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

1.1. Product identifier

Name of product	R 32 Art-Nr(n).: 0032
Name of substance	Difluoromethane (R 32)
EC No	200-839-4
REACH registration number	01-2119471312-47
CAS No	75-10-5

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

Recommended intended purpose(s)
Refrigerant.

1.3. Details of the supplier of the safety data sheet

Manufacturer/distributor

S. Zukausko str. 11, Ramuciai, Kaunas district,
LT - 54464, Lithuania
Phone + 370 37 373248
Fax. + 370 37 373198
E-mail: info@brgroup.eu
www.brgroup.eu

1.4. Emergency telephone number

Emergency advice

The Poison Information Bureau
Siltnamių str. 29, LT-2043 Vilnius
Phone +370 5 2362052;
Fax. +370 5 236 21 42,
E-mail.: info@tox.lt

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to Regulation (EC) No 1272/2008 [CLP/GHS]

Hazard classes and Hazard categories	Hazard Statements Classification procedure
Flam. Gas 1	**H220**
Liquef. Gas	**H280**

Hazard statements for physical hazards

H220	**Extremely flammable gas.**
H280	**Contains gas under pressure; may explode if heated.**

2.2. Label elements

Labelling according to Regulation (EC) No 1272/2008 [CLP/GHS]

GHS02

GHS04

Signal word
Danger

Hazard statements for physical hazards
H220 **Extremely flammable gas.**
H280 **Contains gas under pressure; may explode if heated.**

Precautionary Statements

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 Eliminate all ignition sources if safe to do so.

Storage
P403 Store in a well-ventilated place.

Hazardous ingredients for labeling
Difluoromethane (R 32)

Supplemental Hazard information (EU)

! **Environmental properties**
Contains fluorinated greenhouse gases.

2.3. Other hazards
Adverse physicochemical effects
The vapour of the product is heavier than air and may accumulate below ground level, in pits, channels and basements in higher concentration.

Adverse human health effects and symptoms
Contact with liquid may cause cold burns/frostbite.
Asphyxiant in high concentrations.

Information pertaining to special dangers for human and environment
In use, may form flammable/explosive vapour-air mixture.

Results of PBT and vPvB assessment
This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

! SECTION 3: Composition/ information on ingredients

3.1. Substances
! **Description**
Content: > 99 %

CAS No 75-10-5 **Difluoromethane (R 32)**
EC No 200-839-4
REACH registration number 01-2119471312-47

3.2. Mixtures
not applicable

! SECTION 4: First aid measures

4.1. Description of first aid measures

General information
Remove contaminated soaked clothing immediately.
Adhere to personal protective measures when giving first aid.

In case of inhalation
Remove the casualty into fresh air and keep him immobile.
In case of respiratory standstill give artifical respiration by respiratory bag (Ambu bag) or respirator. Send for a doctor.

! **In case of skin contact**
In case of contact with skin wash off with warm water.
In case of frostbite rinse with plenty of water. Don`t remove clothing.
In case of frostbite spray with lukewarm (not hot) water for at least 15 minutes. Do not remove clothing frozen to the skin. Thaw it with lukewarm water. Apply a sterile dressing. Obtain medical assistance.

In case of eye contact
Rinse cautiously with water for several minuts. Remove contact lenses, if present and easy to do. Continue rinsing.
Call for a doctor immediately.

In case of ingestion
Ingestion is not considered a potential route of exposure.

4.2. Most important symptoms and effects, both acute and delayed

! **Physician's information / possible symptoms**
The following symptoms may occur in case of strong exposition:
Unconsciousness
Cardiac arrhythmia (disordered cardiac rhythm).
Headache
Nausea
Confusion
Dizziness
Contact with liquid may cause cold burns/frostbite.

! **Physician's information / possible dangers**
Long-term inhaling of separation products may cause pulmonary oedema.
In case of strong exposition risk of cardiac rhythm disturbances.

4.3. Indication of any immediate medical attention and special treatment needed

! **Treatment (Advice to doctor)**
Treat symptoms.
Do not give any preparations of the adrenalin-ephedrine group.

! SECTION 5: Firefighting measures

5.1. Extinguishing media

! **Suitable extinguishing media**
Alcohol-resistant foam
Dry powder
Carbon dioxide
Water spray jet

Unsuitable extinguishing media
Full water jet

5.2. Special hazards arising from the substance or mixture
In case of fire formation of dangerous gases possible.
Carbon monoxide (CO)
Hydrogen fluoride (HF)
Carbonyl fluoride.

