HEXAFLUORINE®

Emergency Washing Solution Specific to Hydrofluoric Acid Hazards

Although not completely chemically dissociated (pK = 3.20), hydrofluoric acid (HF) is a hazardous acid (HF).

Its danger is due to:

- Its corrosivity linked to its acid character (release of the H^+ ion),
- Its toxicity due to the release of the fluoride ion F^-, which chelates the calcium and the magnesium of cells.

By definition, the fluorides in acidic medium represent the same type of danger.

The Hexafluorine® molecule can both act on the proton H^+ and chelate the fluoride ion F^-, while removing them rapidly from the surface of the eye or the surface of the skin. The penetration of the acids and the toxic action of the fluorides are stopped.

Thus immediate washing with **Hexafluorine®** permits to reduce the seriousness of the exposure and to minimize or to avoid complications (heart troubles that may prove fatal) and sequelae (scars, amputations).

Numerous studies show (1,2,3):

> Its efficacy on HF and its derivatives, in comparison with washing with water only or water followed by calcium gluconate, whatever the concentration,

> Its innocuousness,

> Its benefit as first aid washing.

Ex vivo(1,2), and *in vivo*(3) studies have shown greater efficacy (complete absence of burns) when **Hexafluorine®** is used within the first minute, versus water and/or application of calcium gluconate (usual antidote for burns due to fluorinated acids), even on concentrations of 70 % HF.

With 32 published cases (3, 4, 5), the use of **Hexafluorine®** in industry results in the following observations:

- After every washing, pain stops rapidly which facilitates the secondary care management,
- No sequela reported, although 5 cases could have been fatal,
- Sick leaves are close to nil, and consist mainly in observation time in hospital.

CONCLUSION

With an active solution such as Hexafluorine® used immediately after a splash, the penetration and the effect of HF on tissues can be avoided or reduced. Thus using Hexafluorine® limits the development of the burn and its associated complications. After late or insufficient washing, a secondary treatment such as calcium gluconate may be applied, in accordance with the protocol of the responsible medical authority.

All information available on www.prevor.com/hexafluorine

1 - Analysis of hydrofluoric acid penetration and decontamination of the eye by means of time-resolved optical coherence tomography" Burns, June 2008; 34(4):549-55
2 - Comparative Experimental Decontamination of concentrated Hydrofluoric Acid (HF) in an ex vivo Human Skin Model" oral communication presented at the International Society for Burns Injuries, September 2008, submitted in PLoS ONE.
3 - Hexafluorine® for emergent decontamination of hydrofluoric acid eye/skin splashes" Semiconductor and Safety Association Journal, 2000, Summer; 14 :30-33
4 - Efficacy of Hexafluorine® for emergent decontamination of hydrofluoric acid eye and skin splashes" Veterian and Human Toxicology, 2001; 43(5): 263-265
5 - An improved method for emergent decontamination of ocular and dermal hydrofluoric acid splashes" Veterian and Human Toxicology, 2002; 46(4): 216-218

Technical information on HEXAFLUORINE®

1 . DESCRIPTION

Hexafluorine®: emergency washing solution for splashes due to hydrofluoric acid and its derivatives.

2 . CLAIMS

> First aid device for the washing of hydrofluoric acid (HF) splashes operating on the double danger of acid and of fluorides in acidic medium (for instance, boron trifluoride).

> Antalgic effect.

> Hexafluorine® stops the action of the acid, prevents the penetration of the aggressive product and chelates the fluoride ion.

> Hexafluorine® may be used on acids, in general.

> At the workplace, when Hexafluorine® is used within the first minute after splash, the chemical can be removed before it starts to burn.

> Used as delayed washing, Hexafluorine® can limit the initial injuries and facilitates the secondary treatments such as calcium gluconate, thus bringing the risk of severe sequelae to a minimum.

3 . MAIN FEATURES

> **Etat :** liquid

> Amphoteric and chelating **molécule**, absorbing acids and chelating fluorides

> **Double effet:** washing by mechanical effect and chemical bonding (chelation)

> **Shelf life:** 2 years

4 . SAFETY / INNOCUOUSNESS

> EC 0459 Marking

> Medical device, class IIa

> Acute toxicology: non-irritant (to eye and skin), non-toxic (DL_{50} > 2000 mg/kg)

> Sensitization : non-allergenic

> Sterile solution (sterilized by autoclave)

> Made in France by PREVOR

5 . INSTRUCTIONS FOR USE

> Storage:

Hexafluorine® freezes at 0 °C and recovers its properties when warming. It remains stable up to 150 °C.

> Use on work premises:

1. Remove clothes or/and contact lenses
2. Wash as soon as possible (for about 3 minutes for an eye and 5 minutes for skin)
3. Visit a specialist for medical attention

> Recommended temperature of use:
from 15 and 35 °C

> Use as delayed washing:

1. Wash for 3 to 5 times longer than the time of contact
2. Application of calcium gluconate gel on skin, in accordance with the medical protocol established by the responsible medical authority
3. Visit a specialist for medical attention

6 . PACKAGING

> **Wall-mounted station** with 2 x 500 ml eyewashes and 1 x 200 ml Afterwash II® bottle

> 500 ml portable **eyewash**
Option: 1 x 28 g tube of 2.5 % calcium gluconate gel

> **Autonomous Portable Shower** (DAP) 5 L

> Standard-compliant with EN 15154 part 3 and 4 and recommended by the French National Health Insurance Department CNAM (2008)

7 . MEDICAL DEVICE VIGILANCE

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