

## SAFETY DATA SHEET

# 1547

### 1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

#### 1.1 Product identifier

**Product name** LESS THAN 30 PPM CARBON MONOXIDE BALANCE HYDROGEN  
**Synonym(s)** 1547 - SDS NUMBER • PRODUCT CODE: 292 • SPECIAL GAS MIXTURE

#### 1.2 Uses and uses advised against

**Use(s)** CALIBRATION • INDUSTRIAL APPLICATIONS

#### 1.3 Details of the supplier of the product

**Supplier name** BOC LIMITED (AUSTRALIA)  
**Address** 10 Julius Avenue, North Ryde, NSW, 2113, AUSTRALIA  
**Telephone** 131 262, (02) 8874 4400  
**Fax** 132 427 (24 hours)  
**Website** <http://www.boc.com.au>

#### 1.4 Emergency telephone number(s)

**Emergency** 1800 653 572 (24/7) (Australia only)

### 2. HAZARDS IDENTIFICATION

#### 2.1 Classification of the substance or mixture

CLASSIFIED AS HAZARDOUS ACCORDING TO AUSTRALIAN WHS REGULATIONS

**GHS classification(s)** Flammable Gases: Category 1  
Gases Under Pressure: Compressed gas

#### 2.2 Label elements

**Signal word** DANGER

**Pictogram(s)**



#### Hazard statement(s)

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

#### Prevention statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.

#### Response statement(s)

P377 Leaking gas fire: Do not extinguish, unless leak can be stopped safely.  
P381 Eliminate all ignition sources if safe to do so.

#### Storage statement(s)

P410 + P403 Protect from sunlight. Store in a well-ventilated place.

#### Disposal statement(s)

None allocated.

**2.3 Other hazards**

Asphyxiant. Effects are proportional to oxygen displacement.

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**3. COMPOSITION/ INFORMATION ON INGREDIENTS**

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**3.1 Substances / Mixtures**

| Ingredient      | CAS Number | EC Number | Content (v/v) |
|-----------------|------------|-----------|---------------|
| HYDROGEN        | 1333-74-0  | 215-605-7 | 99.997%       |
| CARBON MONOXIDE | 630-08-0   | 211-128-3 | 0.003%        |

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**4. FIRST AID MEASURES**

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**4.1 Description of first aid measures**

|                             |                                                                                                                                                                                                                                                                                                                                                        |
|-----------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Eye</b>                  | Adverse effects not expected from this product.                                                                                                                                                                                                                                                                                                        |
| <b>Inhalation</b>           | If inhaled, remove from contaminated area. To protect rescuer, use an Air-line respirator or Self Contained Breathing Apparatus (SCBA). Be aware of possible explosive atmospheres. Apply artificial respiration if not breathing. Give oxygen if available. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor. |
| <b>Skin</b>                 | Adverse effects not expected from this product.                                                                                                                                                                                                                                                                                                        |
| <b>Ingestion</b>            | Due to product form and application, ingestion is considered unlikely.                                                                                                                                                                                                                                                                                 |
| <b>First aid facilities</b> | No information provided.                                                                                                                                                                                                                                                                                                                               |

**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.

**4.3 Immediate medical attention and special treatment needed**

Treat symptomatically.

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**5. FIRE FIGHTING MEASURES**

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**5.1 Extinguishing media**

Stop flow of gas if safe to do so, such as by slowly closing the cylinder valve. If the gas source cannot be isolated, do not extinguish the flame, since re-ignition and explosion could occur. Await arrival of emergency services or manufacturer's advisor. Drench and cool cylinders with water spray from protected area at a safe distance. If it is absolutely necessary to extinguish the flame, use only a dry chemical powder extinguisher. Avoid shock and bumps to cylinders.

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

Extremely flammable. Eliminate all ignition sources including cigarettes, open flames, spark producing switches/tools, heaters, naked lights, pilot lights, mobile phones etc. when handling.

**5.3 Advice for firefighters**

Temperatures in a fire may cause cylinders to rupture and internal pressure relief devices to be activated. Cool cylinders or containers exposed to fire by applying water from a protected location. Do not approach cylinders or containers suspected of being hot. This material is capable of forming explosive mixtures in air.