5.3. Advice for firefighters
Special protective equipment for fire-fighters
Use breathing apparatus with independent air supply (isolated).
Wear full protective clothing.

! **Additional information**
Cool endangered containers with water spray jet.
Exposure to fire may cause containers to rupture / explode.
Leaking gas fire: Do not extinguish, unless leak can be stopped safely.

! SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
! **For non-emergency personnel**
See section 8.
Evacuate area.
Keep people away and stay on the upwind side.
Keep away sources of ignition.

! **For emergency responders**
Remove persons to safety.
Keep area evacuated and free from ignition sources until any spilled liquid has evaporated. (Ground free from frost).
Personal protection by wearing close-fitting protective clothing and breathing apparatus.

6.2. Environmental precautions
If possible, stop flow of product.
Do not discharge into the drains/surface waters/groundwater.
Suppress gases/vapours/mists with water spray jet
Do not discharge into the subsoil/soil.

6.3. Methods and material for containment and cleaning up
Ensure adequate air ventilation.
Allow to vaporise.

6.4. Reference to other sections
Safe handling: see section 7
Disposal: see section 13
Personal protection equipment: see section 8

! SECTION 7: Handling and storage

7.1. Precautions for safe handling
! **Advice on safe handling**
Use only in thoroughly ventilated areas.
Transfer and handle only in enclosed systems.
Containers' temperature may not be increased above 50 °C.
Do not heat with open flames.
The working pressure in the receptacle must not exceed the saturation vapour pressure of the pure product resulting at a temperature of 50 °C.
Provide good room ventilation even at ground level (vapours are heavier than air).
Prevent cylinders from falling over.

Avoid release to the environment.
Ensure valve protection device is correctly fitted.
Ensure valve outlet cap nut or plug (where provided) is correctly fitted.
Open valve slowly to avoid pressure shock.
Do not allow backfeed into the container.
Suck back of water into the container must be prevented.
No water to valves, flanges and other fittings.
Purging of pipes and valves with inert gases - to avoid: water, solvents.

General protective measures
Do not inhale gases/vapours/aerosols.

Hygiene measures
At work do not eat, drink and smoke.

! **Advice on protection against fire and explosion**
The product is combustible.
Because of risk of explosion avoid vapours getting into cellar, sewage system and holes.
Take precautionary measures against static discharges.
Formation of explosive gas mixtures in air.
Pay attention to general rules of internal fire prevention.
Use explosion-proof equipment / fittings and non-sparking tools.

7.2. Conditions for safe storage, including any incompatibilities

! **Requirements for storage rooms and vessels**
Keep in closed original container.
Ventilate store-rooms thoroughly.
Only use containers that are approved specifically for the substance/product.
Suitable materials: Normalised carbon steel, tempered alloy steel, aluminium alloys, austenitic stainless steels.
Valve: Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, austenitic stainless steels.
Other material details see ISO 11114.
All regulations and local requirements for the storage of containers have to be respected.

Advice on storage compatibility
Do not store with spontaneously flammable materials.
Do not store together with combustible liquids or combustible solids.
Do not store together with animal feedstuffs.
Do not store together with explosives.
Do not store together with infectious substances.
Do not store together with radioactive material.
Do not store together with toxic liquids or toxic solids.
Do not store together with food.
Do not store together with oxidizing agents.

! **Further information on storage conditions**
Store only in original container at temperature of 50 °C maximum (=122 °F).
Keep container tightly closed and store at cool and aired place.
Prevent cylinders from falling over.
Protect of heat.

7.3. Specific end use(s)

! **Recommendation(s) for intended use**
Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.

