

Explosion and fire in a tank cleaning station

What happened?

We were recently informed that an explosion and big fire occurred in a tank cleaning installation during the cleaning of pentane.

The cleaning bay had a direct connection to the workshop and the vapour of the product was sucked into this building and ignited by a spark produced by a workshop device.

What were the consequences?

Despite the efforts of different fire brigades the cleaning installation, the attached workshop and the office building were destroyed.

One operator was injured and, after being provided with first aid, transported to the hospital.

What can we learn?

- Pentane is a very volatile and extremely flammable product:
 - * Boiling point: 36°C
 - * Flashpoint: -50°C
 - * Vapour pressure at 20°C: 573 hPa
 - * Explosion limits: 1,4 - 8 volume %
 - * Relative density saturated vapour/air mixture (air=1): 1,8
- A closed tank is already under a lot of pressure. Releasing this in the atmosphere without any precaution creates already a big volume of air within the explosion limits.
- Liquid product evaporates very quickly creating even bigger areas with a concentration within the explosion limits.
- Pentane is heavier than air and will distribute over big distances where ignition and flash back can occur.
- The cleaning must be done on an explosion proof bay.
- Very careful grounding of the tank and all used equipment is necessary.
- The removal of liquid residue should be avoided in all cases and certainly when the environment temperatures are high.
- Direct connection of a cleaning bay with a workshop or office building where electrical tools are used or mechanical activities are carried out, should be avoided at all times.