**5.4 Hazchem code**

|     |                                                                                                              |
|-----|--------------------------------------------------------------------------------------------------------------|
| 2SE |                                                                                                              |
| 2   | Fine Water Spray.                                                                                            |
| S   | Risk of violent reaction or explosion. Wear full fire kit and breathing apparatus. Dilute spill and run-off. |
| E   | Evacuation of people in and around the immediate vicinity of the incident should be considered.              |

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**6. ACCIDENTAL RELEASE MEASURES**

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

If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Wear self-contained breathing apparatus when entering area unless atmosphere is proved to be safe. Ensure adequate air ventilation. Eliminate all sources of ignition. Consider the risk of potentially explosive atmospheres.

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### 6.2 Environmental precautions

Prevent from entering sewers, basements and workpits, or any place where its accumulation can be dangerous.

### 6.3 Methods of cleaning up

Carefully move material to a well ventilated remote area, then allow to discharge if safe to do so. Do not attempt to repair leaking valve or cylinder safety devices.

### 6.4 Reference to other sections

See Sections 8 and 13 for exposure controls and disposal.

## 7. HANDLING AND STORAGE

### 7.1 Precautions for safe handling

Use of safe work practices are recommended to avoid inhalation. Do not drag, drop, slide or roll cylinders. The uncontrolled release of a gas under pressure may cause physical harm. Use a suitable hand truck for cylinder movement. The uncontrolled release of a gas under pressure may cause physical harm. When handling gas cylinders, the use of appropriate mechanical handling devices is recommended.

### 7.2 Conditions for safe storage, including any incompatibilities

Do not store near sources of ignition or incompatible materials. Cylinders should be stored below 45°C in a secure area, upright and restrained to prevent cylinders from falling. Cylinders should also be stored in a dry, well ventilated area constructed of non-combustible material with firm level floor (preferably concrete), away from areas of heavy traffic and emergency exits.

### 7.3 Specific end use(s)

No information provided.

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1 Control parameters

#### Exposure standards

| Ingredient      | Reference | TWA        |                   | STEL |                   |
|-----------------|-----------|------------|-------------------|------|-------------------|
|                 |           | ppm        | mg/m <sup>3</sup> | ppm  | mg/m <sup>3</sup> |
| Carbon monoxide | SWA (AUS) | 30         | 34                | --   | --                |
| Hydrogen        | SWA (AUS) | Asphyxiant |                   |      |                   |

#### Biological limits

| Ingredient      | Determinant                        | Sampling Time | BEI                |
|-----------------|------------------------------------|---------------|--------------------|
| CARBON MONOXIDE | Carboxyhemoglobin in blood         | End of shift  | 3.5% of hemoglobin |
|                 | Carbon monoxide in end-exhaled air | End of shift  | 20 ppm             |

Reference: ACGIH Biological Exposure Indices

### 8.2 Exposure controls

#### Engineering controls

Provide suitable ventilation to minimise or eliminate exposure. Confined areas (e.g. tanks) should be adequately ventilated or gas tested. Flammable/explosive vapours may accumulate in poorly ventilated areas. Vapours may also travel some distance to an ignition source and flash back.

#### PPE

|             |                                                                                                            |
|-------------|------------------------------------------------------------------------------------------------------------|
| Eye / Face  | Wear safety glasses.                                                                                       |
| Hands       | Wear leather gloves.                                                                                       |
| Body        | Wear safety boots.                                                                                         |
| Respiratory | Where an inhalation risk exists, wear Self Contained Breathing Apparatus (SCBA) or an Air-line respirator. |



## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1 Information on basic physical and chemical properties

|                           |                      |
|---------------------------|----------------------|
| Appearance                | COLOURLESS GAS       |
| Odour                     | ODOURLESS            |
| Flammability              | EXTREMELY FLAMMABLE  |
| Flash point               | NOT AVAILABLE        |
| Boiling point             | NOT AVAILABLE        |
| Melting point             | NOT AVAILABLE        |
| Evaporation rate          | NOT APPLICABLE       |
| pH                        | NOT APPLICABLE       |
| Vapour density            | NOT AVAILABLE        |
| Specific gravity          | NOT APPLICABLE       |
| Solubility (water)        | 0.018 L/L (Hydrogen) |
| Vapour pressure           | NOT AVAILABLE        |
| Upper explosion limit     | 75 % (Hydrogen)      |
| Lower explosion limit     | 4 % (Hydrogen)       |
| Partition coefficient     | NOT AVAILABLE        |
| Autoignition temperature  | 571°C (Hydrogen)     |
| Decomposition temperature | NOT AVAILABLE        |
| Viscosity                 | NOT AVAILABLE        |
| Explosive properties      | NOT AVAILABLE        |
| Oxidising properties      | NOT AVAILABLE        |
| Odour threshold           | NOT AVAILABLE        |

### 9.2 Other information

|                               |                   |
|-------------------------------|-------------------|
| Cylinder pressure (when full) | 13,000 kPa @ 15°C |
| % Volatiles                   | 100 %             |

## 10. STABILITY AND REACTIVITY

### 10.1 Reactivity

Unreactive under normal conditions.

