

2019

COMBUSTIBLE DUST INCIDENT REPORT

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EXPLOSION AT
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Jönköping, Sweden
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**NFPA 652 DHA
REQUIREMENTS
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**DUST
SAFETY
SCIENCE**

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MEMBER COMPANIES



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PARTNERS



LETTER FROM THE AUTHOR

DR. CHRIS CLONEY

Managing Director, DustEx Research Ltd.



Awareness, Knowledge, Connection and Change...

Two years since launching [DustSafetyScience.com](https://dustsafety.com) and I still believe in these four pillars we were founded on more than ever. This is how we, the dust safety community, will achieve our goal of a year with zero fatalities from dust explosions by 2038.

The incident reporting covers awareness of combustible dust hazards. Since starting in 2016 we have recorded 632 fires and 243 explosions. Of these 875 incidents, 116 of them (13.2%) caused injury and 24 of them (2.7%) caused fatalities, resulting in 417 injuries and 45 deaths.

This gives us our measuring stick, the tool we use to track our progress over time.

However, as the famous words say 'What got you here, won't get you there'. And we need to do more to enable, facilitate and drive change in industries handling combustible dust.

As we move into year three of our 20 year mission, we are focussing more and more on the Knowledge, Connection, and Change pillars. This includes our communication platform, the [Dust Safety Science Podcast](#), our education platform, the [Dust Safety Academy](#) and our annual event, the [Digital Dust Safety Conference](#).

Early indications are that we are on the right track. With over 12,300 downloads of the podcast, 250+ people inside the Dust Safety Academy and over 200 people from 25 countries attending the first conference, we are making an impact as a global community driving change in these industries.

And this wouldn't have been possible without your help. So I am here to say from myself and from the DustEx Research Team, thank you for reading, thank you for supporting the mission, thank you for sharing, expanding on, and continuously improving our work, and thank you for everything you do in industries handling combustible dust to make them safer every day.

We have a long way to go, but we will get there together.

Stay Safe,

Chris

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

P.P.S. You can read previous letters from the author [here](#)

"... in analyzing many of the recent events, it seems that there is a sameness [...] and the lessons seem to be learned (or in fact not learned) over and over, again and again."

- Dr. Sam Mannan
(1954 – 2018)

"Successful knowledge transfer involves neither computers nor documents but rather interactions between people"

- Thomas H. Davenport
(1802 – 1851)

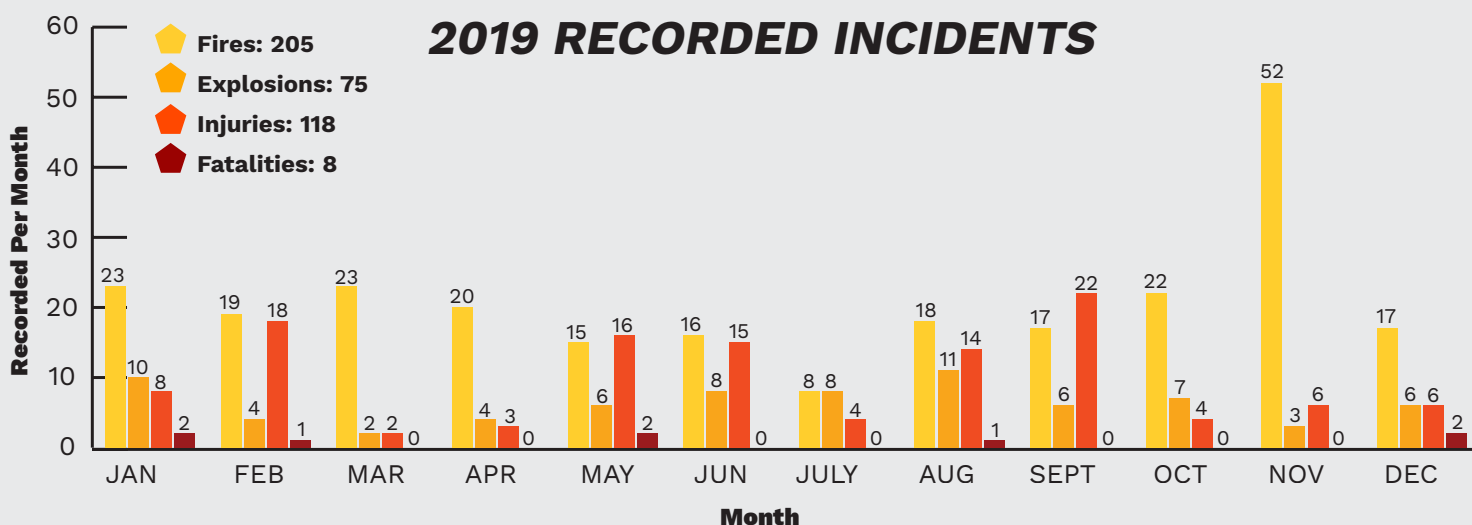
INCIDENT DATA OVERVIEW

	UNITED STATES				CANADA				INTERNATIONAL		
	2016	2017	2018†	2019	2016	2017	2018	2019*	2017	2018*	2019
Fires	--	117	158	175	--	15	17	22	37	38	53
Explosions	31	28	37	37	2	4	4	1	36	26	37
Injuries	22	52	40	42	0	9	1	4	102	73	72
Fatalities	3	6	2	1	0	0	0	0	7	19	7

† A fatal metal dust explosion at an recycling facility in Johnson City, Tennessee on March 14, 2018 was added to the incident data from the last report.

‡ A pellet mill explosion in Entwistle, Alberta was removed from the mid-year report as preliminary investigation suggests it was a gas explosion.

*A fatal metal dust explosion at an educational facility in Beijing, China on December 26, 2018 was added to the incident data from the last report.



LOSS HISTORY - UNITED STATES

Loss history from dust explosions in the United States over the last four years is given in the following table. This data has been collected in the incident database and reported in the combustible dust incident reports, 2016 to 2019.

YEAR	EXP./YEAR	INJ./YEAR	FAT./YEAR
2016	31	22	3
2017	28	43	6
2018	37	30	2
2019	37	27	1

This data gives an average of 33 dust explosions per year, 30 injuries and 3 fatalities over the last four years. Note that dust fires are excluded in this analysis.

2019 GLOBAL LOSS OVERVIEW

In 2019, 87% of the fatalities recorded occurred due to dust explosions. Of the injuries, 73% occurred due to explosions and 27% occurred due to fires. Some of the more severe incidents include:

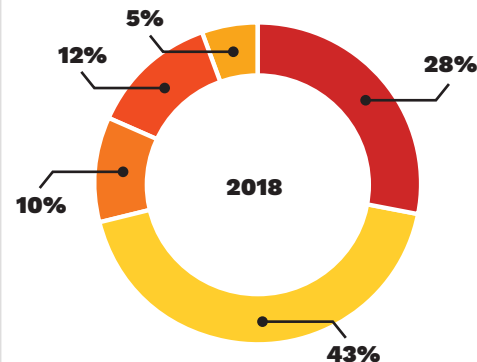
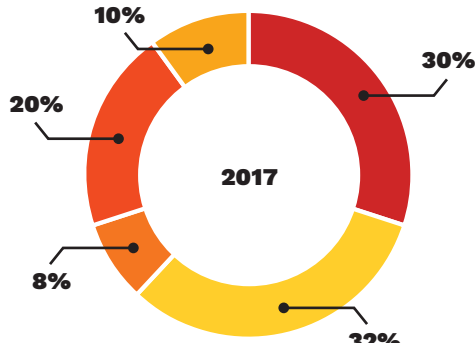
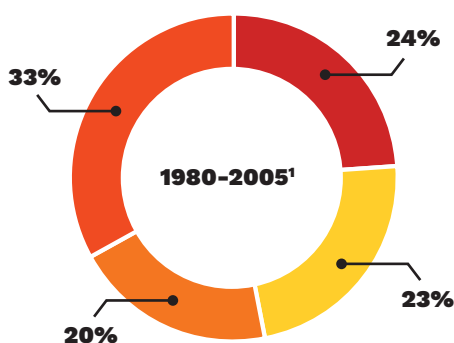
- [Firefighter Killed In Grain Silo Dust Explosion](#) (Clinton, IA)
- [Two Killed in Steelmaker Coal Explosion](#) (Divinópolis, Brazil)
- [One Killed in Wood Dust Explosion](#) (Anzegem, Belgium)
- [One Killed and Nine Injured in Grain Explosion](#) (Punjab, India)

Limited information is available for damages from dust explosions and fires. From the information that is available the following incidents resulted in more than \$1,000,000 in losses:

- [Equip. Failure Causes Particleboard Plant Fire](#) (Post Falls, ID)
- [Paper Products Fire Injures Firefighter](#) (Waterville, ME)
- [Biorefinery Dust Explosion Damages Facility](#) (Cloverdale, IN)
- [Dust Col. Fire Knocks Out City Power](#) (Eaganville, Ontario)

MATERIALS INVOLVED

◆ Wood Products
 ◆ Food Products
 ◆ Metal
 ◆ Other
 ◆ Unknown



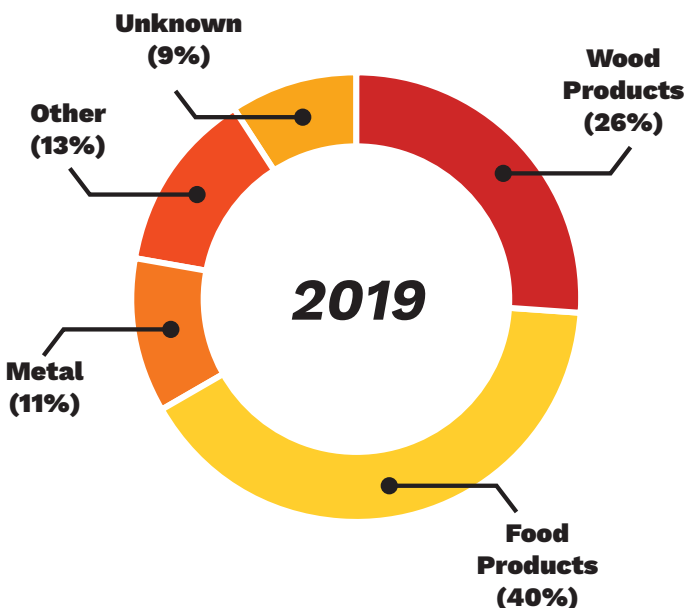
DISCUSSION POINTS

In reviewing the global incident data, food and wood products made up over 65% of the combustible dust fires and explosions recorded. These materials also resulted in 59% of the injuries and 62% of the fatalities. A breakdown of the fires, explosions, injuries and fatalities for each type of material is given as follows:

	FIRES	EXP.	INJ.	FAT.
FOOD	107	24	30	2
WOOD	62	24	40	3
METAL	29	6	12	0
COAL	11	5	17	2
PAPER	13	2	1	0
PLASTIC	0	2	2	0
OTHER	3	7	6	1
UNKNOWN	25	5	10	0
TOTAL	250	75	118	8

Metal dust explosions causing injury involved titanium and aluminum, while metal dust fires causing injury involved nickel as well as other unspecified metals.

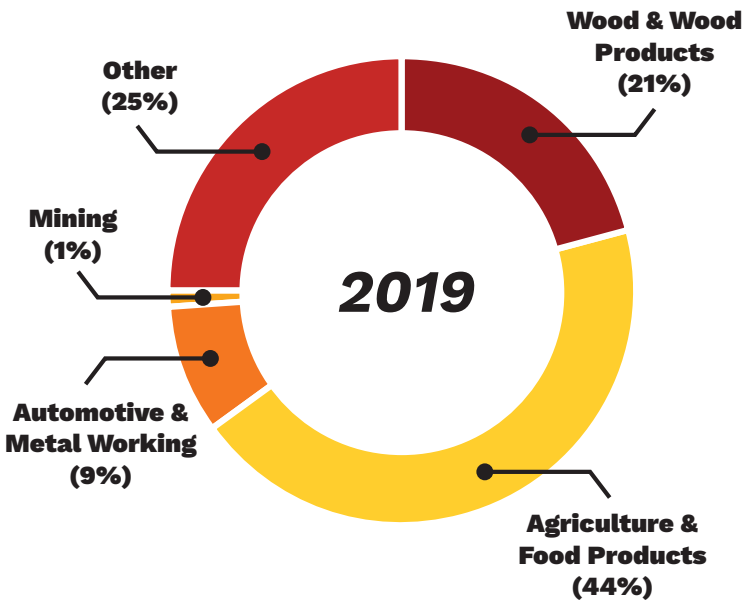
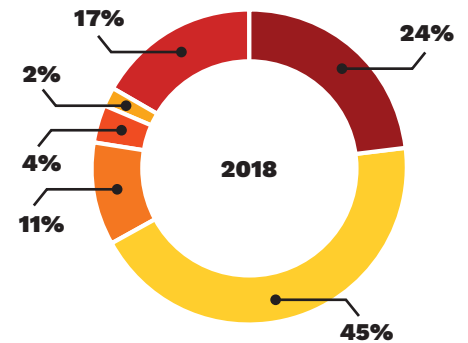
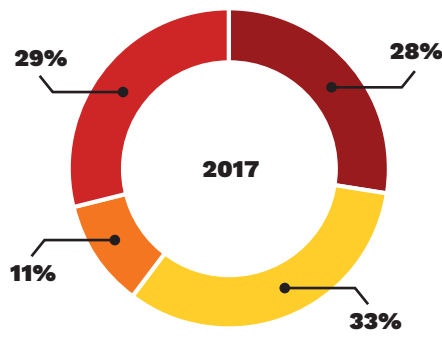
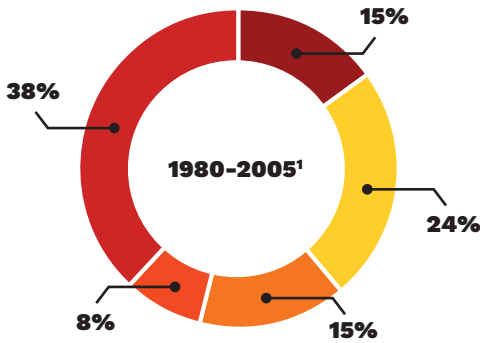
Incidents involving coal dust, plastic, paper and other or unspecified materials resulted in 14%, 2%, 1% and 14% of the injuries, respectively. Additional fatalities resulted from a coal dust explosion in Brazil and what appears to be a fly ash explosion in India.



