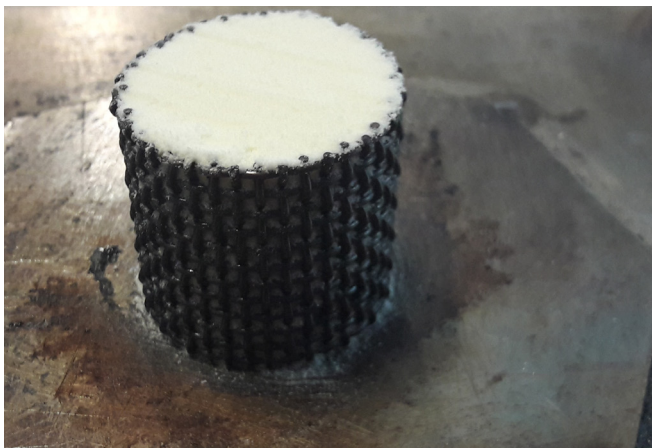
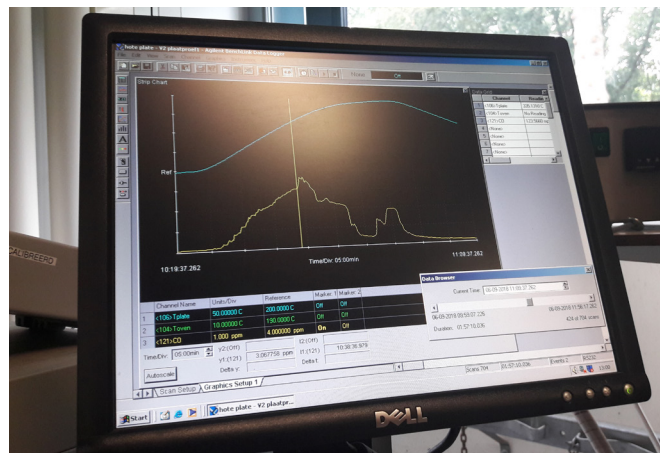


Fire in a spray drying installation is one of the possible hazards in producing powders. Such a fire is often related to lumps of powder which start to smoulder and subsequently self-ignite or break open and ignite the rest of the powder in the spray dryer. With regard to risk assessment and fire prevention, it is important to determine whether the powder of interest exhibits self-ignition at the temperatures occurring in the drying installation and if the amount of CO produced prior to self-ignition exceeds the detection limits of the CO detection system.

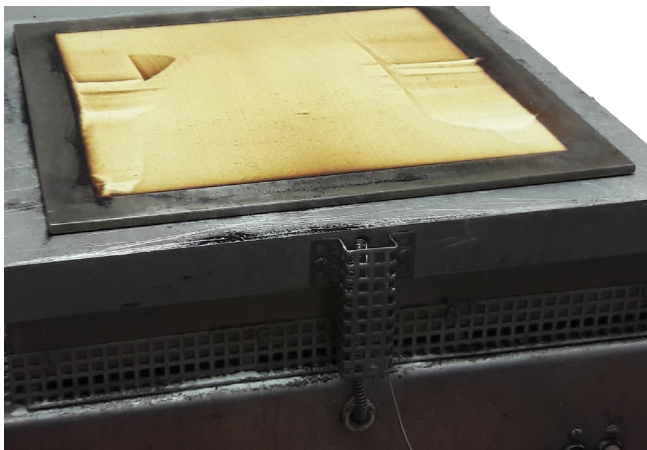
To have better view on the safety of spray drying processes and a better understanding of the impact of changes in the production process NIZO can perform smouldering trials. To be able to do a proper risk assessment NIZO offers a standard package of three analyses per sample.



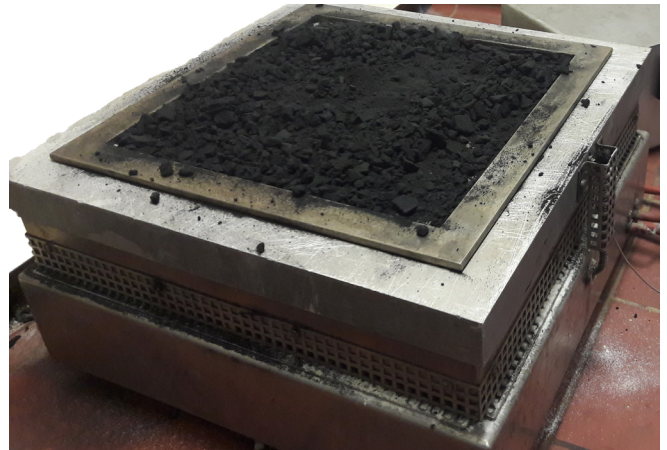
A



B



C



D

A: different sized wire mesh baskets filled with powder before smouldering trials

B: typical curves of product temperatures and CO produced during smouldering trials

C: product during smouldering in a layer of powder

D: typical example of product after smouldering trial

1. DETERMINATION MINIMUM LUMP SIZE

Minimum air temperature at which self-ignition occurs is determined at two different lump sizes (e.g. min. 30 mm and max. 170 mm). This is done by placing the lumps in air flows at different temperatures. The core temperature of the powder sample and the amount of CO produced are measured as a function of time. This parameter indicates which zones in a spray dryer are potentially dangerous.

2. MINIMUM IGNITION TEMPERATURE

The minimum size of a lump of powder leading to self-ignition at the maximum inlet air temperature is determined (e.g. min. 30 mm and max. 170 mm). This measurement indicates how large a lump should be to initiate smouldering in the investigated spray drying process, i.e. to what extent the maximum air inlet temperature used is a potential risk factor.

3. CO PRODUCTION IN A SMOULDERING LAYER

A layer of powder is heated with a constant rate while CO production is monitored. This measurement indicates whether sufficient CO is produced in a layer of powder during smouldering, to justify a CO detection system in an industrial dryer as a safety measure.

The results will be described a confidential NIZO report and illustrated with pictures. For a standard analysis maximum 25 kg of powder is required. Depending on the exact question it is possible to deviate from the standard analysis package described above. However the chance exist that certain risks are overlooked in this case.

Fixed prices for execution of these three trials are:

- For 1 sample: **€ 7.000**
- For 5 samples: **€ 18.000**
- For 10 samples: **€ 33.000**

Amounts mentioned are price level 2018 and excluding VAT. The General Terms and Conditions of NIZO are applicable. These are filed at the Chamber of Commerce and Industry at Arnhem on February 20th, 2004. A copy of these General Terms and Conditions can be found at:

<https://www.nizo.com/wp-content/uploads/2017/10/General-Terms-and-Conditions-20-2-2004.pdf>

For more information contact:

Peter Heusinkveld

Business Development Manager, T: +31 318 659 651, E: peter.heusinkveld@nizo.com



ABOUT US

You've come to the world's leading company in contract research for better food and health. NIZO is a private and independent company. We are one of the most advanced R&D centres in the world and bring the latest food technologies to life in our food grade processing centre. Our focus is on the development and applications of innovations for the global food industry and related markets. Our customers value their gains in product quality, sustainability, cost effectiveness and speed to market. We are continuously looking for new ways of improving food products, and at the same time quality of life. Our headquarters are in Ede, the Netherlands.

**INNOVATING
TOGETHER**

NIZO
Kernhemseweg 2, 6718 ZB Ede
P.O. Box 20, 6710 BA Ede, The Netherlands

www.nizo.com