

EYE AND SKIN HYDROFLUORIC ACID SPLASHES : ABOUT 32 CASES RINSED WITH HEXAFLUORINE®

Introduction

Hexafluorine® is a first aid rinsing solution for eye and skin splashes due to hydrofluoric acid^{1,2,3} (HF). It can, thanks to its chelating and hypertonic properties, stop simultaneously the acidity and the toxic acid of fluoride ions and avoid their penetration⁴.

Methods

A review of all cases of hydrofluoric acid eye and skin splashes that happened in the industry and that were initially rinsed with Hexafluorine®.

Results

32 cases of eye and skin splashes due to hydrofluoric acid were rinsed with Hexafluorine® as first aid rinsing solution.

CASE REPORTS

Year	Number of cases	Compagny/country	Exposure	Body area	Type of rinsing	Consequence
1997	1	Woeste Germany	HF/HCl* bath	Complete immersion	**Hexafluorine® on the body ***Water Eyewash	**Light burns on the abdomen and the back ***Severe burn on the left eye
1996	1	Arc International France	70 % HF vapor	Right	Hexafluorine®	Light and non painful erythema. Ointment with a calcium gluconate gel on the day after, no loss of work
1996	1	Krupp Germany	38 % HF	One eye	Hexafluorine®	No burn, no loss of work
1993	2	Alcan Germany	5%HF	Body	Hexafluorine®	No burn, no loss of work

* : 30 litres of 31/33% hydrochloric acid and 233 litres of 59% hydrofluoric acid in 1505 litres of water

SERIE OF 11 CASES IN MANNESMANN (Remscheid, GERMANY), from 1994 to 1998

Exposure	HF 40%	HF 6% / HNO ₃ 15%	HF 40%	HF 6% / HNO ₃ 15%
Number of cases	1	1	5	5
% involved area	2 eyes*	1 eye	0.2 - 1 - 4.5 - 4.5 - 16.5*	0.2 - 2.25 - 4 - 4.5 - 10.5
First rinsing	Hexafluorine®	Hexafluorine®	Hexafluorine®	Hexafluorine®
Second rinsing	Hexafluorine®	Hexafluorine®	Hexafluorine®	Hexafluorine®

* both eye and skin splash due to 40% HF



Results : There were no after effects, neither secondary care nor losses of work were necessary for all these hydrofluoric acid splashes rinsed in emergency with Hexafluorine®.

SERIE OF 16 CASES IN AVESTA (several plants, Sweden), from 1998 to 1999

Number of cases	Exposure	Body surface	Time of contact	Loss of work (day)
2	70% HF	Left forearm-oral cavity	< 1 min	0 - 1
1	HF (unknown concentration)	1 eye	< 1 min	0
2	HF / HNO ₃ pH = 1	1 eye	< 1 min	0 - 0
1	HF / HNO ₃ pH = 1*	1 eye	3 - 5 min	3
1	HF / HNO ₃ pH = 1	2 eyes	< 1 min	0
1	HF / HNO ₃ pH = 1	1 thigh	< 1 min	0
2	HF / HNO ₃ pH = 1	2 thighs	1h - 1h30	2 - 2
1	HF / HNO ₃ pH = 1*	Face	3 - 5 min	3
2	HF / HNO ₃ pH = 1	Face + oral cavity - Forehead	< 1 min	1 - 1
3	HF / HNO ₃ pH = 1	Forearm - Arm + hand - Two elbows	< 1 min	0 - 0 - 1
1	HF / HNO ₃ pH = 1	Wrists	2 h	0

* HF / HNO₃ / H₂SO₄ pH = 1 représente une même projection oculaire et cutanée

Results : Immediate pain relief, no after effects. In 75% of the cases, including both 70% HF splashes, no secondary were reported and the average of days lost from work is inferior to 1 day ($\sigma = 1.1$).

All 32 cases due to hydrofluoric acid were rinsed with Hexafluorine® as first aid rinsing solution. No serious burn was noted in any case. It was not necessary to have any prolonged and intensive secondary care.

Conclusion

The first aid rinsing with Hexafluorine® allowed to stop the appearance of the burn due to hydrofluoric acid or to decrease strongly its seriousness.

References

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- (2) Mathieu L, Nehles J, Blomet J, Hall AH, Vet Hum Toxicol 2001, 43 (5), 263-265
- (3) Peltier A, CND 2000, 178, 37-41
- (4) Burgher F, Blomet J, Mathieu L 1996 Le Risque Chimique et la Santé au Travail, Ed PREVOR, France, ISBN2-9510211-0-0

Pictures given by Mannesmann