

## Explosion och brand på en plastfabrik.

950318 MARS 1995\_05

Vid rengöringsarbete på en spraypistol utfördes arbetet i ett dåligt ventilerat rum. Rengöringen skedde med aceton. Acetonångorna antändes av en gnista statisk elektricitet. Fabriken brann ned till grunden. Riskanalysen i samband med rengöringsarbetet bedöms som amatörmässiga.

### Inblandade ämnen och mängder

	CAS Nr.	Mängd
aceton	67-64-1	okänt
polyesterharts		
styren		

### Skador:

Människor: 1 person skadades allvarligt.  
Materiella: Fabriken brann ned till grunden.  
Miljö/ekologi: Inga effekter rapporterade.  
Infrastruktur: Inga.

**Erfarenheter redovisade (Ja/Nej): Nej**

## Report Profile

### Identification of Report:

country: FA ident key: 1995\_005\_01

reported under Seveso I directive as major accident reports: SHORT+FULL

### Date of Major Occurrence: Time of Major Occurrence

start: 1995-03-18 start:

finish: 1995-03-19 finish:

### Establishment:

name:

address:

industry: 2003 plastics and rubber manufacture

Polyester

Seveso II status: not applicable: Yes art. 6 (notification): No

art. 7 (MAPP): No

art. 9 (safety report): No

### Date of Report:

short: full:

### Authority Reporting:

name:

address:

### Authority Contact:

rep\_cont\_name:

rep\_cont\_phone:

rep\_cont\_fax:

**Additional Comments:**

a) - not applicable -

b) - not applicable -

c) - not applicable -

d) - not applicable -

e) - not applicable -

## Short Report

country: FA ident key: 1995\_005\_01

**Accident Types:**

release: No explosion: No

water contamination: No other: No

fire: Yes

**description:**

A big fire with one person badly injured

**Substance(s) Directly Involved:**

toxic: No explosive: No

ecotoxic: No other: No

flammable: Yes

**description:**

- Aceton

- Polyester resin

- Styrene

**Immediate Sources of Accident:**

storage: No transfer: No

process: Yes other: No

**description:**

By a lack of ventilation an inflammable vapour cloud could occur. The vapour cloud was ignited by the sparks of electrostatical source, caused by the removing of the product out of the mould.

**Suspected Causes:**

plant or equipment: Yes environmental: Yes

human: Yes other: Yes

**description:**

A lack of ventilation could occur by switching off the ventilation. The vapour cloud occur by cleaning the equipment with acetone. The people worked in one room. In that room everything happened in the field of the production of polyester pr... see Appendix Short Report / description of suspected causes

**Immediate Effects:**

**material loss:** Yes

**human deaths:** No

**human injuries:** Yes **community disruption:** No

**other:** No

**ecological harm:** Yes

**national heritage loss:** No

**description:**

The whole factory was burned

One person badly injured

The smoke caused ecological harm.

### **Emergency Measures taken:**

**on-site systems:** No **decontamination:** No

**external services:** Yes **restoration:** No

**sheltering:** No **other:** No

**evacuation:** No

**description:**

Fire brigade

### **Immediate Lessons Learned:**

**prevention:** Yes **other:** No

**mitigation:** Yes

**description:**

To be aware of the occurrence of vapour cloud

To be aware of the possibility that ignition can also happen by sparks of electrostatic course as the removing of products out of moulds.

## **A Occurrence Full Report**

**country:** FA **ident key:** 1995\_005\_01

### **1 Type of Accident**

**remarks:** - not applicable -

### **2 Dangerous Substances**

**remarks:** - not applicable -

### **3 Source of Accident**

**illustration:** - not applicable -

**remarks:** Cleaning the spray gun with acetone with a lack of ventilation because of the fact that the exhaust system was switched off.

### **4 Meteorological Conditions**

**precipitation none: fog: rain: hail: snow:**

Yes No No No No

**wind speed (m/s):**

**direction (from):**

**stability (Pasquill):**

**ambient temperature (°C):** 7

**remarks:** The weather had no influence on the accident.

## 5 Causes of Major Occurrence

**main causes**

**technical / physical** 5102 operation: component/machinery failure/malfunction

5109 operation: electrostatic accumulation

- not applicable -

- not applicable -

- not applicable -

**human / organizational** 5301 organization: management organization inadequate

5303 organization: organized procedures (none, inadequate, inappropriate, unclear)

5304 organization: training/instruction (none, inadequate, inappropriate)

5305 organization: supervision (none, inadequate, inappropriate)

5308 organization: design of plant/equipment/system (inadequate, inappropriate)