! SECTION 8: Exposure controls/personal protection

8.1. Control parameters

DNEL-/PNEC-values

DNEL worker

CAS No	Substance name	Value	Code	Remark
75-10-5	Difluoromethane (R 32)	7035 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 7,5, Extrapolation

DNEL Consumer

CAS No	Substance name	Value	Code	Remark
75-10-5	Difluoromethane (R 32)	750 mg/m3	DNEL long-term inhalative (systemic)	Assessment factor 25

PNEC

CAS No	Substance name	Value	Code	Remark
75-10-5	Difluoromethane (R 32)	1,42 mg/l	PNEC aquatic, intermittent release	Assessment factor 100
		0,142 mg/l	PNEC aquatic, freshwater	Assessment factor 1000
		0,534 mg/kg dw	PNEC sediment, freshwater	Extrapolation

8.2. Exposure controls

! **Respiratory protection**
Breathing apparatus in the event of high concentrations.
Keep self contained breathing apparatus readily available for emergency use.
Respiratory protection complying with EN 137.
In case of rescue and maintenance activities in storage containers use environment-independent breathing apparatus because of risk of suffocation by edging out of air oxygen

! **Hand protection**
Leather gloves
Protective gloves complying with EN 374.

! **Eye protection**
Protective goggles according to EN 166, in case of increased risk add protective face shield.

! **Other protection measures**
Safety shoes with steel toe.
Body covering work clothing, or chemical resistant suit at increased risk.

Appropriate engineering controls
Transfer and handle only in enclosed systems.

! SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Appearance
Gaseous / liquefied under pressure.

Colour
colourless

Odour
mildly ethereal

Odour threshold
not determined

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not applicable				
Acid number	not applicable				
boiling point	-51,6 °C		1013 hPa		
melting point	-136 °C				
Flash point	not applicable				
Vapourisation rate	not determined				
Flammable (solid)	not applicable				
Flammability (gas)					flammable.
Ignition temperature	648 °C				
Self ignition temperature	530 °C				
Lower explosion limit	12,7 Vol-%				
Upper explosion limit	33,4 Vol-%				
Vapour pressure	1701 kPa	25 °C			
Relative density	959 kg/m3	25 °C	16900 hPa		liquid phase
Vapour density	1,82			Calculated	Heavier than air.
Solubility in water	1680 ppm	25 °C			
Solubility/other	not determined				
Partition coefficient n-octanol/water (log P O/W)	0,21	25 °C		OECD 107	
Decomposition temperature	not determined				
Viscosity	not applicable				

Oxidising properties
no

Explosive properties
Due to its chemical structure, the product is not classified as explosive.

9.2. Other information
Vapours are heavier than air.

! SECTION 10: Stability and reactivity

10.1. Reactivity
See section "Possibility of hazardous reactions".

10.2. Chemical stability
Stable under recommended conditions of use and storage (see section 7).

10.3. Possibility of hazardous reactions
May react violently with oxidants.
May form an explosive mixture with air.
Reactions with alkali metals.
Reactions with earth alkali metals.
Reactions with metals in powder form.
Reactions with metal salts in powder form.
Reactions with alkalies.

10.4. Conditions to avoid
Formation of explosive gas/air mixtures.
Heat sources / heat - risk of bursting.
Sources of ignition.

10.5. Incompatible materials
! **Substances to avoid**
Metals in powder form.
Metallic salts in powder form.
Strong oxidizing agents.
Alkali metals.
Earth alkali metals.

10.6. Hazardous decomposition products
Carbon monoxide
Fluorophosgene on contact open flame or glowing objects
Hydrogen fluoride
Carbonyl fluoride

Thermal decomposition

Remark No decomposition if used as directed.

! SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritation/Sensitization

	Value/Validation	Species	Method	Remark
LD50 acute oral				not applicable

	Value/Validation	Species	Method	Remark
LD50 acute dermal				not applicable
LC50 acute inhalation	> 520000 ppm (4 h)	rat (male / female)	OECD 403	
Skin irritation	non-irritant			
Eye irritation	non-irritant			
Skin sensitization				not determined
Sensitization respiratory system				not determined

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subchronic Toxicity	NOAEL 49100 ppm (91 d) Inhalation 6 h/d, 5 d/w	Rat (male / female)	OECD 413	No effects of toxicological significance.
Mutagenicity	NOAEL 150000 ppm (6 h) Inhalation.	Mouse	OECD 474	No experimental information on genotoxicity in vitro and in vivo available.
Reproduction-Toxicity	NOAEL 49600 ppm Inhalation.	Rat	TSCA 798 4420	No indications of toxic effects were observed in reproduction studies in animals.
Carcinogenicity	Inhalation.			No indications of carcinogenic effects are available from long-term trials.

! **Specific target organ toxicity (single exposure)**
Substance or mixture is not classified in GHS-criteria as specific target organ toxic with single exposure.

