



DATA SHEET

EU Commission Regulation 2020/878

How often have you reviewed a safety data sheet (SDS) and seen the phrase 'may form explosible dust-air mixtures if dispersed'? This statement can often be found for solid materials but what does this really mean, and should you be concerned?

When handling / processing hazardous materials one important document that should be available is the safety data sheet (SDS). This document provides information on the safe storage, handling and disposal as well as potential health hazards. It also provides hazard statements based on the material's physicochemical properties.

When reviewing an SDS the phrase 'may form explosible dust-air mixtures if dispersed' is often found in section 7: Handling and Storage but this really doesn't tell you much about the potential explosion hazards / risks associated with the material in question. The first question that should be asked after seeing this generic statement would be 'Is the material actually a combustible dust?'

As a crude rule of thumb, powders with an average particle size distribution above 500 μm are not usually capable of propagating combustion. Below this threshold most organic substances will be capable of propagating combustion. A particular challenge is posed by materials with a high average particle size distribution – but which contains "fines" formed by attrition or during the manufacturing process. In the event of dispersion, the fines will remain suspended for a much longer duration – hence posing an ignition risk even when the homogeneous bulk material will not. For this reason, particle size as defined by distribution is less relevant in assessing the risk than looking at the actual distribution – and particularly the percentage of fines present. Having decided which powder fraction to test, it is necessary to determine if the material is combustible when dispersed.

ISO/IEC 80079-20-2: Explosive atmospheres, Part 20-2: Material characteristics - Combustible dusts test methods detail a standardised approach to assessing whether a dust sample is capable of forming a flammable atmosphere. This involves attempting to ignite the material as a dispersed dust cloud using various types of ignition sources from an electrical spark to heated wires and high energy chemical igniters. If the material fails to ignite then it does not pose an explosion risk under atmospheric conditions. Whereas if the material is found to ignite then how should you assess the potential risk?

After identifying that the material is capable of forming a flammable atmosphere, the next step would be to assess the handling / process for potential flammable atmospheres, in both normal and abnormal conditions. When these zones have been identified, you need to consider what potential ignition sources are present and whether they pose a risk. This is where additional information on a safety data sheet would be beneficial. If the SDS provides basic information on the dust explosion properties, such as minimum ignition energy (MIE), minimum ignition temperature of a dust cloud (MIT) and minimum ignition temperature of a dust layer (LIT) then this would give you a good starting platform to establish a suitable basis of safety through avoidance of ignition sources.

These three parameters would be applicable for many, if not all, handling operations or processes, yet this information is rarely found in an SDS. However, it is becoming more widely recognised as key safety information that needs to be relayed to the user and has been adopted within the Globally Harmonized System of Classification and Labelling of Chemicals (GHS) eighth revised edition

(Annex 11) as well as implemented within the Biocides directive (EEC/528/2012). In addition to this the European Chemicals Agency (ECHA) has issued a draft document providing guidance on the compilation of safety data sheets which also includes key combustible dust data in section 9.2.2 relating to the formation of explosible dust/air mixtures. The amendment, to Annex II of REACH, known as Commission Regulation (EU) 2020/878, will come into force on 1st January 2021 and all new EU safety data sheets from this date will have to comply. For materials pre-dating 1st January 2021, manufacturers will have a two-year period in which to revise and update SDS's to include the newly required data.

The new requirements will not necessarily be directly usable in a specific plant environment. Segregation of particle sizes (or size reduction processes such as milling), for example, can radically alter explosion sensitivity and severity. The impact of a range of variables on combustible dust properties is the subject of a [separate DEKRA whitepaper](#). Furthermore, the basic properties listed on an SDS under the new requirements may not be sufficient to support alternative bases of safety such as nitrogen inerting.

At DEKRA we're able to provide technical support and testing services to aid in the compilation of a robust Safety Data Sheet for your materials. We have state of the art purpose-built laboratories to undertake dust explosion, physical properties, physical hazards and transport classification testing. Our quality and safety accreditations (Good Laboratory Practice (GLP), ISO9001 and ISO45001) are designed and maintained to ensure absolute reliability in the service we provide. Data you can trust and unrivalled support from the global leaders in process safety and regulatory testing.

If you have any concerns or questions related to the topic above, please do not hesitate to contact us on dekra-ops.uk@dekra.com

DEKRA Organisational & Process Safety

DEKRA Organisational and Process Safety are a behavioural change and process safety consultancy company. Working in collaboration with our clients, our approach is to assess the process safety and influence the safety culture with the aim of 'making a difference'.

In terms of behavioural change, we deliver the skills, methods, and motivation to change leadership attitudes, behaviours and decision-making among employees; supporting our clients in creating a culture of care and measurable sustainable improvement of safety outcomes is our goal.

The breadth and depth of expertise in process safety makes us globally recognised specialists and trusted advisors. We help our clients to understand and evaluate their risks, and work together to develop pragmatic solutions. Our value-adding and practical approach integrates specialist process safety management, engineering and testing. We seek to educate and grow client competence to vide sustainable performance improvement; partnering with our clients we combine technical expertise with a passion for life preservation, harm reduction and asset protection.

We are a service unit of DEKRA SE, a global leader in safety since 1925 with over 45,000 employees in 60 countries and 5 continent. As a part of the world's leading expert organisation DEKRA, we are the global partner for a safe world.

For more information, visit www.dekra.nl/nl/onze-dienstverlening/process-safety/

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