

# Safety Data Sheet



2% iso-Butane, 2% n-Butane, 20% iso-Pentane, 25% n-Pentane in n-Hexane

Date of first issue: 31/07/2014

Revised date: 05/12/2016

Supersedes: 31/07/2014

Version: 1.0

SDS reference: AL712

**Danger**



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

### 1.1. Product identifier

SDS no : AL712

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

Relevant identified uses : Industrial and professional. Perform risk assessment prior to use  
Test gas/Calibration gas  
Laboratory use  
Contact supplier for more information on uses

Uses advised against : Consumer use

### 1.3. Details of the supplier of the safety data sheet

Company identification : Air Liquide Australia Limited  
Level 9 / 380 St. Kilda Road  
3004 Melbourne VIC Australia  
+61 3 9697 9888  
ALAEquiries@AirLiquide.com

### 1.4. Emergency telephone number

Emergency telephone number : 1800 812 588

## SECTION 2: Hazards identification

### 2.1. Classification of the substance or mixture

#### Classification according to WHS Regulation

Physical hazards	Flammable gases, Category 1	H220
	Gases under pressure : Liquefied gas	H280
Health hazards	Skin corrosion/irritation, Category 2	H315
	Reproductive toxicity, Category 2	H361
	Specific target organ toxicity — Single exposure, Category 3, Narcosis	H336
	Specific target organ toxicity — Repeated exposure, Category 2	H373
Environmental hazards	Hazardous to the aquatic environment — Chronic Hazard, Category 2	H411

### 2.2. Label elements

#### Classification according to WHS Regulation

Hazard pictograms :



Signal word :

Danger

Hazard statements :

- H220 - Extremely flammable gas.
- H280 - Contains gas under pressure; may explode if heated.
- H315 - Causes skin irritation.
- H336 - May cause drowsiness or dizziness.
- H361 - Suspected of damaging fertility or the unborn child.
- H373 - May cause damage to organs through prolonged or repeated exposure.
- H411 - Toxic to aquatic life with long lasting effects.

Precautionary statements

- Prevention : P202 - Do not handle until all safety precautions have been read and understood  
 P260 - Do not breathe dust/fume/gas/mist/vapours/spray  
 P280 - Wear protective gloves, protective clothing, eye protection, face protection  
 P210 - Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking
- Response : P308+P313 - IF exposed or concerned: Get medical advice/attention  
 P302+P352 - IF ON SKIN: Wash with plenty of water

**2.3. Other hazards**

: None

### SECTION 3: Composition/information on ingredients

**3.1. Substance** : Not applicable

**3.2. Mixture**

Name	Product identifier	%	Classification according to WHS Regulation
n-hexane	(CAS No) 110-54-3 (EC no) 203-777-6 (EC index no) 601-037-00-0	Bal	Flam. Liq. 2, H225 Repr. 2, H361f Asp. Tox. 1, H304 STOT RE 2, H373 Skin Irrit. 2, H315 STOT SE 3, H336 Aquatic Chronic 2, H411
pentane	(CAS No) 109-66-0 (EC no) 203-692-4 (EC index no) 601-006-00-1	0 - 27.5	Flam. Liq. 2, H225 Asp. Tox. 1, H304 STOT SE 3, H336 Aquatic Chronic 2, H411
Isopentane	(CAS No) 78-78-4 (EC no) 201-142-8 (EC index no) 601-006-00-1	0 - 25	Flam. Liq. 1, H224 Asp. Tox. 1, H304 STOT SE 3, H336 Aquatic Chronic 2, H411
Isobutane	(CAS No) 75-28-5 (EC no) 200-857-2 (EC index no) 601-004-00-0 (REACH-no) 01-2119485395-27	0 - 2.2	Flam. Gas 1, H220 Press. Gas (Liq.), H280
Butane n-	(CAS No) 106-97-8 (EC no) 203-448-7 (EC index no) 601-004-00-0 (REACH-no) 01-2119474691-32	0 - 2.2	Flam. Gas 1, H220 Press. Gas (Liq.), H280

