NEWSLETTER 2013-07: Fire & Explosion Data for Highly Active Compounds (HIACs)

Testing of highly active compounds (HIACs) is a substantial problem in the chemical and pharmaceutical industry as working in normal fume cupboards may not provide sufficient protection. This is especially true for the standard fire & explosion tests due to their test design which cause serious work hygiene and occupational health problems.

What is a HIAC?
Highly active compounds or high potency compounds are hazardous compounds, such as certain APIs, hormones and vaccines, cytotoxins, steroids, mutagenic, teratogenic & reprotoxic substances. Compounds with an OEL ≤ 10 μg/m³, i.e. of class 4 and 5 (see below), are generally regarded as highly active or high potency compounds.

OEL (Occupational Exposure Limit; in German also MAK, AGW and BGW) is an upper limit on the acceptable concentration of a hazardous substance in workplace air.

HIACs at SWISSI PS
Recognising these problems and the need of test data to assess the fire & explosion hazards of materials, SWISSI Process Safety developed over the last years several unique testing apparatuses that are fully closed (confined) and generate the required data.

After testing, the sample material is destroyed (burned) in-situ or safely disposed together with the containment (one-way devices).

The tests are performed in a specifically designed laboratory for class 4 and 5 substances, down to OEL 100 ng/m³ (in air), or 100 ng/dm² (on surfaces).

Occupational Hygiene Compliance at SWISSI PS
Our occupational hygiene conditions are inspected by an independent expert/consultant. This ensures the high standard of our work hygiene and occupational health.

SWISSI PS HIAC laboratory

Our HIACs Tests
- Dust explosion tests:
  - mod. Hartmann tube
  - 20L sphere (Pmax, Kst,max)
- Minimum ignition energy MIE
  - 10, 30, 100 mJ
- Powder resistivity
- Burning test (combustibility index)
- Particle size distribution (in liquid phase)
- Impact & friction sensitivity
- Self-ignition temperature
  - screening in the DSC under 5 bar oxygen which can be correlated correlated to the results in a Greiner oven test

- Thermal stability
  - TMRad or ADT24 by thermo-kinetic modeling of DSC or C80 calorimetry data
- Gas release under thermal stress with gas analysis, if required

If you have further questions or just want to discuss, please do not hesitate to get in touch with us.

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With best regards
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Further information about our services can be found under www.swissips.com