**XV INTERNATIONAL CONGRESS**

To be presented at the

XV Congress – Geneva – Switzerland
25th-29th May 2005

# INFORMATION FORM

*In order to help the SAFEX Secretariat to complete the publication of the proceedings all papers should be submitted in electronic format*

**Title of the Paper : Deflagration of Nitrocellulose in the Lab**

- **Abstract :** see separate sheet


**Primary author:**

Name: Heinz Krätschmer
Company: Austin Powder GmbH
Address : Weissenbach 16, A-8813 St. Lambrecht
Phone: +43 3585 2251 265
*E-mail*: Heinz.kraetschmer@austinpowder.at


**Presenter** at the Congress ( if not the author ):

*
* *

**Please return to NO LATER THAN 1st October 2004**


**International Secretary General** : **Bernard Hueber**
32 Route du Grand Pont, 78110 Le Vésinet,France.
Tél : + 33 (0) 6 85 41 78 37 Fax : 33 (0) 1 39 76 73 03 Email : safex.secretariat@wanadoo.fr


**With a copy to the facilitator concerned:**

For the SHE System plenary and workshop: Frank Barker l: frank.barker@orica.com
For the Good Explosive Practice plenary and workshop :Andy Begg : andy.begg@tiscali.co.uk
For any Accident Case Studies : Steve Connolly stephen.p.connolly@orica.com

On 07.01.2002 app. 800 g Nitrocellulose deflagrated in a convection oven in the lab of Dynamit Nobel Wien GmbH (DNW) in St. Lambrecht. Fortunately nobody was hurt. The building was extensively damaged.

Normal process was to dry NC wetted with 35 % Ethanol in a convection oven at 50 °C for 1 week. The NC was placed on an aluminium tray inside the oven. Dry NC was used for a lab scale manufacturing process. Excess dry NC was added to next batch for drying. Drying was done for 50 years without any problems.

Most possible causes, like

- overheating of convection oven
- electrical defect in convection oven
- inhomogeneous temperature dispersion in the convection oven
- electrostatic discharge
- fire outside the convection oven
- explosion of ethanol vapors

could be excluded by tests and examinations by an expert, but

- investigation of thermal stability of the NC batch showed a decrease in stability when stored on aluminium trays at elevated temperatures
- traces in the drying tray show some evidence of a starting explosion
- manufacturer of NC reduced shelf life of this NC type to one year
- manufacturer of NC did not inform us about this reduction of shelf life
- batch used was app. 2 years old.

Actions to prevent repetition:

- adaptation of a separate building for drying and further processing of NC
- remote controlled drying process
- design of a special drying oven with hot water heating reduced drying time to 20 hours at temperatures of 30 to 35 °C
- stainless steel trays
- excess of dry NC is destroyed
- NC batch used for 1 year max.
- manufacturer of NC asked for MSDS at regular intervals.

Lessons learned:

- Do not take over a process designed outside the company without doing an in house risk assessment
- Audit the process for possible changes on a regular basis