Combustible dusts are fine particles of combustible solids that present a fire or explosion hazard when suspended in air under certain conditions. A dust explosion can be catastrophic, causing employee injuries and deaths along with significant property damage. Between 1980 and 2005, there were 281 documented combustible dust incidents in the United States which resulted in 119 deaths, 718 injuries, and extensive property damage. These incidents occurred in 44 states, many different industries, and involved a variety of combustible dusts. Employers and employees were unaware that a hazard even existed in many combustible dust accidents.

OSHA embarked on a National Emphasis Program (NEP) in 2007 to inspect facilities that generate or handle combustible dusts which pose a fire or explosion hazard when suspended in air, regardless of particle size or shape. BakerRisk can assist clients with identifying combustible dust explosion hazards, carrying out needed testing, evaluating whether a facility is in compliance with the intent of applicable national codes and standards (e.g., NFPA 654), performing a risk assessment, and developing preventative and mitigation strategies.

The NFPA 654 standard governs combustible dust fire and explosion hazards at many facilities. Other NFPA standards govern these hazards for specific industries (e.g., NFPA 61 for agricultural and food processing facilities, NFPA 664 for wood processing facilities, and NFPA 484 for facilities processing metal). The NFPA 69 standard provides methods to prevent dust explosion hazards and the NFPA 68 standard provides guidance on the application of explosion venting to control dust explosion hazards.
OVERVIEW OF NFPA 654

“NFPA 654: Standard for the Prevention of Fire and Dust Explosions from the Manufacturing, Processing, and Handling of Combustible Particulate Solids” contains comprehensive guidance on the control of dusts to prevent explosions. The following are some of its most important recommendations:

- Minimize the escape of dust from process equipment or ventilation systems
- Use dust collection systems and filters
- Utilize surfaces that minimize dust accumulation and facilitate cleaning
- Provide access to all hidden areas to permit inspection
- Inspect for dust residues in open and hidden areas, at regular intervals
- Clean dust residues at regular intervals
- Use cleaning methods that do not generate dust clouds, if ignition sources are present
- Only use vacuum cleaners approved for dust collection
- Locate explosion vents and relief valves away from dust hazard areas using guidance provided in NFPA 68
- Develop and implement a hazardous dust inspection, testing, housekeeping, and control program (preferably in writing with established frequency and methods)

BAKERRISK SERVICES

Compliance Audits
Assist with review of practices and provide recommendations on how to meet industry standards (e.g., NFPA) and how to minimize risk associated with combustible dust hazards. Consulting advice on explosion prevention and impartial guidance on choice and design of explosion protection systems to satisfy NFPA 68 & 69 (e.g., relief venting, containment, suppression, use of inert gas, isolation techniques, etc.)

Incident Investigation
Assistance with gathering complete, accurate, and objective incident data. Provide support for the cause and origin investigation and, if needed, assist with subsequent litigation issues.

Dust Testing Recommendations
Facilitate testing services and provide impartial recommendations of which combustible dust tests to conduct (Pmax, Kst, LOC, MIE, MIT), how to interpret results, and what they mean to the user.

Combustible Dust Hazard PHA
Facilitate and provide subject matter expert support for process hazard analyses (PHA) with focus to identify and mitigate hazards associated with handling combustible dusts. Each relevant NFPA standard requires that all operations that handle combustible dusts must have performed and documented a PHA.