless container is secured with valve outlet piped to use point. Use a check valve or trap in the discharge line to prevent ha- zardous back flow into the cylinder. Prevent backflow into the gas tank. Use a pressure reducing regulator when connecting cylinder to lower pressure (<3000 psig) piping or systems. Close valve after each use and when empty. Do NOT change or force fit connections. Prevent the intrusion of water into the gas tank. Never attempt to lift cylinder by its cap. Do not drag, slide or roll cylinders. Use a suitable hand truck for cylinder movement. Keep away from heat and sources of ignition. Take precautionary measures against static discharges. Take care to prevent spills, waste and minimize release to the environment.				
Conditions for safe storage		:	 Cylinders should be stored upright and firmly secured to pr vent falling or being knocked over. Separate full containers from empty containers. Do not store near combustible materials. Avoid area where salt or other corrosive materials are press Keep in properly labeled containers. Keep in a cool, well-ventilated place. Keep away from direct sunlight. Store in accordance with the particular national regulations 				
Mater	ials to avoid	:	Self-reactive su Organic peroxic Oxidizing agen Flammable liqu Flammable soli Pyrophoric liqu Pyrophoric solic Self-heating su	ts ids ds ds ds bstances and mixtures d mixtures which in contact with water emit			



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			2	stances and mixtures nixtures with chronic toxicity
	Recommended storage tem- perature		< 126 °F / < 52 °C	
Stora	Storage period		> 10 y	
	ner information on stor- stability	:	The product has a	an indefinite shelf life when stored properly.

SECTION 8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Ingredients with workplace control parameters

Contains no substances with occupational exposure limit values.

Engineering measures :	Ensure adequate ventilation, especially in confined areas. Minimize workplace exposure concentrations.							
Personal protective equipmen	Personal protective equipment							
Respiratory protection :	General and local exhaust ventilation is recommended to maintain vapor exposures below recommended limits. Where concentrations are above recommended limits or are unknown, appropriate respiratory protection should be worn. Follow OSHA respirator regulations (29 CFR 1910.134) and use NIOSH/MSHA approved respirators. Protection provided by air purifying respirators against exposure to any hazar- dous chemical is limited. Use a positive pressure air supplied respirator if there is any potential for uncontrolled release, exposure levels are unknown, or any other circumstance where air purifying respirators may not provide adequate protection.							
Hand protection Material :	Low temperature resistant gloves							
Remarks :	Choose gloves to protect hands against chemicals depending on the concentration specific to place of work. For special applications, we recommend clarifying the resistance to che- micals of the aforementioned protective gloves with the glove manufacturer. Wash hands before breaks and at the end of workday. Breakthrough time is not determined for the pro- duct. Change gloves often!							
Eye protection :	Wear the following personal protective equipment: Chemical resistant goggles must be worn. Face-shield							
Skin and body protection :	Skin should be washed after contact.							



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P	Protective measures		:	Wear cold insulating gloves/ face shield/ eye protection.			
F	Hygiene measures		:	If exposure to chemical is likely during typical use, provide eye flushing systems and safety showers close to the wor- king place. When using do not eat, drink or smoke. Wash contaminated clothing before re-use.			
SECT	SECTION 9. PHYSICAL AND CHEMICAL PROPERTIES						
А	Appear	ance	:	Liquefied gas			
С	Color		:	colorless			
С	Ddor		:	slight, ether-like			
С	Ddor Tł	nreshold	:	No data available			
р	эΗ		:	No data available)		
N	lelting	point/freezing point	:	-247.2 °F / -155.4	⊃° L		
	nitial bo ange	biling point and boiling	:	-115.65 °F / -82.0 (1,013 hPa))3 °C		
F	-lash p	oint	:	Not applicable			
E	Evapora	ation rate	:	Not applicable			
F	lamma	ability (solid, gas)	:	Will not burn			
		explosion limit / Upper bility limit	:	Upper flammabili Method: ASTM E None.			
		explosion limit / Lower bility limit	:	Lower flammabili Method: ASTM E None.			
\vee	/apor p	pressure	:	47,054 hPa (77 °	F / 25 °C)		
R	Relative	e vapor density	:	2.4 (Air = 1.0)			
	Density		:	0.0029 g/cm ³ (77	°F / 25 °C)		
"s	Solubili Wat	ty(ies) er solubility	:	0.838 g/l(77 °F,	′ 25 °C)		
P	Partition	n coefficient: n-	:	log Pow: 0.84 (77	′ °F / 25 °C)		

