Material Safety Data Sheet (MSDS)

According to GHS (Seventh Revised Edition)

Section 1 Product and Company Identification

1.1 Product Identifier

Product Name	R600a refrigerant
Item No.	
Synonyms	N/AV

CAS No.	000075-28-5
EC No.	200-857-2
Molecular Formula	C4H10/(CH3)2CHCH3

1.2 Relevant Identified Uses of the Substance or Mixture and Uses Advised Against

Relevant Identified Uses	Please consult manufacturer	**Uses Advised Against**	Please consult manufacturer

1.3 Details of the Supplier of the Safety Data Sheet

	UK	**EU**	**Australia**	**New Zealand**
Importer Name	Polar	Polar	Polar	Polar
Address	Fourth Way, Avonmouth	42 North Point Business Park, New Mallow Road, Cork	15 Badgally Rd, Campbelltown	23 Business Parade, Auckland
Post Code	BS11 8TB	T23 C9T0	NSW 2560	2013
Telephone	0845 146 2887	021 494 6777	1300 225 960	0800 222 700
Manufacturer Name	Polar			
Address	Fourth Way, Avonmouth, United Kingdom			
Post Code	BS11 8TB			
Telephone	08451462887			

1.4 Emergency Phone Number

	UK & Ireland	**EU**	**Australia**	**New Zealand**
Emergency Phone Number	08451462887	0031-40-2628080	1300 225 960	0800 222 700

Section 2 Hazards Identification

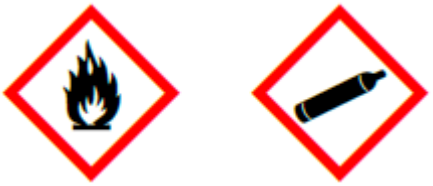
2.1 Classification of the substance or mixture.

Hazard class and label elements of the product according to GHS (the seventh revised edition):
GHS Hazard Class:

Flammable Gases	Category 1
Gases under pressure-Liquefied gas	Warning

Toxicity (Repeated Exposure)

2.2 GHS Label Elements

Pictogram	
Signal Word	Danger

Hazard Statements

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

Precautionary Statements

Prevention	:P210: Keep away from heat/sparts/open flames/hot surfaces.—No smoking.
Response	:P377: Leaking gas fire: Do not extinguish, unless leak can be stopped safelyc
	:P381: Eliminate all ignition sources if safe to do so.
Storage	:P403: Store in a well-ventilated place.

2.3 Other Hazards.

None	

Section 3 Composition/Information on ingredients

3.1 Substances

Component	Concentration (%)	CAS No.	EC No.
Isobutane	99.0-99.9%	75-28-52	00-857-2

Section 4 First Aid Measures

4.1 Description of First Aid Measures

General Advice	None
Eye Contact	:For liquid spillage - flush with water for at least 15 minutes.
Skin Contact	:For liquid spillage - flush with water for at least 15 minutes.
Ingestion	: Ingestion is not considered a potential route of exposure.
Inhalation	: In high concentrations may cause asphyxiation. Symptoms may include loss of mobility/consciousness. Victim may not be aware of asphyxiation. In low concentrations may cause narcotic effects. Symptoms may include dizziness, headache, nausea and loss of co-ordination. Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped
Protecting of First-aiders	none

4.2 Most Important Symptoms and Effects, both Acute and Delayed

: In low concentrations may cause narcotic effects, Symptoms may include dizziness, headache,nausea and loss of co-ordination.

In high concentrations may cause asphyxiation.Symptoms may include loss of mobility/consciousness.Victim may not be aware of asphyxiation.

4.3 Indication of Any Immediate Medical Attention and Special Treatment Needed

Obtain emergency medical attention.

