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2018 MID-YEAR

COMBUSTIBLE DUST INCIDENT REPORT

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LETTER FROM THE AUTHOR

DR. CHRIS CLONEY

Director, DustEx Research Ltd.



How big is the combustible dust problem around the world?

Although my PhD thesis focused on scientific research into dust and hybrid mixture explosion, this more practical question of lives touched by combustible dust incidents has always loomed in the back of my mind.

In the opening of my thesis, I listed sources reporting over 2000 incidents, 4000 injuries, and 1000 fatalities around the world since the start of the 20th century: 1404 explosions in North America (1900 – 2005), 269 explosions in Japan (1952 – 1995), 357 explosions in Germany (1965 – 1980), 984 fires and explosions in the United Kingdom (1958 – 1988), and 72 explosions in China (1981 – 2011).

Finding these incidents proved quite difficult as the data is scattered across textbooks, government reports, reports by standardized bodies, and articles from scientific journals. Each of these sources, in turn, referenced dozens, if not hundreds, of other sources for their information.

The dispersed nature of information around combustible dust hazards is just one of the challenges facing our community. Other challenges include lack of general awareness of the hazards, limited generation of knowledge from past incidents, effective communication between stakeholders, and a lack of advocacy to influence change across the globe.

Our purpose at DustEx Research Ltd. and DustSafetyScience.com is to tackle these challenges one-by-one. We are looking to provide a platform for the powder safety community to learn, discuss, educate and work towards reducing loss in these industries. The semi-annual incident reporting gives our community a chance to check-in on our progress and to measure the effectiveness of global safety programs. It also provides a tool that we can use to measure and manage our success moving forward.

As always, I appreciate your readership, your support, and your help to spread the word about combustible dust safety. In these exciting times, I look forward to seeing what we can achieve together as we move into the second half of 2018 and beyond.

All the best,

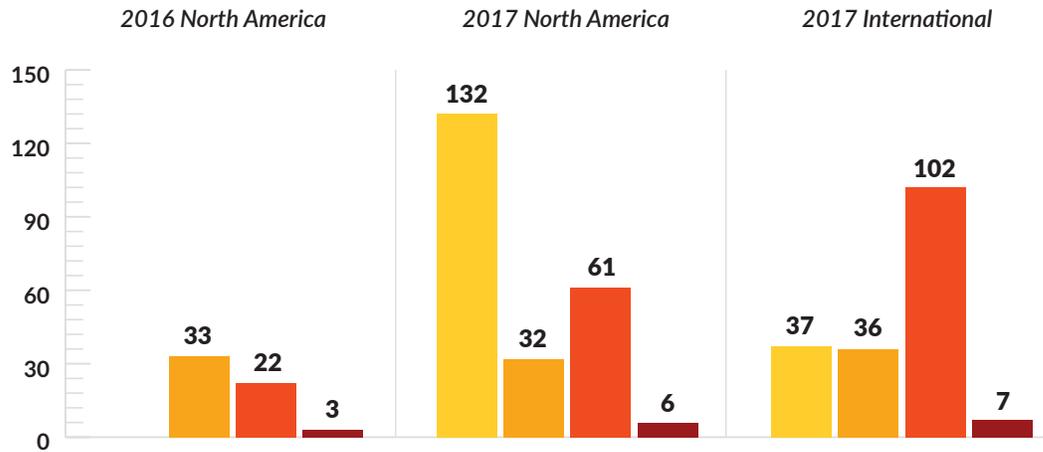
Chris

P.S. Have feedback on the incident reporting? Email me at chris@dustsafetyscience.com

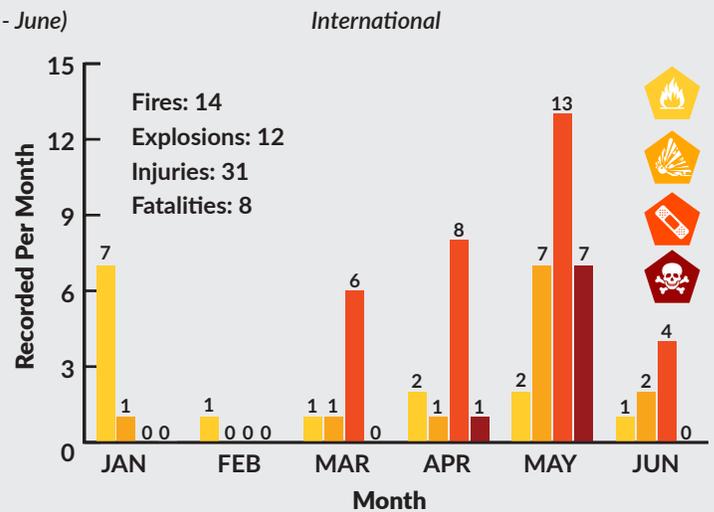
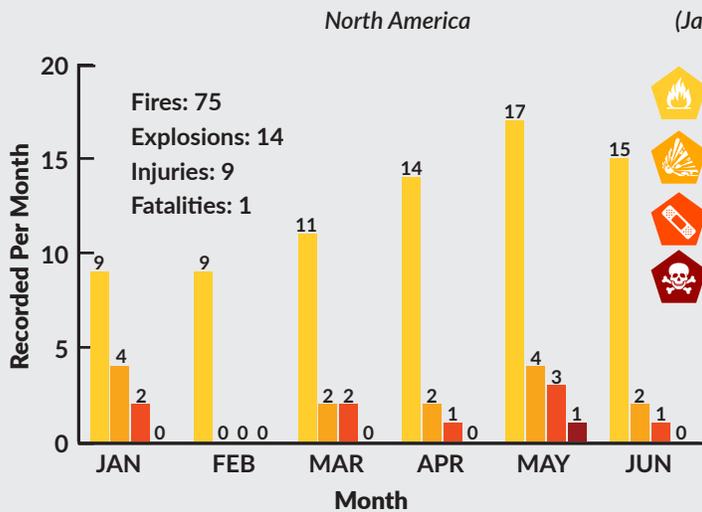
“There’s a famous quote by Peter Drucker, business management consultant: ‘You can’t manage what you don’t measure.’ That’s what my work is about, that is what the Combustible Dust Incident Database is about.”

- iPBS Powder Show Presentation 2018

REPORT SUMMARY



2018



COMPARISON OVER TIME

Although international data is limited, the Combustible Dust Hazard Study published by the US Chemical Safety Board gives information on explosions in the United States. From this report 5- and 25-year trends can be calculated as of 2005:

1980-2005: 11 Explosions, 28 Injuries and 5 Fatalities Per Year
2001-2005: 19 Explosions, 43 Injuries and 9 Fatalities Per Year

The current reporting effort gives the following averages since 2016:

2016-2018: 31 Explosions, 34 Injuries and 4 Fatalities Per Year

This suggests that the number of explosions per year is increasing over time. It also tentatively suggests that the explosions may be less severe although we have yet to see a year with zero fatalities in the United States.

