

# from experience

## Mitigating Dust Collection Hazards

Since 2006, the U.S. Chemical Safety Board (CSB) has reported more than 100 combustible dust incidents, 20% of which involved food products. In that time, the National Fire Protection Association also published NFPA Standard 652: Standard on the Fundamentals of Combustible Dust, as discussed in a [2017 Hixson From Experience article](#). That standard provided the industry with a documented program for conducting a Dust Hazard Analysis (DHA). The DHA should include the dust collecting systems in your facility, which the CSB has cited in the past as being responsible for a large portion of all dust explosions. Listed below are some good design practices that Hixson considers to help minimize combustible dust hazards:

- Maintain sufficient airflow at adequate velocity (generally 3,500 to 4,500 feet per minute (fpm) – higher for some dusts) to eliminate particulate buildup in ductwork, which can turn into fuel in dust explosions.
- Design collection points with minimum required face velocities to capture dust over the entire opening of the hood or pickup point.
- Design airflow at each hood or pickup point to convey and control the collected dust.
- Do not modify (add to, blank off, change size, disconnect, etc.) branch lines without considering how the change will affect overall system performance.
- Use lockable air flow blast gates or fixed orifice (to bleed air from removed branches) for system balance.
- Maintain proper documentation including the range of particulate sizes, system flow rates, velocities, static pressures, pressure drops through equipment, etc.
- Certify that dust control system components are dust tight.
- Have appropriate explosion protection systems and deflagration isolation systems in place where required.
- Construct ductwork of metal, or noncombustible, conductive material.
- Use tapered transition pieces with the included angle of the taper not more than 30 degrees for changes in duct size.

### The Four Cs of Dust Collection

<p><b>CONTAIN</b></p>  <p><i>Don't spill dry materials or allow them to escape.</i></p>	<p><b>CAPTURE</b></p>  <p><i>Confine dust with hoods or plenums.</i></p>
<p><b>CONVEY</b></p>  <p><i>Use air to move dust through ductwork at adequate velocities.</i></p>	<p><b>COLLECT</b></p>  <p><i>Filter the conveying air to remove dust particles.</i></p>

### experience in brief

For sizing ventilation equipment, specifying duct and face velocities, and other key design parameters, consult Industrial Ventilation, published by the American Conference of Governmental Industrial Hygienists (ACGIH).

### continuing education

Hixson associates regularly participate in continuing professional education events across the country. To learn more about the events listed below, e-mail Hixson at: [info@hixson-inc.com](mailto:info@hixson-inc.com)

[Local Exhaust Ventilation From Experience June 2019](#)

[Food Engineering's 43rd Annual Plant Construction Survey June 2020](#)

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