### SECTION 4: First aid measures

#### **4.1. Description of first aid measures**

- Inhalation : Remove person to fresh air and keep comfortable for breathing  
Remove victim to uncontaminated area wearing self contained breathing apparatus. Keep victim warm and rested. Call a doctor. Apply artificial respiration if breathing stopped
- Skin contact : Remove contaminated clothing. Drench affected area with water for at least 15 minutes  
Wash skin with plenty of water  
Take off contaminated clothing  
If skin irritation occurs: Get medical advice/attention
- Eye contact : Immediately flush eyes thoroughly with water for at least 15 minutes  
Rinse eyes with water as a precaution
- Ingestion : Ingestion is not considered a potential route of exposure  
Call a poison center or a doctor if you feel unwell

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

- : 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  
May cause irritation to skin  
Refer to section 11

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

- : Obtain medical assistance

### **SECTION 5: Firefighting measures**

#### **5.1. Extinguishing media**

- Suitable extinguishing media : Water spray or fog  
Water spray  
Dry powder  
Foam
- Unsuitable extinguishing media : Carbon dioxide  
Do not use water jet to extinguish

#### **5.2. Special hazards arising from the substance or mixture**

- Specific hazards : Exposure to fire may cause containers to rupture/explode
- Hazardous combustion products : None that are more toxic than the product itself

#### **5.3. Advice for fire-fighters**

- Specific methods : Use fire control measures appropriate for the surrounding fire. Exposure to fire and heat radiation may cause gas receptacles to rupture. Cool endangered receptacles with water spray jet from a protected position. Prevent water used in emergency cases from entering sewers and drainage systems  
If possible, stop flow of product  
Use water spray or fog to knock down fire fumes if possible  
Do not extinguish a leaking gas flame unless absolutely necessary. Spontaneous/explosive re-ignition may occur. Extinguish any other fire  
Move containers away from the fire area if this can be done without risk
- Special protective equipment for fire fighters : In confined space use self-contained breathing apparatus  
Wear gas tight chemically protective clothing in combination with self contained breathing apparatus  
EN 943-2: Protective clothing against liquid and gaseous chemicals, aerosols and solid particles. Gas-tight chemical protective suits for emergency teams  
Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask
- Hazchemcode : 2YE

### **SECTION 6: Accidental release measures**

**6.1. Personal precautions, protective equipment and emergency procedures**

- : Try to stop release
- Evacuate area
- Monitor concentration of released product
- Consider the risk of potentially explosive atmospheres
- Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe
- Eliminate ignition sources
- Use chemically protective clothing
- Ensure adequate air ventilation
- Act in accordance with local emergency plan
- Stay upwind

**6.2. Environmental precautions**

- : Avoid release to the environment
- Try to stop release
- Reduce vapour with fog or fine water spray

**6.3. Methods and material for containment and cleaning up**

- : Hose down area with water
- Ventilate area
- Wash contaminated equipment or sites of leaks with copious quantities of water

**6.4. Reference to other sections**

- : See also sections 8 and 13
- For further information refer to section 13

**SECTION 7: Handling and storage****7.1. Precautions for safe handling**

Safe use of the product

- : The substance must be handled in accordance with good industrial hygiene and safety procedures
- Only experienced and properly instructed persons should handle gases under pressure
- Consider pressure relief device(s) in gas installations
- Ensure the complete gas system was (or is regularly) checked for leaks before use
- Do not smoke while handling product
- Avoid exposure, obtain special instructions before use
- Protect eyes, face and skin from liquid splashes
- Use only properly specified equipment which is suitable for this product, its supply pressure and temperature. Contact your gas supplier if in doubt
- Assess the risk of potentially explosive atmospheres and the need for explosion-proof equipment
- Purge air from system before introducing gas
- Take precautionary measures against static discharge
- Keep away from ignition sources (including static discharges)
- Consider the use of only non-sparking tools
- Do not breathe gas
- Avoid release of product into atmosphere.