2019 DETAILED ANALYSIS

Wood	26.5%	Plastic	0.6%
Food	40.3%	Textile	0.3%
Metal	10.8%	Other	2.8%
Coal	4.9%	Unknown	9.2%
Paper	4.6%		

INDUSTRIES INVOLVED



DISCUSSION POINTS

As shown in the historical data, wood processing, wood products, agricultural activity and food production make up a large portion of the overall fire and explosion incidents. Since 2017 wood and wood products have ranged from 21% to 28% of the incidents, while agricultural activity and food production have ranged from 33% to 44%. These ranges are higher than the US Chemical Safety Board data from 1980 to 2005. This is likely because the incident reporting includes both fire and explosion incidents, and global data.

As shown in the detailed incident breakdown, the “other” category in the pie chart includes pulp & paper, coal handling, high schools, and educational facilities. Industries not broken out in the detailed breakdown include incidents in polymer processing, lighting products, tire recycling, concrete production, medical equipment, scrap and recycling, cosmetics, asphalt, marine transportation, printing, metallic pigments, pharmaceutical manufacturing, and mineral processing facilities.

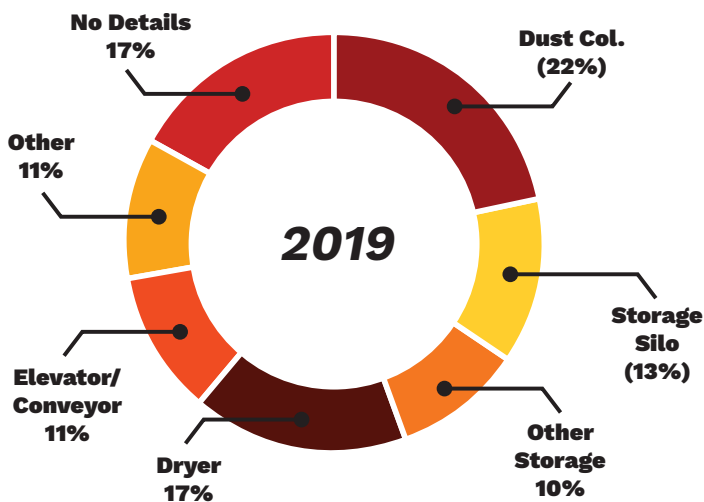
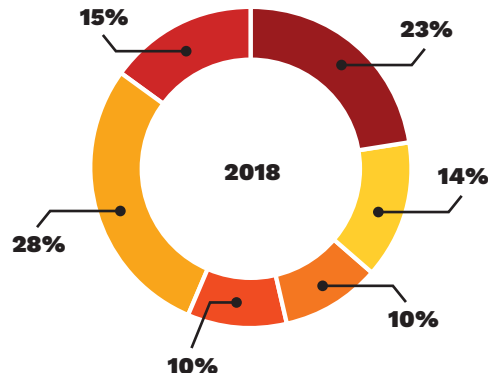
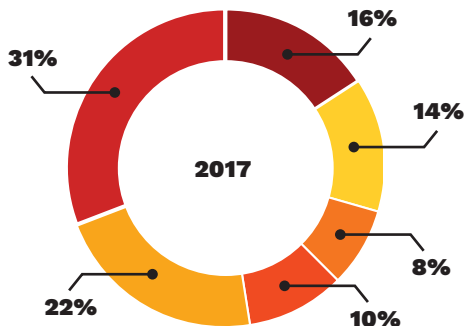
Combined, the overall “other” category of industries makes up 37% of the injuries reported in 2019. Wood and wood products, agriculture and food processing, and automotive and metal working, make up 29%, 25% and 8% of the injuries, respectively.

2019 DETAILED ANALYSIS

◆ Wood & Wood Pro.	21.1%	◆ Power Generation	0.3%
◆ Agriculture	34.8%	◆ Mining	1.2%
◆ Food Processing	8.3%	◆ Pulp & Paper	6.2%
◆ Ethanol Pro.	0.9%	◆ Coal Handling	2.2%
◆ Metal Processing	7.1%	◆ Schools and Edu.	2.2%
◆ Automotive	1.8%	◆ Other	13.8%

EQUIPMENT & CAUSES

◆ Dust Collector
 ◆ Storage Silo
 ◆ Other Storage
 ◆ Dryer
 ◆ Elevator/Conveyor
 ◆ Other
 ◆ No Details



The breakdown between fires, explosions, injuries and fatalities for different pieces of equipment are summarized the following table for 2019:

	FIRES	EXP.	INJ.	FAT.
DUST COLLECTOR	59	12	9	0
STORAGE SILO	29	13	18	4
OTHER STORAGE	27	7	7	1
ELEV./CONV.	30	5	0	0
DRYER	52	2	4	0
OTHER	19	16	56	3
NO DETAILS	34	20	24	0
TOTAL	250	75	118	8

DISCUSSION POINTS

As discussed in previous incident reports, dust collectors demonstrate the highest percentage of combustible dust incidents with 59 fires and 12 explosions reported in 2019. This is consistent with the range given in previous incident reports between 2016 and 2019 but lower than the historic data from the CSB, which suggests up to 40%.

Although more incidents occur in dust collectors, they appear to be less severe than fires and explosions occurring in storage silos, bins, buckets and hoppers.

Although equipment labeled under “Other” only had 11% of the total incidents, these incidents resulted in 47% of the injuries and 38% of the fatalities. Some of these include a wood dust fire on top of an exhaust manifold, a wood dust explosion in ductwork, a dust explosion in a titanium shredding machine, a mixing drum explosion at a cosmetics manufacturer, an explosion in a grinding machine at a packaging plant, an explosion in a wood pressing machine, an explosion in a spice grinder, and an explosion in a paint mixing machine. In terms of the fatalities, one occurred while raw material was being loaded into a boiler from mechanical belts, one resulted from a boiler explosion that ignited sawdust piles and plywood stacks, and two resulted from a dust explosion when a boiler was blocked with fly ash and cleared by workers.

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2019 OSHA CITATIONS

ISSUE DATE	INDUSTRIAL ACTIVITY	STATE	VIOLATIONS	INT. PEN.	CUR. PEN.	INSPECTION	STATUS	CITATION LINK
25-Jan	Commercial Screen Printing	IL	1	\$8,525	\$6,500	1342863.015	Closed	More Info
4-Feb	Wood Office Furniture Man.	WI	2	\$10,144	\$5,072	1353604.015	Closed	More Info
15-Feb	Sanitary Paper Product Man.	TX	3	\$61,260	\$24,504	1352498.015	Closed	More Info
27-Feb	Cheese Manufacturing	PA	3	\$26,521	\$26,521	1347834.015	Under Contest	More Info
29-Mar	Commercial Bakeries	IL	2	\$6,062	\$3,789	1358281.015	Under Contest	More Info
18-Apr	Fabricated Metal Product Manufacturing	WI	1	\$7,104	\$7,104	1355325.015	Under Contest	More Info
23-Apr	Kitchen Cabinet and Countertop Manufacturing	TX	2	\$10,230	\$4,092	1377770.015	Pay. Plan	More Info
29-Apr	Plastics Product Man.	TX	8	\$25,763	\$12,880	1380049.015	Pay. Plan	More Info
6-May	Hazardous Waste Treat. & Disposal	ID	3	\$66,300	\$50,000	1360878.015	Pending Abatement	More Info
10-May	Nursery, Garden Center, and Farm Supply Stores	NY	6	\$56,260	\$33,756	1355248.015	Closed	More Info
14-May	Mobile Home Man.	PA	10	\$318,234	\$296,640	1361440.015	Pending Abatement	More Info
11-Jun	Wood Product Man.	PA	6	\$10,230	\$6,000	1377258.015	Pay. Plan	More Info
11-Jun	Machinery Repair & Main.	IL	2	\$6,820	\$4,775	1370209.015	Closed	More Info
19-Jun	Paper Product Ma.	WV	11	\$26,711	\$20,000	1367708.015	Pay. Plan	More Info
24-Jun	Millwork	WI	1	\$6,630	\$5,000	1379970.015	Pay. Plan	More Info
5-Jul	All Other Plastics Product Manufacturing	PA	1	\$3,221	\$2,000	1370741.015	Closed	More Info
22-Jul	Wood Office Furniture Man.	NJ	4	\$23,868	\$13,127	1374944.015	Pay. Plan	More Info
25-Jul	Motor Vehicle Brake System Manufacturing	OH	3	\$37,888	\$13,261	1377984.015	Closed	More Info
30-Jul	Commercial and Institutional Building Construction	KS	3	\$51,146	\$26,022	1378495.015	Closed	More Info
22-Aug	Medicinal & Botanical Man.	NJ	6	\$53,806	\$31,965	1385559.015	Closed	More Info
23-Aug	Kitchen Cabinet & Countertop Man.	MA	9	\$24,757	\$9,000	1384019.015	Pending Abatement	More Info
6-Sep	Sawmills	PA	3	\$22,542	\$22,542	1394706.015	Under Contest	More Info
13-Sep	Wet Corn Milling	MS	1	\$13,259	\$5,000	1398353.015	Closed	More Info
25-Sep	Engineered Wood Member (except Truss) Manufacturing	WV	3	\$39,023	\$27,500	1402841.015	Closed	More Info
3-Oct	Wood Container & Pallet Man.	IL	1	\$13,260	\$7,956	1421681.015	Closed	More Info
9-Oct	Pump and Pumping Equi. Man.	NY	1	\$7,577	\$5,304	1400773.015	Closed	More Info
10-Oct	Other Millwork (including Flooring)	NY	8	\$68,553	\$68,553	1405933.015	Under Contest	More Info
16-Oct	Wood Kitchen Cabinet and Countertop Manufacturing	IL	3	\$9,851	\$9,851	1394524.015	Pending Abatement	More Info
17-Oct	Recyclable Material Merchant Wholesalers	PA	4	\$7,730	\$5,400	1404720.015	Pay. Plan	More Info
12-Nov	Paper Bag and Coated and Treated Paper Man.	GA	2	\$7,577	\$4,546	1428309.015	Closed	More Info
13-Nov	Iron foundries	NY	20	\$214,059	\$214,059	1401131.015	Under contest	More Info
15-Nov	Fabricated Structural Metal Manufacturing	OH	8	\$98,503	\$53,703	1404889.015	Pending Abatement	More Info
23-Dec	Wood Kitchen Cabinet and Countertop Manufacturing	NJ	1	\$9,282	\$5,000	1412255.015	Pending Abatement	More Info

Inspections Resulting In Citations: 33

Total Citations: 142

Total Initial Penalties: \$1,352,696

Total Current Penalties: \$1,031,422

Initial Penalty/Citation: \$9,526

Initial Penalty/Inspection: \$40,991

***Information was collected from OSHA Data & Statistics by searching for "dust" within inspection details from citations made using the General Dusty Clause.**



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METAL DUST EXPLOSION AT UNIVERSITY IN BEIJING, CHINA

DECEMBER 26, 2018

(MISSING FROM 2018 INCIDENT REPORT)

Three Fatalities

BACKGROUND

The university where the explosion occurred was established in 1896, making it one of the oldest universities in mainland China. It includes 22 research institutes and research centers, and 39 laboratories. As of 2017, there were 25,569 full-time students on the campus.

INCIDENT DESCRIPTION

At the time of the explosion, students from the urban planning and environmental engineering department were carrying out sewage treatment experiments. The students were stirring phosphoric acid and magnesium powder in a mixer when metal-on-metal friction produced a spark that ignited hydrogen generated in the hopper and led to a magnesium dust explosion.

OUTCOME

Three students were killed in the explosion. Video footage showed that the building was engulfed in dark smoke while flames were visible. The university issued a statement saying that the fire was brought under control within an hour.

Public security representatives stated that the director of the research project and the laboratory manager would be investigated for criminal negligence. The Ministry of Education and Beijing Jiaotong University also disciplined 12 university officials and comprehensive safety inspections were ordered at every stage of the production, sale, transportation, and storage of dangerous chemicals.

