Minimum Explosible Concentration (MEC)

The Minimum Explosible Concentration determines the lowest concentration of a dust or powder that will allow combustion. The test follows BS EN 14034-3 and may be used for DSEAR risk assessments and hazardous area classification.

Minimum Explosible Concentration

The minimum explosible concentration is the lowest concentration of dust or powder that will ignite on contact with an ignition source and propagate a dust explosion.

A weighed quantity of dust is placed in the storage chamber and the explosion chamber is then evacuated to 0.4 bar absolute. An automatic test sequence is initiated to pressurise the dust storage chamber to 20 bar g and activate the ignition source 60 ms after the dust has been dispersed. This procedure ensures that the dust explosion takes place at atmospheric pressure and at such a degree of turbulence that the explosion data obtained are compatible with results from tests in a 1m³ vessel.

A test series is undertaken with a systematic increase of the dust concentration until ignition of the dust/air mixture is observed. The test is then repeated with a dust connection 10g/m³ lower and the dust concentration is reduced further until a concentration is reached at which no ignition of the dust/air mixture is observed in three consecutive tests.

An ignition is deemed to have occurred if the maximum explosion pressure is at or above 0.4 bar.

Test Results

The test determines the minimum explosible concentration of a dust that will allow a dust explosion.

Examples of typical dangerous substances in the workplace:

- Acrylic Polymer
- Aluminium Dust
- Amino Alcohol
- Bronze Powder
- Carbon Black
- Carbon Fibre Dust
- Cereal Flake Dust
- Coal Dust
- Coke Dust
- Composite Dust
- Curry Powder
- Dimethyl-phenylpyrazolidone
- Dried Sewage Sludge
- Fibre Insulation
- Flour
- Glass Fibre Polyurethane
- Grain Dusts
- Gum Arabic
- HDPE
- Hydroxy-methyl-phenylpyraolidone
- Leather Dust
- Liquorice Powder
- Melamine Dust
- Paper Dust
- Paraformaldehyde
- Pharmaceutical Powders
- Phenolic Resin
- Pigment Powder
- Polyelectric Powder
- Plastic Dust
- Potato starch
- Refined sugar
- Resin Dust
- Sodium Flurbiprofen
- Sulfaramide
- Tea
- Wood
Please see our dust web page for a full list of BRE’s dust services including:

- Dust or powder testing
- DSEAR consultancy
- Risk Assessment and hazard identification
- Hazardous area zoning
- DSEAR—Staff and safety training in fire and explosion awareness (health and safety)
- Explosion prevention and protection (risk management)
- Equipment for use in hazardous areas
- HAZOP for DSEAR/ATEX compliance

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PROTECT PEOPLE, PROPERTY AND THE PLANET

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- researching and writing standards
- testing and certification in the areas of fire, electronics, security, and sustainability
- undertaking research and consultancy for clients and regulators
- promulgating standards and knowledge throughout the industry through publications and events
- developing and delivering training

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