

MATERIAL SAFETY DATA SHEET

Product Code: M0217; File S:\GreenDevil.doc

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Section 1 – Statement of Hazardous Nature, Chemical Product and Company Identification

**CLASSIFIED AS HAZARDOUS ACCORDING TO CRITERIA OF NOHSC AND
CLASSIFIED AS A DANGEROUS GOOD ACCORDING TO THE ADG CODE.**

Klen International (74) Pty Ltd
19 Motivation Drive
Wangara WA 6065
EMAIL: info@klen.com.au
ABN: 25 008 776 681
TEL: (08) 9302 4000
FAX: (08) 9302 5000
TOLL FREE: 1800 999 196

CONTACT POINT - Chemist - TELEPHONE (08) 9302 4000
EMERGENCY TELEPHONE NUMBER: A/H 0419 906 672 or Toll Free 1800 999 196

Product Name: **GREEN DEVIL**

Use: *Acidic cleaner for aluminium and other metals*

2. Hazards Identification

Emergency Overview: Corrosive. Extremely hazardous liquid and vapour. Causes severe burns which may not be immediately painful or visible. May be fatal if swallowed or inhaled. Liquid and vapour can burn skin, eyes and respiratory tract. Causes bone damage. Reaction with certain metals generates flammable and potentially explosive hydrogen gas.

Health Rating: - Extreme

Flammability Rating: - None

Reactivity Rating: - Moderate

Contact Rating: - Extreme (Corrosive)

Potential Health Effects: Exposure to hydrofluoric acid can produce harmful health effects that may not be immediately apparent. Causes severe burns on contact with any body tissue

Inhalation: Severely corrosive to the respiratory tract. May cause sore throat, coughing, laboured breathing and lung congestion/inflammation.

Ingestion: Corrosive. May cause sore throat, abdominal pain, diarrhoea, vomiting, severe burns of the digestive tract, and kidney dysfunction.

Skin Contact: Corrosive to the skin. Skin contact causes serious skin burns. Hydrofluoric acid symptoms may be delayed 8 hours or longer. The fluoride ion readily penetrates the skin causing destruction of deep tissue layers and even bone.

Eye Contact: Corrosive to the eyes. Symptoms of redness, pain, blurred vision, and permanent eye damage may occur.

Chronic Exposure: Intake of more than 6 mg of fluorine per day may result in fluorosis, bone and joint damage. Hypocalcaemia and hypomagnesaemia can occur from absorption of fluoride ion into blood stream. Strong inorganic acid mists containing sulfuric acid can cause cancer.

Aggravation of Pre-existing Conditions: Persons with pre-existing skin disorders, eye problems, or impaired kidney or respiratory function may be more susceptible to the effects of this substance.

3. Composition/Information on Ingredients

Ingredient	CAS No	Percent	Hazardous
Sulfuric Acid	7664-93-9	9.8	Yes

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Phosphoric Acid	7664-38-2	9.4	Yes
Hydrofluoric Acid	7664-39-3	0.95	Yes
2-Butoxyethanol	111-76-2	< 10	No
Nonylphenoethoxylate	68603-42-9	< 10 %	No
Sodium Alkylethoxysulfate	685-34-2	< 10 %	No
Materials determined to be not hazardous		To 100%	

4. First Aid Measures

For any route of contact: Detailed First Aid procedure should be planned before beginning work with Hydrogen fluoride solutions.

Inhalation: Get medical help immediately. If patient is unconscious, give artificial respiration or use inhalator. Keep patient warm and resting, and send to hospital after first aid is complete.

Ingestion: If swallowed, DO NOT INDUCE VOMITING. Give large quantities of water. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Skin Contact: FOR ACID BURNS TO THE BODY: 1) Remove the victim from the contaminated area and immediately place him under a safety shower or wash him with a water hose, whichever is available. 2) Remove all contaminated clothing. 3) Keep washing with large amounts of water for a minimum of 15 to 20 minutes. 4) Have someone make arrangements for medical attention while you continue flushing the affected area with water. 5) a) If available, after thorough washing, the burned area should be immersed in a solution of 0.2% iced aqueous Hyamine 1622 or 0.13% iced aqueous Zephiran Chloride. If immersion is not practical, towels should be soaked with one of the above solutions and used as compresses for the burn area. Ideally compresses should be changed every 2 minutes. 5) b) An alternative treatment to 5a is for the physician to inject sterile 10% aqueous calcium gluconate solution subcutaneously beneath, around, and in the burned area. Initially use no more than 0.5 cc per square centimetre and do not distort appearance of skin. If pain is not completely relieved, additional treatment is indicated. 6) Seek medical attention as soon as possible for all burns regardless of how minor they may appear initially. Hyamine 1622 is a trade name for Tetracaine Benzethonium Chloride, Merck Index Monograph 1078, a quaternary ammonium compound sold by Rohm & Haas, Philadelphia. Zephiran Chloride is a trade name for Benzalkonium Chloride, Merck Index Monograph 1059, also a quaternary ammonium compound, sold by SANOFI Winthrop Pharmaceutical, New York, NY.