2018 LOSS OVERVIEW

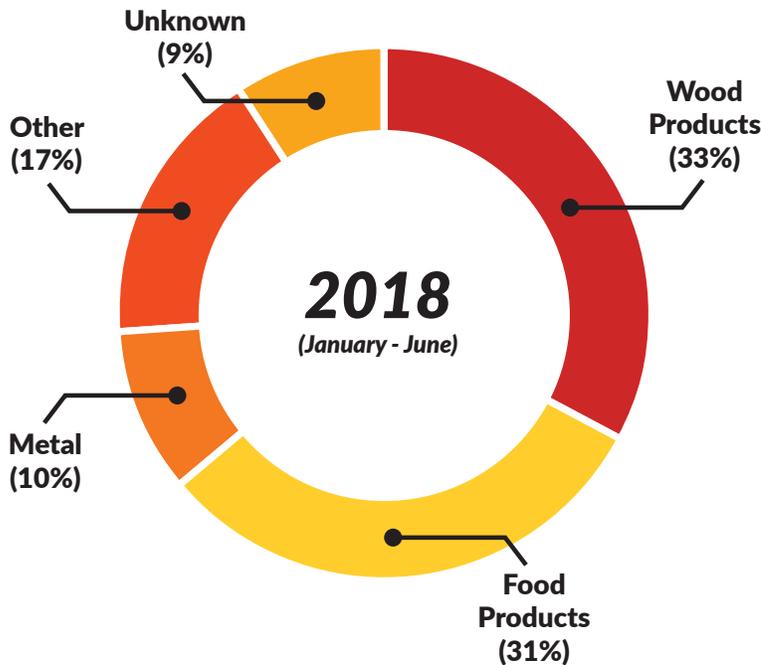
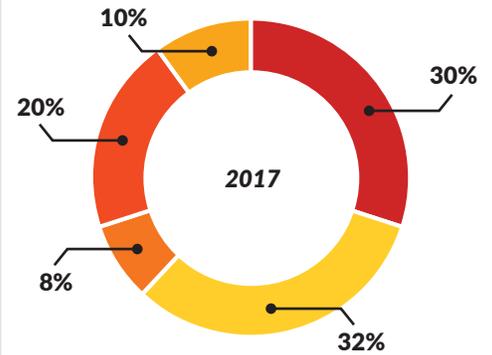
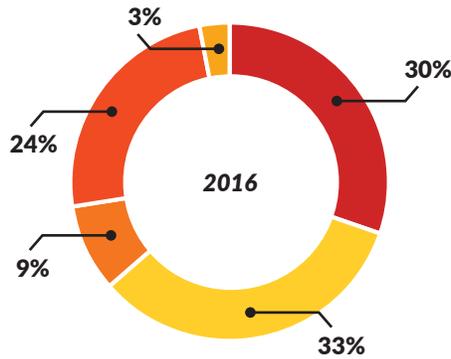
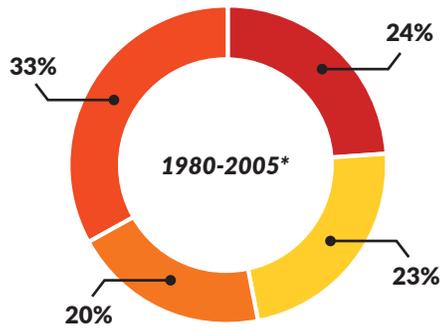
From the 2018 global data, 89% of the fatalities occurred due to explosions. From the injuries, 70% occurred from explosions while 30% were from fires. Some of the more severe incidents include:

- [Seven Killed in Grain Silo Explosion](#) (Port Aqaba, Jordan)
- [One Killed in Grain Elevator Explosion](#) (South Sioux City, NE)
- [Ten Injured in Metal Dust Explosion](#) (Changhua, Taiwan)

In North America, the trend for capital cost was reversed from personal loss. Out of the 11 incidents with a reported loss of \$1 Million and above, 8 were from fires and 3 were from explosions. Three incidents were recorded with losses above 15 million:

- [Cotton Seed Elevator Fire in Altus, Oklahoma](#) (\$20 Million)
- [Coal Silo Explosion in San Juan, New Mexico](#) (\$15-20 Million)
- [Metallurgic Dust Fire in Muskegon, Michigan](#) (\$15 Million)

MATERIALS INVOLVED



DISCUSSION POINTS

As shown in the historic data, wood and food products make up to 45% or more of the materials involved in combustible dust fires and explosions. Combustible products of wood processing include sawdust, chips, shavings, fibers and pellets. Food products included grain, flour, barley, pecan, cocoa, spices, and cereals in 2018.

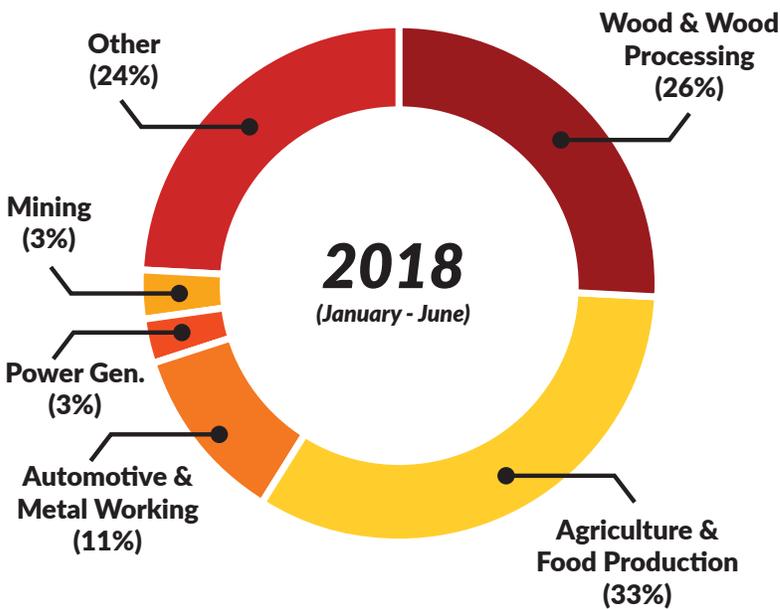
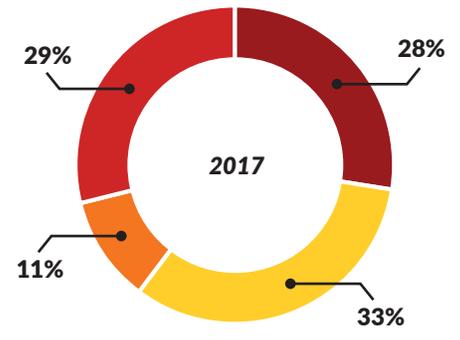
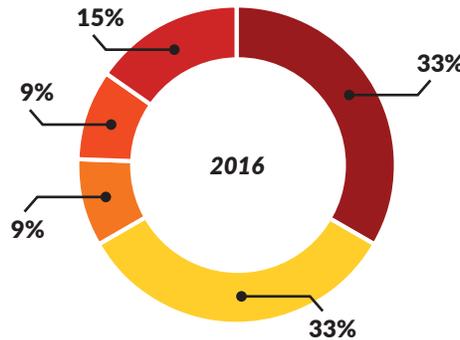
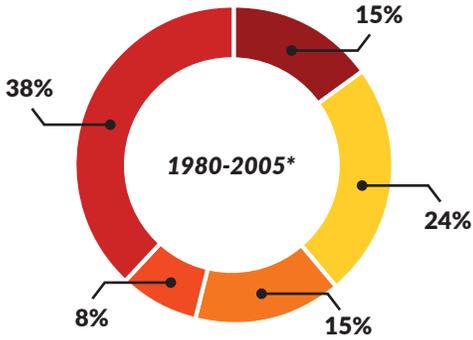
Although wood and food products have a similar proportion of the overall incidents, the global 2018 data suggests that food products have a disproportionately higher percentage of explosions and more severe incidents:

Wood Products: 33 Fires, 5 Explosions, 10 Injuries, 0 Fatalities
 Food Products: 24 Fires, 12 Explosions, 14 Injuries, 8 Fatalities

Other materials besides wood, food, and metal made up an average of 25% of the incidents considering all of the data. In 2018 these materials included paper, coal, carbon, sulfur, textile, and toner.

