



Hazard alert

Hydrofluoric (HF) acid in commercial cleaners for vehicles

Employers use hydrofluoric (HF) acid, in significant quantities, in a number of common commercial cleaners. Specifically, in wax removers for cleaning farm equipment, spoke wheels, and walls inside drive-through car washes.

A car wash worker was afflicted with severe tissue burns on his feet after spilling car wash cleaner on his shoes.

The cleaner was diluted to contain approximately 2 percent HF. Because of the low concentration, his pain was delayed and the acid saturated deep into his tissues before he sought medical attention. His recovery took a month.

At another car wash, a worker put on a pair of latex gloves that were tainted with the substance. Her fingers turned black within a day and had to be amputated a few days later. The employer thought the cleaning substance was safe.

Health Effects

Skin contact, even with diluted solutions, is dangerous; solutions with less than 2 percent HF can cause burns. HF is similar to other acids in that the initial extent of a burn depends on the concentration, the temperature, the duration of contact with the acid, and the size of the burn. HF acid differs, however, from other acids because the fluoride ion readily penetrates the skin, causing destruction of deep tissue layers. Unlike other acids that are rapidly neutralized, this process may continue for days if it's left untreated.

In the early stages, damage often occurs without any pain warning. As the HF concentration increases, so does the speed and severity of tissue destruction. An HF burn covering less than 2 percent of your body can kill you.

All cases with extensive skin burns will have some vapor inhalation unless a respirator is used. Eye exposure to liquid HF acid can result in serious injury, such as blindness, due to severe or untreated exposures. The cornea and conjunctiva can be damaged by hydrogen fluoride gas alone.

Ammonium bifluoride (ABF) is often substituted for HF and passed off as an "acid-free" ingredient in products. ABF's fluoride ions are just as hazardous as those of HF.

Precautions for Safe Use

Due to the serious burns that can occur even at low concentrations, it is important to select the best protective equipment and clothing. Neoprene and nitrile butadiene rubber (NBR) gloves are resistant to oils, fuels, greases, and various chemicals, and are to be used with HF.

HF poses a serious inhalation hazard. For this reason, liquid HF cleaner should not be applied with pump sprayers.

First Aid Guidelines

Review your safety data sheet for first aid procedures.

When HF contacts the skin or eye:

- Immediately wash the affected area with water for at least 15 minutes. Using water is critical, but may not stop all destructive action.
- Immediately after washing, seek professional medical treatment.
- Apply calcium gluconate gel or magnesium oxide paste to skin burns, and sterile 1 percent calcium gluconate in saline drops for eye burns to limit tissue damage. This treatment should be applied as soon as possible, preferably while en route to a medical treatment facility.

- In case of inhalation exposure or burns on the nose or mouth, transport the victim to a treatment facility immediately. If a treatment facility is not nearby, and the acid is concentrated, the victim can breathe 100 percent oxygen by a mask with a nebulized mist of 2.5 percent calcium gluconate.
- If acid is ingested and the person is conscious, give them large quantities of water immediately. DO NOT attempt to make the person vomit.

More information

- ☞ [Oregon OSHA Program Directive A-204, Hydrofluoric Acid and Hydrogen Fluoride](#)
- ☞ [OR-OSHA 1910.1200, Hazard Communication Standard](#)



Hazard alerts provide information on hazardous materials, equipment, or practices. For more information, contact the Oregon OSHA Standards and Technical Resources Section at 503-378-3272 or 800-922-2689 (toll-free), or visit our website at osha.oregon.gov.