BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 1702

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name **263 TO 1,350 PPM ARSINE BALANCE HYDROGEN**

Synonym(s) 1702 - 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 SAFE WORK AUSTRALIA CRITERIA

GHS classification(s) Flammable Gases: Category 1
Gases Under Pressure: Compressed gas
Acute Toxicity: Inhalation: Category 4

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.
H332	Harmful if inhaled.

Prevention statement(s)

P210	Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P261	Avoid breathing dust/fume/gas/mist/vapours/spray.
P271	Use only outdoors or in a well-ventilated area.

Response statement(s)

P304 + P340	IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P312	Call a POISON CENTER or doctor/physician if you feel unwell.
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.

3. COMPOSITION/ INFORMATION ON INGREDIENTS

3.1 Substances / Mixtures

Ingredient	CAS Number	EC Number	Content (v/v)
ARSINE	7784-42-1	232-066-3	0.0263 to 0.135%
HYDROGEN	1333-74-0	215-605-7	Remainder

4. FIRST AID MEASURES

4.1 Description of first aid measures

Eye If in eyes, hold eyelids apart and flush continuously with running water. Continue flushing until advised to stop by a Poisons Information Centre, a doctor, or for at least 15 minutes.

Inhalation 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.

Skin If skin or hair contact occurs, flush affected area with copious quantities of water. Use an emergency shower for large areas. Remove affected clothing as quickly as possible.

Ingestion Due to product form and application, ingestion is considered unlikely.

First aid facilities No information provided.

4.2 Most important symptoms and effects, both acute and delayed

Almost all toxic effects can be explained by haemolysis, that is, attack on the red blood cells. Damaging effects also occur in the heart, liver, and kidneys. Bone marrow depression and peripheral neuropathy have been reported in more severe cases and may develop months after poisoning. Arsenic and inorganic arsenic compounds are classified as carcinogenic to humans (IARC Group 1).

4.3 Immediate medical attention and special treatment needed

Basic life support measures. Treatment is aimed at haemolysis and acute tubular necrosis. Total replacement blood transfusion may be indicated, and prolonged artificial dialysis may also be helpful. BAL may be helpful. Dosage is 2.5 mg/kg body weight, repeated four to six times the first two days and reduced to twice daily for up to ten days.

5. FIRE FIGHTING MEASURES

5.1 Extinguishing media

Stop flow of gas if safe to do so. If safe, extinguish fire using dry chemical. Cool cylinders with water spray from protected area. Contact manufacturer for further advice.

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

2PE

2 Fine Water Spray.

P Risk of violent reaction or explosion. Wear liquid-tight chemical protective clothing and breathing apparatus. Dilute spill and run-off.

E Evacuation of people in and around the immediate vicinity of the incident should be considered.

6. ACCIDENTAL RELEASE MEASURES

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.

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 eye or skin contact and 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.

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/m³	ppm	mg/m³
Arsine	SWA (AUS)	0.05	0.16	--	--
Hydrogen	SWA (AUS)	Asphyxiant			

Biological limits

No biological limit values have been entered for this product.

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. Maintain vapour levels below the recommended exposure standard.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear leather gloves.
Body	Wear leather or safety boots and impervious coveralls.
Respiratory	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	GARLIC ODOUR
Flammability	EXTREMELY FLAMMABLE
Flash point	NOT AVAILABLE
Boiling point	-62.5°C (Arsine)
Melting point	NOT AVAILABLE
Evaporation rate	NOT APPLICABLE
pH	NOT APPLICABLE
Vapour density	2.70 (Air = 1)
Specific gravity	NOT APPLICABLE
Solubility (water)	0.23 cm^3/cm^3 (Arsine)
Vapour pressure	NOT AVAILABLE
Upper explosion limit	75 % (Hydrogen)
Lower explosion limit	4 % (Hydrogen)
Partition coefficient	NOT AVAILABLE
Autoignition temperature	230°C (Arsine)
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)	1410 kPa @ 15°C
% Volatiles	100 %

10. STABILITY AND REACTIVITY

10.1 Reactivity

Carefully review all information provided in sections 10.2 to 10.6.

10.2 Chemical stability

No information provided.

10.3 Possibility of hazardous reactions

Polymerization will not occur.

10.4 Conditions to avoid

No information provided.

10.5 Incompatible materials

Arsine is a strong reducing agent and will react violently with oxidising agents such as fluorine, chlorine, nitric acid and nitrogen trichloride. Arsine is a strong reducing agent, will react violently with oxidising agents such as fluorine, chlorine, hydrochloric acid and nitrogen trichloride.

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Harmful if inhaled. Onset of symptoms ranges from 20 minutes to 36 hours depending on concentration inhaled. Over exposure may result in general malaise, headache, nausea, vomiting, tightness in the chest and pain in the abdomen and loins. Urine will usually become red or darkened in colouration and skin will take on a bronze or jaundiced colouration. Tingling of the face and extremities may also occur. Respiration and pulse may become more rapid. ARSINE LC50 (Inhalation): 16.2 ppm (rat)
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	Arsenic and inorganic arsenic compounds are classified as carcinogenic to humans (IARC Group 1).
Reproductive	Not classified as a reproductive toxin.
STOT – single exposure	Over exposure causes destruction of red blood cells (intravascular haemolysis) and also damages heart, liver, kidney and central nervous system. Symptoms of over exposure include headaches; malaise, weakness, dizziness; shortness of breath (dyspnoea); abdomen and back pain; nausea, vomiting, diarrhoea; bronze skin; jaundice and fever.
STOT – repeated exposure	Chronic exposure leads to anaemia as a result of red blood cell destruction. Repeated exposure may damage kidneys and affect liver function.
Aspiration	Not classified as causing aspiration.

12. ECOLOGICAL INFORMATION

12.1 Toxicity

No information provided.

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.

13. DISPOSAL CONSIDERATIONS

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.

14. TRANSPORT INFORMATION

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

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	1953	1953	1953
14.2 Proper Shipping Name	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. (Contains arsine)	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. (Contains arsine)	COMPRESSED GAS, TOXIC, FLAMMABLE, N.O.S. (Contains arsine)
14.3 Transport hazard classes	2.3, 2.1	2.3, 2.1	2.3, 2.1
14.4 Packing Group	None Allocated	None Allocated	None Allocated

14.5 Environmental hazards No information provided

14.6 Special precautions for user

Hazchem code	2PE
GTEPG	2A4
EMS	F-D, S-U
Other information	Ensure cylinder is separated from driver and foodstuffs. Refer to Commonwealth, State and Territory Dangerous Goods Legislation which contain requirements which affect gas storage and transport.

15. REGULATORY INFORMATION

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

Poison schedule Classified as a Schedule 7 (S7) Standard for the Uniform Scheduling of Medicines and Poisons (SUSMP).

Classifications Safework Australia criteria is based on the Globally Harmonised System (GHS) of Classification and Labelling of Chemicals.

The classifications and phrases listed below are based on the Approved Criteria for Classifying Hazardous Substances [NOHSC: 1008(2004)].

Hazard codes	F+	Extremely flammable
	Xn	Harmful
Risk phrases	R12	Extremely Flammable.
	R20	Harmful by inhalation.
Safety phrases	S16	Keep away from sources of ignition - No smoking.
	S33	Take precautionary measures against static discharges.
	S45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

Inventory listing(s) **AUSTRALIA: AICS (Australian Inventory of Chemical Substances)**
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.

Abbreviations

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/m³	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

Revision history

Revision	Description
2.0	Standard SDS Review
1.0	Initial SDS creation

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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