Ehsan International Gases

Isobutane

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

1.1. Product identifier

Name of product	Isobutane Art-Nr(n).: 0056, 0066, 2322-2324
Name of substance	isobutane
Index No	601-004-00-0
EC No	200-857-2
REACH registration number	01-2119485395-27
CAS No	75-28-5

Manufacturer / Distributor:

Ehsan International Gases
40/9, Aurangabad, Nazimabad
#3, Karachi 74600, Pakistan.
+92 21 36612091 – 36612907
info@ehsan.com.pk
www.ehsan.com.pk

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

Identified uses

! **Sector of uses [SU]**
SU10 - Formulation [mixing] of preparations and/or re-packaging (excluding alloys)
SU12 - Manufacture of plastics products, including compounding and conversion
SU2a - Mining (without offshore industries)
SU2b - Offshore industries
SU21 - Consumer uses: Private households (= general public = consumers)
SU22 - Professional uses: Public domain (administration, education, entertainment, services, craftsmen) SU0 - Other
SU3 - Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8 - Manufacture of bulk, large scale chemicals (including petroleum products)

! **Product categories [PC]**
PC13 - Kraftstoffe
PC16 - Heat transfer fluids
PC19 - Intermediate
PC21 - Laboratory chemicals
PC24 - Lubricants, greases, release products
PC29 - Pharmaceuticals
PC3 - Air care products
PC32 - Polymer preparations and compounds
PC34 - Textile dyes, finishing and impregnating products; including bleaches and other processing aids
PC35 - Washing and cleaning products (including solvent based products)
PC39 - Cosmetics, personal care products
PC0 - Other
PC8 - Biocidal products (e.g. Disinfectants, pest control)

PC9a - Coatings and paints, thinners, paint removers
PC9b - Fillers, putties, plasters, modelling clay

! **Process categories [PROC]**
PROC1 - Use in closed process, no likelihood of exposure
PROC2 - Use in closed, continuous process with occasional controlled exposure
PROC3 - Use in closed batch process (synthesis or formulation)
PROC5 - Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC7 - Industrial spraying
PROC9 - Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC12 - use of blowing agents in manufacture of foam
PROC16 - Using material as fuel sources, limited exposure to unburned product to be expected
PROC8a - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at nondedicated facilities
PROC11 - Non industrial spraying
PROC8b - Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities

! **Environmental release categories [ERC]**
ERC1 - Manufacture of substances
ERC7 - Industrial use of substances in closed systems
ERC8a - Wide dispersive indoor use of processing aids in open systems
ERC2 - Formulation of preparations (mixtures)
ERC3 - Formulation in materials
ERC6a - Industrial use resulting in manufacture of another substance (use of intermediates)

Recommended intended purpose(s)
Basic substance.
Propellant.
Refrigerant (R-600a)

SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification according to 67/548/EEC or 1999/45/EC

F+; R12

R-phrases

12	Extremely flammable.

Additional hints
Listed substance (Regulation (EC) No 1272/2008, Annex VI, part 3).

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

Hazard classes and Hazard	Hazard Statements	Classification procedure categories
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.**

Additional hints
Listed substance (Regulation (EC) No 1272/2008, Annex VI, part 3).

Isobutane

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/sparks/open flames/hot surfaces. – 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.

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.

! **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

CAS No 75-28-5 **isobutane**
EC No 200-857-2
Index No 601-004-00-0
REACH registration number 01-2119485395-27

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. Seek medical treatment immediately.
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. 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
Shortness of breath
Anaesthetic state

4.3. Indication of any immediate medical attention and special treatment needed
Treatment (Advice to doctor) Monitor circulation.

SECTION 5: Firefighting measures

5.1. Extinguishing media
! **Suitable extinguishing media**
Dry powder
Carbon dioxide

! **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.
Formation of explosive gas mixtures in air.
In the event of fire the following can be released:
Carbon monoxide (CO)

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.
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur.
Extinguish any other fire.

Isobutane

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

! **For non-emergency personnel**

See chapter 8.
Keep people away and stay on the upwind side.
Keep away sources of ignition.

! **For emergency responders**

Remove persons to safety.
Evacuate area.
Keep away sources of ignition.

6.2. Environmental precautions

If possible, stop flow of product.
Eliminate ignition sources.
Do not discharge into the drains/surface waters/groundwater.
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.
Take measures against electrostatically charging.
Barrels and installations thoroughly earthing (grounding).
Use antistatic tools.
Treatment only in suitable rooms and systems.
Provide good room ventilation even at ground level (vapours are heavier than air).
Prevent cylinders from falling over.
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.

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.

Use transportable pressure equipment.

Suitable materials: Normalised steel and carbon steel, tempered steel, aluminium alloys, stainless steel. Valve:

Suitable materials: Brass, copper alloys, carbon steels, aluminium alloys, stainless steel.

! **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 liquids or oxidizing solids.

! **Further information on storage conditions**

Ensure valve protection device is correctly fitted.