Incident Database: [Explosion That Killed Three Beijing Students Attributed to Negligence](#)

GRAIN SILO DUST EXPLOSION IN CLINTON, IOWA

JANUARY 5, 2019

One Fatality, One Injury

BACKGROUND

The grain processing facility is located in Clinton, Iowa, on the Upper Mississippi River. It is also served by the UP, CP, and BNSF railroads and has facilities for ground and covered storage. No public information is available about its processes.

INCIDENT DESCRIPTION

Fire crews from the Clinton Fire Department went to the facility after receiving reports that a fire had ignited in a silo storage bin. Later reports suggest that a smoldering fire was discovered during efforts to clear a material bridge formation in the silo. There was initially some confusion between the owners, contractors and firefighters on the best way to put it out. The firefighters were in the process of extinguishing it when an explosion occurred, killing one firefighter and injuring another.

OUTCOME

The fireman who died was a 33-year-old lieutenant in the Clinton Fire Department. On January 10, local news resources reported that the other fireman was in critical but stable condition. He recovered and was able to return to work on May 8.

The findings of the Occupational Safety and Health Administration (OSHA) were made public in July. They revealed that six serious citations totalling \$55,894 had been filed against the company for violations that included lack of training, lack of communication, and lack of safety gear.

Incident Database: [One Firefighter Killed and Another Injured By Grain Silo Dust Explosion](#)

WOODWORKING PLANT DUST EXPLOSION IN ANZEGEM, BELGIUM

JANUARY 24, 2019

One Fatality, Three Injuries

BACKGROUND

The woodworking plant, which is located in Anzegem, Belgium, manufactures doors and windows for upscale residences and buildings. It employs 90 people in its 20,000m² facility. On January 24, a small fire had broken out in a silo. The following day, a cleaning company arrived to clear out the contents, which consisted of still-warm wood shavings.

INCIDENT DESCRIPTION

When a hatch was opened around four meters off the ground, oxygen came into contact with the smoldering shavings, causing a dust explosion and meter-high flash fire. Four cleaning company employees suffered severe burn injuries and were sent to the hospital.

One of the employees, a 24-year-old man, subsequently died. He was standing on the platform and fell when the fireball hit him. Of the remaining three, two had to be transferred to a burn center. Due to the seriousness of their injuries, they could not be immediately identified.

OUTCOME

After the injured workers were removed, the fire department made a hole in the silo to enable a better extinguishing effort. The Ghent labor auditorium commenced a preliminary investigation into the incident, but the results were not made public.

Incident Database: [One Person Dead and Three Injured in Dust Explosion at Woodworking Plant](#)

DUST COLLECTOR EXPLOSION AT BIOREFINERY IN CLOVERDALE, INDIANA

JUNE 21, 2019

Two Injuries

BACKGROUND

The biorefinery is located in Cloverdale, Indiana, and produces 92 million gallons of ethanol per year. It processes approximately 31 million bushels of corn per year, with output including fuel and livestock feed for regional, national and international markets. At the time of the explosion, two truck drivers who were not employed by the facility were unloading corn.

INCIDENT DESCRIPTION

The explosion occurred at around 12:30 p.m. in the grain-loading area of the facility. When the Cloverdale Township Fire Department arrived, firefighters located a smoldering fire in the dust collector and extinguished it. The two truck drivers were injured during the explosion and taken to an area hospital for treatment.

OUTCOME

Both truck drivers were later released from the hospital. Details about their injuries and condition were not disclosed. The refinery general manager told media representatives that the fire following the explosion was quickly extinguished, but the overall facility damage was estimated at \$1 million. No status update is available about repairs or impact on company operations.

Incident Database: [Dust Explosion At Biorefinery Causes Over \\$1 Million In Damage](#)

ALUMINUM DUST EXPLOSION AT PIGMENT PLANT IN JÖNKÖPING, SWEDEN

JUNE 7, 2019

Three Injuries

BACKGROUND

The metallic pigment production company is located in Huskvarna, Sweden. It employs 65 people and manufactures aluminum paste and powder in a modern process industry with 24-hour operation.

PROCESS OPERATIONS

The manufacturing process includes milling the raw material in ball mills for 2-12 hours. To avoid dust explosions the process takes place in wet form with liquid naphtha applied. Drying is used to remove liquid from the powder.

If a completely dry product is needed, the aluminum must be vacuum dried and checked on shaker screens to remove lumps. Due to previous dust explosions, the vacuum drying process is done in a reduced oxygen concentration environment. Although this protects from explosions in the vacuum system, the material can still oxidize during the sieving step.

INCIDENT DESCRIPTION

At the time of the explosion, a worker noticed that the transport container in which the powder aluminum falls after sieving was warm to the touch. When lifting the lid off the container, powder fell into material that was already burning causing an explosion. Three workers were taken to the hospital from the explosion.

Continued on next page....

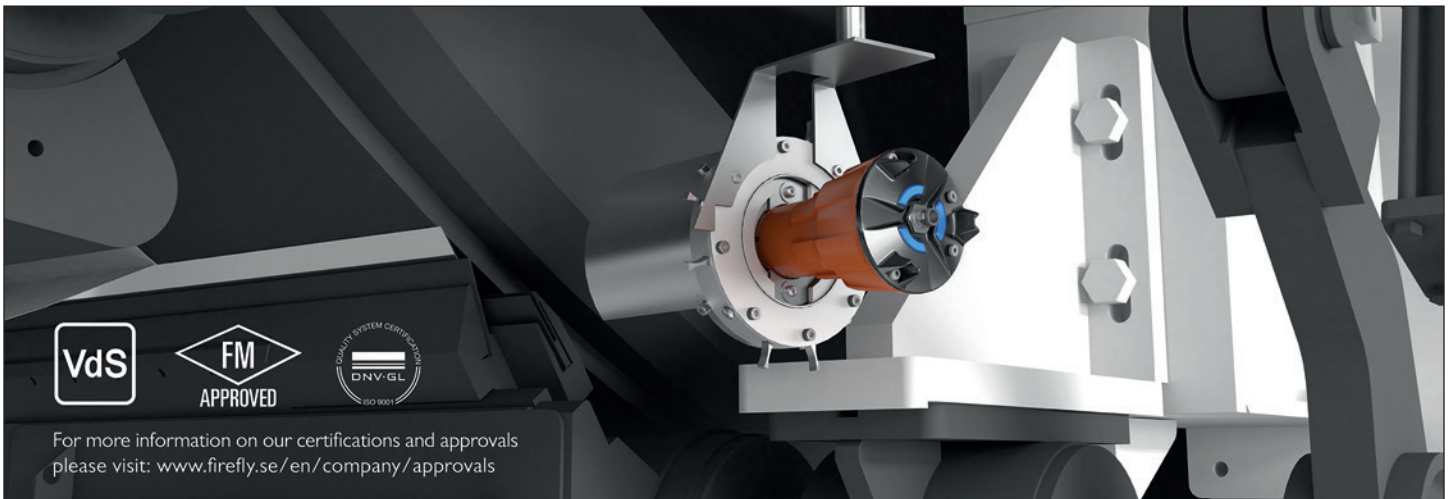
OUTCOME

After the explosion, the company introduced remote control to allow the operator to stand at a safe location when lifting the lid of the transport container. They also apply sectioning and placing of machines to avoid fire and deflagration spread, and regular cleaning to reduce the chance of workers being injured from fires and explosions.

The company was also involved in a industry project entitled “Dust explosion risks in the metalworking industry” with Swedish research groups such as RISE (Research Institute of Sweden) and PS Group. The company not only shared lessons learned from explosion incidents at their facility, but also helped to constructor the SafeDustExplosion.org platform which is a knowledge center for sharing dust explosion best practices and prevention efforts in Sweden.

Incident Database: [Dust Explosion at Metallic Pigment Plant Leaves Three Injured](#)

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BOILER EXPLOSION AT PHARMACEUTICAL FACILITY IN ANDHRA PRADESH, INDIA

AUGUST 11, 2019

Two Fatalities, One Injury

BACKGROUND

The company involved was founded in 1986 and has five research centers that employ over 1560 scientists and analysts. Product areas include antibiotics, antiretrovirals, cardiovascular products, central nervous system products, gastroenterological products, and anti-allergics.

INCIDENT DESCRIPTION

Local authorities reported that the explosion occurred when ash powder had blocked a boiler system. Three workers went to check on the problem when the explosion occurred. Local sources state that the explosion was caused by excess pressure in the boiler; however, it is unclear to what degree combustible fly ash may have contributed to the explosion and resulting injuries.

OUTCOME

All three workers were directly impacted by the explosion and deflagration; two were killed instantly, while the third worker jumped out of a window, suffering severe injuries.

PREVIOUS INCIDENTS

The pharmaceutical manufacturing unit in this incident has a long history of severe explosions in their boiler/reactor system: On December 14, 2016 a flash fire was reported at the facility that also killed two workers and injured another; On December 20, 2014 an explosion at the facility injured three workers; In January 2014 a reactor explosion injured three other workers; and on November 27, 2011 a reactor explosion severely burned three workers.

Incident Database: [Two Workers Killed In Explosion at Pharmaceutical Manufacturing Plant](#)

GRINDER EXPLOSION AT DUTCH SPICE FACTORY IN OVERIJSEL, THE NETHERLANDS

SEPTEMBER 11, 2019

Three Injuries

BACKGROUND

The company involved is a family-run business that processes and sells herbs and spices. Raw materials are unloaded, stored, ground, and mixed on the premises before being packaged and distributed. The company, which is located in Wijhe in the Netherlands, has 12 employees and opened for business in 1974.

INCIDENT DESCRIPTION

The incident started when a fire broke out in a processing machine around 2:30 p.m. It was followed by an explosion that blew away the building facade and a rolling door. Local news agencies stated that the cause of the explosion and resulting fire is believed to be a blockage in the herb grinder.

OUTCOME

Three people were injured and transferred to a nearby hospital. One of the victims is said to have sustained significant burn injuries.

Incident Database: [Three People Injured in Dust Explosion at Dutch Spice Factory](#)

BOILER EXPLOSION AT CEMENT PLANT IN CHITTORGARH, INDIA

SEPTEMBER 29, 2019

Fifteen Injuries

BACKGROUND

The company involved has ten cement manufacturing units across India with a combined capacity of nearly 15.5 million tons per year. It was founded in 1919 and primarily engaged in cement manufacturing and jute goods.

INCIDENT DESCRIPTION

According to local news agencies a boiler explosion was reported at the cement plant on September 29, 2019. Police stated that coal caught fire as the temperature rose in the “coil plant” which led to the explosion. After the explosion burning coal fell on the personnel below causing a large degree of injury to the workers.

OUTCOME

Fifteen workers in total were injured from the explosion and resulting deflagrations or fires. Eleven of them were in critical condition with burns over 70% of their body. Local authorities levied an inquiry into the explosion; however, details could not be found publicly.

Incident Database: [Boiler Explosion at Cement Plant In India Leaves 15 People Injured](#)

COAL DUST EXPLOSION AT STEELMAKER IN DIVINÓPOLIS, BRAZIL

DECEMBER 27, 2019

Two Fatalities, Two Injuries

BACKGROUND

The company involved is listed as a mining and metals facility, and is involved in metalworking operations. It was founded in 1995 and employs between 250 and 500 people.

INCIDENT DESCRIPTION

According to the fire department, a storage silo containing coal overheated causing an explosion that quickly spread to other areas of the facility. Representatives stated that company employees had failed to open a mechanism that acts as a relief valve. A team of 17 firefighters worked for four hours to get the fire under control.

OUTCOME

Three workers were injured in the explosion. One had burns to 80% of their body, one had burns to 90% of their body and the other had burns to his eyes. One injured worker passed away at hospital almost immediately while another died a week after the explosion. The police stated that an inquiry has been opened to investigate the cause of the incident.

Incident Database: [Two People Killed And Two Injured After Explosion At Steelmaker](#)

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DSS049:

DUST HAZARD ANALYSIS REQUIREMENTS FOR OWNERS AND OPERATORS IN NFPA 652



Have you listened to the Dust Safety Science podcast yet?

Below is a copy of the show notes from a past episode to give you an idea of what is typically covered. We regularly feature interviews with combustible dust experts around the world, how the most recent research is integrated into industry application and the latest developments in best practice, engineering guidance and regulation.

INTRODUCTION

In this episode of the Dust Safety Science Podcast, we're talking about dust hazard analysis requirements for owners and operators as specified in NFPA 652. NFPA 652 is the central document.

NFPA 652 is the central document for the prevention of combustible dust explosions and fires. There are also standards that are specific to certain commodities and industries:

- NFPA 61 for fires and dust explosions in agricultural and food processing facilities
- NFPA 655 for sulphur fires and explosions
- NFPA 484 for combustible metals
- NFPA 664 for wood processing and woodworking facilities
- NFPA 654 for combustible particulate solids

WHAT ARE THE REQUIREMENTS FOR OWNERS AND OPERATORS?

NFPA 652 imposes certain requirements on owners and operators of facilities that handle combustible dust.

Hazard Identification

Chapter 4, Section 4.1 and Chapter 5 indicate that

those responsible for facility operations must know the combustibility and deflagration properties of materials, either by testing them or looking at historical data.

