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# WELDING DESIGN & FABRICATION

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**Tactics for successful  
band sawing**



**Long-lasting grinding  
wheels**



## **\$hops clean up with filtration**

# Clean air is a modular affair

Modular filtration systems efficiently target smoke-generation sources.

Typically, shops don't account for the effects of air filtration on plant image or their bottom-line performance. However, one industrial-air-filtration company is challenging this traditional belief with modular systems that slash up-front costs, lower operational expenses, and enhance facility appearance.

Rome, Ga.-based Clean Air America Inc.'s modular approach consists of first conducting site surveys to assess customer needs. It then incorporates modern dust-collection and air-filtration equipment as turnkey systems. The company does so in concert with cell integrators, equipment manufacturers, and plant engineering staffs. Project phases intertwine to ensure optimum air-intake positions that do not degrade production efficiency.

With regard to air filtration, the traditional approach typically involves massive roof-mounted blowers and filter-cartridge units connected through a maze of ductwork to point-of-source pickup points. What Clean Air does is focus on the source of smoke generation, targeting solutions on a modular level instead of basing them on plantwide needs.

In some instances, initial equipment and installation savings are as much as 50% with a Clean Air America air-filtration system.

In some of the company's installed systems, initial equipment and installation savings amount to as much as 50% as compared to traditional air filtration. Clean Air's systems efficiently move less air volume through point-of-source capture concepts using small, less-energy-consuming motors. Because the systems filter and return air to a plant, they reduce expenses associated with make-up air.

The company also uses down-flow filtering technology. This, combined with its special smoke-capture concept, diminishes smoke to improve air quality at a low filter-replacement cost. Additionally, as compared to traditional approaches, this type of system is less susceptible to air-imbalance problems.

During Clean Air America's down-flow filtration, incoming dirty air flows downward through filters positioned vertically — not at an angle — to readily shed dust. As dirty air spreads and distributes in a downward laminar flow around the filters, it passes into and through them, with some catching against the filters. The rest goes into a 100% dust-settling hopper or tray that doesn't create air currents to stir up and recirculate dust



Clean Air America focuses on the source of smoke generation, targeting air-filtration solutions on a modular level instead of basing them on plantwide needs.

finer. A jet-pressure wave cleans the system's row of filters, propelling trapped dust to also move downward into the hopper.

According to Bertil Brahm, president of Clean Air America, it isn't always necessary to place huge filtration equipment on a plant roof or along its exterior walls. Clean Air America minimizes the amount and size of equipment and ducting required to get the job done, thus reducing clutter, waste, and noise and enhancing overall plant appearance.

Some types of the company's filtration systems include DFC collector units, DFX air filtration, Septronic mist collectors, Cap-Ture units, and Workstation and Weld Station. The DFC line handles weld smoke, grinding particulate, dust, and other mainly dry applications.

DFX units filter rubber smoke, ambient air, fumes, odors, and extremely fine particulate. Multiple filtration stages separate and capture various particle sizes. Filter ranges

are metal mesh, 30% pre-filter, 60% pre-filter, 95% ASHRAE, 95% DOP, HEPA, and carbon.

Septronic mist collectors use oil-screen technology to tackle oil and coolant mist typically generated in machining processes. According to Clean Air America, the technology is documented by a University of North Carolina study as the most efficient filtration method for mist and aerosols.

Cap-Ture is a low-profile, weld cell top-mount system that is completely self-contained. The system integrates into a hood and caps the weld cell, so there's no need for ducting.

Work and Weld Stations, also self-contained, are modular continuous-duty workspaces for weld smoke and grinding particulate from manual operations. Their sizes adapt to workpieces measuring from one to 12-ft long.

### Clean air in Georgia

For one of its customers, Clean Air America engineered modular systems that handle a combined total air volume of 153,000 cfm. With its heating and cooling costs at about \$2.00/cfm and \$3.00/cfm, respectively, the customer stands to save up to \$300,000 annually by filtering and returning plant air as opposed to exhausting it to the outside.

The customer, F&P Georgia Corp. in Rome, Ga., manufactures vehicle parts for companies such as Honda and Nissan. Its turnkey Clean Air America ventilation system consists of hoods in front of quick-clamp-style ducting, modular preformed hoods for welding cells, and dust collectors for shop-air filtration in the 144,000-ft<sup>2</sup> facility. Dust collectors are on a service mezzanine above the plant floor to conserve space, reduce sound, and keep them out of the way of the plant's working technicians.



To conserve space, reduce sound, and keep units out of the way, Clean Air America often places its dust collectors on service mezzanines above plant floors.

Clean Air America collector equipment for F&P's Honda welding cells consists of three 48-cartridge filter units, while the Nissan cell has three 18-cartridge units and one Weld Station 5. For another Honda cell, the company uses a modular system with two 48-cartridge filter units and two 24-cartridge ones. Twenty-six preformed modular hood systems fit to the robotic cell's walls.

In addition, F&P employs Clean Air America's special Smart Collector series with built-in Fire Suppressor technology. The system detects and extinguishes fires in the filter compartment within seconds. Its dry sequestering gas leaves no chemical residue.

In operation, the unit's smoke detector senses smoke from the start of a fire and instantly triggers an inlet-block plate, which limits airflow

through the collector. Power shuts off to the blower motor and pulse-cleaning system. Sequestering gas discharges into the filter compartment to control the fire at the incipient stage. A warning light illuminates, alerting operators to inspect and reset the system.

According to Clean Air America, traditional dust collectors can accelerate a fire when all necessary ingredients are present. In air filtration, these are fuel, oxygen, and heat. Dirty cartridge filters laden with oily smoke and dust provide the fuel. High volumes of oxygen-rich air then draw through the system, are filtered, and exhausted back into the plant. Sparks or embers from the production process provide the heat.

If a large enough spark bypasses the traditional prevention measures, the filters can ignite and burn rapidly, filling the facility with smoke. This situation results in lost production time, costly cleanup, and equipment damage.



Clean Air America's down-flow filtering combined with its special smoke-capture concept reduces smoke to improve air quality at a low filter-replacement cost for applications such as this robotic welding cell.