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octan	ol/water		
Autoi	gnition temperature	: No data	a available
Deco	mposition temperature	: No data	a available
Visco Visco	sity scosity, kinematic	: Not app	blicable
Explo	sive properties	: Not exp	blosive
Oxidiz	zing properties	: The sub	bstance or mixture is not classified as oxidizing.
Partic	cle size	: Not app	blicable

SECTION 10. STABILITY AND REACTIVITY

Reactivity	:	Not classified as a reactivity hazard.
Chemical stability	:	Stable if used as directed. Follow precautionary advice and avoid incompatible materials and conditions.
Possibility of hazardous reac- tions	:	Can react with strong oxidizing agents.
Conditions to avoid	:	This substance is not flammable in air at temperatures up to 100 °C (212 °F) at atmospheric pressure. However, mixtures of this substance with high concentrations of air at elevated pressure and/or temperature can become combustible in the presence of an ignition source. This substance can also become combustible in an oxygen enriched environment (oxygen concentrations greater than that in air). Whether a mixture containing this substance and air, or this substance in an oxygen enriched atmosphere become combustible depends on the inter-relationship of 1) the temperature 2) the pressure, and 3) the proportion of oxygen in the mixture. In general, this substance should not be allowed to exist with air above atmospheric pressure or at high temperatures; or in an oxygen enriched environment. For example this substance should NOT be mixed with air under pressure for leak testing or other purposes.
Incompatible materials	:	Oxidizing agents
Hazardous decomposition products	:	No hazardous decomposition products are known.





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SECTION	11. TOXICOLOGICA	L INFO	RMATION	
Infor	mation on likely rout	os of or	nosuro	
Inhala	-		posure	
Skin	contact			
	contact			
	e toxicity		ta ana dia a	
	lassified based on ava	allable in	formation.	
11	<u>ponents:</u>			
	oromethane:			
Acute	e inhalation toxicity		_C50 (Rat): > 6 Exposure time:	••
			Fest atmosphe	
		ſ	Method: OECD	Test Guideline 403
			No observed ad Fest atmosphe	dverse effect concentration (Dog): 500000 pp re: gas
		L	_owest observe	ed adverse effect concentration (Dog): >
		Ę	500000 ppm	/
			Fest atmosphe	re: gas
			Cardiac sensitis Fest atmosphe	sation threshold limit (Dog): > 1,430,000 mg/ re: gas
II Skin	corrosion/irritation			
-	lassified based on ava	ailable in	formation.	
Serio	ous eye damage/eye i	irritatio	า	
	lassified based on ava			
Resp	iratory or skin sensi	tization		
•	sensitization			
-	lassified based on ava	ailable in	formation	
	iratory sensitization		lonnation	
-	lassified based on ava		formation.	
	cell mutagenicity			
	lassified based on ava	ailable in	formation.	
Com	ponents:			
11	oromethane:			
	toxicity in vitro	ſ		terial reverse mutation assay (AMES) Test Guideline 471 e
		Ī	Fest Type: In vi	tro mammalian cell gene mutation test Test Guideline 476

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Geno	toxicity in vivo	:	cytogenetic assa Species: Mouse Application Rout	e: inhalation (gas) Test Guideline 474
	cell mutagenicity - ssment	:	Weight of evider cell mutagen.	nce does not support classification as a germ
II Carci	nogenicity			
	assified based on avai No ingredie	nt of th	nis product prese	nt at levels greater than or equal to 0.1% is confirmed human carcinogen by IARC.
OSH			this product pres regulated carcinc	ent at levels greater than or equal to 0.1% is gens.
NTP				nt at levels greater than or equal to 0.1% is I carcinogen by NTP.
	s on fetal developmen	t :	Species: Rat Application Rout	atal development toxicity study (teratogenicity) e: inhalation (gas) Test Guideline 414
Not c	-single exposure lassified based on avai	ilable i	nformation.	
	<u>oonents:</u>			
UL.	oromethane: es of exposure	:	inhalation (gas)	
	ssment	:	tions of 20000 p	ealth effects observed in animals at concentra- omV/4h or less
Asses STOT	 -repeated exposure assified based on available 	: ilable i	tions of 20000 p	
Asses STOT Not cl	-repeated exposure	: ilable i	tions of 20000 p	
Asses STOT Not cl Com Triflu Route	-repeated exposure lassified based on avai	: ilable i : :	tions of 20000 p nformation. inhalation (gas)	pmV/4h or less ealth effects observed in animals at concentra-



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Repeated dose toxicity

Components:

Trifluoromethane:

NOAEL : LOAEL : Application Route :	Rat, male and female 10000 ppm > 10000 ppm inhalation (gas) 90 Days
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Aspiration toxicity

Not classified based on available information.