Chapter Seven of NFPA 652 covers the requirement to identify and assess any fire, flash fire, and explosion hazards. Its opening sections feature important points of consideration for owners and operators.

- 7.1.1 states that a dust hazard analysis (DHA) must be completed for all new processes and facility compartments.
- 7.1.2 specifies that DHAs must be carried out for all existing processes and facility compartments by September 7, 2020.
- 7.1.3 indicates that an absence of previous incidents will not be used as a reason for not performing a DHA.
- 7.1.4 states that DHAs shall be reviewed and updated every five years.

Dust Hazard Analysis

By September 7, 2020, a DHA must be carried out on all processes in facilities handling combustible dust. Although the NFPA 652 documentation does not specify how to do a DHA, Annex B provides a good example using a typical powder processing operation.

There are different methods for carrying out a DHA:

- Node-based analysis
- 'What if' analysis
- Checklist-based
- Hazard and operability (haz-op) study

Owners and operators should work with a combustible dust expert or a specialist in the field to come up with the best approach for their facility.

WHAT IS INCLUDED IN A DUST HAZARD ANALYSIS?

The NFPA 652 guidance states that a DHA is a systematic review to identify and evaluate the potential fire, flash fire or explosion hazards associated with the presence of one or more combustible dust or combustible particulate salts in a processing facility. It will likely include the following:

- Identification and evaluation of locations where hazards exist.
- Identification and evaluation of specific hazards scenarios.
- Identification of existing safeguards.
- Recommendations of additional safeguards where warranted.
- A plan for implementation of additional safeguards.

In the body of the NFPA 652 documentation, it states that each part of the process shall be evaluated. This means all equipment and each line between equipment units (such as conveyors and ducts) and each building or building compartment shall be evaluated.

The annex provides guidance on what could or should constitute a process, building or compartment, such as ducts, conveyors, silos, bunkers and hidden areas above drop ceilings. It also states that the elimination of accumulated fugitive dust is critical and one of the most important criteria for a safe workplace.

WHO CAN PERFORM A DHA?

NFPA 652 specifies who can perform a DHA. Section 7.2.2 stated that it must be performed or led by a qualified person. According to the definition in the front matter,

this is someone “who, by possession of skill, recognized degrees, certificate of professional standing or who, by knowledge, training, and experience, has demonstrated the ability to deal with the problems related to the subject matter, the work or the project.”

The annex material expands on this definition, stating that the person should be familiar with conducting a DHA and the hazards of combustible dust. It also says that a team should be involved. For a small process, this could be a two-person team consisting of a combustible dust expert and someone from the processing operation who is familiar with its operation, maintenance, and any history of previous incidents.

The subject of a qualified person has been discussed in previous episodes of the podcast, specifically Episode #12 with Jason Reason and #15 with Michael Marrington, who recommended the implementation of a system that certifies people to do DHAs.

CONCLUSION

How do we start making facilities safer? If we focus on the incident sequences (in particular, the fugitive dust accumulations), it may be possible to prevent a single fire or explosion from escalating into a disaster. Perhaps the biggest component, however, is doing a dust hazard analysis. With DHAs becoming mandatory on September 7th, 2020, they will be a key driver in outlining facility risks and developing ways to improve safety.

See links to all of the resources mentioned in this episode on the podcast page: [DSS049: Dust Hazard Analysis Requirements for Owners and Operators in NFPA 652](#)

CHECK OUT SOME OF OUR MOST POPULAR PODCAST EPISODES LAST YEAR



DSS033: Explosion and Fire Safety in 3D Printing Applications with Jason Reason



DSS037: Minimum Layer Thickness Requirements for Combustible Dust With Jeramy Slaunwhite



DSS040: How to Run Effective Dust Explosion Training Sessions With Dr. Chris Bloore

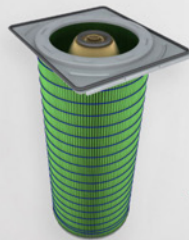


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DSS076:

CASE STUDY – NYLON FLOCK EXPLOSION IN THE TEXTILE INDUSTRY



NOT SURE HOW COMBUSTIBLE DUST SAFETY APPLIES TO YOU?

This year we started a series of podcast episodes focused on detailed case studies from previous dust fire and explosion incidents. Below is a copy of the show notes from an episode focused on a “non-traditional” combustible dust - nylon fibres from an electrostatic flocking process.

See the list of all case study episodes given on [Page 25](#) or visit the [podcast homepage](#) to see what other episodes we have recorded (almost 100 to date!).

INTRODUCTION

In this episode of the DustSafetyScience Podcast, we examine a case study for a nylon flock explosion in the textile industry.

The nylon flock explosion happened in the north of Italy in 2001. The investigation was featured in a journal paper titled “Case study of a nylon fibre explosion: An example of explosion risk in a textile plant” by Dr. Luca Marmo, which was published in 2010 in Volume 23 of the *Journal of Loss Prevention In The Process Industries*.

As we review the case, we answer the following questions:

- What is nylon flock?
- What does the flocking process look like?
- What did the facility look like?
- What did the investigation find?
- What caused the explosion?
- Why was there no explosion protection?

WHAT IS NYLON FLOCK?

Nylon flock is created using an assortment of small fibers that range from half a millimeter to one millimeter in length and generally have a 10 to 100-micron thickness. They are applied to a central core to create a fuzzy textile material for applications like noise reduction, insulation, and surface protection.

WHAT DOES THE FLOCKING PROCESS LOOK LIKE?

During the flocking process, plant operators take a ream of these long threads, dye them to the desired color, cut them, and apply them to a nylon core using an electrostatic field.

After a drying process, the flocked material is ready for use.

WHAT DID THE FACILITY LOOK LIKE?

At the facility where the incident happened, there were three parallel drying lines. Drying line one and two processed 163 of these core threads at a time while the third dryer processed 120 of these threads at the same time.

Each of the dryers is quite large: 14 meters long, two meters wide, and six meters high, with multiple sections. They have a lower part where the incoming freshly-created flock flows in with the warm air that goes through the section twice before travelling to the upper section. The flock continues to dry in the hot air, which is heated through a heat exchanger system at 270 degrees Celsius.

There is also ducting at the top of the system that leads

to the dust collector system, which consists of a dust collector with 12 bag filters, each with a 30-centimetre inner diameter. This system receives air from the in-flow line where the freshly-flocked fibres are located.

The last thing is that each of the dryers has eleven inspection doors. We'll see that this played an important role in the actual explosion as well in the injury to the workers.

WHAT DID THE INVESTIGATION FIND?

In terms of the investigation, the authors of the paper-covered multiple areas, including:

- Witness statements
- The properties of the flock material
- Post-explosion damage to the facility
- The process that led to the explosion

Witness statements indicated that at approximately 4:10 a.m. on the morning of the explosion, one worker noticed some broken threads in dryer number two. They then followed the standard procedure, which was to shut down the dryer to retie core threads. This process turns off the fans or shuts the fans and the valves that control the heating medium, but the heating system is still hot inside the dryer.

At around 5:45 p.m., with everything being done, employee number two started to close the inspection doors to the dryer and employee number one went to turn on the line. When he turned it on, the explosion happened immediately.

A deflagration propagated throughout the dryer system. Flames spread throughout the facility, burning employee number one, who was at the control board. Employee number two was still closing the dryer doors when he was knocked down and suffered severe burns. Another employee was also injured during the explosion and flash fires that followed.

The investigators also looked at the properties of the flocking material. They measured these properties using standard testing apparatus like the 20-litre chamber and determined that the minimum explosible concentration for the flocking material was 70 to 80 grams per meter cubed, which is a similar concentration as many combustible dusts.

They did a thermogravimetric analysis to determine if the flock could release flammable gases at the heats that were found, and concluded that at 270 degrees Celsius, the nylon flock did release some combustible gases.

Examination of post-explosion damage included a look at the dryer assembly, dust collection system, and related areas. Burnt nylon flock was found throughout the entire dryer assembly, which indicates where the deflagration took place and propagated. Thick layers of melted nylon material appeared in the upper part of dryer number two inside the ducts, leading back to the dust collection system.

Other observations included:

- One of the bags was detached in the battery of bags in the dust collector and had been for quite a long time before the incident happened.
- A lot of melted flock was on top of the heat exchanger inside that dryer, giving an idea of where the explosion originated.
- Every inspection door was open in the dryers, even though the employee had closed them. This suggests that the dryers experienced overpressure, which caused the doors to open. They did not have any explosive protection on them, so the incident could have been more severe had those doors not been able to open.
- A large hole was found in the ducting where the deflagration had come out of the side. Drops of plastic were found in an 18 by 18-meter radius, giving a good idea of how large the fireball had been.
- They found the building itself suffered only minor damage. All glass was broken, but there was little structural damage to the roof or to the beams in the columns of the facility because it is much larger than the dryers in which the explosion happened.

WHAT CAUSED THE EXPLOSION?

The authors proposed two ignition processes that could have occurred when the dryer was turned on after being turned off for the hour and a half.

1. There could have been smouldering combustion in the nylon flock that settled on the heat exchangers. When the dryer was turned back on, fresh oxygen flowing through the system could have ignited either the flock material in the vicinity of the smouldering

combustion or even combustion gases that have been released from the flock material.

2. Electrostatic discharge inside the dryer ignited either the flock material itself or a hybrid mixture of the flock material and the combustible gases released.

By looking at factors like the damage between the ducting and the dust collector, the fact that all the dryers were pressurized and that the inspection doors were open, they came up with the following likely sequence of events.

A primary explosion occurred in the upper part of dryer number two due to one of the ignition processes above. It then ignited a secondary explosion in the flock material, with flames propagating throughout the ductwork above the dryer.

Since the flame front couldn't propagate through the bag filter, it reverted and went in three different directions: two travelled back to the other dryers, pressurizing them and forcing the inspection doors open while the third ejected out the side of the ductwork into the facility, injuring employee number one. Employees number two and three were injured by the explosions and flames that ejected from dryer number two.

WHY WAS THERE NO EXPLOSION PROTECTION?

There was no venting or suppression installed at the facility, nor was there isolation between the equipment. A risk assessment had been done at the facility, but it

had never regarded the flocking material as a combustible dust hazard. No one was aware that these fibres could explode and propagate a deflagration when suspended as a cloud.

This lack of awareness is concerning, especially during these critical times. Due to the COVID-19 pandemic, a lot of facilities are either partially shut down or shutting down their operations completely. When they come back online, what steps are being followed to resume operations safely and avoid fires and explosions?

In addition to taking startup precautions, facilities need to obtain expert testing, because materials are quite difficult to assess under the standard testing conditions. A different process needs to be followed to identify things like KSt and minimum explosible concentration, and creating this process requires expertise.

CONCLUSION

Dealing with nontraditional dusts (a term coined by Dr. Paul Amyotte) can be an uphill battle because their explosive nature is not widely recognized, even despite events like this nylon flock explosion and a [2017 incident at a flocking facility](#) in Leominster, Massachusetts. A willingness to overcome complacency and take a different approach is the best way to move forward.

See links to all of the resources mentioned in this episode on the podcast page: [DSS076: Case Study – Nylon Flock Explosion in the Textile Industry](#)

WANT MORE CASE STUDIES? CHECK OUT OUR FULL LIST OF CASE STUDY EPISODES BELOW.



DSS069: Case Study – Dust Explosion in a Fish Meal Factory in Norway in 1975



DSS071: Case Study – Metal Dust Explosion in a 3D Printing Application in 2013



DSS074: Case Study – Insufficient Venting During Sawdust Silo Explosion Leads to Fatality



DSS078: Case Study - Grain dust explosion in a milling facility with Dr. Suzanne Smyth

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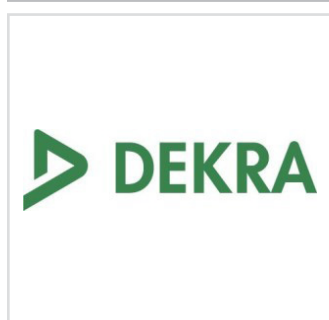
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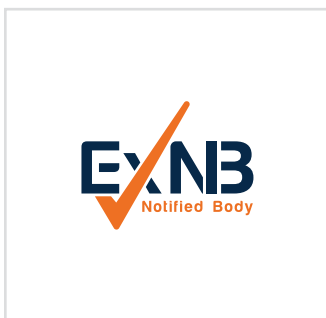
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JENSEN HUGHES is your partner in combustible dust hazard protection. Our expert team of engineers and consultants provides unbiased dust testing, comprehensive dust hazard analysis, employee training and related services to ensure your facility is suitably protected in a cost-effective manner.



Masterduct, Inc.

5235 Ted Street
Houston, Tx 77040

Phone: (713) 462-5779
Email: info@masterduct.com



MASTERDUCT specializes in providing high-quality, flexible, abrasive-resistant and heat tolerant hoses as a solution to just about any need. These include anti-static/electrically conductive hoses for combustible dusts in automotive, agriculture, plastics, woodworking, and dust collection applications.



Nederman

4404-A Chesapeake Drive
28216 Charlotte
North Carolina, USA

Phone: 800-533-5286
customerservice.us@nederman.com



Since 1944, Nederman has delivered solutions for filtering, cleaning and recycling air to make industrial environments more efficient, safe and sustainable. Nederman protects people, planet and products from harmful effects of industrial processes that include harmful dust, smoke and fumes.