US Chemical Safety Board (2006), "Combustible Dust Hazard Study" Report No. 2006-H-1

INDUSTRIES INVOLVED



DISCUSSION POINTS

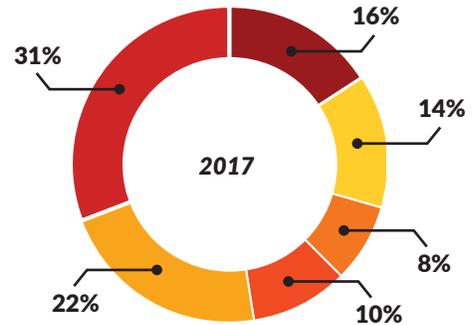
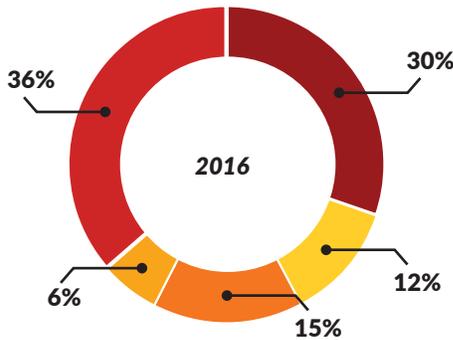
Again, wood processing, agricultural activities, and food production make up a large proportion of the overall fire and explosion incidents. Other industries not broken out in the data include: Pulp & Paper, Education, Coatings, Oil and Gas, Textiles, Recycling, and Other Manufacturing.

According to the 2018 incident data, Wood and Wood Product industries tended to have larger capital cost from combustible dust incidents. Out of the 11 incidents which reported losses of \$1 million or more, six occurred in wood working, biomass storage, and pellet manufacturing industries. Five of these were fires and one was an explosion. Combined, these incidents resulted in \$24 million in reported losses although the unreported losses are likely much higher.

The remaining five 'High-Loss' incidents included an explosion in a metal die-casting facility, two coal dust explosions at power generation and mining operations, respectively, and a fire at a cottonseed facility.

US Chemical Safety Board (2006), "Combustible Dust Hazard Study" Report No. 2006-H-1

EQUIPMENT & CAUSES



No data for 1980-2005

DISCUSSION POINTS

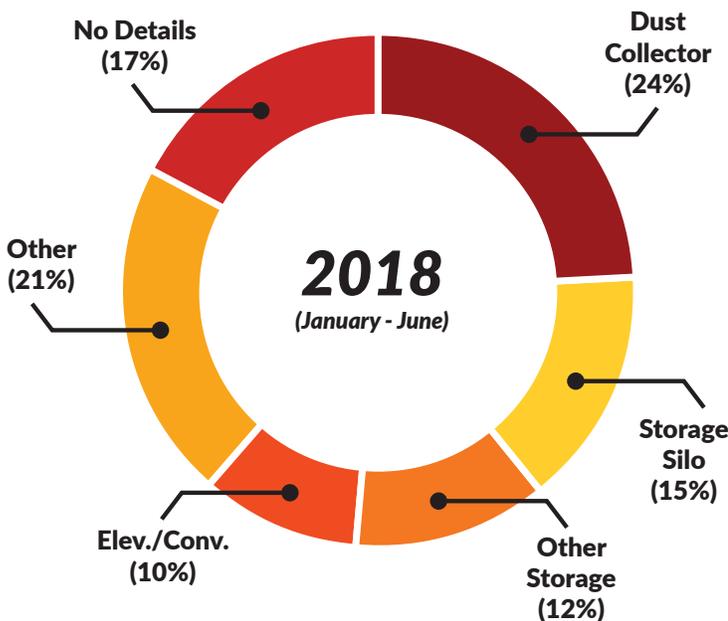
Dust collection equipment is the leading cause of combustible dust incidents with an average just over 20% since 2016. However, this value is less than the historical data which suggests an incident rate of up to 40%.

Dust collectors also make up a smaller proportion of the recorded dust explosions than the historical data with storage silos, elevators, and conveyors involved in more. The breakdown between fires and explosions in 2018 for different equipment is:

Dust Collectors:	25 Fires	3 Explosions
Storage Silos:	8 Fires	9 Explosions
Other Storage:	12 Fires	2 Explosions
Elevators/Conveyors:	7 Fires	5 Explosions
Other:	21 Fires	3 Explosions
No Details:	16 Fires	4 Explosions

There is very little data available outlining the initiating causes of fire and explosion incidents. Out of the seven incidents in North American wood handling industries with more than \$1 million in losses or that caused injury in 2018, two mentioned sparking from equipment and one mentioned an air compressor as contributing factors.

Perhaps more telling is that each of these 'high-loss' incidents mentioned accumulation of combustible material such as sawdust, wood chips, lumber, and insulation as contributing to rapid spread of the building fire and firefighter difficulties in responding to the incident. Proper housekeeping may not stop the incident from occurring, but in all cases, it can reduce the total loss.



2018 OSHA CITATIONS

ISSUANCE DATE	INDUSTRIAL ACTIVITY	STATE	VIOLATIONS	INITIAL PENALTY	CURRENT PENALTY	INSPECTION NUMBER	STATUS	CITATION LINK
Jan 17	Printing Services	OH	1	\$6,467	\$5,174	1259793.015	Closed	More Info
Jan 17	Deydrated Food Processing	NY	9	\$155,205	\$155,205	1250461.015	Open	More Info
Jan 19	Woodworking and Millwork	OK	11	\$39,579	\$39,579	1256134.015	Open	More Info
Jan 19	Fertilizer Manufacturing	ME	9	\$686,292	\$47,799	1269702.015	Open	More Info
Jan 24	Equipment Manufacturing	WI	4	\$48,227	\$23,282	1255618.015	Open	More Info
Jan 30	Metal Tank Manufacturing	AL	10	\$101,800	\$51,000	1266870.015	Open	More Info
Jan 30	Plastic and Resin	WV	2	\$12,934	\$9,700	1279599.015	Open	More Info
Feb 2	Paint and Coating	WI	1	\$5,497	\$3,848	1259598.015	Open	More Info
Feb 5	Dental Equipment	AL	7	\$39,735	\$39,735	1275989.015	Open	More Info
Feb 8	Plastics and Resin	NY	1	\$9,147	\$9,147	1274530.015	Open	More Info
Feb 23	Paper Products	WI	4	\$38,248	\$38,248	1272259.015	Open	More Info
Mar 18	Metal Services	PA	5	\$12,750	\$7,778	1262338.015	Open	More Info
Mar 12	Carbon/Graphite Products	OH	1	\$5,497	\$3,848	1297749.015	Closed	More Info
Mar 20	Smelting and Refining	PA	2	\$21,313	\$15,975	1280334.015	Closed	More Info
Mar 23	Food Processing	IL	3	\$16,815	\$16,815	1267703.015	Open	More Info
Apr 3	Plastic Packaging	IL	4	\$27,716	\$27,716	1275487.015	Open	More Info
Apr 12	Food Processing	NY	3	\$21,619	\$16,216	1273034.015	Open	More Info
Apr 17	Wood Products	TX	4	\$95,322	\$95,322	1272047.015	Open	More Info
Apr 19	Adhesive Manufacutring	WI	3	\$14,118	\$7,000	1278584.015	Open	More Info
Apr 19	Wood Products	MA	5	\$25,872	\$9,240	1272727.015	Open	More Info
Apr 27	Textile Coating	MA	5	\$50,444	\$25,225	1274754.015	Open	More Info
May 16	Wood Products	WI	3	\$13,304	\$5,174	1296278.015	Open	More Info
May 18	Comercial Baking	NJ	2	\$18,294	\$14,000	1297478.015	Open	More Info
May 22	Plating & Polishing	IL	7	\$24,392	\$24,392	1295568.015	Open	More Info
May 23	Wood Products	TX	6	\$54,879	\$27,440	1289686.015	Open	More Info
May 30	Food Processing	WI	2	\$20,787	\$14,552	1280845.015	Closed	More Info
Jun 15	Metal Foundary	NY	1	\$6,467	\$6,467	1283599.015	Open	More Info

Inspections Resulting In Citations: 27

Total Citations: 115

Total Initial Penalties: \$1,572,720

Total Current Penalties: \$722,812

Initial Penalty/Citation: \$13,675

Initial Pentalty/Inspection: \$58,248

**Information was collected from OSHA Data & Statistics by searching for the Combustible Dust National Emphasis Program under inspection details with citations that include the General Duty Clause*



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GRAIN SILO EXPLOSION PORT AQABA, JORDAN | MAY 14, 2018 *Seven Fatalities, Three Injuries*

BACKGROUND

There is some confusion about the circumstances surrounding the grain silo explosion. Port Aqaba appears to be part of a \$10 billion-dollar residential redevelopment project where the second phase (currently on hold) involves relocation of the existing grain silo facilities. However, in July 2017, The Jordan Times reported on efforts to double the storage capacity of the grain silos, which were to be completed by the end of the year.

