

Development of OECD
Test Guideline and Guidance
documents:
Dustiness of Manufactured
Nanomaterials

ATEX, non-HARN, HARN and
exposure models

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NanoHarmony



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Background – the OECD proposal

Dustiness of Manufactured Nanomaterials

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2 EU Projects
Gov4Nano (non-HARN NP)
Nanoharmony (HARN and highly reactive NP)



Scientific basis for
Dustiness testing of ENMs
(1 new TG) & ,(2 new GDs)

April 2022: First draft TG at WNT
April 2023: First Draft GD at WNT



✓ Dustiness = a key parameter

EN 15051-2:2008 : Propensity of materials to produce airborne dust during handling

- Relevant in assessing the risk assessment of exposure
- Potentially useful to support the identification of hazardous scenarios such as dispersion, fire, explosion

Determination of the dustiness of MNs (1 TG)

i) Non-HARNs and HARNs

and its subsequent use of dustiness data (2 GDs) for

i) exposure modelling, and

ii) to improve ATEX safety approaches

Nanoobjects to be tested:

SiO2:NM 203,NM204 , 244 FP

TiO2:PC 105 (MSSA) anatase ,NM 103,
NM105, 244 FP

+ other HARNs (TBD),& reactive materials

Support the current and foreseeable future
regulatory needs

(ex: Reg 2020/878, Reg 2018/1881, Dir 99/92- 2014/34)

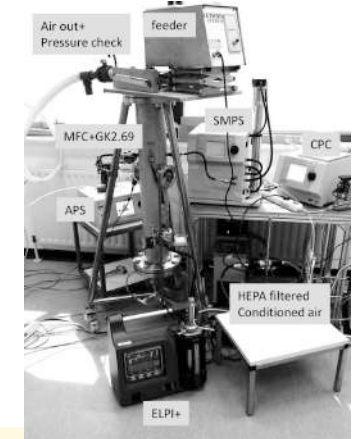
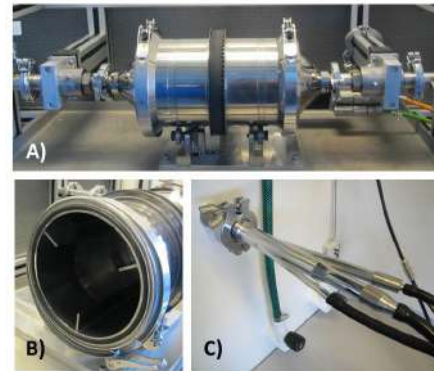


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Different types of Dustiness generation apparatuses to be tested



- **Rotating drum method (RD)**
 - EN 17199-2:2019 (& EN15006): (COM, ITC- Universitat Jaume I, INRS, NRCWE)
- **Small rotating drum (SRD)**
 - EN 17199-4:2019; (NRCWE, BAM, INRS, and CIOP-PIB)
- **Vortex shaker method (VS)**
 - EN 17199-5:2019; (INRS, KRIS, CEA, KTH, LNE, INERIS)
- **Continuous drop method (CD)**
 - EN 17199-3:2019; (TNO, ITC- Universitat Jaume I)
- **Fluidizer**
 - (BAuA, NRCWE, and CYPRUS Institute)
- **Venturi dustiness testing device**
 - (NIOSH/CDC, IPT- University of Wuppertal, and KTH)
- **Continuous drop (CD)-Palas Dust View II**
 - BAM



DUSTINESS TESTING

1TG: Generation of dustiness data and method-specific dustiness ranking schemes for future regulatory risk management classification of powders

1 GD : use of dustiness data for exposure assessment modelling

1 GD: use of dustiness data to support ATEX industrial risk analysis

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Positive Response from 18 international collaborators

Immediate actions: Harmonize dustiness SOPs, Elaborate result templates, start testing.



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ATEX

- TG - Add some ATEX safety provisions in the TG
Include a caveat : occupational, including ATEX risks, should be assessed according to national regulations – Details of ATEX risks assessment are reported in the associated GD
- GD – A flow chart for Determination of the explosivity nature of the powder – For non-HARN , HARN and reactive nanomaterials discussed, to be implemented in the GD

Dustiness testing programme (TG)

- Most proposed methods have potential to support regulatory information requirements for dustiness testing.
- This dustiness testing programme may provide enough generated data and knowledge to establish some method-specific ranking schemes for NMs
-useful for down-stream users to assess occupational & ATEX risks and safety by design
- Agreements on mandatory measurands to be harmonized and determined for all the methods to the extent possible





Use of dustiness data for occupational exposure assessment (GD)

- Agreement on GD content: provide guidance on how to use the dustiness data (as a function of handling energy and dustiness kinetics as modifying factors) for estimating source and predict occupational exposure.
- A database with 47 different materials, sampled in connection with exposure measurement studies was created for this project

- Call for additional occupational exposure measurements during handling of nanomaterial for which corresponding dustiness levels are available (contact Ana Sofia Fonseca (agf@nfa.dk) and Carla Ribalta (crc@nfa.dk))
- More participants would be greatly appreciated to expand the studies on the determination of handling energy factors for different dustiness methods (preliminary data is already available for CD and SRD methods)

Dustiness of HARNs (TG)

- Most important measurands & aerosol sampling & instrumentation techniques via SEM and TEM identified and potentially useful for REACH framework

- Official Call for participation in the TG HARN interlaboratory comparison round robin (beginning of 2021 to be completed April –September 2021) (contact: pohl.anna@buaa.bund.de)