Safe handling of the gas receptacle : Refer to supplier's container handling instructions  
 Do not allow backfeed into the container  
 Protect cylinders from physical damage; do not drag, roll, slide or drop  
 When moving cylinders, even for short distances, use a cart (trolley, hand truck, etc.) designed to transport cylinders  
 Leave valve protection caps in place until the container has been secured against either a wall or bench or placed in a container stand and is ready for use  
 If user experiences any difficulty operating cylinder valve discontinue use and contact supplier  
 Never attempt to repair or modify container valves or safety relief devices  
 Damaged valves should be reported immediately to the supplier  
 Keep container valve outlets clean and free from contaminants particularly oil and water  
 Replace valve outlet caps or plugs and container caps where supplied as soon as container is disconnected from equipment  
 Close container valve after each use and when empty, even if still connected to equipment  
 Never attempt to transfer gases from one cylinder/container to another  
 Never use direct flame or electrical heating devices to raise the pressure of a container  
 Do not remove or deface labels provided by the supplier for the identification of the cylinder contents  
 Containers should be stored in the vertical position and properly secured to prevent them from falling over.

**7.2. Conditions for safe storage, including any incompatibilities**

: Observe all regulations and local requirements regarding storage of containers  
 Containers should not be stored in conditions likely to encourage corrosion  
 Container valve guards or caps should be in place  
 Containers should be stored in the vertical position and properly secured to prevent them from falling over  
 Stored containers should be periodically checked for general condition and leakage  
 Keep container below 50°C in a well ventilated place  
 Store containers in location free from fire risk and away from sources of heat and ignition  
 Keep away from combustible materials  
 Segregate from oxidant gases and other oxidants in store  
 All electrical equipment in the storage areas should be compatible with the risk of a potentially explosive atmosphere.

**7.3. Specific end use(s)**

: None.

**SECTION 8: Exposure controls/personal protection**

**8.1. Control parameters**

2% iso-Butane, 2% n-Butane, 20% iso-Pentane, 25% n-Pentane in n-Hexane		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m <sup>3</sup> )	<= 72 mg/m <sup>3</sup> Hexane
	TWA (ppm)	<= 20 ppm Hexane
<b>Butane n- (106-97-8)</b>		
OEL : Occupational Exposure Limits		
United Kingdom	WEL - LTEL - UK [mg/m <sup>3</sup> ]	1450 mg/m <sup>3</sup>
	WEL - LTEL - UK [ppm]	600 ppm
	WEL - STEL - UK [mg/m <sup>3</sup> ]	1810 mg/m <sup>3</sup>
	WEL - STEL - UK [ppm]	750 ppm
<b>Isopentane (78-78-4)</b>		
OEL : Occupational Exposure Limits		
United Kingdom	WEL - LTEL - UK [mg/m <sup>3</sup> ]	1800 mg/m <sup>3</sup>
	WEL - LTEL - UK [ppm]	600 ppm
<b>pentane (109-66-0)</b>		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m <sup>3</sup> )	1770 mg/m <sup>3</sup>
	TWA (ppm)	600 ppm
	STEL (mg/m <sup>3</sup> )	2210 mg/m <sup>3</sup>
	STEL (ppm)	750 ppm
United Kingdom	WEL - LTEL - UK [mg/m <sup>3</sup> ]	1800 mg/m <sup>3</sup>

	WEL - LTEL - UK [ppm]	600 ppm
<b>n-hexane (110-54-3)</b>		
OEL : Occupational Exposure Limits		
Australia	TWA (mg/m <sup>3</sup> )	72 mg/m <sup>3</sup>
	TWA (ppm)	20 ppm
United Kingdom	WEL - LTEL - UK [mg/m <sup>3</sup> ]	72 mg/m <sup>3</sup>
	WEL - LTEL - UK [ppm]	20 ppm

DNEL (Derived-No Effect Level) : No data available.

