BOC
A Member of The Linde Group

SAFETY DATA SHEET

 # 055

Product Name **HYDROGEN FLUORIDE**

1. IDENTIFICATION OF THE MATERIAL AND SUPPLIER

Supplier Name	**BOC LIMITED (AUSTRALIA)**
Address	10 Julius Avenue, North Ryde, NSW, AUSTRALIA, 2113
Telephone	131 262, (02) 8874 4400
Fax	132 427 (24 hours)
Emergency	1800 653 572 (24/7) (Australia only)
Web Site	http://www.boc.com.au/
Synonym(s)	055 - MSDS NUMBER
Use(s)	CHEMICAL REAGENT • INDUSTRIAL APPLICATIONS • MANUFACTURING
SDS Date	14 Sep 2011

2. HAZARDS IDENTIFICATION

CLASSIFIED AS HAZARDOUS ACCORDING TO SAFE WORK AUSTRALIA CRITERIA

RISK PHRASES

R26/27/28	Very toxic by inhalation, in contact with skin and if swallowed.
R35	Causes severe burns.

SAFETY PHRASES

S7/9	Keep container tightly closed and in a well ventilated place.
S26	In case of contact with eyes, rinse immediately with plenty of water and seek medical advice
S36/37/39	Wear suitable protective clothing, gloves and eye/face protection.
S45	In case of accident or if you feel unwell seek medical advice immediately (show the label where possible).

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

UN No.	1052	**DG Class**	8	**Subsidiary Risk(s)**	6.1
Packing Group	I	**Hazchem Code**	2XE		

3. COMPOSITION/ INFORMATION ON INGREDIENTS

Ingredient	Formula	CAS No.	Content (v/v)
HYDROGEN FLUORIDE	HF	7664-39-3	99.9%

4. FIRST AID MEASURES

Eye Keep patient calm. Immediately hold eyelids apart and irrigate entire eyeball with gentle flow of water for 15 to 20 minutes. Urgently seek eye specialist attention while continuing irrigation. Calcium gluconate gel may be applied to eyes if medical attention is delayed.

Inhalation Quickly remove from exposure. Remove contaminated clothing, check there is no obstruction to the airway if breathing is weak or has ceased and give artificial respiration, preferably using an oxygen resuscitator. In all cases summon ambulance and transport to hospital for further observation. Four effervescent calcium gluconate tablets 600 mg should be given by mouth every 2 hours until the patient is admitted to hospital.

Skin Flush affected area with copious quantities of water. Use an emergency shower for large areas. Remove affected clothing as quickly as possible. Irrigate with tap or tepid water for 15 to 30 minutes. Do not apply chemical

neutralisers. Apply sterile dressing and treat as thermal burn. Immerse large areas or limbs in tap water or tepid water for 15 to 30 minutes. Apply 10% Calcium gluconate gel to burn site. Urgently transport to hospital and recommend admission. Continue skin irrigation for up to 2 hours. Observe for symptoms of shock in severe cases.

Ingestion Conscious patient should drink large volumes of water to dilute. Do not induce vomiting. Urgently seek medical advice.

Advice to Doctor Treatment for pulmonary oedema, cold and hydrofluoric acid burns. Calcium gluconate gel is useful and may be reapplied every 15 minutes. Also the intra-cutaneous injection of a 10% solution of calcium gluconate into and around the burn. Replacement of serum electrolytes in burns involving skin areas greater than 160 cm2 is recommended. Injection of corticosteroids under and around the lesion is useful.

First Aid Facilities Emergency shower and eye wash basin. Calcium gluconate gel and effervescent 600 mg tablets should also be available. Air-VivaTM or Oxy-VivaTM. Water or sterile saline solution for irrigation.

5. FIRE FIGHTING MEASURES

Flammability Non flammable. May evolve flammable hydrogen gas upon contact with metals.

Fire and Explosion Temperatures in a fire may cause cylinders to rupture. Cool cylinders exposed to fire by applying water from a protected location. Do not approach cylinders suspected of being hot. Remove cool cylinders from the path of the fire. Evacuate the area if unable to keep cylinders cool.

Extinguishing All known extinguishers can be used. Use water fog to cool containers from protected area.

Hazchem Code 2XE

6. ACCIDENTAL RELEASE MEASURES

Spillage If the cylinder is leaking, evacuate area of personnel. Inform manufacturer/supplier of leak. Wear self-contained breathing apparatus and chemical protective clothing and carefully move it to a well ventilated remote area, then allow to discharge. Do not attempt to repair leaking valve.

7. STORAGE AND HANDLING

Storage Do not store near 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.

Handling Before use carefully read the product label. Use of safe work practices are recommended to avoid eye or skin contact and inhalation. Do not drag, roll or drag cylinders. The use of mechanical devices for the handling of containers is recommended.

8. EXPOSURE CONTROLS/ PERSONAL PROTECTION

Exposure Stds

Ingredient	Reference	TWA		STEL	
Hydrogen fluoride	SWA (AUS)	3 ppm	2.6 mg/m³ (Peak)	--	--

Biological Limits No biological limit allocated.

Engineering Controls Use only in well-ventilated areas. Maintain vapour levels below the recommended exposure standard.

PPE Wear splash-proof goggles, safety boots, rubber gloves, coveralls and a Full-face Type B (Inorganic and Acid gas) respirator. Only experienced and trained person should use this product. Where an inhalation risk exists, wear: self Contained Breathing Apparatus (SCBA) or an Air-line respirator.