DSS MEMBER COMPANIES



Nilfisk, Inc.

740 Hemlock Road, Suite 100
Morgantown, PA 19543

Phone: +1 800 645 3475
Email: questions@nilfisk.com



Nilfisk is one of the world's leading suppliers of professional cleaning equipment. The company offers a complete line of NRTL-certified and NFPA-compliant industrial vacuum cleaners for collecting combustible dust in Class I, Class II and non-classified environments.



Osprey Filters

1835 Briarwood Road, NE
Atlanta, GA 30329 U.S.

Phone (404) 321-7776
Email: contact@ospreyfilters.com



Osprey is a market leader in process air filtration and recycling systems. Our technology has been applied across multiple industries such as soft disposables, tissue, paper, agriculture, fiberglass, and plastics. Our mission is to create innovative engineered solutions that allow our customers to compete and thrive in a global economy.



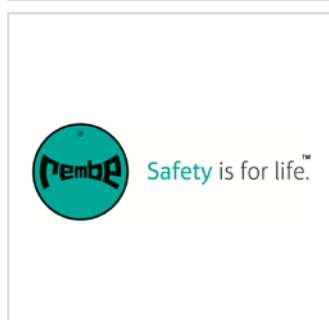
Parker Hannifin Corporation

4087 Walden Avenue
Lancaster, NY 14086

Ph: 1-800-343-4048
Email: smoghog@parker.com



With nearly 50 years of filtration engineering and manufacturing expertise we offer a wide range of the best quality products and services. Our experts have in-depth customer knowledge and service capabilities which help you improve your operation. You need to achieve your operating goals and we are here to provide you with answers, a quick response, and assistance beyond delivery.



REMBE® GmbH Safety + Control

Gallbergweg 21
59929 Brilon, Germany

Phone: +49 2961 7405-0
Email: info@rembe.de



REMBE® is a specialist in explosion safety and pressure relief. As an independent German company, they supply safety systems for industrial plants. REMBE takes a comprehensive approach, primarily developing its own products and providing consultancy and engineering services to customers around the world.



Sigma-HSE

Unit 2, Moorside Point
Moorside Road, Winchester,
Hampshire SO23 7RX, UK

Phone: +44 (0)1962840570
Email: info@sigma-hse.com



International Process Safety company with ISO/IEC 17025 testing. We provide fire and explosion data for example, 20L, MEC, MIE, LIT, LOC, Electrostatic data and ARC, DSC for thermal screening. Our Process Safety Engineers offer ATEX, Seveso, HAZOP, QRA, SIL, LOPA, and cost-effective solutions.

DSS MEMBER COMPANIES



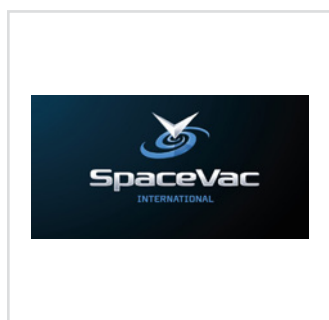
SINTROL Dust Monitors

Ruosilantie 15 00390
Helsinki, Finland

Phone: +358 50 463 5452
Email: info@sintrolproducts.com



Sintrol manufactures high quality, low maintenance dust monitors for the detection and monitoring of dust concentration. Historically the most common applications for Sintrol dust monitors have been inline industrial dust measurement solutions for process control, filtration leak detection and emissions monitoring.



SpaceVac International

Unit 3 JBJ Business Park,
Northampton Road Blisworth,
Northants, United Kingdom,
NN7 3DW

Phone: +0 1604 968 668
Email: info@spacevac.us



SpaceVac is the world's leading high-level cleaning system – enabling operators to remove high-level dust from inaccessible areas from the safety of the ground floor. SpaceVac's innovative cleaning technology can be brought into hazardous and explosive atmospheres using our ATEX certified conductive cleaning system.



Tiger-Vac, Inc.

11 S.W. 12th Ave. #112
Dania, Florida 33004

Phone: 1-800-668-4437
Email: sales@tiger-vac.com



With over forty years of experience, Tiger-Vac has successfully established itself in the International Market as a manufacturer of high-quality Explosion Proof, Industrial and Cleanroom Vacuum Cleaner Systems.



XP Products

800 West 5th Ave, Suite 201G
Naperville, IL 60563

Phone: (630) 464-3800
Email: engineering@xpproducts.com



The XP Products Explosion Proof Drum Kit is an innovative alternative to traditional rotary valves for providing a means of explosion isolation. In addition, XP Products DHA services group specializes in protecting your facility from the effects of combustible dust explosions.



Want to connect with industries
handling combustible dust?

Advertise with us at Dust Safety
Science and the Dust Safety
Academy!

Email marketing@dustsafetyscience.com to inquire about current availability.

SPONSOR CASE STUDIES

IEP Technologies



Case Study: Cost Effective and User-Friendly Passive Explosion Protection for the Wood Industry [\(PDF\)](#)

Fike Corporation



Dust Collector Hazards: Explosion Protection Solutions in Powder-Handling Processes [\(PDF\)](#)

UPCOMING EVENTS & TRAINING

ExNB Certification Insitute











ExAM Personal Competency Assessment - Global Training Providers Needed

View the Community Events & Training calendar [here](#).

WOOD & WOOD PRODUCTS

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 27	Ameriwood	Dowagiac, MI	Explosion	Wood Dust	0	0	Auger System	No Details	🔗
Jan 22	American Wood Fibers Inc.	Circleville, OH	Fire	Wood Dust	0	0	Unknown	No Details	🔗
Feb 14	Santiam Cabinets	Albany, OR	Explosion	Wood Dust	0	0	Dust Col.	No Details	🔗
Mar 12	Millville Lumber Company	Snow Hill, MD	Fire	Wood Dust	0	0	Sawdust Shed	No Details	🔗
Mar 15	Fiber Energy Products	Mountain View, AK	Fire	Wood Dust	2	0	Unknown	No Details	🔗
Mar 24	Plummer Forest Products	Post Falls, ID	Fire	Wood Dust	0	0	Unknown	\$1 million	🔗
Mar 27	Masonite PrimeBoard	Wahpeton, ND	Explosion	Wood Dust	0	0	Tank	No Details	🔗
Apr 9	Graf Brothers Flooring	South Shore, KY	Fire	Wood Dust	0	0	Unknown	No Details	🔗
Apr 10	DT Fowler	Lapeer, MI	Fire	Wood Dust	0	0	Dust Col.	No Details	🔗
Apr 18	Soapstone Sawmill	Peach Bottom, PA	Fire	Wood Dust	2	0	Exhaust Manifold	No Details	🔗
Apr 22	Unknown	Buffington Township, PA	Fire	Wood Dust	0	0	Conveyor Belt	No Details	🔗
Apr 26	The Velvet Mill	Stonington, CT	Fire	Wood Dust	0	0	Dust Col.	No Details	🔗
May 2	Gutchess Hardwood	Unity Township, PA	Fire	Wood Dust	0	0	Silo	No Details	🔗
May 12	New England Wood Pellet	Jaffrey, NH	Fire	Wood Dust	0	0	Unknown	No Details	🔗
May 29	Thomson Georgia Pacific	Thomson, Georgia	Fire	Wood Dust	0	0	Silo	No Details	🔗
Jun 9	Unknown	San Leandro, CA	Explosion	Sawdust	1		Hopper	No Details	🔗
Jun 16	Pacific Fibre	Longview, WA	Fire	Wood Dust	0	0	Unknown	No Details	🔗
Jun 20	Pride Man. Company	Burnham, ME	Fire	Wood Dust	0	0	Silo	No Details	🔗
Jun 27	Timber Products	Grants Pass, OR	Fire	Wood Dust	0	0	Ductwork	No Details	🔗
Jul 2	McCormick Sawmill	Fountain, MI	Explosion	Wood Dust	0	0	Sawmill	No Details	🔗
Jul 11	Roseburg Forest Products	Simsboro, LA	Explosion	Wood Dust	0	0	Dryer System	No Details	🔗
Jul 17	Lignetics of Maine	Strong, ME	Fire	Wood Dust	0	0	Silo	No Details	🔗
Jul 15	Watt Logging Company	Brockway, PA	Fire	Sawdust	0	0	No Details	No Details	🔗
Jul 30	Fairview Mills	Centerview, MO	Explosion	Grain Dust	0	0	Processing Equipment	No Details	🔗
Aug 2	Timber Products Company	White City, OR	Explosion	Wood Dust	0	0	Hopper	No Details	🔗
Aug 7	Vixen Hill	Elverson, PA	Explosion	Wood Dust	0	0	Dust Col.	No Details	🔗
Aug 2	Unknown	Salem, VA	Fire	Wood Dust	0	0	Dust Col.	No Details	🔗
Aug 27	Weyerhaeuser	Columbia Falls, MT	Explosion	Wood Dust	4	0	Unknown	No Details	🔗
Sep 2	West Fraser	Perry, FL	Fire	Wood Dust	0	0	Dry Kiln	No Details	🔗
Sep 4	Northwoods Lumber Co.	Vilas County, WI	Fire	Wood Dust	0	0	Silo	No Details	🔗
Sep 4	Unknown	Arbor Vitae, WI	Fire	Unknown	0	0	Silo	No Details	🔗
Sep 12	Unknown	Dundee, OH	Fire	Sawdust	0	0	Silo	No Details	🔗
Sep 27	Salem Frame Company	Salem, VA	Fire	Wood Dust	1	0	Dust Col.	No Details	🔗
Oct 5	Southern Finishing Co.	Martinsville, VA	Fire	Sawdust	0	0	Dustbin	No Details	🔗
Oct 9	Custom Woodworking	Good Thunder, MN	Fire	Wood Dust	0	0	Dust Col.	No Details	🔗
Oct 15	Masonite PrimeBoard	Wahpeton, ND	Fire	Wood Dust	0	0	Dryer	No Details	🔗

WOOD & WOOD PRODUCTS CONTINUED

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Oct 19	Timber Products Company	Medford, OR	Fire	Wood Dust	0	0	Unknown	No Details	
Nov 13	Curran Renewable Energy	Massena, NY	Fire	Wood Dust	0	0	Hopper	No Details	
Nov 16	Vicksburg Forest Products	Vicksburg, MS	Fire	Wood Dust	0	0	Conveyor Belt	No Details	
Nov 16	Southern Softwoods, Inc.	Lakeland, FL	Fire	Wood Dust	0	0	Unknown	No Details	
Nov 26	Anthony Oak Flooring	Magnolia, AR	Fire	Wood Dust	0	0	Hopper	No Details	
Dec 9	Georgia-Pacific Building Prod.	Alcolu, SC	Explosion	Wood Dust	1	0	Ductwork	No Details	
Dec 21	Wood Products Inc.	Grand Forks, ND	Fire	Wood Dust	0	0	Dust Col.	No Details	
Dec 31	Northeast Pellets	Ashville, ME	Fire	Wood Dust	0	0	Conveyor Belt	No Details	




































INCIDENT SUMMARY - INCIDENTS: 44 | FIRES: 33 | EXPLOSIONS: 11 | INJURIES: 11 | FATALITIES: 0

AUTOMOTIVE & METAL WORKING


DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 3	Global Titanium, Inc.	Detroit, MI	Explosion	Titanium Dust	3	0	Shredding Machine	No Details	
Jan 3	Mercury Marine	Fond du Lac, WI	Fire	Metal Dust	0	0	Dust Col.	No Details	
Jan 14	Custom Alloy	High Bridge, NJ	Fire	Metal Dust	0	0	Dust Col.	No Details	
Jan 22	Nikkei MC Aluminum America Inc.	Columbus, IN	Fire	Metal Dust	0	0	Dust Col.	No Details	
Feb 1	Racine Metal-Fab	Sturtevant, WI	Fire	Metal Dust	0	0	Dust Col.	No Details	
Feb 4	Capacity Trucks	Longview, TX	Fire	Metal Dust	0	0	Dust Col.	No Details	
Feb 15	IntoMetal Company	Lincoln, NE	Fire	Metal Dust	0	0	Dust Col.	No Details	
Feb 21	Royal Green LLC	Reading, PA	Fire	Metal Dust	0	0	Conveyor Belt System	No Details	
Mar 13	Cooper Standard Automotive	Auburn, IN	Fire	Metal Dust	0	0	Dust Col.	No Details	
Apr 25	LJT Tennessee	Chattanooga, TN	Fire	Metal Dust	0	0	Dust Col.	No Details	
Apr 30	M&M Sheet Metal	Williamsport, PA	Fire	Metal Dust	0	0	Dust Col.	No Details	
May 20	Kawasaki Motors Man. Corp.	Lincoln, NE	Fire	Metal Dust	0	0	Vent. Pipe	No Details	
Jul 23	Saginaw Metal Casting Op.	Saginaw, MI	Fire	Metal Dust	0	0	Casting Machine	No Details	
Jul 30	Birmingham Hot Metal Coatings	Birmingham, AL	Explosion	Metal Dust	0	0	Unknown	No Details	
Aug 15	Selmet, Inc.	Albany, OR	Explosion	Metal Dust	2	0	Furnace	No Details	
Aug 28	Unknown	Sherrill, NY	Fire	Metal Dust	0	0	Dust Col.	No Details	
Sep 20	Unknown	Mason, MI	Fire	Metal Dust	0	0	Cable Trays	No Details	
Oct 8	Dicastal North America	Greenville, MI	Fire	Aluminum Dust	0	0	Dust Col.	No Details	
Nov 7	Industrial Hard Chrome	Geneva, IL	Fire	Metal Dust	0	0	Dust Col.	No Details	
Nov 11	Lycoming Engines	Williamsport, PA	Fire	Metal Dust	0	0	Dust Col.	No Details	
Nov 19	OMCO Manufacturing	Pierceton,, IN	Fire	Metal Dust	0	0	Dust Col.	\$1,000 to \$1,500	

