LOSS LESSONS

VOLUME 12

ALLIANZ GLOBAL CORPORATE & SPECIALTY®

FIRE LOSS OF A MATURATION/ DRYING AREA OF POLYURETHANE BLOCKS AVOIDED THANKS TO A SPRINKLER SYSTEM

REPORT PUBLISHED BY

ALLIANZ RISK CONSULTING

Activity:
Automotive Supplier

Property Damages:
€ 15,000

Business Interruption:
Less than 3 hours of Process interruption

CIRCUMSTANCES

On January 12 at 2:30 pm, a batch of polyurethane foam blocks is produced by an automotive supplier. These blocks were supposed to be shaped by cutting operations. As usual after being produced, the blocks are stored in a dedicated storage area for drying/maturing.

On January 13 at 1:00 am, an employee detects a smell of smoke but can't locate the fire. At 1:37 am, the fire protection system is activated (automatic sprinklers). The fire pump running and sprinkler waterflow alarms are received at the guardhouse. The guard informs the plant emergency squad which goes immediately to the concerned area.

At 1:37 am, the plant emergency squad inspects the area and notes that the sprinkler system has controlled and suppressed the fire. An intense smoke cloud is observed. This smoke is spreading to the assembly and the plastic injection areas that are located near the storage area of polyurethane foam blocks. The plant emergency squad opens all doors and windows in the concerned areas for venting the smoke.

All processes are stopped and all employees are mobilized to clean the areas contaminated by the smoke. At 4:00 am, the process is restarted.

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EXTENT OF DAMAGES

The damages are limited to:

- The replacement of 40 m^2 / 430 ft^2 of the roof area damaged during the fire development by smoke and hot gases

- The loss of a dozen of polyurethane foam blocks

- The contamination of the whole storage area and of a part of the process area due to the smoke and the water released by the fire protection system, requiring cleaning operations

CAUSE OF THE LOSS

The start of fire has been located in one of the polyurethane foam blocks (self-ignition).

Polyurethane Foam Block at the origin of the fire

An erroneous composition of one of the raw materials has permitted the exothermic reaction to continue, resulting in the self-ignition of one of the foam blocks. Laboratory analysis showed that the water concentration of one of the raw materials was too high (10 times the maximum limit according to the information on the product delivery slips).

WHAT HAS LIMITED THE LOSS?

PROPERTY DAMAGES

The fire protection system controlled and suppressed the fire. The spreading of the fire was limited despite the high combustible load. Only 4 sprinkler heads operated during this incident.

BUSINESS INTERRUPTION

The very limited damages and the formalized emergency plan have been the key elements to restart the process in normal conditions only 3 hours after the fire protection system activated.

COMMENTS AND LEARNINGS

A well designed fire protection system that is available, well maintained and reliable will control a fire.

An updated emergency plan will help to handle incidents. It will help to reduce the length and the consequences of the incidents (cleaning operations, restart or rework, Business to Business or Business to Customer consequences ...).

The process of manufacturing polyurethane foam is very dangerous. The storage of the hazardous raw materials such as isocyanates, polyols or solvents must be located in dedicated and secured areas (protected by automatic sprinklers and intrusion detection). The process areas must be equipped with an automatic fire protection system and the process lines shall work only when the employees are present. The lines shall be interlocked to automatically shut down with the operation of the fire protection/ detection system.

Dedicated storage areas for the drying/maturing of the polyurethane foam blocks are needed. Indeed, as the reaction is exothermic, when large blocks are processed, several hours or days are needed to dry/mature the products, while the reaction can continue. This period requires a dedicated segregated and protected area or space separation from other process areas to avoid any contamination in case of start of a fire.

The following quality controls shall be performed right after the demoulding step of the foam blocks:

- The surface roughness shall be controlled: if the surfaces are rough, it indicates that the reaction isn't finished and that there is an increased fire hazard
- The dimensions of the block shall be checked: if the dimensions are below the standard dimensions, when the quantity of raw material is stable from one batch to another one, it means that the reaction is abnormal and that there is an increased fire hazard

The characteristics of the raw materials delivered by the suppliers should be checked by sampling to insure the characteristics are in line with the ones needed for the process.

The automotive supplier has installed a fire detection system in addition to the fire protection system. Furthermore, all fire alarms (fire detection and protection) are also now wired to the plant emergency squad to reduce the delay of intervention in case of start of a fire. Additional rounds every 30 minutes have been implemented in the drying/maturing area.

QUESTIONS OR COMMENTS?

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Reference LL 12/18/12

Design: AGCS Graphic Design Centre