

# McGill AirFlow's Current Awareness Service

## TECH BULLETIN

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### ***Simpler Designs Can Be Better Designs***

Rube Goldberg was a cartoonist famous for drawing outlandishly complicated machines to perform the simplest tasks. Whether they realize it or not, many HVAC designers have a little bit of Goldberg's tendency to over-engineer. The problem is that what looks reasonable on paper can be a nightmare in real life.

For example, an engineer recently submitted a design concept for a supply air system at a corrosion control facility. The goal was to provide a continuous air curtain across the entire surface area of an airplane during sandblasting and painting operations. The supply ductwork and diffusers had to fit up in the structural steel of the building 14 feet above the airplane's surface. For sandblasting operations, the diffusers had to maintain 50 fpm at 14 feet; for painting, they had to maintain 100 fpm.

Using McGill AirFlow's Type AD DUCT-D-FUSER™ air diffusers, the engineer initially devised the duct layout shown in **Figure A**. Unfortunately this design misapplied the

DUCT-D-FUSER from the standpoint of supply air orientation. First, this product is engineered for discharge perpendicular to supply airflow. Second, the diffusers cannot provide a perfect air curtain distribution pattern directly perpendicular to the unit as shown in **Figure A**.

McGill AirFlow's Engineering Department created a simulation in their airflow lab and demonstrated that the design would not work. After exploring several alternative designs, they suggested replacing each of the 36-inch-diameter branch feeders with a 36-inch-diameter FACTAIR® outlet shown in **Figure B**.

As this example illustrates, misapplying a product can cause problems rather than providing a solution. In such situations, your supplier's technical staff can be a good source of advice.

Projects like this one present opportunities for value engineering. If a system is over-engineered, simplify the design and products used.

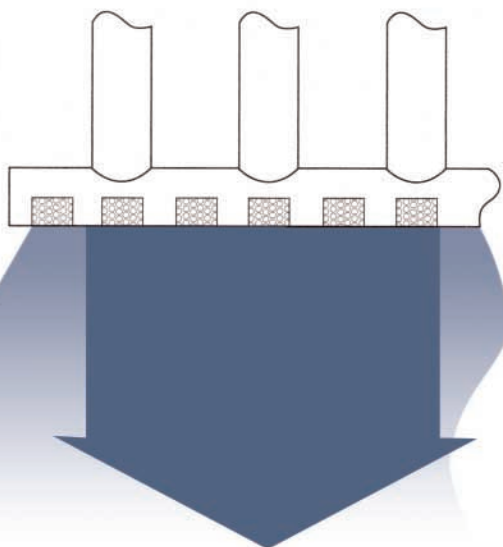
Better understanding of manufacturing and fabrication techniques of duct system products can help cut costs. Customized fittings that require extra layout or fabrication are usually expensive. If a standard product can be substituted, it will probably save money. Your supplier can point out potential manufacturing issues and work with you to find other options.

Unusual designs can also undermine a system's performance. Because a fitting can do the job doesn't mean that it will do it efficiently. Your supplier can often suggest a more effective alternative.

McGill AirFlow's Engineering Department has a wealth of troubleshooting design experience and can work with you to find design changes to improve a system's airflow or acoustical performance. Contact them at

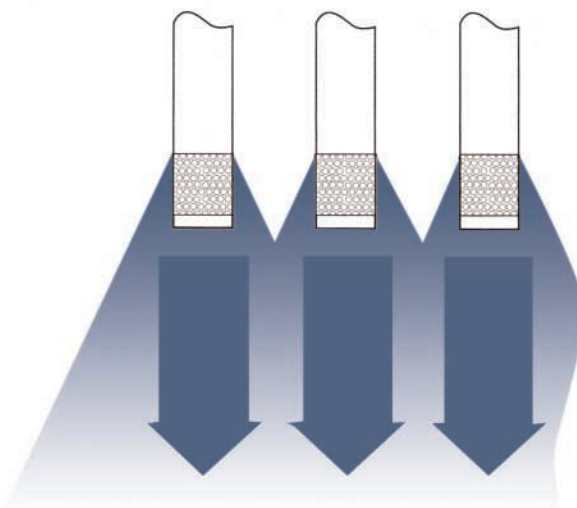
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**Figure A**



Original Design  
Type AD DUCT-D-FUSER™

**Figure B**



Redesign  
Model 25 FACTAIR®