PNEC (Predicted No-Effect Concentration) : No data available.

## 8.2. Exposure controls

### 8.2.1. Appropriate engineering controls

- : Ensure good ventilation of the work station
- Provide adequate general and local exhaust ventilation
- Product to be handled in a closed system
- Systems under pressure should be regularly checked for leakages
- Ensure exposure is below occupational exposure limits (where available)
- Gas detectors should be used when toxic gases may be released
- Keep concentrations well below lower explosion limits
- Consider work permit system e.g. for maintenance activities

### 8.2.2. Individual protection measures, e.g. personal protective equipment

- : 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:
- PPE compliant to the recommended EN/ISO standards should be selected

#### • Eye/face protection

- : Safety glasses
- Wear safety glasses with side shields
- Wear goggles and a face shield when transfilling or breaking transfer connections
- Standard EN 166 - Personal eye-protection

#### • Skin protection

##### - Hand protection

- : Wear working gloves when handling gas containers
- Standard EN 388 - Protective gloves against mechanical risk
- Wear chemically resistant protective gloves
- Standard EN 374 - Protective gloves against chemicals
- Consult glove manufacturer's product information on material suitability and material thickness
- The breakthrough time of the selected gloves must be greater than the intended use period

##### - Other

- : Consider the use of flame resistant anti-static safety clothing
- Standard EN ISO 14116 - Limited flame spread materials
- Standard EN ISO 1149-5 - Protective clothing: Electrostatic properties
- Keep suitable chemically resistant protective clothing readily available for emergency use
- Standard EN943-1 - Full protective suits against liquid, solid and gaseous chemicals
- Wear safety shoes while handling containers
- Standard EN ISO 20345 - Personal protective equipment - Safety footwear

#### • Respiratory protection

- : Gas filters may be used if all surrounding conditions e.g. type and concentration of the contaminant(s) and duration of use are known
- Wear respiratory protection
- Use gas filters and full face mask, where exposure limits may be exceeded for a short-term period, e.g. connecting or disconnecting containers
- Consult respiratory device supplier's product information for the selection of the appropriate device
- Gas filters do not protect against oxygen deficiency
- Standard EN 14387 - Gas filter(s), combined filter(s) and full face mask - EN 136
- Keep self contained breathing apparatus readily available for emergency use
- Standard EN 137 - Self-contained open-circuit compressed air breathing apparatus with full face mask
- Self contained breathing apparatus is recommended, where unknown exposure may be expected, e.g. during maintenance activities on installation systems

- Thermal hazards : Wear cold insulating gloves when transfilling or breaking transfer connections  
Standard EN 511 - Cold insulating gloves

### 8.2.3. Environmental exposure controls

- : Refer to local regulations for restriction of emissions to the atmosphere. See section 13 for specific methods for waste gas treatment  
Avoid release to the environment.

## SECTION 9: Physical and chemical properties

### 9.1. Information on basic physical and chemical properties

#### Appearance

- Physical state at 20°C / 101.3kPa : Gas.
- Colour : Mixture contains one or more component(s) which have the following colour(s):  
Colourless.

Odour : There may be no odour warning properties, odour is subjective and inadequate to warn of overexposure.

Mixture contains one or more component(s) which have the following odour(s):  
Stenchant often added. Sweetish.

Odour threshold : Odour threshold is subjective and inadequate to warn of overexposure.

pH value : Not applicable for gas-mixtures.

Molar mass : Not applicable for gas-mixtures.

Melting point : Not applicable for gas-mixtures.

Boiling point : Not applicable for gas-mixtures.

Flash point : Not applicable for gas-mixtures.

Evaporation rate (ether=1) : Not applicable for gas-mixtures.

Flammability range : Flammability range not available.

Vapour pressure [20°C] : No reliable data available.

Vapour pressure [50°C] : No reliable data available.

Relative density, gas (air=1) : Lighter or similar to air.