INCIDENT DESCRIPTION

The silo explosion was reported to have occurred during removal and demolition. Initial reports stated that the explosion was initiated from sparks arising when workers were cutting iron in the vicinity of oxygen cylinders. Images received from personal communications show what appears to be burn marks on equipment inside the silo and rupture of casings around bucket elevators in the facility.



OUTCOME

The explosion caused extensive damage to the silo structure blowing out several of the brick walls. Nine workers were injured in total with five passing away during the first week following the incident. News reports stated that a sixth worker passed away on May 21 and a seventh on May 29. At least one company has been charged in violation of standard safety procedures in relation to the incident.



Image Sources: Personal Communication

Incident Database: [Explosion During Grain Silo Demolition Kills Seven in Aqaba, Jordan](#)



GRAIN ELEVATOR EXPLOSION

SOUTH SIOUX CITY, NEBRASKA | MAY 29, 2018

One Fatality, One Injury

BACKGROUND

The grain elevator is located in South Sioux City, Nebraska and contains a 200-foot structure with a 30-foot drying cone on top. At the time of the explosion, three workers were getting ready to transfer grain in the elevator. Limited details are available on the processing operations outside of this publicly available information.

INCIDENT DESCRIPTION

Witnesses stated that the explosion started at the top of the elevator and worked its way down, blowing out several of the cement walls of the structure. Nearby residents also reported hearing 3-5 minor explosions half-hour after the initial explosion. The incident ruptured a nearby gas line which was allowed to burn until the utility company could stop the gas flow. Collapse of the remaining structure was a major concern and nearby residents were evacuated after the incident.

OUTCOME

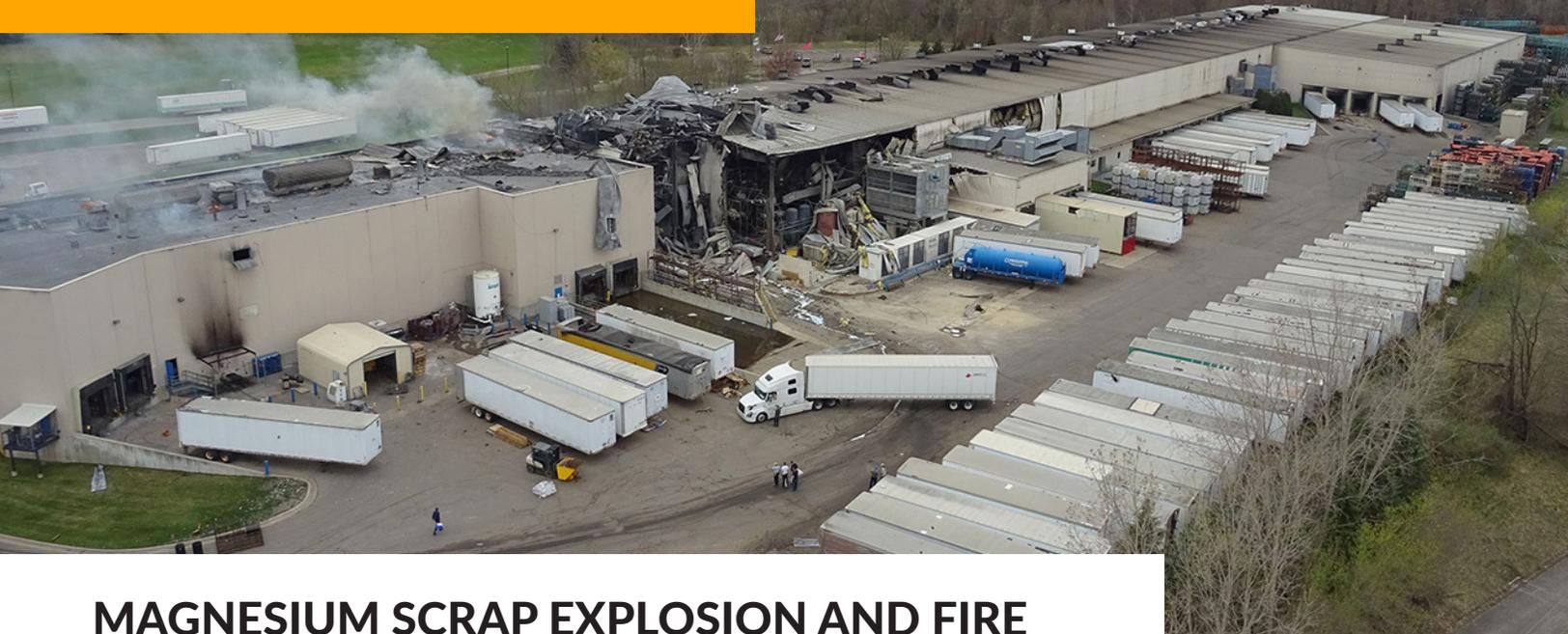
Two of the three employees on site were injured during the explosion. One was treated for minor injuries at the scene while the other was transferred to the hospital with serious burn injuries. News agencies reported that this individual unfortunately passed away on July 13.

In addition to the injuries, 50 individuals were evacuated from their homes. Demolition of the damaged top of the elevator took two weeks, after which point residents were allowed to return home. The remaining demolition was reportedly going to take up to mid-July.

Image Sources: Justin Wan [Sioux City Journal](#) (Top), Tim Hynds [Sioux City Journal](#) (Side)

Incident Database: [One Killed and One Injured in Grain Elevator Explosion in South Sioux City, Nebraska](#)





MAGNESIUM SCRAP EXPLOSION AND FIRE

EATON RAPIDS, MICHIGAN | MAY 2, 2018

Two Injuries

BACKGROUND

The Magnesium Products facility in Eaton Rapids focuses on die-casting automotive parts for the transportation industry. The facility employs 450 individuals and is the largest employer in the community. New agencies reported that fires “break out often” at the facility, but none of the same magnitude as the current incident.

INCIDENT DESCRIPTION

News agencies and the Eaton Rapids City Manager stated that the fire originated in the “tunnel” area of the facility where magnesium scraps are transported on a conveyor line. This was followed by a series of explosions that occurred at the facility. The fire chief’s report was released to the public and indicated that the cause of the initial fire and explosion was unknown. However, the second and third explosions were the result of burning magnesium reacting with the water from fire suppression systems.