INCIDENT SUMMARY - INCIDENTS: 21 | FIRES: 18 | EXPLOSIONS: 3 | INJURIES: 5 | FATALITIES: 0

AGRICULTURE

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 2	Anderson Hay & Grain Co.	Aurora, OR	Fire	Hay Dust	0	0	Unknown	No Details	
Jan 3	Riceland Foods, Inc.	Fair Oaks, AR	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Jan 4	ADM	Decatur, IL	Explosion	Grain Dust	0	0	Conveyor Belt	No Details	
Jan 5	ADM Grain	Clinton, IA	Explosion	Grain Dust	1	1	Storage Bin	No Details	
Jan 10	Terry Jones Farm	Trenton, NY	Fire	Grain Dust	0	0	Silo	No Details	
Jan 13	Meadowland Farmers Coop.	Walnut Grove, MN	Fire	Grain Dust	0	0	Conveyor Belt	No Details	
Jan 22	Wolfe-Reece & Lynch Mill	Boonville, SC	Fire	Grain Dust	0	0	Grain Bin	No Details	
Jan 25	Heartland Cooperative	Wausau, WI	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Jan 30	Baden Farm	Bowling Green, OH	Fire	Grain Dust	0	0	Silo	No Details	
Feb 11	Interstate Grain Port Ter.	Corpus Christi, TX	Fire	Grain Dust	0	0	Silo	No Details	
Feb 24	2610 Grand Avenue	Roachdale, IN	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Mar 19	Consolidated Grain & Barge	Clayton, IA	Explosion	Grain Dust	0	0	Unknown	No Details	
Apr 1	Centerra Co-Op	Mansfield, OH	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Mar 27	Rhea Cattle Company	Arlington, NE	Fire	Grain Dust	0	0	Grain Bin	No Details	
Apr 1	Hoffman Farms	Huntingburg, IN	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Apr 27	Ag Valley Co-op	Edison, NE	Fire	Grain Dust	0	0	Grain Bin	No Details	
Apr 30	Crystal Feeds	Oakwood, GA	Explosion	Grain Dust	0	0	Travel Chute	No Details	
May 2	Gavilon Grain	Kearney, NE	Fire	Grain Dust	0	0	Grain Dryer	\$26,000	
May 2	M&M Milling	Brookhaven, MS	Explosion	Corn Cob Dust	0	0	Silo	No Details	
May 9	ADM Grain	Decatur, IL	Fire	Grain Dust	0	0	Grain Dryer	No Details	
May 16	Synergy Cooperative	Elk Mound, WI	Explosion	Fertilizer Dust	0	0	Fertilizer Leg Pipe	No Details	
Jun 10	New Vision Cooperative	Brewster, MN	Explosion	Grain Dust	1	0	Silo	No Details	
Jun 9	Cargill	Houston, TX	Fire	Grain Dust	4	0	Silo	No Details	
Jun 14	Ag Partners	Sheldon, IA	Explosion	Grain Dust	0	0	Unknown	No Details	
Jun 27	CHS Pekin	Pekin, IL	Explosion	Grain Dust	0	0	Grain Elevator	No Details	
Jul 23	Deluxe Feeds, Inc.	Sheldon, IA	Explosion	Grain Dust	0	0	Unknown	No Details	
Sep 1	Unknown	Berks, PA	Fire	Grain Dust	0	0	Silo	No Details	
Aug 23	Central Valley Ag Grinding,	Oakdale, CA	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Aug 26	Unknown	Westgate, IA	Fire	Unknown	0	0	Unknown	No Details	
Aug 14	Unknown	Sandwich, IL	Fire	Unknown	0	0	Silo	No Details	
Aug 12	Natural Blend	Farmville, NC	Fire	Sweet potato	0	0	Dryer	No Details	
Aug 7	ADM	Fremont, NE	Fire	Grain Dust	0	0	Dryer	No Details	
Sep 4	Unknown	Maria Stein, OH	Fire	Grain Dust	0	0	Silo	No Details	
Sep 9	Jennie-O Turkey	Barron, WI	Fire	Grain Dust	0	0	Silo	No Details	
Sep 9	Phoenix Feeds & Nutrition	Brandon, VT	Fire	Grain Dust	0	0	Unknown	No Details	

AGRICULTURE CONTINUED

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Sep 23	Vermont Timberworks	Springfield, VT	Fire	Sawdust	0	0	Dumpster	No Details	
Oct 1	Legacy Farmers Co-Op	Custar, OH	Explosion	Grain Dust	0	0	Silo	No Details	
Oct 15	Unknown	Palmyra Township, IA	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Oct 22	Unknown	New Liberty, IA	Fire	Grain Dust	0	0	Grain Bin	No Details	
Oct 22	Knott Grain Elevator	Winona, WA	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Oct 22	Unknown	Blair, NE	Fire	Grain Dust	0	0	Grain Bin	No Details	
Oct 20	ADM Grain	Decatur, IL	Fire	Grain Dust	0	0	Metal Tank	No Details	
Oct 23	Unknown	Loraine, IL	Fire	Grain Dust	0	0	Grain Bin	No Details	
Oct 28	Unknown	Manlius, IL	Fire	Grain Dust	0	0	Grain Bin	No Details	
Oct 25	Unknown	Albion, WI	Fire	Grain Dust	0	0	Grain Dryer	\$100,000	
Oct 30	Hansen-Mueller	Sioux City, IA	fire	Grain Dust	0	0	Grain Elevator	No Details	
Oct 31	Braskamp Farms	Fox Lake, WI	fire	Grain Dust	0	0	Grain Bin	\$50,000	
Nov 1	Beck's Hybrids	Atlanta, IN	Fire	Grain Dust	0	0	Conveyor Belt	No Details	
Nov 1	Unknown	Liberty Township, OH	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 3	Unknown	Blanchard, ND	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 3	Brehm Farms	Arcanum, OH	Fire	Grain Dust	0	0	Silo	No Details	
Nov 2	Unknown	Norwalk, OH	Fire	Grain Dust	0	0	Grain Dryer	\$5,000	
Nov 4	Kingsbury Elevator	La Porte County, IN	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Nov 5	Sunrise Cooperative Inc.	South Charleston, OH	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 4	Unknown	Kenesaw, NB	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 5	Unknown	Fitchburg, WI	Fire	Corn Dust	0	0	Silo	No Details	
Nov 6	Unknown	Le Mars, IA	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 6	ADM Farmview	Rensselaer, IN	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 7	Fox Farms	Pendleton, SC	Fire	Fertilizer	1	0	Hopper	No Details	
Nov 8	Bonucci Farms	Princeton, IL	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 8	Unknown	Oto, IA	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Nov 7	Midwest Grain and Barge	Scott City, MO	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Nov 7	Unknown	Belle Plaine, MN	Fire	Grain Dust	0	0	Grain Dryer	\$30,000	
Nov 10	Unknown	Ansonia, OH	Fire	Grain Dust	0	0	Silo	No Details	
Nov 11	Ag First Farmers Co-op	Volga, SD	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 15	Cargill Turkey Prod. LLC	Temple, TX	Fire	Grain Dust	0	0	Grain Hopper	No Details	
Nov 14	Unknown	Ashby, MN	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 17	Witmer's Feed & Grain	Damascus, OH	Fire	Grain Dust	0	0	Grain Dryer	\$55,600	
Nov 19	Midwest Grain and Barge	Scott City, MO	Fire	Grain Dust	0	0	Grain Bin	No Details	
Nov 18	Millville Feed Inc.	Millville, MN	Fire	Grain Dust	0	0	Grain Dryer	No Details	

AGRICULTURE CONTINUED

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Nov 16	Unknown	Elkton, MN	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Nov 15	Riverside Farms	Hawarden, IA	Fire	Grain Dust	0	0	Grain Bin	No Details	🔗
Nov 19	Unknown	Warren, MN	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Nov 26	Unknown	Grimes, IA	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Nov 26	Unknown	Stratford, SD	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Nov 28	Hamlin Farms	South Haven, MI	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Dec 7	Unknown	Malinta, OH	Fire	Grain Dust	0	0	Grain Bin	No Details	🔗
Dec 9	Unknown	Clay County, MN	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Dec 13	Unknown	Suffolk, VA	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Dec 15	Unknown	Chesaning, MI	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Dec 30	Rosenfeld Farm	Downsville, TX	Fire	Cotton Dust	0	0	Unknown	No Details	🔗

INCIDENT SUMMARY - INCIDENTS: 81 | FIRES: 70 | EXPLOSIONS: 11 | INJURIES: 7 | FATALITIES: 1

FOOD PROCESSING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 30	Riviana Foods	Freeport, TX	Explosion	Rice Dust	0	0	Dust Col.	No Details	🔗
Feb 5	Post Consumer Brands	Jonesboro, AR	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Mar 17	FruitSmart	Grandview, WA	Fire	Fruit Seed Powder	0	0	Dust Col.	\$2,000	🔗
Apr 16	Kellogg's	Battle Creek, MI	Fire	Grain Dust	0	0	Grain Bin	No Details	🔗
Jun 19	Kellogg's	Battle Creek, MI	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Jun 24	Perdue Farms	Lothian, MD	Fire	Grain Dust	0	0	Grain Dryer	No Details	🔗
Jul 15	ADM	Decatur, IL	Fire	Grain Dust	0	0	Unknown	\$100,000	🔗
Jul 23	Deluxe Feeds, Inc.	Sheldon, IA	Explosion	Grain Dust	0	0	Unknown	No Details	🔗
Feb 1	ADM	Lincoln, NE	Explosion	Grain Dust	3	0	Unknown	No Details	🔗
Oct 17	Cargill (Dodge City)	Dodge City, KS	Explosion	Blood Meal	2	0	Unknown	No Details	🔗
Nov 12	PBM Covington LLC	Covington, OH	Fire	Baby Formula	0	0	Waste Disposal System	No Details	🔗
Nov 15	Double S Dairy	Alto, WI	Fire	Grain Dust	0	0	Grain Dryer	\$210,000	🔗
Nov 8	Tyson Foods	Portland, IN	Fire	Grain Dust	0	0	Silo	No Details	🔗
Dec 5	Trillium Farms	Grand Township, OH	Fire	Grain Dust	0	0	Grain Bin	No Details	🔗
Dec 9	ADM	Decatur, IL	Fire	Grain Dust	0	0	Unknown	No Details	🔗
Dec 11	Nestlé USA	Burlington, WI	Fire	Powdered Chocolate	0	0	Dust Col.	No Details	🔗
Dec 13	Hostess Brands, Inc.	Emporia, KS	Fire	Flour Dust	0	0	Vents	No Details	🔗

INCIDENT SUMMARY - INCIDENTS: 17 | FIRES: 13 | EXPLOSIONS: 4 | INJURIES: 5 | FATALITIES: 0

PULP & PAPER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 9	Marcac Paper Mills, LLC	Elmwood Park, NJ	Fire	Paper Dust	0	0	Dust Col.	No Details	
Jan 29	Huhtamaki Paper Products	Waterville, ME	Fire	Paper Dust	1	0	Drying Machine	\$1,000,000	
Jan 30	Marcac Paper Mills, LLC	Elmwood Park, NJ	Fire	Paper Dust	0	0	Unknown	No Details	
Feb 21	Verso Paper Mill	Bucksport, ME	Fire	Sawdust	0	0	Dust Col.	No Details	
Feb 26	Marcac Paper Mills, LLC	Elmwood Park, NJ	Fire	Unknown	0	0	Unknown	No Details	
Mar 17	SCA Tissue North America	South Glens Falls, NY	Fire	Paper Dust	0	0	Conveyor Belt	No Details	
Mar 18	WestRock	Florence, SC	Fire	Wood Dust	0	0	Unknown	No Details	
Apr 17	Green Bay Packaging	Green Bay, WI	Fire	Paper Dust	0	0	Dust Col.	No Details	
Jun 3	Resolute Forest Products	Thunder Bay, ON	Fire	Paper Dust	0	0	Dust Col.	No Details	
Jun 6	Monadnock Paper Mills Inc.	Bennington, NH	Fire	Paper Dust	0	0	Fan	\$20,000	
Jun 6	IP Paper Recycling	Kent, WA	Fire	Paper Dust	0	0	Conveyor Belt	No Details	
Aug 23	Mercury Paper	Strasburg, VA	Fire	Paper Dust	0	0	Unknown	No Details	
Sep 26	Hayter Printing	Morristown, TN	Fire	Cardboard Dust	0	0	Dust Col.	No Details	

