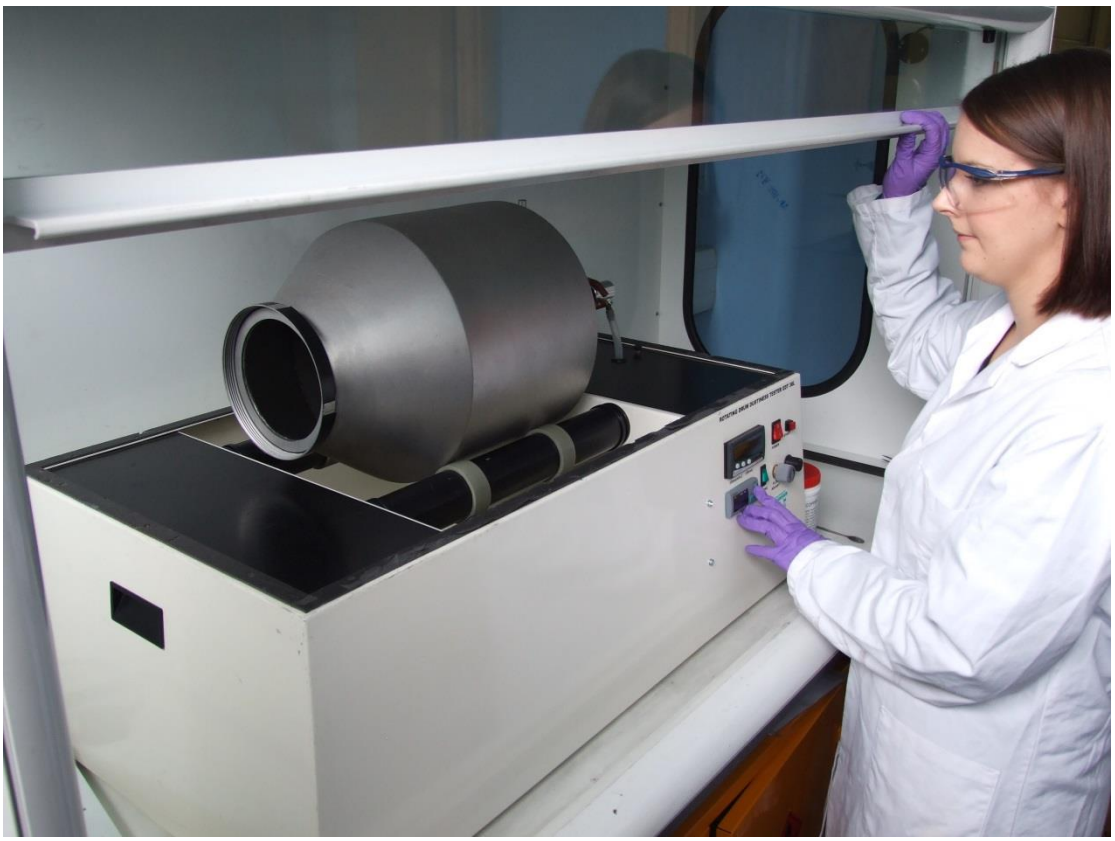
IOM

WORKING FOR A HEALTHIER FUTURE

Dustiness Testing of Bulk Powders to EN15051-2

Determining the Exposure Potential of Bulk Materials

Dustiness evaluation is relevant in the context of general material characterisation used to support regulatory compliance for bulk powders. Under REACH, dustiness is assessed in order that handling and exposure risks can be evaluated, controlled and minimised.



We are a leading provider of health and safety solutions to industry, commerce, public sector and professional bodies. We have a wealth of expertise and experience, enabling us to provide practical solutions to a broad spectrum of workplace health needs.

Dustiness Testing

Dustiness is defined as the propensity of materials to produce airborne dust during handling. Dry powder and bulk material handling can generate dust which can affect:

- Potential exposure to workers;
- The need for ventilation and filtration systems;
- Loss of material and contamination of machinery and products.

Dustiness testing is undertaken according to the European Standard EN 15051:2006 "Workplace atmospheres-Measurement of the dustiness of bulk materials-Requirements and reference test methods".

Materials are classified by the European standard in accordance with the measured values of inhalable, thoracic and respirable dustiness mass fractions, as detailed below:

Category of Dustiness	Inhalable Dustiness Mass Fraction mg/kg	Thoracic Dustiness Mass Fraction mg/kg	Respirable Dustiness Mass Fraction mg/kg
Very low	< 300	< 80	< 10
Low	300 – 650	80 – 300	10 – 60
Moderate	650 – 3000	300 – 1000	60 – 210
High	> 3000	> 1000	> 210

Dustiness and Risk Assessment

Dustiness evaluation can be used within the broad spectrum of complimentary material characterisation methods available to inform risk assessment.

As detailed in EN15051, the level of dustiness generally depends on materials-specific and process-specific parameters. As part of the dustiness analysis, material specific parameters are also determined:

- Particle size distribution analysis by laser diffraction;
- Moisture content;
- Bulk density.

In addition, SWeRF analysis (size weighted respirable fraction analysis), including crystalline silica specific SWeRF in mixtures for CLP, can be undertaken to offer further understanding on the potential respirability of materials.

The dustiness method simulates a wide range of material handling processes used by industry, with dustiness characterisation applicable to material characterisation under REACH, able to support manufacturing processes and batch control decisions, as well as able to provide information to tackle health-based concerns.

Compliance-driven Analysis

Materials characterisation is an important aspect in understanding the potential hazards presented by bulk powders and nanomaterials, as well as a requirement for regulatory compliance. IOM has extensive experience in providing data for substance characterisation to support these needs.

To obtain Dustiness analysis of materials, contact us to discuss your requirements and receive a quote.

OUR ANALYSIS TECHNIQUES

Particle Characterisation

- Dustiness testing of bulk powders to EN15051-2
- Particle Size Distribution (PSD) of dry powders and wet dispersions by laser diffraction to ISO 13320:2009 and ISO 14487:2000, and dynamic light scattering to ISO 22412:2008
- Size Weighted Respirable Fraction (SweRF) analysis by laser diffraction to ISO 13320:2009
- Zeta-potential and molecular weight analysis to ISO 13099-2:2012
- Microscopy and elemental analysis by SEM/EDXS
- Absolute density by helium pycnometry
- Nanoparticle characterisation as per the EC recommended definition 2011/696/EU
- Other specialist characterisation (e.g. TEM, BET)
- Aerosolisation and size-fractionation for the analysis of respirable particles based on aerodynamic size

Morphology & Chemical Analysis

- Elemental analysis, including trace metal content by ICP-AES and SEM/EDXS
- Organics & VOCs analysis by GC-FID, GC-MS and HPLC
- Acids anions by IC
- Crystalline silica analysis by XRD
- Elemental Carbon determination (NIOSH 5040) for carbon-based nanomaterials
- Bio-durability assessment
- Other specialist characterisation (e.g. FT-IR, XPS, SIMS, NMR, UV-vis, Raman)

OUR COMPANY

The Institute of Occupational Medicine (IOM) is one of the leading providers of workplace health research, consulting and services. Our expertise extends across a very wide range of disciplines.

We have a reputation for high quality, authoritative and independent measurement, surveys and reporting, which we undertake for hundreds of clients – large and small – each year.

Today, IOM is one of a select few internationally recognised authorities on workplace health around the world.

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