OUTCOME

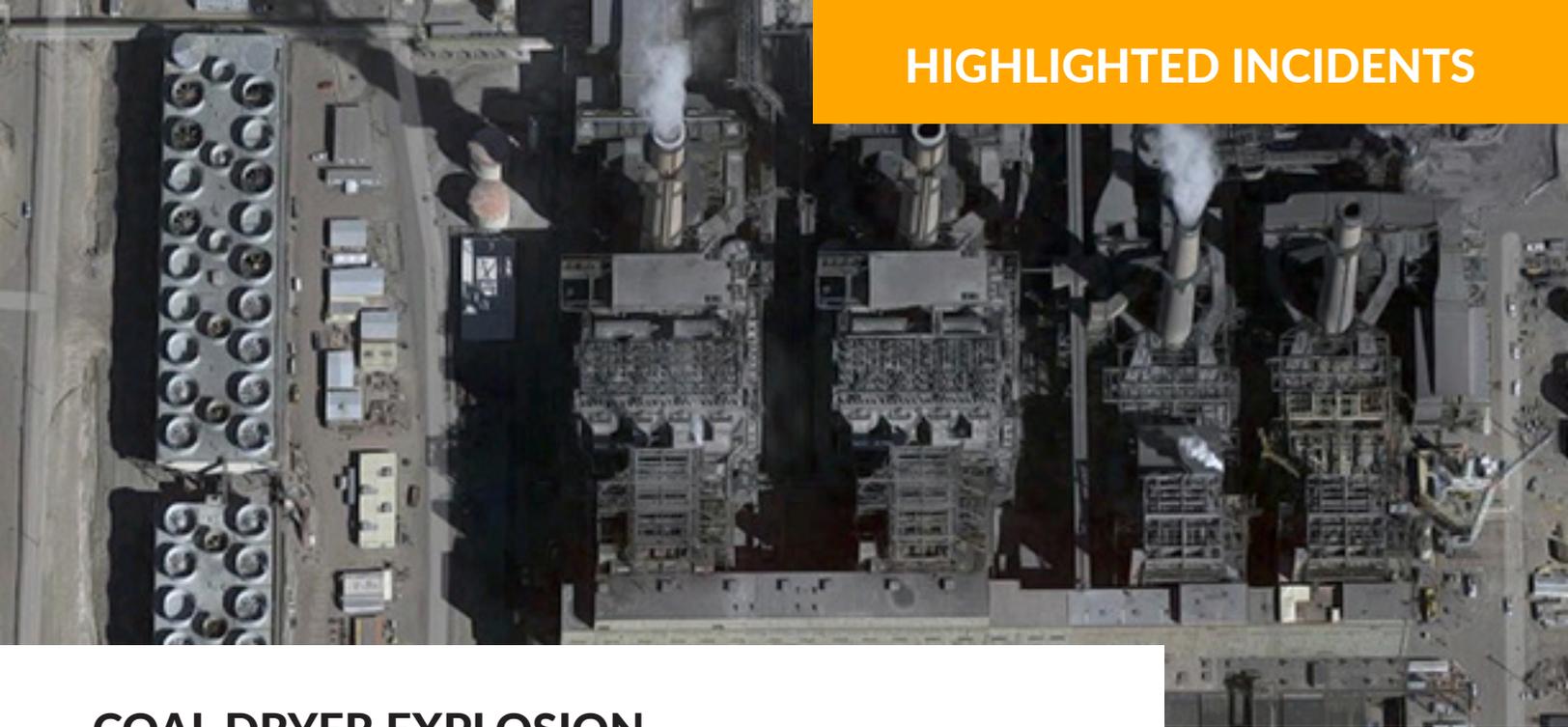
Two employees were injured during the multiple explosions. One was injured by debris during the explosions. The second was thrown into the air and hit the door jamb on the way out of the building. OSHA currently has an inspection open from this incident which is flagged under the Combustible Dust National Emphasis Program.

In addition to the injured employees, the magnesium facility fire and explosions had a large impact on the automotive industry in North America. Industry trade publications reported that Ford, Chrysler, and General Motors were impacted as the Eaton Rapids facility was the main producer of specific parts for their vehicles.

Image Sources: Michigan State Police Drone Footage ([Lansing State Journal](#))

Incident Database: [Magnesium Dust Fire and Explosions in Eaton Rapids Michigan Injures Two and Cuts Automotive Parts Supply Line](#)





COAL DRYER EXPLOSION

SAN JUAN, NEW MEXICO | MARCH 17, 2018

\$15-20 Million in Damages

BACKGROUND

The San Juan Power Generation Station is located 15 miles West of Farmington, New Mexico. As the state's largest electricity provider, the plant serves more than 50,000 New Mexico residential and business customers and has been in operation since 1973.

INCIDENT DESCRIPTION

On March 17, the Unit 1 silo which was holding 614 tons of coal, collapsed causing an explosion and fire. A subsequent investigation determined that a faulty weld holding two sections of the silo together and corrosion led to the silo collapse. Dust in the falling coal was reported to have then exploded damaging nearby equipment in Unit 1.

OUTCOME

No one was injured in the silo collapse, coal dust explosion, or structural fire. Repairs to Unit 1 were estimated between \$15-20 million and a company spokesperson stated that the utility expected to have the unit back in service by June 2018. No status update is available on the repairs, but the utility is planning on moving away from coal and retiring the power station by 2022.

Image Source: Google Maps

Incident Database: [Faulty Weld Cause of Power Plant Explosion in Waterflow, New Mexico](#)



SPARK CAUSES METALLURGIC DUST FIRE

MUSKEGON, MICHIGAN | MARCH 13, 2018

\$14-15 Million in Damages

BACKGROUND

The Muskegon facility is part of the Port City group of companies focusing on aluminum die casting and rapid prototyping. The 75,000 square foot foundry where the fire occurred manufactures parts for the automotive industry.

INCIDENT DESCRIPTION

News reports state that the fire started from an equipment or propane tank malfunction which produced a spark and ignited oils and metallurgic dust near the rear of the facility. As firefighters arrived, they determined that there were multiple fires moving towards each other from different points in the facility. As the walls and ceilings collapsed, firefighters had to take a defensive position and flames could still be seen two days after the incident while the facility was being dismantled.

OUTCOME

None of the 40 employees on-site during the fire were injured. The foundry was completely destroyed with a rebuild cost estimated between \$14-15 million dollars. The company stated that no one will lose their jobs and that they plan to rebuild immediately.

Incident Database: [Dust Fire Destroys Muskegon, Michigan Foundry, Costs \\$15M to Rebuild](#)





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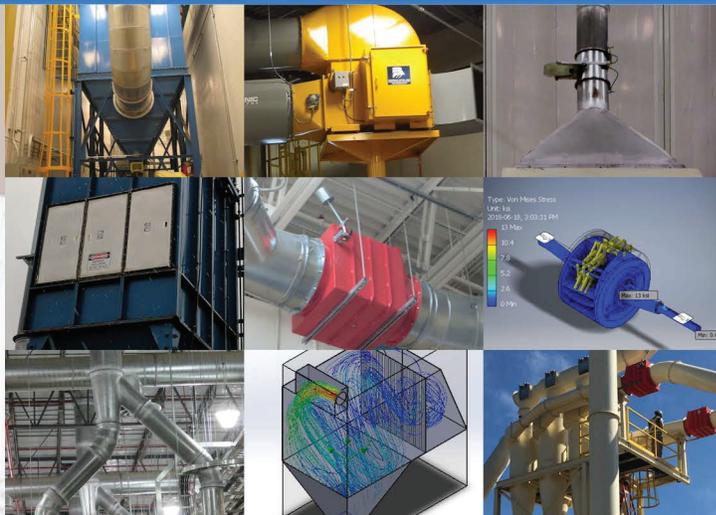
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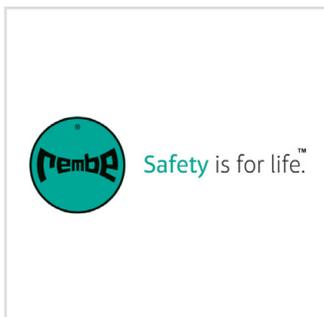
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Fauske & Associates LLC

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Email: info@fauske.com



Fauske & Associates provide expert safety testing, engineering, and training programs. Dust Hazards Analysis (DHA) includes combustible dust explosion and fire hazards testing, onsite assessments, OSHA/NFPA compliance, audit preparation, electrostatic hazards, ignition source evaluation and vent sizing calculations.