### 10.2 Chemical stability

Stable under recommended conditions of storage.

### 10.3 Possibility of hazardous reactions

Polymerization will not occur.

### 10.4 Conditions to avoid

Avoid shock, friction, heavy impact, heat, sparks, open flames and other ignition sources.

### 10.5 Incompatible materials

Hydrogen is explosive with peroxides, oxidising agents and metal catalysts. Hydrogen can cause embrittlement of steels under special conditions and preference given to copper, bronze or stainless steel. At pressures above 7,000 kPa copper lining should be used to reduce corrosion. Stress corrosion cracking can occur in steels especially if other acid gases (e.g. Carbon Dioxide, Sulphur compounds) are present.

### 10.6 Hazardous decomposition products

This material will not decompose to form hazardous products other than that already present.

## 11. TOXICOLOGICAL INFORMATION

### 11.1 Information on toxicological effects

|                 |                                                                   |
|-----------------|-------------------------------------------------------------------|
| Acute toxicity  | Based on available data, the classification criteria are not met. |
| Skin            | Not classified as a skin irritant.                                |
| Eye             | Not classified as an eye irritant.                                |
| Sensitization   | Not classified as causing skin or respiratory sensitisation.      |
| Mutagenicity    | Not classified as a mutagen.                                      |
| Carcinogenicity | Not classified as a carcinogen.                                   |
| Reproductive    | Not classified as a reproductive toxin.                           |

**PRODUCT NAME LESS THAN 30 PPM CARBON MONOXIDE BALANCE HYDROGEN**

|                                 |                                                                                                                                                                                |
|---------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>STOT – single exposure</b>   | Asphyxiant. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness. |
| <b>STOT – repeated exposure</b> | Not classified as causing organ effects from repeated exposure.                                                                                                                |
| <b>Aspiration</b>               | Not classified as causing aspiration.                                                                                                                                          |

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**12. ECOLOGICAL INFORMATION**

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**12.1 Toxicity**

No ecological damage caused by this product.

**12.2 Persistence and degradability**

No information provided.

**12.3 Bioaccumulative potential**

No information provided.

**12.4 Mobility in soil**

No information provided.

**12.5 Other adverse effects**

No information provided.

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**13. DISPOSAL CONSIDERATIONS**

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**13.1 Waste treatment methods**

**Waste disposal** Cylinders should be returned to the manufacturer or supplier for disposal of contents.

**Legislation** Dispose of in accordance with relevant local legislation.

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**14. TRANSPORT INFORMATION**

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CLASSIFIED AS A DANGEROUS GOOD BY THE CRITERIA OF THE ADG CODE



|                                    | LAND TRANSPORT<br>(ADG)                                     | SEA TRANSPORT<br>(IMDG / IMO)                               | AIR TRANSPORT<br>(IATA / ICAO)                              |
|------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|-------------------------------------------------------------|
| <b>14.1 UN Number</b>              | 1954                                                        | 1954                                                        | 1954                                                        |
| <b>14.2 Proper Shipping Name</b>   | COMPRESSED GAS,<br>FLAMMABLE, N.O.S. (Contains<br>hydrogen) | COMPRESSED GAS,<br>FLAMMABLE, N.O.S. (Contains<br>hydrogen) | COMPRESSED GAS,<br>FLAMMABLE, N.O.S. (Contains<br>hydrogen) |
| <b>14.3 Transport hazard class</b> | 2.1                                                         | 2.1                                                         | 2.1                                                         |
| <b>14.4 Packing Group</b>          | None Allocated                                              | None Allocated                                              | None Allocated                                              |

**14.5 Environmental hazards** No information provided

**14.6 Special precautions for user**

|                          |                                                                                              |
|--------------------------|----------------------------------------------------------------------------------------------|
| <b>Hazchem code</b>      | 2SE                                                                                          |
| <b>GTEPG</b>             | 2A1                                                                                          |
| <b>EMS</b>               | F-D, S-U                                                                                     |
| <b>Other information</b> | Ensure cylinder is separated from driver and that outlet of relief device is not obstructed. |

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**15. REGULATORY INFORMATION**

