This is a two-day advanced course on dust and powder explosion hazards. The course addresses all aspects of dust explosion hazards. The emphasis of this course is dust properties, explosion modeling, preventive measures, ignition sources, protective measures, process hazard analysis, legislation, and case studies. It enables attendees to better understand dust hazards, to recognize potentially serious events, and to implement effective safeguards. The course will prove helpful to experienced engineers, safety supervisors, and operating managers who are committed to safe workplaces.

**CONTENT**

- Dust Explosion Accidents
- Dust Explosion Basics and Dust Explosion Characteristics
- Ignition Sources
- Legislation and Standards
- Preventive Measures:
  - Introduction
  - How to Perform a Hazardous Area Classification
  - Avoidance of Ignition Sources
  - Housekeeping
- Protective Measures:
  - Introduction
  - Dust Explosion Venting Design
  - Dust Explosion Suppression Design
  - Dust Explosion Isolation
- Dust Explosion Process Hazard Analysis
- Dust Explosion Modeling
AGENDA

Day 1

09:00 Registration and Coffee

09:30 Opening
Why is dust a problem? Statistics on dust explosions: equipment involved, ignition sources, dust types

09:45 Dust Explosion Accidents
Examples of accidents: Imperial Sugar, West Pharmaceutical, Jahn Foundry, Bremer Hammer Mühle, etc.

10:15 Dust Explosion Basics and Dust Explosion Characteristics
Combustion mechanisms, explosion properties and test methods, influence factors

10:45 Coffee Break

11:00 Ignition Sources
Mechanical sparks, hot surfaces, static electricity, hot work

12:00 Lessons Learned: Legislation and Standards
US legislation, OSHA's NEP, NFPA standards

12:30 Lunch

13:30 Preventive Measures 1: Introduction
Inerting, avoidance of ignition sources, housekeeping, hazard area classification

14:30 Coffee Break

14:45 Preventive Measures 2: How to Perform a Hazardous Area Classification
Guidance, important factors to consider, examples

15:30 Preventive Measures 3: Avoidance of Ignition Sources
Demands to electric and mechanical equipment

16:15 Coffee Break

16:30 Preventive Measures 4: Housekeeping
Why? How? NFPA 654, OSHA's NEP

17:15 Questions and Answers

Day 2

08:00 Arrival and Coffee

08:30 Protective Measures 1: Introduction
Principles of explosion venting, suppression, isolation, and containment

09:00 Protective Measures 2: Dust Explosion Venting Design
How to calculate vent sizes, practical examples of dust handling equipment, vent panels, recoil forces, external effects, vent ducts, examples of poor design

10:15 Coffee Break

10:30 Protective Measures 3: Dust Explosion Suppression Design
Design of explosion suppression. Important factors: detection, dust reactivity, vessel parameters, and hardware properties. Examples of dust handling equipment

11:15 Protective Measures 4: Dust Explosion Isolation Design
Features regarding the use of slam-shut valves, extinguishing barriers, diverters, rotary valves, explosion flap valves

12:00 Lunch

12:45 Dust Explosion Process Hazard Analysis
How to perform a sound dust explosion hazard analysis. Examples of dust handling equipment, how to comply with OSHA's NEP

13:45 Dust Explosion Modeling
Using CFD to describe explosion propagation and protection measures for complex dust handling equipment geometry. Examples of design and accident investigation

14:45 Questions and Answers

15:15 Small-Scale Demonstration

16:30 McNeese Lab Tour

The lecturers include explosion experts Dr. Kees van Wingerden and Dr. Scott Davis.