DSS MEMBER COMPANIES

	<p>Delfin Industrial Corporation</p> <p>2010 E Center Cir. Bldg. C #300 Plymouth, MN, 55441</p> <p>Phone: +1 877 205 9015 Email: sales@delfinindustrial.com</p> <p> </p>	<p>Delfin is a leading modern industrial vacuum company founded on strong values and lasting passion with the highest standards for service and efficiency. With a catalogue of 140 standard vacuum models, they have the ability to fulfill any individual customer requirement by targeting and customizing every proposal.</p>
	<p>Boss Products LLC</p> <p>6729 Guada Coma Dr. Schertz, TX 78154</p> <p>Phone: +1 360 263 2360 Email: info@bossproductsamerica.com</p> <p>   </p>	<p>Boss Products is your single source for EcoMAXX® and EcoMAXX®/VigilEX® Fire and Explosion Protection Solutions. ATEX Certified & FM Approved products that comply to NFPA Standards. Headquartered in Schertz, TX, Boss Products serves North and Latin America through a vast network of highly trained local distributors.</p>
	<p>CV Technology</p> <p>15852 Mercantile Ct, Jupiter, FL 33478</p> <p>Phone: +1 561 694 9588 Email: info@cvtechnology.com</p> <p> </p>	<p>CV Technology specializes in explosion protection solutions for the prevention and mitigation of explosion hazards related to combustible dust. Located in Jupiter, Florida, CV Technology manufacturers various explosion mitigation products including explosion vents, isolation valves, flameless vents, and chemical suppression equipment.</p>
	<p>AT Industrial Products</p> <p>3633 Pomona Blvd. Pomona, California 91768</p> <p>Phone: +1 909 593 8340 Email: info@atindustrialproducts.com</p> <p>    </p>	<p>AT Industrial Products has been keeping workers and processing equipment safe from combustible metal dust fires for 20 years. Specializing in wet dust collection equipment for the capture and containment of combustible metal dusts generated by sanding, grinding, sawing, cutting and deburring.</p>
	<p>Anpak Industry Support & ATEX</p> <p>Burggraaf 14, 8448MK Heerenveen, The Netherlands</p> <p>Phone: +31 611 247212 Email: info@anpak.eu</p> <p>   </p>	<p>Get Focused, Get Going, Get Results! If you do not know where to start in the “World of Process Safety” or are stuck with ATEX, PED, RI&E or HAZOP issues, ANPAK can help. Based out of Heerenveen, The Netherlands, ANPAK specializes in explosion safety and is IECEx CoPC 05 Certified.</p>

SPONSOR CASE STUDIES

IEP Technologies



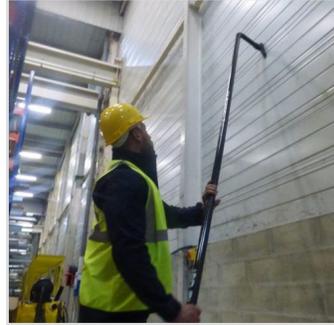
Dust Explosion Protection for Dried Whey Protein Products

Fike



The Importance of Testing when Designing Explosion Protection Systems

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Dust Collector Design and Installation in Metal Deburring Systems

UPCOMING EVENTS & TRAINING

REMBE® GmbH Safety + Control

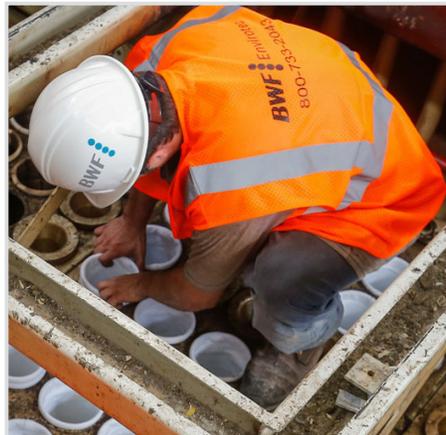


REMBE® Explosion Safety Days 2018 - Woodhandling Industry

Location: Brilon, Germany

Date: Oct. 23 & 24, 2018

BWF Envirotec, USA



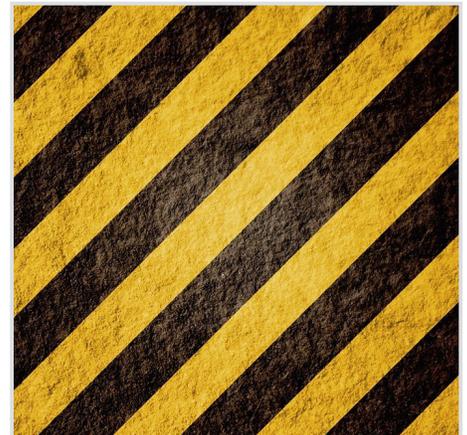
Dust Collector Training Academy

Location: Hebron, KY

Date: Sept. 25-27, 2018

April 2019; Sept. 2019

ExNB Certification Institute



ExAM - Ex Personnel Competency Training and Certification

Location: Various Locations

Date: Upcoming



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WOOD & WOOD PRODUCTS

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 3	Durgin & Crowell Lumber	Springfield, NH	Fire	Wood Dust	0	0	Planer Mill	\$5-10 Million	
Jan 15	Tatum Brothers Lumber	Lawtey, FL	Fire	Pine Dust	0	0	Compressor	\$1 Million	
Jan 27	Enviva Partners, LP	Chesapeake, VA	Fire	Wood Pellets	0	0	Domes/ Conveyor	\$1 Million	
Feb 1	Great Lakes Renewable Energy	Hayward, WI	Fire	Sawdust	0	0	Baghouse	No Details	
Feb 3	No Details	Danbury, NC	Fire	Wood Dust	0	0	Unknown	No Details	
Feb 6	Alberni Pacific Division	Port Alberni, BC	Fire	Sawdust	0	0	Sawdust Bin	No Details	
Mar 4	Klausner Trading USA	Live Oak, FL	Fire	Pine Dust	0	0	Shaker Unit	No Details	
Apr 16	Delta Timber & Landscape	Montrose, CO	Fire	Wood Dust	0	0	No Details	No Details	
Apr 23	Hardwoods of Michigan	Clinton, MI	Fire	Wood Dust	0	0	Silo	No Details	
Apr 24	Widner Product Finishing Co.	Rogers, TX	Explosion	Wood Dust	0	0	Dust Collector	\$1 Million	
Apr 27	Conklin Office Furniture	Holyoke, MA	Fire	Wood Dust	0	0	Dust Collector	No Details	
Apr 30	Shoun Lumber	Butler, TN	Fire	Wood Shavings	0	0	Hot Work	\$1 Million	
May 14	Ameriwood Industries	Tiffin, OH	Fire	Sawdust	0	0	Dust Collector	No Details	
May 23	Weyerhaeuser Co.	Columbia Falls, MT	Fire	Sawdust	0	0	Hot Work	No Details	
May 27	Whitsell Manufacturing Inc.	Cottage Grove, OR	Fire	Sawdust	0	0	No Details	\$10 Million	
May 28	Burmeister Woodwork	Hales Corners, WI	Fire	Wood Dust	0	0	Dust Collector	No Details	
Jun 1	Fornebu Lumber	Bathurst, NB	Fire	Wood Dust	0	0	Dust Collector	No Details	
Jun 5	No Details	Charlottesville, NY	Fire	Wood Dust	1	0	Sawmill Motor	No Details	
Jun 8	Fibrestick Manufacturing Ltd.	Sault Sainte Marie, ON	Fire	Wood Dust	0	0	Dust Collector	No Details	
Jun 19	DCI Corporation	South Royalton, VT	Fire	Sawdust	0	0	Bandsaw	No Details	