**remarks:** By cleaning the spray pistol with a lack of ventilation a vapour cloud occurred, which was ignited by electrostatic sparks caused by removing the manufactured product from the mould. The organisation was rather amateuristic and inadequate... see Appendix Full Report A / causes of major occurrence

## 6 Discussion about the Occurrence

- not applicable -

**Type of Accident** country: FA ident key: 1995\_005\_01

**event:**

**major occurrence** 1201 fire: conflagration (a general engulfment fire)

**initiating event** 1101 release: gas/vapour/mist/etc release to air

**associated event** 1401 other: combustion products into air

## Dangerous substances

country: FA ident key: 1995\_005\_01

### a) total establishment inventory

**CAS number: identity:** Unsaturated Polyester Resin

**name from Seveso I Directive:** - not applicable -

**name from Seveso II Directive:** - not applicable -

**category from Seveso II:** - not applicable -

**other hazards (1):** - not applicable -

**other hazards (2):** - not applicable -

**maximum quantity (tonnes):** 15

use of substance as: STARTING MATERIAL

**b) substance belongs to relevant inventory directly involved:** Yes

actual quantity: -1 potential quantity: -1

**c) substance belongs to relevant inventory indirectly involved:** No

actual quantity: -1 indir\_pot\_quant: -1

**a) total establishment inventory**

CAS number: identity: Organic Peroxide

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 0,4

use of substance as: STARTING MATERIAL

**b) substance belongs to relevant inventory directly involved:** Yes

actual quantity: -1 potential quantity: -1

**c) substance belongs to relevant inventory indirectly involved:** No

actual quantity: -1 indir\_pot\_quant: -1

**a) total establishment inventory**

CAS number: 67-64-1 identity: Acetone

name from Seveso I Directive: - not applicable -

name from Seveso II Directive: - not applicable -

category from Seveso II: - not applicable -

other hazards (1): - not applicable -

other hazards (2): - not applicable -

maximum quantity (tonnes): 3

use of substance as: NORMAL FINISHED PRODUCT

**b) substance belongs to relevant inventory directly involved:** Yes

actual quantity: -1 potential quantity: -1

**c) substance belongs to relevant inventory indirectly involved:** No

actual quantity: -1 indir\_pot\_quant: -1

**Source of Accident - Situation** country: FA ident key: 1995\_005\_01

**situation**

**industry**

**initiating event** 2003 plastics and rubber manufacture

**associated event** - not applicable -

**activity/unit**

**major occurrence** 3105 process: treating/use for treatment (strenching, preserving, etc.)

**initiating event** - not applicable -

**associated event** - not applicable -

**component**

**major occurrence** - not applicable -

**initiating event** - not applicable -

**associated event** - not applicable -

## **B Consequences Full Report**

**country:** FA **ident key:** 1995\_005\_01

### **1 Area concerned**

**affected**

**extent of effects installation:** Yes

**establishment:** Yes

**off-site; local:** Yes

**off-site; regional:** No

**off-site; transboundary:** No

**illustration of effects** - not applicable -

**remarks** The whole factory was burned down. The surrounding factories had light damage.... see Appendix

Full Report B / area concerned - remarks

### **2 People**

**establishment popul. emergency personnel off-site population**

**total at risk** 30 30

**immediate fatalities**

**subsequent fatalities**

**hospitalizing injuries** 1

**other serious injuries**

**health monitoring**

**remarks** - not applicable -

### **3 Ecological Harm**

**pollution/contamination/damage of:**

- residential area (covered by toxic cloud) Suspected

- common wild flora/fauna (death or elimination) Suspected

- rare or protected flora/fauna (death or elimination) Suspected

- water catchment areas and supplies for consumption or recreation Suspected

- land (with known potential for long term ecological harm or Suspected

preventing human access or activities)