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

|                             |                                                                                                                                                                                                                                                                             |                                                        |
|-----------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------|
| <b>Poison schedule</b>      | A poison schedule number has not been allocated to this product using the criteria in the Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).                                                                                                             |                                                        |
| <b>Classifications</b>      | Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.<br><br>The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)]. |                                                        |
| <b>Hazard codes</b>         | F+                                                                                                                                                                                                                                                                          | Extremely flammable                                    |
| <b>Risk phrases</b>         | R12                                                                                                                                                                                                                                                                         | Extremely Flammable.                                   |
| <b>Safety phrases</b>       | S2                                                                                                                                                                                                                                                                          | Keep out of reach of children.                         |
|                             | S9                                                                                                                                                                                                                                                                          | Keep container in a well ventilated place.             |
|                             | S16                                                                                                                                                                                                                                                                         | Keep away from sources of ignition - No smoking.       |
|                             | S33                                                                                                                                                                                                                                                                         | Take precautionary measures against static discharges. |
| <b>Inventory listing(s)</b> | <b>AUSTRALIA: AICS (Australian Inventory of Chemical Substances)</b><br>All components are listed on AICS, or are exempt.                                                                                                                                                   |                                                        |

## 16. OTHER INFORMATION

**Additional information** The storage of significant quantities of gas cylinders must comply with AS4332 The storage and handling of gases in cylinders.

APPLICATION METHOD: Gas regulator of suitable pressure and flow rating fitted to cylinder or manifold with low pressure gas distribution to equipment.

**PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:**

The recommendation for protective equipment contained within this report is provided as a guide only. Factors such as method of application, working environment, quantity used, product concentration and the availability of engineering controls should be considered before final selection of personal protective equipment is made.

**HEALTH EFFECTS FROM EXPOSURE:**

It should be noted that the effects from exposure to this product will depend on several factors including: frequency and duration of use; quantity used; effectiveness of control measures; protective equipment used and method of application. Given that it is impractical to prepare a ChemAlert report which would encompass all possible scenarios, it is anticipated that users will assess the risks and apply control methods where appropriate.

|                      |                   |                                                                                                 |
|----------------------|-------------------|-------------------------------------------------------------------------------------------------|
| <b>Abbreviations</b> | ACGIH             | American Conference of Governmental Industrial Hygienists                                       |
|                      | CAS #             | Chemical Abstract Service number - used to uniquely identify chemical compounds                 |
|                      | CNS               | Central Nervous System                                                                          |
|                      | EC No.            | EC No - European Community Number                                                               |
|                      | EMS               | Emergency Schedules (Emergency Procedures for Ships Carrying Dangerous Goods)                   |
|                      | GHS               | Globally Harmonized System                                                                      |
|                      | GTEPG             | Group Text Emergency Procedure Guide                                                            |
|                      | IARC              | International Agency for Research on Cancer                                                     |
|                      | LC50              | Lethal Concentration, 50% / Median Lethal Concentration                                         |
|                      | LD50              | Lethal Dose, 50% / Median Lethal Dose                                                           |
|                      | mg/m <sup>3</sup> | Milligrams per Cubic Metre                                                                      |
|                      | OEL               | Occupational Exposure Limit                                                                     |
|                      | pH                | relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline). |
|                      | ppm               | Parts Per Million                                                                               |
|                      | STEL              | Short-Term Exposure Limit                                                                       |
|                      | STOT-RE           | Specific target organ toxicity (repeated exposure)                                              |
|                      | STOT-SE           | Specific target organ toxicity (single exposure)                                                |
|                      | SUSMP             | Standard for the Uniform Scheduling of Medicines and Poisons                                    |
|                      | SWA               | Safe Work Australia                                                                             |
|                      | TLV               | Threshold Limit Value                                                                           |
|                      | TWA               | Time Weighted Average                                                                           |

**Report status**

This document has been compiled by RMT on behalf of the manufacturer, importer or supplier of the product and serves as their Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer, importer or supplier or obtained from third party sources and is believed to represent the current state of knowledge as to the appropriate safety and handling precautions for the product at the time of issue. Further clarification regarding any aspect of the product should be obtained directly from the manufacturer, importer or supplier.

While RMT has taken all due care to include accurate and up-to-date information in this SDS, it does not provide any warranty as to accuracy or completeness. As far as lawfully possible, RMT accepts no liability for any loss, injury or damage (including consequential loss) which may be suffered or incurred by any person as a consequence of their reliance on the information contained in this SDS.

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**[ End of SDS ]**