Components:

Trifluoromethane:

No aspiration toxicity classification

SECTION 12. ECOLOGICAL INFORMATION

Ecotoxicity

Components:

Trifluoromethane:		
Toxicity to fish	:	LC50 (Fish): 633.26 mg/l Exposure time: 96 h Method: ECOSAR (Ecological Structure Activity Relation- ships)
Toxicity to daphnia and other aquatic invertebrates	:	LC50 (Daphnia sp. (Water flea)): 323.05 mg/l Exposure time: 48 h Method: ECOSAR (Ecological Structure Activity Relation- ships)
Toxicity to algae/aquatic plants	:	EC50 (green algae): 154.54 mg/l Exposure time: 96 h Method: ECOSAR (Ecological Structure Activity Relation- ships)

Persistence and degradability

Components:

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	Trifluoromethane:		
Ĭ	Biodegradability	:	Result: Not readily biodegradable. Remarks: Based on data from similar materials



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Bioa	ccumulative potential			
Com	ponents:			
Triflu	oromethane:			
	ion coefficient: n- ol/water	: log Pow: 0.84		
Mobi	lity in soil			
No da	ata available			
Othe	r adverse effects			
No da	ata available			
SECTION	13. DISPOSAL CONS	IDERATIONS		
Dispo	osal methods			
Wast	e from residues	: Dispose of in a	ccordance with local regulations.	

r o o r F	Empty containers should be taken to an approved waste handling site for recycling or disposal. Empty pressure vessels should be returned to the supplier. If not otherwise specified: Dispose of as unused product.
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SECTION 14. TRANSPORT INFORMATION

International Regulations

UNRTDG UN number Proper shipping name Class Packing group Labels		UN 1984 REFRIGERANT GAS R 23 2.2 Not assigned by regulation 2.2
IATA-DGR UN/ID No. Proper shipping name Class Packing group Labels Packing instruction (cargo aircraft) Packing instruction (passen- ger aircraft)		UN 1984 Refrigerant gas R 23 2.2 Not assigned by regulation Non-flammable, non-toxic Gas 200
IMDG-Code UN number Proper shipping name	:	UN 1984 REFRIGERANT GAS R 23
Class Packing group Labels EmS Code		2.2 Not assigned by regulation 2.2 F-C, S-V



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Marin	e pollutant	: no		
Trans	port in bulk accordin	ig to Annex II o	of MARPOL 73/78 and the IBC Code	
Not ap	oplicable for product a	s supplied.		
Domestic regulation				
49 CF	R			
UN/ID	/NA number	: UN 1984	4	
Prope	r shipping name	: Refrigera	ant gas R 23	
Class		: 2.2		
	ng group	: Not assig	gned by regulation	
Labels	S	: NON-FL	AMMABLE GAS	
ERG		: 126		
Marin	e pollutant	: no		
Speed	al propositions for us	~ *		

Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

SECTION 15. REGULATORY INFORMATION

CERCLA Reportable Quantity

This material does not contain any components with a CERCLA RQ.

SARA 304 Extremely Hazardous Substances Reportable Quantity

This material does not contain any components with a section 304 EHS RQ.

SARA 302 Extremely Hazardous Substances Threshold Planning Quantity

This material does not contain any components with a section 302 EHS TPQ.

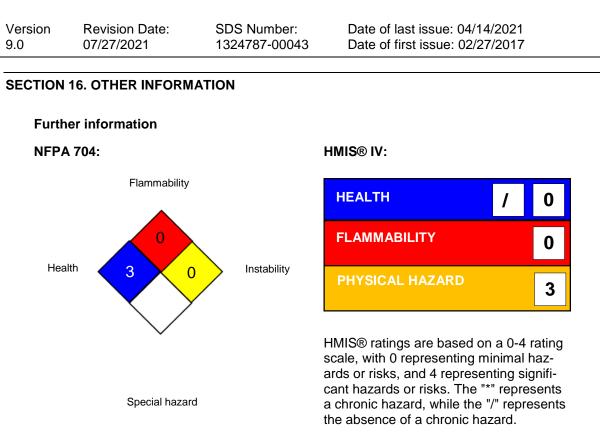
SARA 311/312 Hazards	:	Gases under pressure
		Simple Asphyxiant

SARA 313	:	This material does not contain any chemical components with known CAS numbers that exceed the threshold (De Minimis) reporting levels established by SARA Title III, Section 313.

