



Company Name: _____ Job Site Location: _____

Date: _____ Start Time: _____ Finish Time: _____ Foreman/Supervisor: _____

Topic 753: Hydrofluoric Acid (Part A)

Introduction: Hydrofluoric acid tends to be handled as a concentration stock solution which is then diluted on-site to solutions ranging down to 0.5 percent. The handling of the concentrated acid in conjunction with the widespread use of hydrofluoric acid in industry contributes to the hazard potential. The chance of harmful exposure is enhanced beyond a direct pH effect due to the ability of the fluoride ion to penetrate tissue. In severe cases, this can lead to damage to underlying muscles, ligaments, and bones.

- Skin contact even with much diluted solutions should be considered dangerous. Solutions of less than 2 percent can cause burns. The process of tissue destruction and neutralization of hydrofluoric acid can be prolonged for days, unlike other acids which are rapidly neutralized. Damage occurs often without any warning sensation of pain in the early stages.
- For solutions of less than 20 percent, pain and erythema (Redness of the skin caused by dilatation and congestion of the capillaries, often a sign of inflammation or infection) may not occur for up to 24 hours. With 20 to 50 percent solutions this latent period will vary from 1 to 8 hours. Solutions above 50 percent cause immediate pain and tissue destruction.
- The onset and severity of burns will depend on the extent and duration of contact as well as the concentration of hydrofluoric acid.
- Extensive skin burn areas should be considered as very serious since one fatality was reported involving only 2.5 percent of skin surface area. All cases with extensive skin burns will have some vapor inhalation unless a respirator was used.
- Anhydrous hydrofluoric acid will change from a colorless liquid to hydrogen fluoride gas at room temperature. In moist air the acid will fume strongly. At low air concentrations around the PEL of 3 ppm minor irritations of the eyes, respiratory tract, and skin often occur. As protection against these effects the ACGIH has recently proposed to change the 3 ppm TWA value to a Ceiling Limit.
- Splashes of concentrated hydrofluoric acid, especially to the upper extremities, with resultant vapor inhalation can lead to severe or even fatal pulmonary edema. Symptoms can be delayed for one to two days.
- Eye exposure to liquid hydrofluoric acid can result in serious injury which rapidly penetrates the epithelium. The cornea and conjunctiva can be damaged by hydrogen fluoride gas exposure alone.
- Repeated exposure to subacute concentrations of fluoride over a period of years can result in increased radiographic density of bone and possible crippling fluorosis.

Personal Protective Equipment and Eyewash or Deluge Showers: In order to comply with the general requirements of OSHA 1910.132(a), the personal protective equipment needs to assure prevention of eye and skin contact as listed in Table A.

- Table A also shows approximate pH values for various dilutions of hydrofluoric acid solutions. Due to the fact that serious burns can result from extended contact with diluted solutions of hydrofluoric acid, protective equipment is necessary even at very low concentrations. The table is to be used to evaluate situations where the acid exceeds 0.006 percent by weight or a solution of lower concentration is frequently used and repetitive skin or eye contact may occur.
- Neoprene and Nitrile-NBR are recommended glove materials.
- Leather apparel, including shoes, cannot be decontaminated and must be destroyed after exposure to hydrofluoric acid.
- Of particular importance is the need for immediate and thorough drenching of areas where there was contact with hydrofluoric acid solutions even if there is no immediate pain.
- It is critical that the workers are aware of this and the need for follow-up medical evaluation after washing.

Table A - Appropriate Protective Wear and Emergency Devices for Hydrofluoric Acid

% HF by weight	pH	
>20.0	1.2 or less	Safety shower, eyewash, face shield and goggles, acid suit, boots and gloves
2.0 to 20.0	1.2 to 1.7	Safety shower, eyewash, face shield and goggles, gloves, aprons, boots and rubber sleeves
0.2 to 2.0	1.7 to 2.2	Eyewash, goggles, gloves and apron
<0.2	>2.2	Protective equipment not normally required

Work Site Review

Work-Site Hazards and Safety Suggestions: _____

Personnel Safety Violations: _____

Material Safety Data Sheets Reviewed: _____ (Name of Chemical)

Employee Signatures:

(My signature attests and verifies my understanding of and agreement to comply with, all company safety policies and regulations, and that I have not suffered, experienced, or sustained any recent job-related injury or illness.)

Foreman/Supervisor's Signature: _____

These guidelines do not supercede local, state, or federal regulations and must not be construed as a substitute for, or legal interpretation of, any OSHA regulations.