Section 5 Firefighting Measures

5.1 Extinguishing Media

Suitable Extinguishing Media	: All known extinguishants can be used
Unsuitable Extinguishing Media	: None

5.2 Specific Hazards Arising from the Substance or Mixture

1	**Specific hazards**	: Exposure to fire may cause containers to rupture/explode.
2	**Hazardous combustion products**	: Incomplete combustion may form carbon monoxide

3	

5.3 Advice for Firefighters

1	**Specific methods** : If possible, stop flow of product. Move away from the container and cool with water from a protected position. Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/ explosive re-ignition may occur. Extinguish any other fire
2	**Special protective equipment for fire fighters**: In confined space use self-contained breathing apparatus.
3	

Section 6 Accidental release measures

6.1 Personal Precautions, Protective Equipment and Emergency Procedures

1	:Evacuate unnecessary personnel
2	:Ensure adequate air ventilation.
3	:Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe
4	:Eliminate ignition sources

6.2 Environmental Precautions

1	: Try to stop release
2	: Prevent from entering sewers, basements and workpits, or any place where its accumulation can be gangerous.

6.3 Methods and Materials for Containment and Cleaning Up

1	: Ventilate area.
2	
3	

6.4 Reference to other sections

N/AV

Section 7 Handling and storage

7.1 Precautions for Handling

1	: Take precautionary measures against static discharge
2	: Purge air from system before introducing gas
3	: Suck back of water into the container must be prevented. Do not allow backfeed into the container.
4	: Use only properly specified equipment which is suitable for this product, its supply pressure and

	temperature. Contact your gas supplier if in doubt
5	:Keep away from ignition sources (including static discharges). Open valve slowly to avoid pressure shock

7.2 Conditions for safe storage, including any incompatibilities

1	: Segregate from oxidant gases and other oxidants in store.
2	: Keep container below 50°C in a well ventilated place.
3	
4	

7.3 Specific end use(s)

Where available, refer to the exposure scenarios identified in the document enclosed to this Material SAFETY Data Sheet

Section 8 Exposure control/personal protection

8.1 Control Parameters

Occupational Exposure Limit Values

Component	Country/Region	Limit Value - Eight Hours		Limit Value - Short Term	
		ppm	mg/m³	ppm	mg/m³
Isobutane	Sweden	800	N/AV	N/AV	N/AV
	New Zealand	800	N/AV	N/AV	N/AV
	Ireland	800	N/AV	N/AV	N/AV
	Germany (AGS)	800	N/AV	N/AV	N/AV
	Denmark	800	N/AV	N/AV	N/AV
	Australia	800	N/AV	N/AV	N/AV

Biological Limit Values -
None
Monitoring Methods

1	: Ensure adequate ventilation.
2	: Consider the risk of explosive atmospheres.

8.2 Exposure Controls

1	General: Ensure adequate Ventilation. Do not smoke while handling product.
2	
3	
4	

Personal Protection Equipment

Eye Protection	: Even though no eye contact is expected under reasonable normal conditions of use, appropriate eye protection should be worn when handling this

	material.
Hand Protection	: Leather safety gloves when handling cylinders.
Respiratory protection	: No special respiratory protection equipment is recommended under normal conditions of use with adequate ventilation.
Skin and Body Protection	: Skin protectin appropriate to the conditions of use should be provided.

Section 9 Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance:	Physical state at 20℃ : Gas Colour : Golourless gas		Odor:	: Sweetish, Poor warning properties at low concentrations Stenchant often added
Odor Threshold:	N/AV		pH:	N/AV
Melting Point/Freezing Point (℃):	-159		Initial Boiling Point and Boiling Range (℃):	-12
Flash Point (℃)(Closed Cup):	N/AV		Evaporation Rate:	N?AV
Flammability:	1.5 to 8.5		Upper/lower explosive limits[%(v/v)]:	
Vapor Pressure (MPa):	3bar		Relative Vapour Density(Air＝1):	2
Relative Density(Water=1):	0.59		Solubility:	54
n-Octanol/Water Partition Coefficient:	N/AV		Auto-Ignition Temperature(℃):	460
Decomposition Temperature (℃):	N/AV		Kinematic Viscosity (mm2/s):	N/V
Particle characteristics:	N/AV		n/av	

9.2 Other Information

Gas/vapour heavier than air. May accumulate in confined spaces, particularly at or below ground level

Section 10 Stability and reactivity

10.1	Reactivity	: May react violently with oxidants, May react violently with alkalis.
10.2	Chemical Stability	: Stable under normal conditions.
10.3	Possibility of Hazardous Reactions	: Can form explosive mixture with air.
10.4	Conditions to Avoid	: Keep away from heat/sparts/open flames/hot surfaces.-No smoking.
10.5	Incompatible Materials	: Air, Oxidisers.
10.6	Hazardous Decomposition products	None.