Store away from combustible materials.

Keep container tightly closed and store at cool and aired place.

Prevent cylinders from falling over.

Protect of heat.

Storage temperature may not exceed 50°C (=122°F).

7.3. Specific end use(s)

! **Recommendation(s) for intended use**

See section 1.2

No further recommendations.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

! Ingredients with occupational exposure limits to be monitored

! CAS No	Name	Code	[mg/m3]	[ppm]	Remark
75-28-5	Isobutane	REL, 8 hours	1900	800	NIOSH, USA

Additional advice

DNEL / DMEL values are not available.

8.2. Exposure controls

Respiratory protection

Keep self contained breathing apparatus readily available for emergency use.

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
Eye protection
safety goggles with side protection safety goggles, 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.

! **Limitation and surveillance of the environment**
PNEC values are not available.

SECTION 9: Physical and chemical properties

Important health, safety and environmental information

	Value	Temperature	at	Method	Remark
pH value	not applicable				
Acid number	not applicable				
boiling point	-11,7 °C		1013 hPa		
melting point	-159,6 °C				
Flash point	-83 °C				
Vapourisation rate	not applicable				
Flammable (solid)	not applicable				
Flammability (gas)					Flammable.
Ignition temperature	460 °C				
Self ignition temperature	460 °C				
Lower explosion limit	1,3 Vol-%				
Upper explosion limit	9,8 Vol-%				

Isobutane

	Value	Temperature	at	Method	Remark
Bulk density	not applicable				
Vapour density	2,07				
Solubility in water	49 mg/l	20 °C			
Solubility/other					soluble in organic solvent
Partition coefficient noctanol/water (log P O/W)	2,76				
Decomposition temperature	not applicable				
Viscosity dynamic	0,228 mPa*s	-11,7 °C			liquid phase

Oxidising properties
no

Explosive properties
Due to its 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 normal conditions.

10.3. Possibility of hazardous reactions
Reactions with oxidising agents.

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

10.5. Incompatible materials
! **Materials to avoid**
Air
Oxidising agent

10.6. Hazardous decomposition products
No hazardous decomposition products known.
Thermal decomposition

Remark	No decomposition if used as directed.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity/Irritability/Sensitization

	Value/Validation	Species	Method	Remark
LC50 acute inhalation	520400 ppm (120 min)	Rat (male)		
Irritability skin	Study technically not feasible.			
Irritability eye	Study technically not feasible.			
Skin sensitization	Study technically not feasible.			
Sensitization respiratory system	No data available			

Subacute Toxicity - Carcinogenicity

	Value	Species	Method	Validation
Subchronic Toxicity	NOAEC 9000 ppm (42 d) Inhalation 6 h/d, 5 d/w	Rat (male / female)	OECD TG 422	No effects of toxicological significance.
Mutagenicity	0,5 - 8 % (24 - 44 h) Gene mutation	human lymphocytes	OECD 473	No experimental information on genotoxicity in vitro available.
Reproduction-Toxicity	NOAEC 3000 ppm Inhalation 6 h/d, 7 d/w	Rat (male / female)	OECD TG 422	
Carcinogenicity	not determined			

! **Specific target organ toxicity (single exposure)**
Not known.

! **Specific target organ toxicity (repeated exposure)**
Not known.

! **Aspiration hazard**
not applicable

! **Toxicity test (Additional information)**
No experimental indication of genotoxicity in vitro (Ames-test negative).
No indication of cancerogenic effects at humans available.

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 27,98 - 147,54 mg/l (96 h)	Fish	QSAR	
Daphnia	EC50 46,6 mg/l (48 h)	Daphnia	QSAR	
Algae	EC50 7,71 - 8,57 mg/l (96 h)	Algae	QSAR	
Bacteria	not determined			

12.2. Persistence and degradability
Physico-chemical degradability
At normal temperature very highly volatile or gaseous product that can be released to atmosphere.
Elimination test cannot be employed.

Biological degradability	100 % (385,5 h)	OECD	readily degradable

12.3. Bioaccumulative potential
Bioaccumulation improbable.

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
GWP: 3

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 dangerous 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.
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	1969	1969	1969	**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.
14.2. UN proper shipping name	ISOBUTANE	ISOBUTANE	Isobutane	
14.3. Transport hazard class(es)	2	2.1	2.1	
14.4. Packing group	-	-	-	
14.5. Environmental hazards	No	No	No	

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

SECTION 15: Regulatory information

15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture
! **Other regulations (EU)**
Regulation (EC) No 1907/2006 concerning the Registration, Evaluation, Authorisation and Restriction of Chemicals (REACH), Annex XVII No 40.
Directive 96/82/EC on the control of major-accident hazards involving dangerous substances.

! **VOC standard**
VOC content -100 % 20 °C 3020 hPa

15.2. Chemical Safety Assessment
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
National and local regulations concerning chemicals shall be observed.

Isobutane

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: 7.5