Solubility in water : No data available

Partition coefficient n-octanol/water [log Kow] : Not applicable for gas-mixtures.

Auto-ignition temperature : Not known.

Viscosity [20°C] : Not applicable.

Explosive Properties : Not applicable

Oxidising Properties : Not applicable

### 9.2. Other information

Other data : None

## SECTION 10: Stability and reactivity

### 10.1. Reactivity

- : No reactivity hazard other than the effects described in sub-sections below  
Extremely flammable gas

### 10.2. Chemical stability

- : Stable under normal conditions

### 10.3. Possibility of hazardous reactions

- : May react violently with oxidants  
Can form explosive mixture with air

### 10.4. Conditions to avoid

: Keep away from heat/sparks/open flames/hot surfaces. – No smoking  
Avoid contact with hot surfaces  
Heat  
No flames, no sparks. Eliminate all sources of ignition

**10.5. Incompatible materials**

: May react violently with oxidants

**10.6. Hazardous decomposition products**

: Under normal conditions of storage and use, hazardous decomposition products should not be produced

**SECTION 11: Toxicological information**

**11.1. Information on toxicological effects**

**Acute toxicity** : No toxicological effects from this product

**Skin corrosion/irritation** : Irritation to skin

**Serious eye damage/irritation** : No known effects from this product

**Respiratory or skin sensitisation** : No known effects from this product

**Germ cell mutagenicity** : No known effects from this product

**Carcinogenicity** : No known effects from this product

**Toxic for reproduction : Fertility** : No known effects from this product

**Toxic for reproduction : unborn child** : No known effects from this product

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

**STOT-repeated exposure** : May cause damage to organs through prolonged or repeated exposure

**Aspiration hazard** : Not applicable for gases and gas mixtures

**SECTION 12: Ecological information**

**12.1. Toxicity**

Assessment : Toxic to aquatic life with long lasting effects.

**12.2. Persistence and degradability**

Assessment : No data available.

**12.3. Bioaccumulative potential**

Assessment : No data available.

**12.4. Mobility in soil**

Assessment : No data available.

**12.5. Results of PBT and vPvB assessment**

Assessment : Not classified as PBT or vPvB

**12.6. Other adverse effects**

: May cause pH changes in aqueous ecological systems.

Effect on ozone layer : None

Effect on the global warming : No known effects from this product.



## SECTION 13: Disposal considerations

### 13.1. Waste treatment methods

Dispose of contents/container in accordance with licensed collector's sorting instructions  
Contact supplier if guidance is required  
Avoid discharge to atmosphere  
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  
Ensure that the emission levels from local regulations or operating permits are not exceeded  
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

List of hazardous waste codes (from Commission Decision 2001/118/EC)

: 16 05 04: Gases in pressure containers (including halons) containing dangerous substances

### 13.2. Additional information

: None

## SECTION 14: Transport information

### 14.1. UN number

UN-No. : 3161

### 14.2. UN proper shipping name

Transport by road/rail (ADR/RID) : LIQUEFIED GAS, FLAMMABLE, N.O.S. (n-hexane, Isobutane)

Transport by air (ICAO-TI / IATA-DGR) : Liquefied gas, flammable, n.o.s. (n-hexane, Isobutane)

Transport by sea (IMDG) : LIQUEFIED GAS, FLAMMABLE, N.O.S. (n-hexane, Isobutane)

### 14.3. Transport hazard class(es)

Labelling :



2.1 : Flammable gases

Environmentally hazardous substances

### Transport by road/rail (ADG)

Class : 2

Hazchemcode : 2YE

Hazard identification number : 23

Tunnel Restriction : B/D - Tank carriage : Passage forbidden through tunnels of category B, C, D and E. Other carriage : Passage forbidden through tunnels of category D and E

