

Combustible Dust

Combustible dust consists of fine particles that can **ignite or explode when suspended in air** under certain conditions. Many everyday materials become hazardous when processed into dust.

Common Combustible Dust

- Wood and paper
- Sugar, flour, grain, and food products
- Coal
- Plastics and rubber
- Metals (such as aluminum and magnesium)
- Textiles and biosolids

Why It's Dangerous

When dispersed in air, combustible dust can **cause fires, flash fires, or explosions** that results in serious injuries, fatalities, and major facility damage.

The Dust Explosion Pentagon

A dust explosion occurs when all five elements are present:

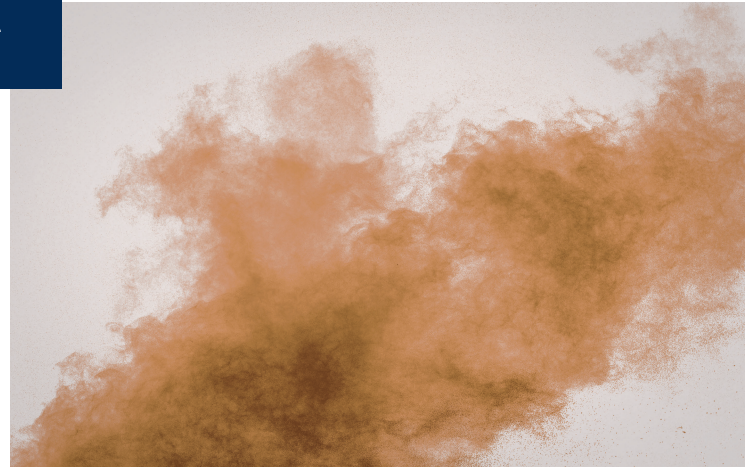
1. Combustible dust (fuel)
2. Oxygen (air)
3. Ignition source (heat, spark, flame)
4. Dust dispersed in the air
5. Confinement (enclosed space)

Remove just **one** element, and an explosion cannot occur.

High-Risk Activities

Combustible dust is often created during:

- Cutting, grinding, sanding, polishing
- Mixing, conveying, sifting, or crushing
- Drying of wet materials
- Poor housekeeping that allows dust buildup



Key Prevention Strategies

- Control and minimize dust generation
- Use proper ventilation and dust collection systems
- Eliminate or control ignition sources
- Keep equipment grounded and bonded
- Clean dust regularly, never used compressed air
- Design systems with explosion venting or suppression
- Use properly rated electrical equipment

Training and Awareness

Employers should ensure workers:

- Understand combustible dust hazards
- Know where dust may be generated or accumulate
- Follow safe work practices and emergency procedures

Proper hazard communication and training saves lives.



Combustible Dust

Industry-Specific Risks & Prevention

Combustible dust is a **serious but often overlooked** hazard across many industries. When fine dust becomes airborne and meets an ignition source in a confined space, it can cause **fire, flash fires, or explosions**.

Bakeries & Food Processing

Common Dusts:

- Flour
- Sugar
- Grain and starch products

High-Risk Activities:

- Mixing, sifting, conveying ingredients
- Bag dumping and ingredient transfer
- Dust accumulation on ledges, equipment, and ceilings

Key Prevention Tips:

- Use dust collection systems at mixers and transfer points
- Clean surfaces routinely, avoid compress air
- Control ignition sources near ovens and mixers
- Ground and bond equipment to prevent static discharge

Pharmaceutical Manufacturing

Common Dusts:

- Active pharmaceutical ingredients (APIs)
- Excipients and powdered chemicals
- Pharmaceuticals (pill dust)

High-Risk Activities:

- Tablet pressing and coating
- Powder blending and transfer
- Drying and milling processes

Key Prevention Tips:

- Use enclosed systems where possible
- Maintain proper ventilation and filtration
- Control static electricity during powder handling

Wood Products & Manufacturing

Common Dusts:

- Sawdust
- Wood flour
- Fine wood particles

High-Risk Activities:

- Cutting, sanding, planing, and routing
- Dust buildup in ducts and collection systems
- Improperly maintained dust collections

Key Prevention Tips:

- Maintain dust collection and exhaust systems
- Empty collection bins regularly
- Inspect ducts and collectors for blockage or leaks
- Keep ignition sources away from dust accumulation areas

Metal Fabrication

Common Dusts:

- Aluminum
- Magnesium
- Titanium and other fine metal dusts

High-Risk Activities:

- Grinding, polishing, sanding
- Cutting and finishing operations
- Dry dust collection of metal particles

Key Prevention Tips:

- Use dust collectors designed for metal dust
- Never mix metal dusts with other materials
- Control sparks and hot work activities
- Follow proper storage and disposal procedures