INCIDENT SUMMARY - INCIDENTS: 13 | FIRES: 13 | EXPLOSIONS: 0 | INJURIES: 1 | FATALITIES: 0

SCHOOLS AND EDUCATIONAL FACILITIES

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 8	Timpview High School	Provo, UT	Fire	Wood Dust	0	0	Dust Col.	No Details	
Feb 19	Kershaw Correctional Ins.	Kershaw, SC	Fire	Wood Dust	1	0	Dust Col.	No Details	
Apr 24	Lansing Community College	Lansing, MI	Fire	Sawdust	0	0	Dust Col.	No Details	
May 2	Fossil Ridge High School	Fort Collins, CO	Fire	Wood Dust	0	0	Dust Col.	No Details	






INCIDENT SUMMARY - INCIDENTS: 4 | FIRES: 4 | EXPLOSIONS: 0 | INJURIES: 1 | FATALITIES: 0

ETHANOL PRODUCTION

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Feb 20	Flint Hills Resources	Fairbank, IA	Fire	Grain Dust	0	0	Silo	No Details	
Jun 21	POET	Cloverdale, IN	Explosion	Grain Dust	2	0	Dust Col.	\$1,000,000	
Sep 9	Didion Milling	Cambria, WI	Fire	Unknown	0	0	Unknown	No Details	


























INCIDENT SUMMARY - INCIDENTS: 3 | FIRES: 2 | EXPLOSIONS: 1 | INJURIES: 2 | FATALITIES: 0

POWER GENERATION & COAL HANDLING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 7	Kingsford Manufacturing	Summer Shade, KY	Explosion	Charcoal	0	0	Unknown	No Details	
Mar 22	ABB	Jefferson City, MO	Fire	Coal Dust	0	0	Exhaust Fan	No Details	
Apr 16	Unknown	Marshall, AK	Fire	Coal Dust	0	0	Trailer	No Details	
Jun 8	Gulf Power Plant Crist	Pensacola, FL	Fire	Coal Dust	1	0	Silo	No Details	
Nov 23	Mountain State Carbon	Follansbee, WV	Fire	Coal Dust	0	0	Conveyor Belt	No Details	




INCIDENT SUMMARY - INCIDENTS: 5 | FIRES: 4 | EXPLOSIONS: 1 | INJURIES: 1 | FATALITIES: 0

OTHER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 7	Appalachian Tank Car Ser.	Lynchburg, VA	Fire	Unknown	0	0	Dust Col.	No Details	
Feb 5	Unknown	Minden, NV	Fire	Unknown	0	0	Dust Col.	No Details	
Jan 29	Albion Man. Technologies	Ogden, UT	Fire	Unknown	0	0	Hopper Bin	No Details	
Feb 15	Agri-Fab	Sullivan, IL	Fire	Unknown	0	0	Dust Col.	No Details	
Feb 15	Davis-Standard, LLC	Pawcatuck, CT	Fire	Metal Dust	0	0	Dust Col.	No Details	
Feb 20	Private Family Home	Manoa, HI	Fire	Wood Dust	0	0	Unknown	\$840,000	
Feb 21	Kenall Manufacturing	Kenosha, WI	Fire	Metal Dust	0	0	Dust Col.	No Details	
Mar 18	Liberty Tire Recycling	Auburndale, WI	Fire	Unknown	0	0	Dust Col.	No Details	
Apr 2	J.F. Allen Company	Bridgeport, WV	Explosion	Asphalt	0	0	Baghouse	No Details	
Apr 7	Stryker Corporation	Mahwah, NJ	Fire	Unknown	0	0	Dust Col. Bins	No Details	
May 3	Private Family Home	La Jolla, CA	Fire	Sawdust	0	0	Unknown	No Details	
May 7	Innotec	Zeeland, MI	Fire	Unknown	0	0	Dust Col.	No Details	
May 8	Keywell Corporation	Falconer, NY	Fire	Metal Dust	0	0	Dust Col.	No Details	
May 21	Avalign Thortex	Portland, OR	Fire	Titanium Dust	0	0	Dust Col.	No Details	
Jun 11	Electro-Cycle	Madisonville, KY	Fire	Metal Dust	0	0	Dust Col.	No Details	
Jun 27	OmniSource	Fort Wayne, IN	Fire	Metal Dust	0	0	Unknown	No Details	
Aug 1	Stamford Water Pollution Control Facility	Stamford, CT	Explosion	Pellet Dust	3	0	Polycyclone Drying Machine	No Details	
Aug 12	BNZ Materials	Zelienople, PA	Fire	Sawdust	0	0	Dust Col.	No Details	
Sep 17	JCS Global Distribution, Inc.	Carlstadt, NJ	Explosion	Cosmetic Powder	1	0	Mixing Machine	No Details	
Oct 4	Unknown	Manchester, CT	Explosion	Plastic Dust	0	0	Dust Col.	No Details	
Oct 9	Coastal Logistics Group	Garden City, GA	Explosion	Voxtar-M40	2	0	Storage Container	No Details	
Nov 13	International Cushioning Co.	Hickory, NC	Explosion	Unknown	1	0	Grinding Machine	No Details	
Nov 15	Unknown	Naperville, IL	Fire	Unknown	0	0	Dust Col.	No Details	
Nov 25	AJ Riley Inc.	Norwalk, OH	Fire	Asphalt	0	0	Dust Col.	No Details	
Dec 28	Ardagh Group	Roanoke, VA	Fire	Unknown	2	0	Bake Oven	\$4,000,000	

INCIDENT SUMMARY - INCIDENTS: 25 | FIRES: 19 | EXPLOSIONS: 6 | INJURIES: 9 | FATALITIES: 0

WOOD & WOOD PRODUCTS

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 2	Lavern Heideman & Sons	Eganville, ON	Fire	Wood Dust	0	0	Dust Collector	Millions	
May 1	Pinnacle Pellet	Williams Lake, BC	Fire	Wood Dust	0	0	Dryer	No Details	
May 7	Aspen Planers	Merritt, BC	Fire	Wood Dust	0	0	Dust Collector	No Details	












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

AUTOMOTIVE & METAL WORKING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jun 5	Crestline Coach Ltd.	Saskatoon, SK	Fire	Aluminum Dust	0	0	Dust Collector	\$15,000	





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

AGRICULTURE

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Feb 21	Richardson Pioneer	Melfort, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Mar 1	Trouw Nutrition/Shur-Gain	Olds, AB	Fire	Grain Dust	0	0	Unknown	No Details	
Mar 11	Parrish & Heimbecker	North Battleford, SK	Fire	Grain Dust	0	0	Grain Elevator	No Details	
Mar 20	Buffalo Creek Mills	Altona, MB	Fire	Grain Dust	0	0	Hammer Mill	No Details	
Oct 1	Unknown	Star City, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Oct 23	Unknown	New Bothwell, MB	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 10	Unknown	Spruce Home, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 11-18	Unknown	Kindersley, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 11-18	Unknown	Wadena, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 11-18	Unknown	Buckland, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Dec 11	Unknown	Melfort, SK	Fire	Grain Dust	0	0	Grain Dryer	No Details	

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

PULP & PAPER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Mar 11	Catalyst Paper	Port Alberni, BC	Fire	Paper Dust	0	0	Paper Machine	No Details	
Mar 18	Resolute Forest Products	Thunder Bay, ON	Fire	Paper Dust	0	0	Paper Machine	No Details	
Jun 20	Port Hawkesbury Paper	Port Hawkesbury, NS	Fire	Wood Dust	2	0	Silo	No Details	
Aug 13	Cascades Paper Mill	Trenton, ON	Fire	Paper Dust	0	0	Dryer	No Details	



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

SCHOOLS AND EDUCATIONAL FACILITIES

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 14	Saunders Secondary School	London, ON	Fire	Wood Dust	0	0	Dust Collector	No Details	

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

OTHER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Aug 7	Minoan Glory	Vancouver, BC	Explosion	Unknown	0	0	Unknown	No Details	
Dec 16	Vale Manitoba Operations	Thompson, MB	Fire	Nickel Dust	2	0	Unknown	No Details	

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

There were no reported incidents in the Food Processing, Ethanol Production, or Power Generation & Coal Handling industries.

WOOD & WOOD PRODUCTS

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 7	JRS (J. RETTENMAIER & Söhne Group)	Herbrechtingen, Germany	Explosion	Wood Dust	0	0	Conveyor Belt	No Details	
Jan 16	Opus Lignum GbR	Kupferberg, Germany	Explosion	Wood Dust	0	0	Heating System	No Details	
Jan 18	Unknown	Chelmsford, UK	Fire	Wood Dust	0	0	Dust Collector	No Details	
Jan 24	Groep Pouleyn	Anzegem, Belgium	Explosion	Wood Dust	3	1	Silo	No Details	
Feb 16	Hyundai (Myanmar) Plywood Factory	Yangon, Myanmar	Fire	Wood Dust	13	1	Boiler	No Details	
Mar 12	Unknown	Nussdorf, Austria	Fire	Wood Dust	0	0	Silo	No Details	
Mar 18	Unknown	Scharnstein, Austria	Fire	Wood Dust	0	0	Dust Collector	No Details	
Mar 19	Kronospan	Chirk, UK	Fire	Wood Dust	0	0	Conveyor Belt	No Details	
Apr 3	Herman Pacific	Silverdale, New Zealand	Explosion	Wood Dust	0	0	Silo	No Details	
May 26	Tableros Hispanos	Lugo, Spain	Explosion	Wood Dust	1	1	Silo	No Details	
Jul 7	Unknown	Rotherwas, UK	Fire	Sawdust	0	0	Container Bags	No Details	
Aug 14	Unknown	TODTMOOS-AU, Germany	Fire	Wood Chips	0	0	Dust Collector	No Details	
Aug 23	Sonae Arauco	Nettgau, Germany	Explosion	Wood Dust	1	0	Unknown	300,000 euros	
Aug 23	Unknown	Blaustein, Germany	Explosion	Wood Dust	0	0	Pellet Heating Equipment	No Details	
Sep 19	Unknown	South Shields, UK	Fire	Wood Pellets	0	0	Silo	No Details	
Sep 22	Heggenstaller	Unterbernbach, Germany	Explosion	Wood Dust	1	0	Wood-Pressing Machine	No Details	
Oct 7	Bulthaup GmbH & Co KG	Bodenkirchen, Germany	Explosion	Sawdust	0	0	Silo	No Details	
Oct 25	Unknown	Wardle, UK	Fire	Wood Dust	0	0	Dust Collector	No Details	
Oct 31	Unknown	Neuenstein-Untereppach, Germany	Fire	Wood Dust	0	0	Silo	80,000 euros	
Nov 10	Unknown	Erfurt, Germany	Fire	Wood Dust	0	0	Silo	10,000 euros	
Nov 23	Woodland Plywood Processing Company	Kushtia, Bangladesh	Explosion	Wood Dust	4	0	Dust Collector	No Details	
Dec 10	Unknown	Mattersburg, Austria	Explosion	Wood Dust	0	0	Silo	No Details	
Dec 12	Strothmann GmbH	Bielefeld, Germany	Explosion	Wood Dust	0	0	Dust Collector	30,000 euros	
Dec 25	Port of Geelong	Geelong, Australia	Fire	Wood Dust	0	0	Unknown	No Details	

INCIDENT SUMMARY - INCIDENTS: 24 | FIRES: 12 | EXPLOSIONS: 12 | INJURIES: 23 | FATALITIES: 3

AUTOMOTIVE & METAL WORKING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Jan 29	Whyalla Steelworks	Whyalla, Australia	Fire	Metal Dust	0	0	Conveyor Belt	No Details	
Jan 30	Continental Engine Company	Bhiwadi, India	Fire	Metal Dust	0	0	Dust Collector	\$100,000	
Jul 29	Dudley Industries	Lytham, UK	Fire	Metal Dust	0	0	Dust Collector	No Details	
Aug 10	AMG Alpoeco UK, Ltd.	Holyhead, UK	Explosion	Aluminum Dust	2	0	Hopper	No Details	
Aug 16	ArcelorMittal	Kraków, Poland	Fire	Coke	0	0	Conveyor Belt	No Details	

AUTOMOTIVE & METAL WORKING CONTINUED

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT.	EQUIPMENT	DAMAGES	LINK
Aug 29	Novelis Inc.	Nachterstedt, Germany	Explosion	Aluminum Dust	0	0	Dust Collector	No Details	
Dec 27	Siderúrgica União	Divinópolis, Brazil	Explosion	Coal Dust	1	2	Silo	No Details	

