

Hazardous Substances – **General**

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Cleaning and etching solutions containing hydrofluoric acid >

Hydrofluoric acid hazards

Many commercial alloy cleaning, brick and tile cleaning and etching solutions (eg. anti-slip floor treatments) contain HYDROFLUORIC ACID (HF). There are many hazards associated with hydrofluoric acid, such as:

Exposure to its vapors can lead to burns and fluoride poisoning.

Symptoms include:

- Irritation of eyes and respiratory tract;
- Conjunctivitis;
- Burns to lips, mouth, throat and lungs;
- Fluid accumulation in lungs;
- Muscle spasms;
- Nausea and vomiting;
- Abdominal pain and diarrhea.

Fluoride is a cumulative poison: it accumulates in the bones and causes weakening and degeneration of the skeletal structure. HF vapours can dissolve in the moisture of the eyes and cause irritation. HF burns can be extremely painful, eating through tissue and attacking the bone.

Etching solutions used to treat slippery floors will release toxic fluoride compounds into the air as they evaporate. Cleaning solutions will do the same, as well as expose users to HF in aerosol mist if they are sprayed on to the article being cleaned.

Hydrofluoric acid causes serious burns to skin and eyes – even a dilute solution may cause burns. Burns caused by dilute solutions may not be noticed for several hours. Immediate medical treatment is required for HF burns. Simply flushing with water is not sufficient. Ensure a supply of fresh calcium gluconate gel, calcium gluconate eye drops and calcium carbonate tablets is always at hand, and personnel have appropriate first aid training.

Many cleaners also contain other strong acids such as nitric, hydrochloric and sulphuric acids which may cause burns to skin, eyes and clothing. Dilute solutions of these may become more concentrated if not washed thoroughly away due to the evaporation of water, leading to acid burns.

Safety Precautions

Ask for a Material Safety Data Sheet (MSDS) for the products you are using. This should tell whether or not they contain hydrofluoric or other strong acids.

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People using hydrofluoric acid or solutions containing it should wear neoprene gloves, full face protection and respiratory protection.

The airborne concentration of fluoride should not exceed 3 ppm (parts per million). Exposure to a level of 50 ppm for several minutes may be fatal.

For concentrations below 25 ppm a cartridge respirator should be worn. Above 25 ppm self-contained or supplied air breathing apparatus is necessary.

Workers exposed to HF vapours may need health surveillance. Regulation 42 of the [Workplace Health and Safety Regulations](#) requires employers to conduct health surveillance where a hazard is identified that places workers health at risk. Six monthly tests for liver and kidney function and fluoride in the urine tests, and annual chest X-rays are recommended.

The most effective means of controlling the hazard is to substitute another product for those containing HF. For example there are many effective alloy cleaners that contain phosphoric acid instead of HF. There are also alternative floor treatments that do not contain HF.

If an alternative is used, make sure that a risk assessment is carried out to determine what precautions, if any, may need to be taken.

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