

Dust Explosion Hazard Assessment



Advancing the Science of Safety

Is your facility at risk of a dust explosion?

Industrial processes often produce combustible dust, either as waste or commercial product. Dust explosion hazards are prevalent throughout industry and often threaten worker safety and business continuity. With increased awareness of combustible dust hazards, more facilities are now dealing with this issue and looking to answer some important questions:

- Is the dust or powder handled at my facility explosible, and if so, is there potential for an explosion?
- What is considered industry best practice in preventing or mitigating dust explosion hazards? Are we doing the right things to prevent an accident?
- Are there gaps in our basis of safety compared to industry best practice? If so, what practicable and economical measures are available towards closing these gaps?

JENSEN HUGHES helps its clients address these questions by using an integrated approach towards combustible dust hazards management:



Material Testing and Hazard Evaluation

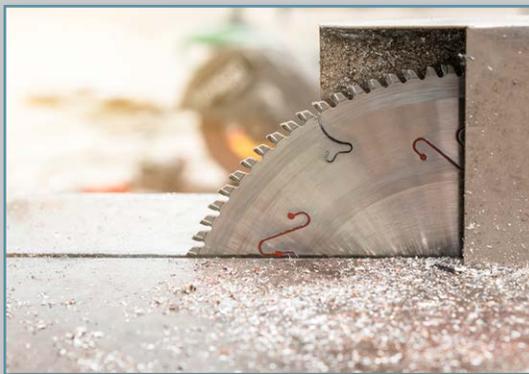
JENSEN HUGHES has established the only commercial dust explosibility test laboratory in Canada. We use this state-of-the-art facility to test whether your dust is explosible, and then to further characterize the material hazards in terms of potential explosion severity and ignition sensitivity.

Our consultants work with you to formulate and implement a dust sampling and testing strategy to produce the process safety data necessary to effectively evaluate and manage dust explosion hazards at your facility.

Equipment and Building Hazard Evaluations

As part of a Dust Hazard Analysis (DHA), each piece of equipment is evaluated for conditions which could lead to an explosion. Existing protection measures are evaluated against industry best practice (e.g., NFPA standards). If there are gaps, practicable and cost-effective solutions are offered.

Areas outside equipment are also reviewed for hazardous conditions. Specifically, fugitive dust accumulation is identified and evaluated to determine if there are flash fire or explosion hazards. Guidelines are offered towards establishing an effective housekeeping program.



INDUSTRIES WE SERVE

- | | |
|-------------------|---------------------------|
| Pharmaceutical | Pulp, Paper, and Forestry |
| Defense | Wood Processing |
| Agriculture | Food and Grain |
| Rubber & Plastics | Chemical |
| Metal Processing | Fertilizer |
| Power Generation | Biomass/Wood Pellet |
| Mining | Textiles |





We use our state-of-the-art laboratory to determine key dust explosibility parameters.

Whether a combustible dust is explosible depends on its physical and chemical properties such as moisture content, particle size and morphology. The standardized approach in evaluating dust explosibility is to perform a “Go/No-go” screening test on a representative dust sample— if it’s a “Go”, then further tests are performed to determine key explosibility parameters. These parameters characterize potential explosion severity and likelihood of ignition, and they are necessary for the design of explosion protection systems and for establishing a basis for safety.



ADDITIONAL SERVICES

- Combustible Dust & Flammability Testing
- Process Hazard Analyses
- Hazardous Area Classification Studies
- Equipment Strength Evaluations
- Explosion Vent Design
- Design Review and Commissioning
- Explosion Prevention
- Expert Testimony
- Product Compliance and Testing
- Educational Seminars & Training

CANADIAN OFFICES

- Vancouver
- Richmond
- Calgary
- Edmonton
- Toronto
- Ottawa
- Halifax



DUST EXPLOSIBILITY PARAMETERS

Parameter	Test Method	Industrial Applications
Explosion Severity (K_{St} , P_{max})	ASTM E1226	Venting Suppression Containment Isolation Partial Inerting
Minimum Explosible Concentration (MEC)	ASTM E1515	Control of Dust Concentrations
Minimum Ignition Energy (MIE)	ASTM E2019	Control of Ignition Sources
Minimum Dust Cloud Ignition Temperature (MIT)	ASTM E1491	Control of Process and Surface Temperatures (Dust Clouds)
Layer Ignition Temperature (LIT)	ASTM E2021	Control of Process and Surface Temperatures (Dust Layers)
Limiting Oxygen Concentration (LOC)	ASTM E2931	Inerting (with Gaseous Diluents)

Commitment + Research

Our Professional Engineers are dedicated to the betterment of industry best practice, as evidenced by our published contributions in scientific journals and conference proceedings, and also by our long-standing, active participation on numerous technical committees related to combustible dust hazards, such as the NFPA Technical Committee for Explosion Protection Systems (NFPA 68 and 69), and Fundamentals of Combustible Dusts (NFPA 652).

For combustible dust and flammability testing services, contact:

Martin Clouthier M.Sc., P.Eng.
 T 1 844 900 DUST (3878)
 E dust@jensenhughes.com