### Transport by air (ICAO-TI / IATA-DGR)

Class / Div. (Sub. risk(s)) : 2.1

### Transport by sea (IMDG)

Class / Div. (Sub. risk(s)) : 2.1

Emergency Schedule (EmS) - Fire : F-D

Emergency Schedule (EmS) - Spillage : S-U

### 14.4. Packing group

Transport by road/rail (ADR/RID) : Not applicable  
Transport by air (ICAO-TI / IATA-DGR) : Not applicable  
Transport by sea (IMDG) : Not applicable

#### **14.5. Environmental hazards**

Transport by road/rail (ADR/RID) : Environmentally hazardous substance / mixture.  
Transport by air (ICAO-TI / IATA-DGR) : Environmentally hazardous substance / mixture.  
Transport by sea (IMDG) : Marine pollutant

#### **14.6. Special precautions for user**

##### **Packing Instruction(s)**

Transport by road/rail (ADR/RID) : P200  
Transport by air (ICAO-TI / IATA-DGR)  
Passenger and Cargo Aircraft : Forbidden  
Cargo Aircraft only : 200  
Transport by sea (IMDG) : P200

Special transport precautions : 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 there is adequate ventilation  
- Ensure that containers are firmly secured  
- Ensure cylinder valve is closed and not leaking  
- Ensure valve outlet cap nut or plug (where provided) is correctly fitted  
- Ensure valve protection device (where provided) is correctly fitted.

HAZCHEMCODE : 2YE

#### **14.7. Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code**

: Not applicable.

### **SECTION 15: Regulatory information**

#### **15.1. Safety, health and environmental regulations/legislation specific for the substance or mixture**

##### **National regulations**

Ensure all national/local regulations are observed.

#### **15.2. Chemical safety assessment**

: A CSA does not need to be carried out for this product  
No chemical safety assessment has been carried out

### **SECTION 16: Other information**

Indication of changes : Revised safety data sheet in accordance with commission regulation (EU) No 453/2010.

Training advice : Ensure operators understand the flammability hazard. Users of breathing apparatus must be trained. Receptacle under pressure.

Full text of H-statements

Aquatic Chronic 2	Hazardous to the aquatic environment — Chronic Hazard, Category 2
Asp. Tox. 1	Aspiration hazard, Category 1
Flam. Gas 1	Flammable gases, Category 1
Flam. Liq. 1	Flammable liquids, Category 1
Flam. Liq. 2	Flammable liquids, Category 2
Press. Gas (Liq.)	Gases under pressure : Liquefied gas
Repr. 2	Reproductive toxicity, Category 2
Repr. 2	Reproductive toxicity, Category 2
Skin Irrit. 2	Skin corrosion/irritation, Category 2
STOT RE 2	Specific target organ toxicity — Repeated exposure, Category 2
STOT SE 3	Specific target organ toxicity — Single exposure, Category 3, Narcosis
H220	Extremely flammable gas
H224	Extremely flammable liquid and vapour
H225	Highly flammable liquid and vapour
H280	Contains gas under pressure; may explode if heated
H304	May be fatal if swallowed and enters airways
H315	Causes skin irritation
H336	May cause drowsiness or dizziness
H361	Suspected of damaging fertility or the unborn child
H361f	Suspected of damaging fertility
H373	May cause damage to organs through prolonged or repeated exposure
H411	Toxic to aquatic life with long lasting effects
R11	Highly flammable
R12	Extremely flammable
R38	Irritating to skin
R48/20	Harmful: danger of serious damage to health by prolonged exposure through inhalation
R51/53	Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment
R62	Possible risk of impaired fertility
R65	Harmful: may cause lung damage if swallowed
R66	Repeated exposure may cause skin dryness or cracking
R67	Vapours may cause drowsiness and dizziness
F	Highly flammable
F+	Extremely flammable
N	Dangerous for the environment
Xi	Irritant
Xn	Harmful

DISCLAIMER OF LIABILITY

: Before using this product in any new process or experiment, a thorough material compatibility and safety study should be carried out  
 Details given in this document are believed to be correct at the time of going to press  
 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

End of document