US State Regulations

Pennsylvania Right To Know		
Trifluoromethane		75-46-7
California List of Hazardous Substances		
Trifluoromethane		75-46-7
International Regulations		
Montreal Protocol	:	Trifluoromethane





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For further information contact the local Chemours office or nominated distributors.

Full text of other abbreviations

AIIC - Australian Inventory of Industrial Chemicals; ASTM - American Society for the Testing of Materials; bw - Body weight; CERCLA - Comprehensive Environmental Response, Compensation, and Liability Act; CMR - Carcinogen, Mutagen or Reproductive Toxicant; DIN - Standard of the German Institute for Standardisation; DOT - Department of Transportation; DSL - Domestic Substances List (Canada): ECx - Concentration associated with x% response: EHS - Extremely Hazardous Substance; ELx - Loading rate associated with x% response; EmS - Emergency Schedule; ENCS - Existing and New Chemical Substances (Japan); ErCx - Concentration associated with x% growth rate response; ERG - Emergency Response Guide; GHS - Globally Harmonized System; GLP - Good Laboratory Practice; HMIS - Hazardous Materials Identification System; IARC -International Agency for Research on Cancer; IATA - International Air Transport Association; IBC - International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk; IC50 - Half maximal inhibitory concentration; ICAO - International Civil Aviation Organization; IECSC - Inventory of Existing Chemical Substances in China; IMDG - International Maritime Dangerous Goods; IMO - International Maritime Organization; ISHL - Industrial Safety and Health Law (Japan); ISO - International Organisation for Standardization; KECI - Korea Existing Chemicals Inventory; LC50 - Lethal Concentration to 50 % of a test population; LD50 - Lethal Dose to 50% of a test population (Median Lethal Dose); MARPOL - International Convention for the Prevention of Pollution from Ships; MSHA - Mine Safety and Health Administration; n.o.s. - Not Otherwise Specified; NFPA - National Fire Protection Association; NO(A)EC - No Observed (Adverse) Effect Concentration; NO(A)EL - No Observed (Adverse) Effect Level; NOELR - No Observable Effect Loading Rate; NTP - National Toxicology Program; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Co-operation and Development; OPPTS - Office

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of Chemical Safety and Pollution Prevention; PBT - Persistent, Bioaccumulative and Toxic substance; PICCS - Philippines Inventory of Chemicals and Chemical Substances; (Q)SAR - (Quantitative) Structure Activity Relationship; RCRA - Resource Conservation and Recovery Act; REACH - Regulation (EC) No 1907/2006 of the European Parliament and of the Council concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals; RQ - Reportable Quantity; SADT - Self-Accelerating Decomposition Temperature; SARA - Superfund Amendments and Reauthorization Act; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance Inventory; TECI - Thailand Existing Chemicals Inventory; TSCA - Toxic Substances Control Act (United States); UN - United Nations; UNRTDG - United Nations Recommendations on the Transport of Dangerous Goods; vPvB - Very Persistent and Very Bioaccumulative

Sources of key data used to compile the Material Safety Data Sheet	:	Internal technical data, data from raw material SDSs, OECD eChem Portal search results and European Chemicals Agen- cy, http://echa.europa.eu/

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Items where changes have been made to the previous version are highlighted in the body of this document by two vertical lines.

The information provided in this Safety Data Sheet is correct to the best of our knowledge, information and belief at the date of its publication. The information is designed only as a guidance for safe handling, use, processing, storage, transportation, disposal and release and shall not be considered a warranty or quality specification of any type. The information provided relates only to the specific material identified at the top of this SDS and may not be valid when the SDS material is used in combination with any other materials or in any process, unless specified in the text. Material users should review the information and recommendations in the specific context of their intended manner of handling, use, processing and storage, including an assessment of the appropriateness of the SDS material in the user's end product, if applicable.

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