INCIDENT SUMMARY - INCIDENTS: 20 | FIRES: 19 | EXPLOSIONS: 1 | INJURIES: 1 | FATALITIES: 0

AUTOMOTIVE & METAL WORKING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Mar 13	Muskegon Castings Corp	Muskegon, MI	Fire	Metallurgic Dust	0	0	Machinery	\$15 Million	
Apr 4	Mann Metal Finishing	Hartford, MI	Fire	Magnesium Dust	0	0	Dust Collector	No Details	
Apr 25	Crystal Distributions Inc.	Elk River, MN	Fire	Metal Dust	0	0	Dust Collector	No Details	
May 2	Meridian Magnesium	Eaton Rapids, MI	Explosion	Magnesium	2	0	Conveyor	No Details	
May 4	Keystone Automotive	Brainerd, MI	Fire	Metal Dust	0	0	Dust Collector	No Details	
May 5	CWC Textron	Muskegon, MI	Fire	Iron Dust	0	0	No Details	No Details	
May 10	GKN Aerospace	El Cajon, CA	Fire	Titanium/ Aluminum	0	0	Dust Collector	No Details	
May 14	Miami Valley Polishing	Piqua, OH	Fire	Metal Dust	0	0	No Details	\$150,000	
Jun 12	Multimatic Inc.	Butler, IN	Fire	No Details	0	0	Dust Collector	No Details	
Jun 26	Clearbrook Iron Works	Abbotsford, BC	Fire	No Details	0	0	Dust Collector	No Details	
Jun 28	Harmony Castings LLC	Harmony, PA	Fire	Aluminum	0	0	Dust Collector	No Details	

INCIDENT SUMMARY - INCIDENTS: 11 | FIRES: 10 | EXPLOSIONS: 1 | INJURIES: 2 | FATALITIES: 0

AGRICULTURE

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 15	No Details	Buchanan, WI	Fire	No Details	0	0	Silo	No Details	
Feb 1	Kinneberg Farm	Preston, MN	Fire	Grain Dust	0	0	Grain Silo	No Details	
Feb 8	Feddick Farms	Medford, WI	Fire	Grain Dust	0	0	Grain Bin	No Details	
Feb 16	Island Dehy Inc.	Cozad, NE	Fire	Sawdust	0	0	Sawdust Shed	No Details	
Mar 8	Topflight Grain Cooperative	Beason, IL	Explosion	Corn	0	0	Grain Elevator	No Details	
Mar 30	Hanley Falls Cooperative	Hanley Falls, MN	Fire	Grain	0	0	Grain Elevator	No Details	
Apr 16	Scott Farm	Spiritwood, SD	Fire	Corn	0	0	Grain Bin	No Details	
Apr 26	Premium Ag Solutions	Hitterdal, MN	Fire	Corn	0	0	Grain Bin	No Details	
May 17	Frenchman Valley Cooperative	Dix, NE	Fire	Grain	0	0	Grain Elevator	\$100,000	
May 18	Local Farm	Baldwin, WI	Fire	Grain	0	0	Storage Silo	No Details	
May 25	Van Der Geest Dairy	Merrill, WI	Fire	Sawdust	0	0	Sawdust Tank	No Details	
May 29	Andersen Farms	South Sioux City, NE	Explosion	Corn	1	1	Grain Elevator	No Details	
Jun 1	Project for Pride for Living	Minneapolis, MN	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Jun 25	Petry Farms	Rochelle, IL	Fire	Grain Dust	0	0	Grain Bin	\$10,000	
Jun 28	IFG Export Grain Terminal	Lake Charles, LA	Explosion	Grain Dust	0	0	Storage Silo	No Details	
Mar 13	No Details	Stirling-Rawdon, ON	Fire	Corn	0	0	Corn Silo	No Details	

INCIDENT SUMMARY - INCIDENTS: 16 | FIRES: 13 | EXPLOSIONS: 3 | INJURIES: 1 | FATALITIES: 1

FOOD PROCESSING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 4	MGI Grain Processing	East Grand Forks, MN	Explosion	Grain Dust	0	0	Grain Elevator	\$200,000	
Jan 6	Bunge North America	Delphos, OH	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Jan 8	Andersons Denison Ethanol	Denison, IA	Fire	Grain Dust	0	0	Grain Bin	No Details	
Jan 31	South Georgia Pecan	Valdosta, GA	Explosion	Pecan	0	0	Storage Silo	No Details	
Apr 10	Cargill	Cedar Rapids, IA	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Apr 25	Jupe Feeds Inc.	Temple, TX	Explosion	Grain Dust	0	0	Grain Elevator	No Details	
Mar 25	Brady Enterprises	Weymouth, MA	Fire	Cocoa Dust	1	0	Compressor	\$300,000	
Mar 7	Frontier Cooperative	North Liberty, IA	Fire	Spices	1	0	Dust Collector	No Details	
May 29	Fowlerville Feed	Fowlerville, MI	Explosion	Grain Dust	0	0	Grain Bin	No Details	
Jun 21	C B Constantini Ltd	Brooks, AL	Fire	Grain Dust	0	0	No Details	\$8-10 Million	
Jun 25	TreeHouse Foods Inc	Lancaster, PA	Fire	Cereal Dust	0	0	Cereal Dryer	No Details	

INCIDENT SUMMARY - INCIDENTS: 11 | FIRES: 7 | EXPLOSIONS: 4 | INJURIES: 2 | FATALITIES: 0

PULP & PAPER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
May 3	International Paper	North Strabane, PA	Fire	Paper Dust	0	0	Dust Collector	No Details	
May 19	Proctor and Gamble	Green Bay, WI	Fire	Paper Dust	0	0	Paper Machine	No Details	
Jun 17	Catalyst Paper Co.	Wisconsin Rapids, WI	Fire	Wood Chips	0	0	No Details	No Details	

INCIDENT SUMMARY - INCIDENTS: 3 | FIRES: 3 | EXPLOSIONS: 0 | INJURIES: 0 | FATALITIES: 0

COAL MINING & PROCESSING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 18	Teck Resources	Elkview, BC	Explosion	Coal Dust	0	0	Dryer	\$5-10 Million	
Mar 17	The Harrison County Coal	Mannington, WV	Fire	Oxidized Coal	0	0	Storage Silo	No Details	
Mar 17	Public Service Company	San Juan, NM	Explosion	Coal Dust	0	0	Storage Silo	\$15-20 Million	
Mar 31	Gilberton Coal Company	Gilberton, PA	Fire	Coal Dust	0	0	Conveyor Belt	No Details	
Apr 18	GENON Coal Facility	Newburg, MD	Fire	Coal Dust	0	0	Coal Hopper	No Details	
Jun 18	Former Bowie Refined Coal	Brazil, IN	Fire	Coal Dust	0	0	No Details	No Details	

INCIDENT SUMMARY - INCIDENTS: 6 | FIRES: 4 | EXPLOSIONS: 2 | INJURIES: 0 | FATALITIES: 0

SCHOOLS & EDUCATIONAL FACILITIES

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 17	General McLane High School	Edinboro, PA	Fire	Wood Dust	0	0	Dust Collector	No Details	
Mar 10	East Greenwich High School	East Greenwich, RI	Fire	Wood Shavings	0	0	Trash Can	No Details	
May 8	Mason High School	Mason, OH	Fire	Wood Dust	0	0	Dust Collector	No Details	
May 16	Dale Jackson Career Center	Lewisville, TX	Fire	Sawdust	0	0	Dust Collector	\$500,000	