9. PHYSICAL AND CHEMICAL PROPERTIES

Appearance	COLOURLESS GAS OR LIQUID (WILL FUME IN MOIST AIR)	**Solubility (water)**	VERY SOLUBLE
Odour	PUNGENT IRRITATING ODOUR	**Specific Gravity**	NOT APPLICABLE
pH	NOT APPLICABLE	**% Volatiles**	100 %

Vapour Pressure	131 kPa @ 25°C	**Flammability**	NON FLAMMABLE
Vapour Density	0.69 (Air = 1)	**Flash Point**	NOT APPLICABLE
Boiling Point	19.5°C	**Upper Explosion Limit**	NOT APPLICABLE
Melting Point	-83°C	**Lower Explosion Limit**	NOT APPLICABLE
Evaporation Rate	NOT APPLICABLE		
Autoignition Temperature	NOT AVAILABLE	**Critical Pressure**	6485 kPa
Critical Temperature	188°C	**Decomposition Temperature**	NOT AVAILABLE
Density	0.957 kg/L @ 19.5°C (Liquid)	**Partition Coefficient**	NOT AVAILABLE
Viscosity	NOT AVAILABLE		

10. STABILITY AND REACTIVITY

Chemical Stability Stable under recommended conditions of storage.

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

Material to Avoid Hydrogen fluoride will rapidly dissolve in water to form hydrofluoric acid. Incompatible with oxidising agents (eg.hypochlorites), acids, alkalis (eg. caustic soda), active metals (evolving hydrogen gas), ceramics, concrete, organic materials and glass.

Hazardous Decomposition Products May evolve toxic gases if heated to decomposition.

Hazardous Reactions Polymerization will not occur.

11. TOXICOLOGICAL INFORMATION

Health Hazard Summary Highly corrosive - toxic. May be fatal with skin contact, ingestion or by inhalation. Onset of severe symptoms may be delayed for up to 48 hours. Initial symptoms of coughing, choking and chills lasting from 1 to 3 hours followed by symptom-free period and then onset of fever, coughing, cyanosis and pulmonary oedema. Over exposure to high concentrations may lead to rapid onset of severe respiratory difficulties.

Eye Highly corrosive. Gas and liquid are extremely irritating and corrosive. May cause permanent damage to vision. Persons with potential exposure should not wear contact lenses.

Inhalation Highly corrosive - toxic. Onset of severe symptoms may be delayed for up to 48 hours.
Inhalation causes an intolerable prickling, burning sensation in the nose and throat, with cough and pain beneath the sternum. Nausea, vomiting, diarrhoea and ulceration of the gums may also occur. In low concentrations, irritation of the nasal passages, dryness, bleeding from the nose and sinus disorders may result, while continued exposure can lead to ulceration and perforation of the nasal septum.

Skin Highly corrosive. Skin irritation at concentrations of 5 to 10 vppm. Direct exposure to skin can cause severe burns in less than 2 seconds and thermal flash burns in 0.6 seconds. Symptoms of exposure to liquid include delayed throbbing, burning pain which is followed by localised destruction of tissue and blood vessels that may penetrate to the bone. Contamination around the nails can give rise to a painful condition and may require amputation of the finger.

Ingestion Ingestion of liquid will cause burns to the mouth and throat.

Toxicity Data HYDROGEN FLUORIDE (7664-39-3)
LC50 (Inhalation): 1276 ppm/1 hour (rat)

12. ECOLOGICAL INFORMATION

Environment Hazardous to the environment. Hazardous to animals as per man. Highly toxic to aquatic life. Will decrease pH in aqueous ecological systems. Toxic to plants above 0.1 ppm. Hydrogen fluoride released to the atmosphere will absorb moisture to form hydrofluoric acid which is extremely corrosive to metals and living tissue.

13. DISPOSAL CONSIDERATIONS

Waste Disposal Cylinders should be returned to the manufacturer or supplier for disposal of contents. Avoid discharge to atmosphere.

Legislation Dispose of in accordance with relevant local legislation.

14. TRANSPORT INFORMATION

Transport Ensure cylinder is separated from driver and foodstuffs.

Product Name **HYDROGEN FLUORIDE**

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

Shipping Name	HYDROGEN FLUORIDE, ANHYDROUS				
UN No.	1052	**DG Class**	8	**Subsidiary Risk(s)**	6.1
Packing Group	I	**Hazchem Code**	2XE	**GTEPG**	8C4

15. REGULATORY INFORMATION

Poison Schedule Classified as a Schedule 7 (S7) Poison using the criteria in the Standard for the Uniform Scheduling of Drugs and Poisons (SUSDP).

AICS All chemicals listed on the Australian Inventory of Chemical Substances (AICS).

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 withdrawal: pre-heated, regulator of suitable pressure and flow rating fitted to cylinder with low pressure gas distribution to equipment.

ABBREVIATIONS:
ACGIH - American Conference of Industrial Hygienists.
ADG - Australian Dangerous Goods.
BEI - Biological Exposure Indice(s).
CAS# - Chemical Abstract Service number - used to uniquely identify chemical compounds.
CNS - Central Nervous System.
EC No - European Community Number.
HSNO - Hazardous Substances and New Organisms.
IARC - International Agency for Research on Cancer.
mg/m³ - Milligrams per Cubic Metre.
NOS - Not Otherwise Specified.
pH - relates to hydrogen ion concentration using a scale of 0 (high acidic) to 14 (highly alkaline).
ppm - Parts Per Million.
RTECS - Registry of Toxic Effects of Chemical Substances.
STEL - Short Term Exposure Limit.
SWA - Safe Work Australia.
TWA - Time Weighted Average.

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.

PERSONAL PROTECTIVE EQUIPMENT GUIDELINES:
The recommendation for protective equipment contained within this ChemAlert 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.

Report Status This document has been compiled by RMT on behalf of the manufacturer of the product and serves as the manufacturer's Safety Data Sheet ('SDS').

It is based on information concerning the product which has been provided to RMT by the manufacturer 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.

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 Report