INCIDENT SUMMARY - INCIDENTS: 7 | FIRES: 4 | EXPLOSIONS: 3 | INJURIES: 3 | FATALITIES: 2

AGRICULTURE









DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 8	ABN	Cullompton, UK	Fire	Grain Dust	0	0	Silo	No Details	
Feb 19	CopRice	Tongala , Australia	Fire	Grain Dust	0	0	Silo	No Details	
Mar 13	Unknown	Risby, UK	Fire	Wood Dust	0	0	Grain Hopper	No Details	
Apr 19	Unknown	Stoke Ferry, UK	Fire	Grain Dust	0	0	Silo	No Details	
May 30	Tiwana Oil Mills Pvt. Ltd	Hyundai (Myanmar) Plywood Factory, India	Explosion	Grain Dust	9	1	Boiler	No Details	
Jun 20	Unknown	Büsum, Germany	Explosion	Grain Dust	1	0	Silo	No Details	
Jul 1	Agri V Raiffeisen eG	Dingden, Germany	Fire	Grain Dust	0	0	Grain Dryer	250,000 euros	
Jul 7	Jäckering Mühlen- und Nahrungsmittelwerke GmbH	Hamm, Germany	Explosion	Grain Dust	0	0	Filter System	No Details	
Jul 25	Agricultores Federados Argentinos (AFA)	Rojas, Argentina	Explosion	Grain Dust	4	0	Silo	No Details	
Aug 4	Unknown	Truro, UK	Fire	Grain Dust	0	0	Dryer	No Details	
Aug 6	Unknown	Seagrave, UK	Fire	Grain Dust	0	0	Dryer	No Details	
Aug 9	Unknown	Piddlehinton, UK	Fire	Grain Dust	0	0	Silo	No Details	
Aug 23	Unknown	Блъсково, Bulgaria	Fire	Sunflower Seed	0	0	Silo	No Details	
Sep 9	Jäckering Mühlen- und Nahrungsmittelwerke GmbH	Hamm, Germany	Explosion	Grain Dust	0	0	Filter System	No Details	
Sep 9	Unknown	Thirsk, UK	Fire	Grain Dust	0	0	Dryer	No Details	
Sep 12	Unknown	Gallowater, UK	Fire	Grain Dust	0	0	Dryer	No Details	
Sep 19	Unknown	Llandrinio, UK	Fire	Grain Dust	0	0	Dryer	No Details	
Oct 28	Potoki LLC	Dnipro, Ukraine	Explosion	Grain Dust	0	0	Unknown	No Details	
Nov 14	Devenish Nutrition	Belfast, UK	Fire	Grain Dust	0	0	Storage Unit	No Details	
Dec 18	Unknown	Nhill, Australia	Fire	Grain Dust	0	0	Truck	\$400,000 AUS	

INCIDENT SUMMARY - INCIDENTS: 20 | FIRES: 14 | EXPLOSIONS: 6 | INJURIES: 14 | FATALITIES: 1

FOOD PROCESSING




DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Mar 13	Clover S.A. Ltd.	Estcourt, South Africa	Fire	Milk Powder	0	0	Unknown	No Details	
Apr 10	Hügli	Radolfzell, Germany	Explosion	Unknown	1	0	Unknown	No Details	
May 12	Glencore Grain NZ	Mount Maunganui, New Zealand	Fire	Palm Kernel Dust	0	0	Unknown	No Details	
Aug 22	Nestle	Smithtown, Australia	Fire	Unknown	0	0	Fan	No Details	

FOOD PROCESSING CONTINUED

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Sep 11	Arva Spices	Wijhe, Netherlands	Explosion	Spices	3	0	Processing Machine	No Details	
Oct 5	Wilmar Sugar Limited's Pioneer Mill	Burdekin, Australia	Fire	Sugar Dust	0	0	Conveyor System	No Details	
Oct 18	Glen Wyvis Distillery	Dingwall, UK	Fire	Wood Dust	0	0	Biomass Storage Room	No Details	
Oct 28	Potoki LLC	Dnipro, Ukraine	Explosion	Grain Dust	0	0	Unknown	No Details	
Nov 8	Mackay Sugar Limited	Marian, Australia	Fire	Sugar Dust	0	0	Conveyor Belt	No Details	
Nov 25	Unknown	West Knapton, UK	Fire	Grain Dust	0	0	Grain Dryer	No Details	
Nov 27	Cutrale	Guarujá, Brazil	Fire	Unknown	0	0	Conveyor Belt	No Details	
Dec 13	Nordzucker AG	Uelzen, Germany	Explosion	Wood Dust	0	0	Silo	No Details	










INCIDENT SUMMARY - INCIDENTS: 12 | FIRES: 8 | EXPLOSIONS: 4 | INJURIES: 4 | FATALITIES: 0

PULP & PAPER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jun 3	Unknown	Mönchengladbach, Germany	Explosion	Paper Dust	0	0	Printing Press	No Details	
Jun 16	Mondi Frantschach	Sankt Gertraud, Austria	Fire	Paper Dust	0	0	Conveyor Belt	No Details	
Nov 30	K.T. Investments	Budumburam, Ghana	Explosion	Paper Dust	0	0	Unknown	GH¢3 Million	



INCIDENT SUMMARY - INCIDENTS: 3 | FIRES: 1 | EXPLOSIONS: 2 | INJURIES: 0 | FATALITIES: 0

POWER GENERATION & COAL HANDLING

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Feb 20	River Trade Terminal	Hong Kong, China	Explosion	Charcoal Dust	0	0	Shipping Container	No Details	
Mar 5	City of Taku	Taku, Japan	Fire	Coal Dust	0	0	Unknown	No Details	
Mar 27	Raichur Thermal Power Station	Raichur, India	Fire	Coal Dust	0	0	Conveyor Belt System	No Details	
May 13	Unknown	London, UK	Explosion	Coal Dust	0	0	Unknown	No Details	
May 17	Bhilai Steel Plant	Bhilai, India	Fire	Coal Dust	0	0	Conveyor Belt System	\$7,500	
Jun 6	Longannet Power Station	Fife, UK	Fire	Coal Dust	0	0	Bunker	No Details	
Aug 18	Unknown	Kuzbass, Russia	Fire	Coal Dust	0	0	Conveyor Belt	No Details	
Oct 20	Unknown	Maddingly, Australia	Fire	Coal Dust	0	0	Conveyor Belt	No Details	
Dec 18	EBB	County Clare, Ireland	Fire	Coal Dust	0	0	Coal Bunker	No Details	

INCIDENT SUMMARY - INCIDENTS: 9 | FIRES: 7 | EXPLOSIONS: 2 | INJURIES: 0 | FATALITIES: 0














SCHOOLS AND EDUCATIONAL FACILITIES

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Mar 5	Orewa College	Orewa, New Zealand	Fire	Sawdust	0	0	Dust Collector	No Details	
Apr 16	Western Australian College of Agriculture Narrogin	Dumberning, Australia	Fire	Unknown	0	0	Dust Collector	\$80,000	

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

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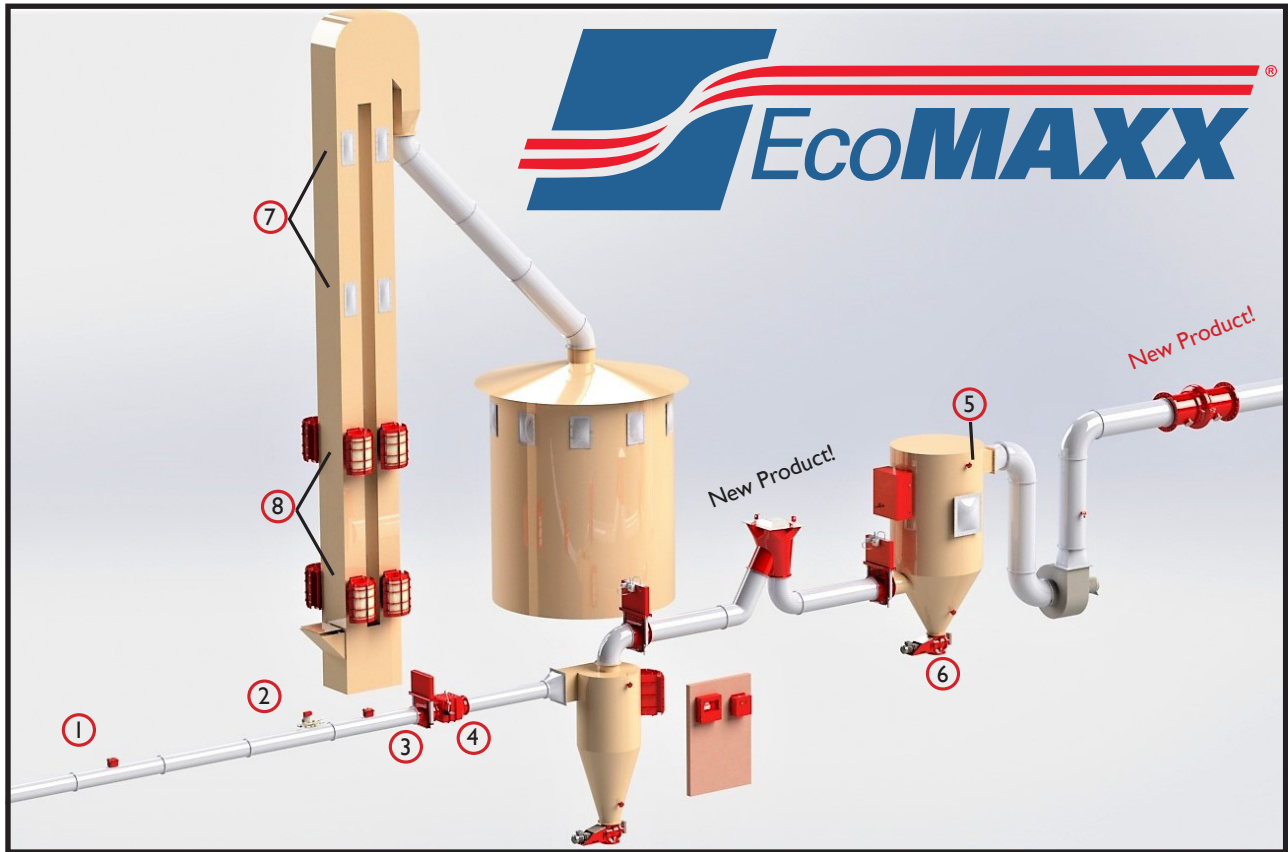
OTHER

DATE	COMPANY	LOCATION	TYPE	FUEL	INJ.	FAT	EQUIPMENT	DAMAGES	LINK
Jan 29	Unknown	Clacton-on-Sea, UK	Explosion	Powdered Dye	0	0	Unknown	No Details	
Feb 7	Unknown	Baumgartenberg, Austria	Explosion	Paint Dust	1	0	Paint Mixing Machine	No Details	
Apr 9	Unknown	Tilbury, UK	Fire	Wood Dust	0	0	Conveyor Belt System	No Details	
Apr 23	Unknown	Hanley, UK	Fire	Unknown	0	0	Dust Extractor	No Details	
Apr 27	Unknown	Tilbury, UK	Fire	Unknown	0	0	Dust Extractor	No Details	
May 18	Patheon Austria GmbH & CoKG	Linz, Austria	Explosion	Unknown	6	0	Unknown	No Details	
Jun 7	Carlfors Bruk AB	Jönköping, Sweden	Explosion	Aluminum Dust	3	0	Unknown	No Details	
Jul 26	Ortho Europe	Girlington, UK	Fire	Unknown	0	0	unknown	No Details	
Aug 11	Aurobindo Pharma	Andhra Pradesh, India	Explosion	Ash	2	1	Boiler	No Details	
Sep 3	Trend Store Shop Creation GmbH	Greding, Germany	Explosion	Paint Dust	1	0	Dust Collector	55,000 euros	
Sep 29	Birla Cement Works	Chandera, India	Explosion	Coal Dust	15	0	Boiler	No Details	
Nov 1	Omya UK Ltd.	Steeple Morden, UK	Fire	Unknown	0	0	Conveyor Belt	No Details	
Dec 17	ESD-SIC	Farmsum, Netherlands	Explosion	Silicon Carbide	0	0	Unknown	No Details	

INCIDENT SUMMARY - INCIDENTS: 13 | FIRES: 5 | EXPLOSIONS: 8 | INJURIES: 28 | FATALITIES: 1

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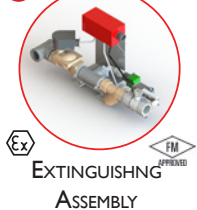
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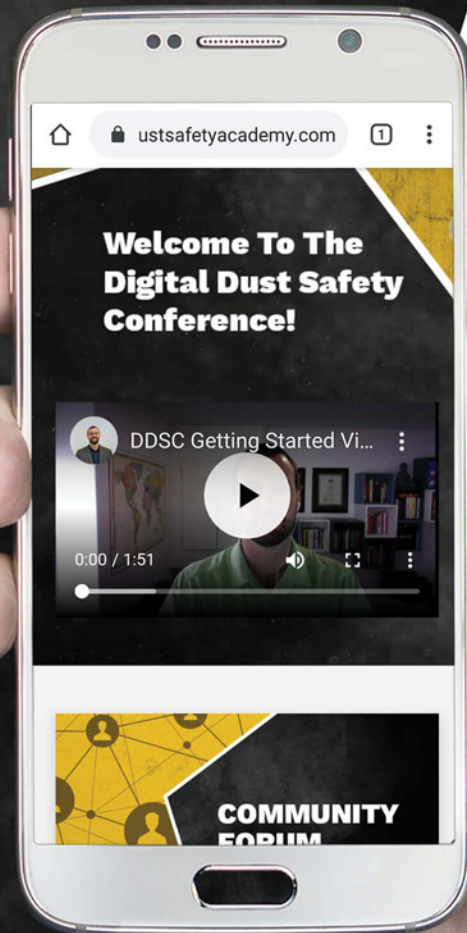
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