AIR DYNAMICS
Industrial Systems Corporation™

CASE STUDY

Industrial Dust Collector

Overview: Air Dynamics Industrial Corp. manufactures an Industrial Dust Collector for Industry Leader - Key Plastics. the industrial dust collector was to be utilized for source capture of synthetic graphite dust at the Felton, PA factory. The industrial dust collector was designed to reduce employee exposure to synthetic graphite dust generated during the cutting, grinding, and machining of large pieces of synthetic graphite.

Key Plastics: Combustible Dust Collection

The Application

Air Dynamics Industrial Systems Corporation was approached by one of the largest manufacturers of automotive interior plastic lens assemblies was seeking to purchase an industrial duty dust collector to minimize employee exposure to synthetic graphite, improve product quality and improve employee working environment. The synthetic graphite infiltrated all areas of the production and administrative area of the facility. The company wanted to insure exposure levels were well below OSHA recommendations for synthetic graphite dust produced during the mold making process. Air Dynamics was contacted and specified a dust collector for Key Plastics and their facility. This was the first time that Key Plastics tried to fix their problem.

The Challenge

This client is an industry leader in indoor and exterior door handle assembly as well as sail panels, mirror shells, pressurized coolant and power steering bottles along with brake reservoirs, battery trays, ignition housing and engine covers. Although an industry leader, Key, had some indoor air quality obstacles to overcome during processing of synthetic graphite in their shop. Synthetic Graphite Dust was being disbursed into the shop and other areas of the building during specific operations such as sawing, machining, and grinding of the graphite work pieces. Working with Air Dynamics, Key was able to enhance their process while creating a more employee friendly environment.

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Providing the Best Solution, By Designing the Best Product

Air Dynamics provided complete Turnkey design and installation of the dust collection system including source capture hoods, industrial duct, dust collector, installation and startup. Key Plastics was provided with a total integration of an industrial ventilation system as well as knowledgeable employees during installation of the indoor air pollution controls. The collector was expected to be installed in accordance with federal and state regulations. Organizations such as OSHA protect employees and their work environments to keep the workers safest while performing their job. Key engaged an industrial hygiene specialist who conducted an overall shop as well as tested a number of personnel with an air sampling survey. The industrial hygienist performed dosimeter tests to check exposure levels prior to the installation of the dust collection system. Air Dynamics provided recommendations outlined in Industrial Ventilation - Manual of Recommended Practice published by the American Conference of Governmental Industrial Hygienists to correct the indoor air pollution problem.

The dust collector was a Turnkey project delivering 13,000 cfm with the air being filtered at a 99.5% @ 2.5 µm efficiency level. Eight inch ducts were to be routed to four CNC machines specified by Key Plastics. Two eight inch ducts were also routed to the surface grinders and additional drops were split into two or three separate flexible collection hoses.

Above: Ducting installed in Key facility

The open CNC machines were serviced with two, 4-inch flex lines with hoods at each end. The enclosed CNC machines were serviced with three, 3-inch flex lines, without hoods. Each surface grinder was serviced with two, 4-inch flex lines; one line having a source capture hood, with the other being attached to the top of the grinder wheel shroud.

Above: Example of Straight Duct Work

Table grinders had two dust collection pickup points - this was to capture the high velocity particles of synthetic graphite dust thrown from the grinding wheel. The second pickup point was directly opposite where the material was currently being discharged. There were twenty-four filter cartridges inside the dust collector and the fan was top mounted. The system was located on the south side of the building resting on a concrete slab with traffic guards.

The dust collection system was installed with fifteen inlets total. Air Dynamics' responsibility was to install the system per the approved drawings. The duct work that was supplied was high performance duct manufactured by Nordfab products.

The QF-System allowed simple modifications, ease of cleaning, and reusability. Included with the proposal was a one year dust collector preventative maintenance plan that included visits to inspect the blower assembly and the filter array. A written report was to be provided with each visit along with any recommendations after the inspections were completed.

Above: Precise Ducting From the Work Area

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The dust collector was successfully installed by Air Dynamics at the Felton factory in York, Pennsylvania. When the machine was fully installed, the Industrial Hygiene Specialist returned to Key Plastics' facility to run another air sampling survey evaluating exposures of synthetic graphite dust and the effectiveness of the new ventilation system.

The result- the synthetic graphite dust levels were well below the ACGIH, TLV, and the OSHA PEL for all five samples collected; results can be seen in Table 1. In this case, it is 15 mg/m3 total dust and 5 mg/m3 in reparable fraction for synthetic graphite. The main reason that Air Dynamics was contacted was to return clean filtered air to the work shop, and by the end of this project, that goal was reached.

Air Dynamics Industrial System Corporation has over twenty-five years of experience in the industrial ventilation field. Our specialized approach is "designed to fit your specific needs". Give us a call or visit our website to see what we can do for you.

Above: Dust Collector Unit Outside Facility

Below: Table 1 of Dust Particular to Key Plastics

Synthetic Graphite Dust

Job	Sample Time (minutes)	Sample Volume (liters)	Results	Standard- ACGIH TLV (mg/m3)	Standard- OSHA PEL (mg/m3)
Machinist	456	904	0.13	10.0	5.0
CNC Operator	498	1,026	0.10	10.0	5.0
Tool & Die Maker	496	1,015	0.18	10.0	5.0
Toolmaker	501	1,008	0.31	10.0	5.0
Toolmaker	445	906	0.12	10.0	5.0

CONTACT INFORMATION

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