Eye Contact: FOR ACID IN THE EYES: 1) Irrigate eyes for at least 30 minutes with copious quantities of water, keeping the eyelids apart and away from eyeballs during irrigation. 2) Get competent medical attention immediately, preferably an eye specialist. 3) If a physician is not immediately available, apply one or two drops of 0.5% Pontocaine Hydrochloride solution. 4) Do not use oily drops or ointment. Place ice pack on eyes until reaching emergency room.

Note to Physician: For burns of large skin areas, (greater than 25 square inches), for ingestion and for significant inhalation exposure, severe systemic effects may occur. Monitor and correct for hypocalcaemia, cardiac arrhythmias, hypomagnesaemia and hyperkalemia. In some cases renal dialysis may be indicated. For certain burns, especially of the digits, use of intra-arterial calcium gluconate may be indicated. Treat as chemical pneumonia. Monitor for hypocalcaemia, 2.5% calcium gluconate in normal saline by nebuliser or by IPPB with 100% oxygen may decrease pulmonary damage. Bronchodilators may also be administered. Medical Surveillance: Provide physical examinations of exposed personnel every six months including fluoride determinations in urine, studies of liver and kidney function: chest X-ray, annually. Protect from exposure those individuals with

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diseases of kidneys, liver, and lung. (ITII. Toxic and Hazardous Industrial
Chemicals Safety Manual).

AN ALTERNATIVE FIRST AID PROCEDURE: Hydrofluoric Acid (HF) is a highly corrosive and toxic acid, even in a dilute form. It can severely damage the skin and eyes causing severe burns which are extremely painful. Additionally, the vapour from anhydrous HF or its concentrated solutions can cause damage to skin, eyes and the respiratory system. HF differs from other strong acids in that it not only causes surface burns but rapidly penetrates the skin, even in dilute solution, and causes destruction of underlying tissue and even bone by the extraction of Calcium. For this reason, washing the burn with water is not sufficient. A neutralizing agent which will also penetrate the skin is required. The effect of HF, ie. onset of pain, particularly in dilute solutions, may not be felt for up to 24 hours. It is important, therefore, that persons using HF have immediate access to an effective antidote even when they are away from their work place in order that first aid treatment can be commenced immediately while the patient seeks medical advice.

HOW TO TREAT HYDROFLUORIC ACID BURNS: It has been conclusively shown (references 1,2,3 and 4 below) that flushing the affected area with water for one minute and then massaging HF Antidote Gel into the wound until there is a cessation of pain is the most effective first aid treatment available. HF Antidote Gel contains Calcium Gluconate which combines with HF to form insoluble Calcium Fluoride, thus preventing the extraction of Calcium from the body tissue and bones. HF Antidote Gel is available in 25g tubes, and since the effects of the dilute acid may not be apparent for some hours, we recommend that any person in contact with HF should carry, or have access to a tube of HF Antidote Gel at all times; ideally with one tube at the work place, one on the person and one at home. For safety's sake, we believe that HF Antidote Gel should be issued to all employees who may come into contact with HF.

EYE INJURIES: Irrigate the affected part immediately with copious amounts of cold water. Urgent medical advice must be sought. HF Antidote Gel is NOT for use in the eye. It is imperative that any person who has been contaminated by HF should seek medical advice even when the treatment by HF Antidote Gel has been applied.

REFERENCES: 1. Brown, T.D. Treatment of Hydrofluoric Acid Burns 2. Sprout, W.L. et al Treatment of Severe Hydrofluoric Acid Exposures (Journal of American Occupational Medicine 25:12, 1993) 3. Bracken, W.M. et al Comparative Effectiveness of Topical Treatments for Hydrofluoric Acid Burns, University of Kansas (Journal of Occupational Medicine 27:10:1985) 4. Burke, W.J., et al Systemic Fluoride Poisoning Resulting from A Fluoride Skin Burn (Journal of Occupational Medicine (5,39:1973) Distributed by PHARMASCIENCE INC., Montreal, Canada.

5. Fire Fighting Measures

Fire: Not considered to be a fire hazard. Fire may produce poisonous or irritating gases.

Explosion: Mild exothermic reaction occurs with water. Reacts with metals forming flammable Hydrogen gas.

Fire Extinguishing Media: Keep upwind of fire. Use water or carbon dioxide on fires in which Hydrofluoric Acid is involved. Halon or foam may also be used. In case of fire, the sealed containers can be kept cool by spraying with water.

Special Information: In the event of a fire, wear full protective clothing and AS1715/ 1716-approved self-contained breathing apparatus with full facepiece operated in the pressure demand or other positive pressure mode. Avoid getting water in tanks or drums; water can cause generation of heat and spattering.