! **Specific target organ toxicity (repeated exposure)**
Substance or mixture is not classified in GHS-criteria as specific target organ toxic with repeated exposure.

! **Aspiration hazard**
not applicable

Toxicity test (Additional information)
No experimental indication of genotoxicity in vitro (Ames-test negative).
No experimental indication of genotoxicity in vivo (micronucleus test negative).

Experiences made from practice
May cause frostbite.
Gases have a suffocating effect.
Inhalation causes narcotic effect/intoxication.

! SECTION 12: Ecological information

12.1. Toxicity

Ecotoxicological effects

	Value	Species	Method	Validation
Fish	LC50 1507 mg/l (96 h)	freshwater fish	QSAR	No noticeable toxic effect in saturated solution.
Daphnia	EC50 652 mg/l (48 h)	Daphnia magna	QSAR	
Algae	EC50 142 mg/l (96 h)	Algae	QSAR	

12.2. Persistence and degradability

	Elimination rate	Method of analysis	Method	Validation
Biological degradability	5 % (28 d)		OECD 301 D	not readily degradable

12.3. Bioaccumulative potential

Bioaccumulation improbable.
Because of the n-octanol/water distribution coefficient (log K o/w) accumulation in organisms is not expected.

12.4. Mobility in soil

High mobility
Adsorption in the soil is not likely.

12.5. Results of PBT and vPvB assessment

This substance does not meet the PBT/vPvB criteria of REACH, annex XIII.

12.6. Other adverse effects

ODP: 0
GWP: 675

! **General regulation**
Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.
Avoid release to the environment.

! SECTION 13: Disposal considerations

13.1. Waste treatment methods

Waste code No.	**Name of waste**
16 05 04*	gases in pressure containers (including halons) containing hazardous substances

Wastes marked with an asterisk are considered to be hazardous waste pursuant to Directive 2008/98/EC on hazardous waste.

Recommendations for the product
Dispose of as hazardous waste.
Return to manufacturer.

Recommendations for packaging
Transportable pressure equipment (empty, residual pressure): Return to supplier / manufacturer.

SECTION 14: Transport information

	ADR/RID	IMDG	IATA-DGR
14.1. UN number	3252	3252	3252
14.2. UN proper shipping name	REFRIGERANT GAS R 32 (Difluormethan)	REFRIGERANT GAS R 32 (Difluoromethane)	Refrigerant gas R 32 (Difluoromethane)
14.3. Transport hazard class(es)	2.1	2.1	2.1
14.4. Packing group	-	-	-
14.5. Environmental hazards	No	No	No

14.6. Special precautions for user
The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.

14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code
not applicable
No transport as bulk according IBC - Code.

Land and inland navigation transport ADR/RID
Hazard label(s) 2.1
tunnel restriction code B/D
Classification code 2F

Marine transport IMDG
Ems: F-D, S-U

! SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
! Other regulations (EU)
Regulation (EU) No 517/2014 on fluorinated greenhouse gases.
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
Directive 2012/18/EU on the control of major-accident hazards involving dangerous substances.
Regulation (EU) 2015/2068 establishing, pursuant to Regulation (EU) No 517/2014, the format of labels for products and equipment containing fluorinated greenhouse gases.
Regulation (EU) 2015/2067 establishing, pursuant to Regulation (EU) No 517/2014, ~ certification ~ as regards stationary refrigeration, air conditioning and heat pump equipment, and ~ containing fluorinated greenhouse gases.

VOC standard
VOC content >=99 % 25 °C 17010 hPa

15.2. Chemical Safety Assessment
The protective measures listed in Sections 6, 7 and 8 of the Safety Data Sheet have to be considered.
For this substance a chemical safety assessment has been carried out.
An exposure scenario is not required.

! SECTION 16: Other information

! **Recommended uses and restrictions**

Use in accordance with regulation (EU) No 517/2014 on fluorinated greenhouse gases.
National and local regulations concerning chemicals shall be observed.

Further information

All declarations of safety-data-sheet refer to pure substance.
The information contained herein is based on the state of our knowledge. It characterizes the product with regard to the appropriate safety precautions. It does not represent a guarantee of the properties of the product.

Indication of changes: "!" = Data changed compared with the previous version. Previous version: 1.1

! **Sources of key data used**

For the preparation of this safety data sheet, information from our suppliers as well as data from the "database of registered substances" of the European Chemicals Agency (ECHA) were used.