Section 11 Toxicological information

11.1 Information on toxicological effects

No known toxicological effects from this product.

a	Acute Toxicity				
	Component	CAS No.	LD_{50} (Oral)	LD_{50} (Dermal)	LC_{50} (Inhalation, 4h)
	N/AV	N/AV	N/AV	N/AV	N/AV

b	Skin Corrosion/Irritation	N/AV
c	Serious Eye Damage/Irritation	N/AV
d	Respiratory or Skin Sensitization	N/AV
e	Germ Cell Mutagenicity	N/AV

f	Carcinogenicity				
	ID	CAS No.	Component	IARC	NTP
	N/AV	N/AV	N/AV	N/AV	N/AV

g	Reproductive Toxicity	N/AV
h	STOT-Single Exposure	N/AV
i	STOT-Repeated Exposure	N/AV
j	Aspiration Hazard	N/AV
k	Inhalation	: Asphyxiant gas
l	Dermal	: Prolonged or repeated contact may cause skin to become dry or cracked.
m	Ocular	May cause eye irritation.
n	Ingestion	Ingestion is not considered a potential route of exposure.
o	Rate inhalation LC50 (PPM/4h)	No data available.

Section 12 Ecological information

12.1	**Toxicity : No kjown ecological damage caused by this product**				
	Acute aquatic				
	Component	CAS No.	Fish	Crustaceans	Algae
	N/AV	N/AV	N/AV	N/AV	N/AV
	Chronic aquatic				
	None				

12.2	Persistence and Degradability	Biodegradable.
12.3	Bio-accumulative Potential	None
12.4	Mobility in Soil	: Not applicable.
12.5	Results of PBT and vPvB Assessment	: Note applicable.
12.6	Other adverse effects	No known ecological damage caused by this product.

Section 13 Disposal considerations

13.1 Waste treatment methods

General: 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.
Do not discharge into any place where its accumulation could be dangerous.
Contact supplier if guidance is required

Waste Chemicals	N/AV
Contaminated Packaging	N/AV
Disposal Recommendations	: Consult supplier for specific recommendations.

Section 14 Transport information

	Transporting Label	
14.1	UN Number	3358
14.2	UN Proper Shipping Name	: Refrigerating machines containing flammable,non toxic liquefied gas
14.3	Transport Hazard Class	2
	Transport Subsidiary Hazard Class	N/AV
14.4	Packing Group	P200
14.5	Environmental hazards	N/AV
14.6	Special precautions for user	N/AV
14.7	Transport in bulk according to Annex II of Marpol and the IBC Code	N/AV

Section 15 Regulatory information

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

15.2 Chemical safety assessment

International Chemical Inventory									
Component	**EINECS**	**TSCA**	**DSL**	**IECSC**	**NZIoC**	**PICCS**	**KECI**	**AICS**	**ENCS**
Isobutane	√	√	√	√	√	√	√	√	√

EINECS	European Inventory of Existing Commercial Chemical Substances.
TSCA	United States Toxic Substances Control Act Inventory.
DSL	Canadian Domestic Substances List.
IECSC	China Inventory of Existing Chemical Substances.
NZIoC	New Zealand Inventory of Chemicals.
PICCS	Philippines Inventory of Chemicals and Chemical Substances.
KECI	Existing and Evaluated Chemical Substances.
AICS	Australia Inventory of Chemical Substances.

ENCS	Existing and New Chemical Substances.

Note

“√” Indicates that the substance included in the regulations “×” That no data or included in the regulations

Section 16 Other information

Creation Date	2020/07/24
Revision Date	
Reason for Revision	

Disclaimer

This Safety Data Sheet (SDS) was prepared according to UN GHS (the 7th revised edition). The data included was derived from international authoritative database and provided by the enterprise. Other information was based on the present state of our knowledge. We try to ensure the correctness of all information. However, due to the diversity of information sources and the limitations of our knowledge, this document is only for user’s reference. Users should make their independent judgment of suitability of this information for their particular purposes. We do not assume responsibility for loss, damage or expense arising out of or in any way connected with the handling, storage, use or disposal of the product.