- marine or fresh water habitat Suspected

- areas of high conservation value or given special protection Suspected

**remarks** The factory was located in an industrial area at a reasonable distance from the ... see Appendix

Full Report B / ecological harm

#### **4 National Heritage Loss**

**effects on:**

- **historical sites** Suspected - **historic monuments** Suspected

- **historic buildings** Suspected - **art treasures** Suspected

**remarks** - not applicable -

#### **5 Material Loss**

**establishment losses off site losses**

**costs (direct costs to operator) (social costs)**

**in ECU HFL ECU HFL**

**material losses -1**

**response, clean up, restoration**

**remarks** - not applicable -

#### **6 Disruption of Community Life**

**establishment/plant evacuated disabled/unoccupiable destroyed**

- **nearby residences/hotels** No No No

- **nearby factories/offices/small shops** No No No

- **schools, hospitals, institutions** No No No

- **other places of public assembly** No No No

**interruption of utilities etc. no / yes duration**

- **gas** No

- **electricity** No

- **water** No

- **sewage treatment works** No

- **telecommunications** No

- **main roads** No

- **railways** No

- **waterways** No

- **air transport** No

**significant public concern none local level national level**

- **off site populations** Yes No No

- **media interest** No Yes No

- **political interest** Yes No No

**remarks** The factory was located in an industrial area. Only the director lived near the ... see Appendix

#### **7 Discussion of Consequences**

- not applicable -

#### **Ecological Components involved**

country: FA ident key: 1995\_005\_01

type: 6301 shore: salt-marsh/mud-flats

threatened: Suspected affected: not applicable

type: 6102 inland: urban development

threatened: Suspected affected: not applicable

## C Response Full Report

country: FA ident key: 1995\_005\_01

### 1 Emergency Measures

taken - on site - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

- off site - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

still - on site - not applicable - - not applicable -

#### required

- not applicable - - not applicable -

- not applicable - - not applicable -

- off site - not applicable - - not applicable -

- not applicable - - not applicable -

- not applicable - - not applicable -

#### continuing contamination or danger

-on site not applicable

-off site not applicable

remarks - not applicable -

### 2 Seveso II Duties

#### pre-accident evaluation

Article item not due yet not done done/submitted evaluated

6 notification No No No No

7 policy (MAPP) No No No No

9 safety report No No No No

9, 10, 11 update No No No No

11 internal plan No No No No

11 external plan No No No No

13 informing public No No No No

9, 12 siting policy No No No No

#### post-accident evaluation



Seveso II duty was actual were actual compared with actual

contingency consequences consequences, the

addressed? addressed? predicted extent was?

Article item

7 policy (MAPP) not applicable not applicable not applicable

9 current safety report not applicable not applicable not applicable

11 internal plan not applicable not applicable not applicable

11 external plan not applicable not applicable not applicable

13 informing public not applicable not applicable not applicable

9, 12 siting policy not applicable not applicable not applicable

evaluation of safety organisation

organisational element element existed did element relate to actual circumstances of

yes / no no / partly / yes adequate?

- written policy objectives No

- specified management No

structure

- specified responsibilities No

- specified working procedures No

- specified procedures for No

assessment/auditing of

management system

- specified procedures for No

review and update of

management policy

- specified general training No

procedures

- specified emergency No

training procedures

evaluation of ecological impact control

organisational element element existed did element relate to actual circumstances of

yes / no no / partly / yes adequate?

- ecological status review No

before incident

- potential ecological No

consequences assessment

- ecological impact review No

after incident

- ecological restoration No

procedures

- subsequent review of No

**restoration success**

**remarks** - not applicable -

### **3 Official Action Taken**

**legal action**

- not applicable -

**other official action**

- not applicable -

### **4 Lessons Learned**

**measures to prevent recurrence**

A better lay-out of the factor... see Appendix Full Report C / lesson learned - prevent

**measures to mitigate consequences:**

Repression measures are very d... see Appendix Full Report C / lesson learned - mitigate

**useful references:**

- not applicable -

### **5 Discussion about Response**

- not applicable -

## **Appendices for the FA / 1995\_005\_01 report**

#### **Appendix Short Report / description of suspected causes:**

A lack of ventilation could occur by switching off the ventilation. The vapour cloud occur by cleaning the equipment with acetone. The people worked in one room. In that room everything happened in the field of the production of polyester products, from applying polyester in the moulds for removing the product out of the mould.

#### **Appendix Full Report A / causes of major occurrence:**

By cleaning the spray pistol with a lack of ventilation a vapour cloud occurred, which was ignited by electrostatic sparks caused by removing the manufactured product from the mould. The organisation was rather amateuristic and inadequate to recognize dangers and to make procedures for preventing and repressing dangers. The layout of the manufacturing accomodation was poor. The instruction of the people was rather bad. The whole manufacturing of polyester product was situated in a single accom

#### **Appendix Full Report B / area concerned - remarks:**

The whole factory was burned down. The surrounding factories had light damage.

#### **Appendix Full Report B / ecological harm:**

The factory was located in an industrial area at a reasonable distance from the village.

#### **Appendix Full Report B / disruption of community life:**

The factory was located in an industrial area. Only the director lived near the factory.

#### **Appendix Full Report C / lesson learned - prevent:**

A better lay-out of the factory.

Separation of the different steps of the manufacturing process.

Better instruction of the personnel staff.

Better ventilation and exhaust system,

#### **Appendix Full Report C / lesson learned - mitigate:**

Repression measures are very difficult. If a polyester factory is on fire it is almost impossible to extinguish.