INCIDENT SUMMARY - INCIDENTS: 4 | FIRES: 4 | EXPLOSIONS: 0 | INJURIES: 0 | FATALITIES: 0

OTHER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 2	Evergreen Community Power	Reading, PA	Fire	Wood	0	0	Silo	No Details	
Jan 24	TIMET	Henderson, NV	Explosion	Magnesium	2	0	No Details	No Details	
Jan 31	Georgia Power	Floyd County, GA	Fire	Carbon Dust	0	0	Storage Silo	No Details	
Feb 11	Plymouth Energy LLC	Merrill, IA	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Feb 17	CemexUSA	New Braunfels, TX	Fire	No Details	0	0	Hopper	No Details	
Feb 27	Keystone Filler	Muncy, PA	Fire	Carbon Dust	0	0	Dust Collector	\$100,000	
Mar 2	Mayville	Beaver Dam, WI	Fire	No Details	0	0	Dust Collector	No Details	
Mar 22	Victor Technologies	West Lebanon, NH	Fire	Paper Filters	0	0	Dust Collector	No details	
Apr 4	Unknown	Artesia, NM	Fire	Sulfur Dust	1	0	No Details	No Details	
Apr 9	R.W. Lyall & Co	Corona, CA	Fire	No Details	0	0	Dust Collector	No Details	

OTHER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Apr 11	Sioux City Foundry Company	Sioux City, IA	Fire	Metal Dust	0	0	Dust Collector	No Details	
Apr 17	Unknown	Altus, OK	Fire	Cottonseed	0	0	No Details	\$20 Million	
May 2	No Details	Winona, MN	Fire	Textile Dust	0	0	Dust Collector	No Details	
May 3	Close the Loop	Hebron, KY	Explosion	Toner Dust	0	0	Dust Collector	No Details	
May 14	South Bend Ethanol LLC.	South Bend, IN	Fire	Grain Dust	0	0	Dryer Unit	No Details	
Jun 11	Crown Battery	Fremont, OH	Fire	No Details	0	0	Filter House	\$5,000	
Jun 11	Northeast Asphalt Inc	Green Bay, WI	Explosion	No Details	0	0	Conveyor Belt/ Silo	\$30,000	
Jun 22	Cogle's Recycling	Hamburg, PA	Fire	Cardboard Dust	0	0	Conveyor	\$60,000	

INCIDENT SUMMARY - INCIDENTS: 18 | FIRES: 15 | EXPLOSIONS: 3 | INJURIES: 3 | FATALITIES: 0

WOOD & WOOD PRODUCTS

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	LINK
Jan 26	Juken New Zealand	Matawhero, New Zealand	Fire	Sawdust	0	0	Dryer	
Jan 28	Dongwha	Southland, New Zealand	Fire	Wood Dust	0	0	Cyclone	
Jan 29	Corinthian Doors	Canning Vale, Australia	Fire	Wood Dust	0	0	Silo	
Jan 31	Southwood Export	Awarua, New Zealand	Fire	Wood Dust	0	0	No Details	
Apr 26	No Details	Rosenburg, Germany	Fire	Cellulose	7	0	No Details	
May 8	No Details	St. Georgen, Austria	Explosion	Wood Dust	1	0	Plate Grinder	
May 18	Righini	Tonneins, France	Explosion	Wood Chips	1	0	Dust Collector	
May 24	Mendip	Upper Milton, United Kingdom	Fire	Wood Shavings	0	0	Packing Area	
May 27	Borg Manufacturing	Mount Gambier, Australia	Explosion	Pine Chips	0	0	Storage Silo	
Jun 6	No Details	Kruikeke, Belgium	Explosion	Wood Dust	0	0	Storage Silo	

INCIDENT SUMMARY - INCIDENTS: 10 | FIRES: 6 | EXPLOSIONS: 4 | INJURIES: 9 | FATALITIES: 0

AGRICULTURE & FOOD PROCESSING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	LINK
Jan 4	National Cereals and Produce	Eldoret, Kenya	Explosion	Grain Dust	0	0	Dryer	
Jan 11	National Cereals and Produce	Eldoret, Kenya	Fire	Grain Dust	0	0	Dryer	
Jan 28	Bairds Malt Ltd.	Grantham, United Kingdom	Fire	Grain Dust	0	0	Hopper	
Mar 16	Agrícola Ganadera	La Angelita, Argentina	Explosion	Grain Dust	6	0	Storage Silo	
Apr 6	Deoleo	Andujar, Spain	Explosion	No Details	0	0	No Details	
May 14	No Details	Port Aqaba, Jordan	Explosion	Grain Dust	0	7	Grain Silo	
May 19	Manildra Flour Mill	Manildra, Australia	Explosion	Flour	1	0	No Details	
May 20	No Details	Julich, Germany	Explosion	Coal Dust	0	0	Coal Bunker	
May 22	Cargill SACI	San Martin, Argentina	Fire	Grain Dust	0	0	Conveyor Belo	
Jun 2	Bairds Malt Ltd.	Grantham, United Kingdom	Fire	Barley Malt	0	0	No Details	
Jun 6	Comptoir Agricole	Strasbourg, France	Explosion	Grain Dust	4	0	Grain Silo	

INCIDENT SUMMARY - INCIDENTS: 11 | FIRES: 4 | EXPLOSIONS: 7 | INJURIES: 11 | FATALITIES: 7

OTHER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	LINK
Jan 16	Essar Steel	Paradip, India	Fire	No Details	0	0	Conveyor Belt	
Feb 4	Energy Australia	Yallourn, Australia	Fire	Coal Dust	0	0	Coal Bunker	
Mar 12	No Details	Marsden, United Kingdom	Fire	Textile	0	0	No Details	
Apr 29	Bhansali Engineering Polymers	Madhya Pradesh, India	Fire	No Details	1	1	Fluid Bed Dryer	
May 2	No Details	Changhua County, Taiwan	Explosion	Aluminum / Magnesium	10	0	No Details	

INCIDENT SUMMARY - INCIDENTS: 5 | FIRES: 4 | EXPLOSIONS: 1 | INJURIES: 11 | FATALITIES: 1

ECOMAXX/VIGILEX FLAMELESS EXPLOSION VENTING SYSTEM

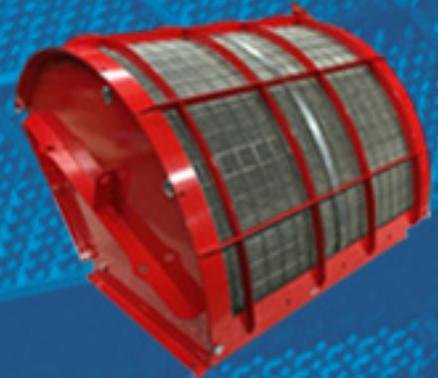


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24/7 dust monitoring in high-risk areas will immediately alert operators when abnormal dust levels are detected and allow them to identify the source and react quickly. No longer do plants have to rely on operators to notice dust clouds to alert of possible events.

The chances are low, and the risks are real

The dangerous mentality of “we have never had a dust explosion” can be fatal. Most dust explosion occurrences are complete surprises in facilities that have been operating for decades. The awareness of explosions has improved, operators are implementing numerous safeguards and precautions to keep the working environments safe.

While dust can be controlled, managers often run into problems of not getting information of interruptions or unexpected events.

Monitoring for dust clouds and monitoring dust to avoid dust accumulations can alleviate the hazards considerably.

High-risk area examples in milling and grain handling are:

- Enclosed bin-deck areas
- Packaging lines
- Pelleting areas
- Receiving tunnels
- Hammer mill areas
- Enclosed silo skirt areas
- Mixing rooms
- High risk processing areas (upsets such as leaking gaskets)

Real time dust monitoring to detect upset dust conditions can be just one more safeguard to help mitigate the risks. Good housekeeping practice and confidence in dust management should be the norm. Manual grab samples for accurate snapshots have their place, but it is time for operators to stop relying on them as their primary method of measuring dust. 24/7 real time monitoring is now best practice.





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Class II, Div I

Author: Dr. Chris Cloney, DustEx Research Ltd.

Document Version #1

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Any questions or comments can be sent to chris@dustsafetyscience.com

Example Reference:

Cloney, Chris (2018), "2018 Mid-Year Combustible Dust Incident Report – Version #1"
DustEx Research Ltd. Retrieved from <http://dustsafetyscience.com/2018-Report>



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