Technical Bulletin *Safety Alert!*

☐ *Place a copy of this bulletin in the front of each Blueprints Manual.*
☐ *Redline drawings as needed and include a TB reference note.*
☐ *Document TB implementation schedule request and completion:*

Date Scheduled _____ Date Completed _____

Completed by (name) _____

TB Number: 100
Date Issued: 03/19/2015
Expiration Date: None

Subject/Key Words:	Hydrofluoric Acid (HF) – Exposure Prevention and First Aid			
Classification:	■ Informational	❑ Mandatory	■ Safety Alert	❑ Preventive Maintenance Impact
	❑ Warranty Impact	❑ Purchase Parts	❑ No Charge For Parts expires ___ / ___/___. Reference this TB# when ordering NC parts.	
Application:	For those who handle or are at risk for skin exposure to HF acid.			
Parts/Documents:	**Part Number:** 241868-001 CALCIUM GLUCONATE GEL 2.5%, 30G TUBE			
Policy/Reporting:	Arion Systems Employee Handbook Safety incident reporting page 10-11, Safety Policy 601-1 and associated Incident report Form Policy 601-1A			

Hydrofluoric acid burns require immediate specialized first aid and medical attention!

HF-to-skin contact prevention and first aid is supported by the use of Calcium Gluconate Gel 2.5%.

Akrion Systems will distribute Calcium Gluconate Gel 2.5% to field and factory personnel bi-annually for personal first aid supply. Employees are to order replacement tubes as needed for resupply of open or damaged tubes.

Prevention of HF acid exposure:

Prevent exposure to HF acid through safe work practices and by wearing effective PPE. Study first aid for HF exposure in advance of an accidental exposure to minimize your health risk and to maximize chances for a full recovery.

Work safely and wear appropriate PPE, be aware of your surroundings, avoid and report unsafe work practices of others to your supervisor.

Follow the safety protocol and policies of the facility where you are working to ensure you practice safe handling and understand first aid practices for HF acid exposure and location of HF exposure first aid supplies.

HF compatible PPE: *(HF compatible clothing is not limited to the list provided)*

Harvard University Dept. of Chemistry & Chemical Biology 02/2013: According to the Quick Selection Guide to Chemical Protective Clothing (5th edition, page 149), the following gloves will provide protection from hydrofluoric acid (30-70%) for 4 hours or more:

Gloves: Butyl rubber, Neoprene rubber, Viton®/butyl rubber, Silver Shield/4H® (PE/EVAL/PE), Tychem® SL (Saranex®) ,
Clothing/cover wear: Saranex coated coveralls, rubber apron and boots, goggles and face shield

Contact Akrion Technical Support Department via e-mail at technicalsupport@akrionsystems.com if you require more information.
(Form QA1656F1AD)

First Aid for HF-to-Skin Contact:

Skin contact with hydrofluoric acid may cause severe burns. At concentrations of less than 50% hydrofluoric acid, the burns may not manifest immediately. Fluoride ions penetrate the skin easily and, thus, the burns may be deep and can cause considerable damage. Use and application of the antidote gel should not be based on the visible observation of burns but on the knowledge of dermal contact. Be cognizant that exposure may occur under fingernails, where antidote application is especially challenging. Therefore, medical care is absolutely essential.

1. Remove the victim to a safe location. Use protective equipment when handling a contaminated victim.
2. **Immediately flush the exposed skin with water for a maximum of 5 minutes**. Flush well but briefly. It is critical to apply antidote as soon as possible.
3. Remove contaminated clothing during washing. Cut away clothing, if necessary, to avoid injuring affected skin.
4. While someone is assisting the patient with rinsing of the exposed skin, a colleague shall contact the facility safety response team or call 911.
5. **After adequate 5-minute rinsing, apply calcium gluconate gel to the affected and surrounding skin. Aggressively massage the gel into the affected part (wearing gloves) and continue to reapply and massage until pain is entirely relieved.** If medical assistance is delayed, apply gel every 15 minutes until pain and/or redness disappear or until the emergency rescue team arrives. If the exposure is to a hand or fingers, the gel may be placed in a latex glove then the hand placed inside the glove to maximize contact with the affected area.
   - Discard tubes that have been opened during first aid treatment of the injury. Opened tubes should not be saved for later reuse. *Fresh tubes are sealed for sterility protection.*
   - Following an incident involving use of the gel, ensure that the supply of gel remains adequate. Replace the gel when the expiration date is exceeded.
6. **All hydrofluoric acid burns are to be evaluated by a physician, usually in the emergency room setting**. This includes burns to a very small area of the skin and those treated with gel. Further reapplication of antidote gel or other medical procedures may be necessary at the emergency room in order to prevent reversion of the acid burn.

First Aid for HF Eye contact:

Hydrofluoric acid can cause severe eye burns, with destruction or opacification of the cornea. Blindness may result from severe or untreated exposures. Immediate first aid is necessary.

1. Immediately flush eye(s) for at least 5 minutes.
2. *Irrigate the eye repeatedly with 500-1000 ml of a 1% calcium gluconate solution applied through a syringe.*
3. Call for prompt emergency room transport. Apply ice-water compresses during transport.
4. Send the patient to an eye specialist as soon as possible.

First Aid for HF fumes Inhalation:

Concentrated solutions and anhydrous hydrofluoric acid produce pungent fumes on contact with air. These fumes can cause nasal congestion and bronchitis, even in low concentrations. Burns that occur when the vapors or liquid contact the oral mucosa or upper airway may cause severe swelling, to the point of airway obstruction.

1. Immediately move the victim to fresh air and seek medical attention. *Trained medical responders will be necessary to administer oxygen and nebulized calcium gluconate.*
2. Keep the victim warm, quiet, and relatively comfortable.
3. If breathing has stopped, start artificial respiration at once.

REFERENCES

Segal, Eileen B, "First Aid for a Unique Acid: HF," *Chemical Health and Safety*, September/October 1998, Vol. 5, No. 5, p.25.
Bronstein, A. C. and Currance, P. L. "Emergency Care for Hazardous Materials Exposures." Mosby Company,1988.