

SAFETY DATA SHEET

0192

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

1.1 Product identifier

Product name DICHLOROSILANE
Synonym(s) 0192 - SDS NUMBER • BOC DICHLOROSILANE • PRODUCT CODE: 301

1.2 Uses and uses advised against

Use(s) ELECTRONIC GASES APPLICATION

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) Acute Toxicity: Inhalation: Category 2
Gases Under Pressure: Liquefied gas
Flammable Gases: Category 1
Skin Corrosion/Irritation: Category 1B

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.
H314 Causes severe skin burns and eye damage.
H330 Fatal if inhaled.

Prevention statement(s)

P210 Keep away from heat/sparks/open flames/hot surfaces. No smoking.
P260 Do not breathe dust/fume/gas/mist/vapours/spray.
P264 Wash thoroughly after handling.
P271 Use only outdoors or in a well-ventilated area.
P280 Wear protective gloves/protective clothing/eye protection/face protection.
P284 Wear respiratory protection.

PRODUCT NAME DICHLOROSILANE**Response statement(s)**

P301 + P330 + P331 IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
P303 + P361 + P353 IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 IF INHALED: Remove to fresh air and keep at rest in a position comfortable for breathing.
P305 + P351 + P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P310 Immediately call a POISON CENTER or doctor/physician.
P320 Specific treatment is urgent - see first aid instructions.
P363 Wash contaminated clothing before reuse.
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)

P403 + P233 Store in a well-ventilated place. Keep container tightly closed.
P405 Store locked up.
P410 + P403 Protect from sunlight. Store in a well-ventilated place.

Disposal statement(s)

P501 Dispose of contents/container in accordance with relevant regulations.

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
DICHLOROSILANE	4109-96-0	223-888-3	>98%

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. If over exposure has occurred, delayed pulmonary oedema result. Keep patient under medical observation for at least 24 hours. For advice, contact a Poison Information Centre on 13 11 26 (Australia Wide) or a doctor.

Skin If skin or hair contact occurs, remove contaminated clothing and flush skin and hair with running water. Continue flushing with water until advised to stop by a Poisons Information Centre or a doctor.

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

First aid facilities Eye wash facilities and safety shower are recommended.

4.2 Most important symptoms and effects, both acute and delayed

Causes severe skin burns and eye damage. Irritating and corrosive to the upper and lower respiratory tracts. Over exposure may result in irritation of the nose and throat, coughing, breathing difficulties, excessive salivary and sputum formation. Excessive irritation of the lungs causes acute pneumonitis and pulmonary odema that can be fatal. Direct contact with the liquefied material or escaping compressed gas may cause frostbite injury.

4.3 Immediate medical attention and special treatment needed

Treat symptomatically.

5. FIRE FIGHTING MEASURES

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. Do not move cylinders for at least 24 hours. 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

4WE

4 Dry Agent (water MUST NOT be allowed to come into contact with substance).

W Risk of violent reaction or explosion. Wear liquid-tight chemical protective clothing and breathing apparatus. Contain 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

No exposure standards have been entered for this product.

Biological limits

No biological limit values have been entered for this product.

8.2 Exposure controls

Engineering controls Avoid inhalation. Use in well ventilated areas. Where an inhalation risk exists, mechanical extraction ventilation is recommended.

PPE

Eye / Face	Wear safety glasses.
Hands	Wear leather or insulated gloves.
Body	Wear coveralls and safety boots.
Respiratory	Wear a Type B (Inorganic gases and vapours) respirator. At high vapour levels, 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 (LIQUEFIED UNDER PRESSURE)
Odour	PUNGENT ODOUR
Flammability	EXTREMELY FLAMMABLE
Flash point	< 23°C
Boiling point	8.4°C
Melting point	-122°C
Evaporation rate	NOT APPLICABLE
pH	NOT APPLICABLE
Vapour density	3.48 (Air = 1)
Specific gravity	NOT APPLICABLE
Solubility (water)	REACTS
Vapour pressure	1.6 bar
Upper explosion limit	80 %
Lower explosion limit	2.5 %
Partition coefficient	NOT AVAILABLE
Autoignition temperature	185°C
Decomposition temperature	NOT AVAILABLE
Viscosity	NOT AVAILABLE
Explosive properties	NOT AVAILABLE
Oxidising properties	NOT AVAILABLE
Odour threshold	NOT AVAILABLE

9.2 Other information

Relative density	3.5 (Air = 1)
% 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

Incompatible with oxidising agents (e.g. hypochlorites), water, heat and ignition sources.

10.6 Hazardous decomposition products

May evolve toxic gases if heated to decomposition.

11. TOXICOLOGICAL INFORMATION

11.1 Information on toxicological effects

Acute toxicity	Fatal if inhaled. Dichlorosilane hydrolyses rapidly in water or moist air to form hydrochloric acid. Over exposure may result in irritation of the nose and throat, coughing, breathing difficulties, excessive salivary and sputum formation. Excessive irritation of the lungs causes acute pneumonitis and pulmonary oedema that can be fatal.
Skin	DICHLOROSILANE LC50 (Inhalation): 144 ppm / 4 hours (mouse) Corrosive. Irritating and corrosive in contact with skin. Skin burns exhibit severe pain, redness, possible swelling and early necrosis. In contact with moisture, dichlorosilane forms hydrochloric acid resulting in acid burns. Direct contact with the liquefied material or escaping compressed gas may cause frost-bite injury.
Eye	Causes severe burns. Contact may result in irritation, lacrimation, pain, redness and corneal burns with possible permanent eye damage. Direct contact with the liquefied material or escaping compressed gas may cause frostbite injury.
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.
STOT – single exposure	Asphyxiant. Effects are proportional to oxygen displacement. Over exposure may result in dizziness, drowsiness, weakness, fatigue, breathing difficulties and unconsciousness.
STOT – repeated exposure	Not classified as causing organ effects from repeated exposure.
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 known ecological damage is caused by this product.

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



PRODUCT NAME DICHLOROSILANE

	LAND TRANSPORT (ADG)	SEA TRANSPORT (IMDG / IMO)	AIR TRANSPORT (IATA / ICAO)
14.1 UN Number	2189	2189	2189
14.2 Proper Shipping Name	DICHLOROSILANE	DICHLOROSILANE	DICHLOROSILANE
14.3 Transport hazard classes	2.3, 2.1, 8	2.3, 2.1, 8	2.3, 2.1, 8
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 4WE

GTEPG 2A1

EMS F-D, S-U

Other information Ensure cylinder is separated from driver and foodstuffs.

15. REGULATORY INFORMATION

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

Poison schedule 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).

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

C	Corrosive
F+	Extremely flammable
T+	Very toxic

Risk phrases

R12	Extremely Flammable.
R26	Very toxic by inhalation.
R34	Causes burns.

Safety phrases

S9	Keep container in a well ventilated place.
S16	Keep away from sources of ignition - No smoking.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S33	Take precautionary measures against static discharges.
S36	Wear suitable protective clothing.
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/m ³	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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