

Dust Collection: Metal Grinding

Parker Hannifin Solves Metal Grinding Issues With Customized Cross-Ventilation System

Wyman-Gordon is a leading producer of complex metal components that include some of the world's largest products for aerospace applications. The company uses forging, a process that uses heat and pressing to form metal. Forged materials include titanium, steel, and nickel-based alloy.

**Focus:**

Wyman-Gordon

Challenge:

Design a system to handle large volumes of fine grinding dust 24 hours a day, 365 days a year.

Solution:

Customize DustHog® MCB crossflow dust collectors with high-capacity fans, air-balancing dampers, high-efficiency open filters and re-entrainment prevention baffles added to the dust drawers.

Impact:

- Grinding operators enjoy cleaner workplace air.
- Filters last one to one and a half service years before replacement.

At Wyman-Gordon's Grafton, Mass. Plant, workers hand grind metal to remove defects from the forging process and excess flash. Parts range from 2-ft. to 10-ft. wide, up to 22-ft. long, and can weigh under 100-lbs., or over 15,000-lbs.

Challenge

The dust generated from hand grinding is extremely fine with a tendency to plug dust collection system filters. It quickly became obvious that the existing dust collection units were not up to the task.

Wyman-Gordon needed a solution that would:

- Collect and handle a large volume of fine grinding dust
- Operate flawlessly 24 hours a day, 365 days a year
- Provide flexibility to handle small and large metal parts
- Reduce filter maintenance, time and labor
- Be thoroughly performance tested

Solution

A UAS, now Parker Hannifin representative recommended replacing the ineffective unit with a specially modified dust collection system with proven performance. Parker Hannifin Application Engineers, factory personnel, and the Parker

representative all worked together to develop a customized solution that met Wyman Gordon's demanding application requirements. They also performed extensive testing to ensure the system was the absolute right solution.

The first step in the process was installation of a 6-ft. and 9-ft. MCB cross ventilation cartridge dust collection system into a 15-ft module. Initial performance testing however showed that the standard blower was inadequate for the task, as many grinding operations are operated three shifts, seven days a week.

Parker Hannifin engineers then added high-capacity fans to improve the dust collection capacity of the system, air-balancing dampers to allow for precise air volume control, cage-less filters for excellent dust release during pulse cleaning sequences and baffles to the dust drawers to prevent collected dust from re-entering the system. Also added were inlet back draft strips to prevent dust from exiting the MCB unit and an off-line cleaning sequence for easy maintenance. Each change was thoroughly performance tested to make sure the solution implemented was the right solution.

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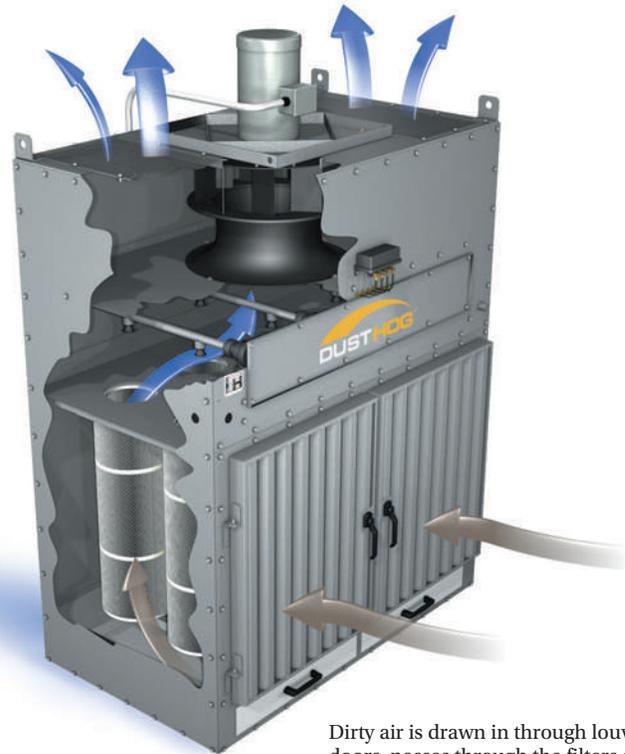
Impact

The extra effort to ensure every part of the Parker Hannifin solution was exactly right paid off. As a direct result, Wyman-Gordon now has twenty 6-ft. and 9-ft. MCB crossflow units tagged together in 15-ft. segments in 30-ft. long grinding booths. By pairing the MCB dust collection units into 15-ft. segments, the company has the option of having two grinders in a 30-ft. booth—one each at a 15-ft. station. Or, one grinder in a 30-ft. module for very long forged parts.

Grinding dust in the air is drawn in through the large louvered doors. Airborne contaminants are captured within high-efficiency cartridge filters, and cleaned air is sent upward and out the top of the system. At the same time factory air is being cleaned, a blast of air is periodically sent through the center of vertically arranged cartridge filters, causing the dust to “pulse” off into large capacity dust drawers for easy disposal.

“Of special significance,” notes Matt Service, facilities engineer, Wyman-Gordon, “is the fact that our grinding operators like the solution as the MCB units perform exceptionally well. We also added a ‘hood’ with integral lighting at the front perimeter of each 30-ft. booth that serves to keep the flow of air around the operators while they are grinding.”

Overall, the company is getting over one to one and a half years of service life before a filter change is necessary.



Dirty air is drawn in through louvered doors, passes through the filters and is released as clean air from the top of the dust collector.

Parker Hannifin Application Engineers, factory personnel and the Parker representative all worked together to develop a customized solution that met Wyman Gordon’s demanding application requirements.