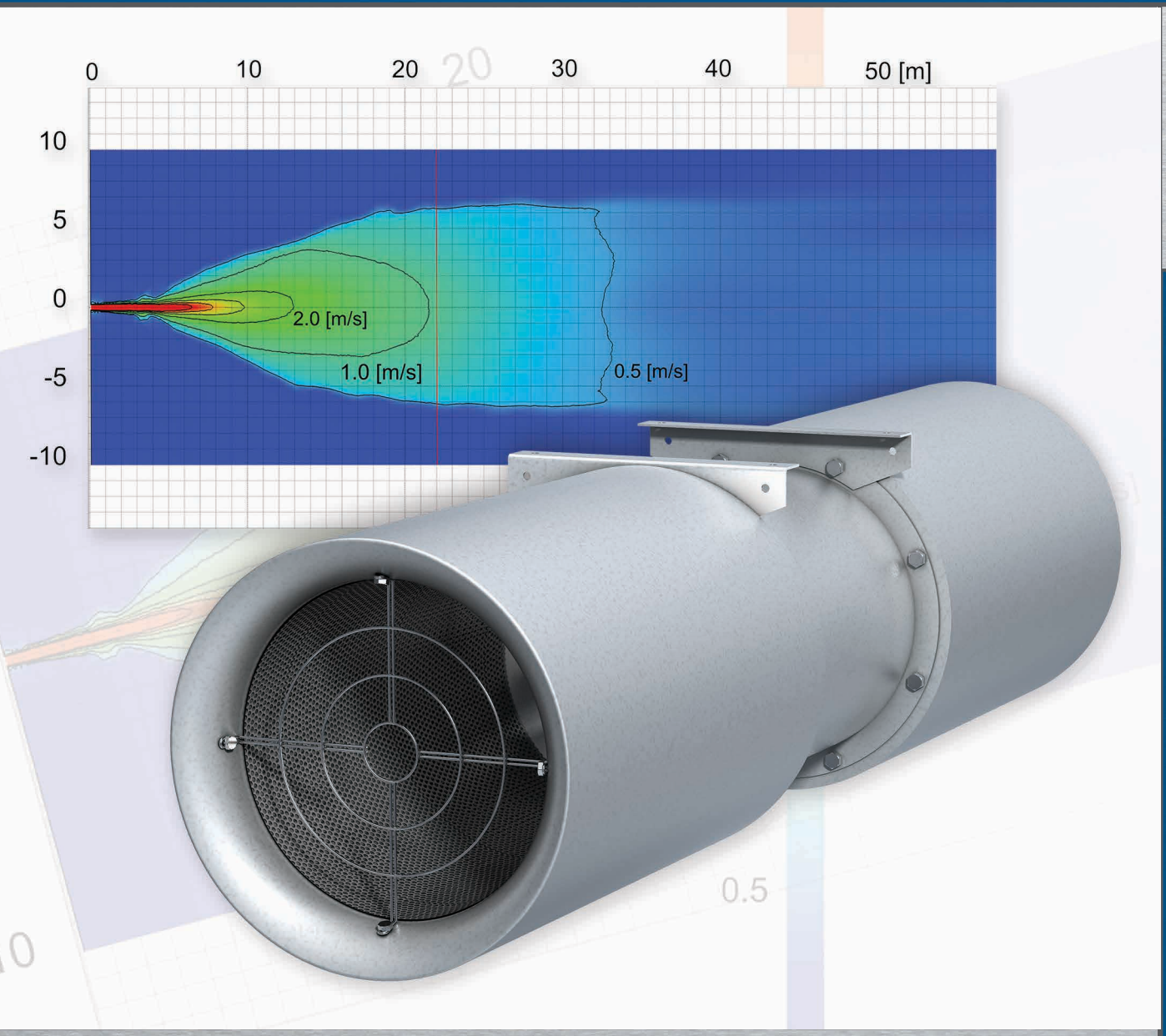
GreenPark™
GreenJet Throw Performance



GREENHECK
Building Value in Air.

BUILDING VALUE IN AIR.

February
2017

GreenPark™ Overview

As cars are parked within an underground parking structure, carbon monoxide (CO) and other noxious fumes are emitted into the atmosphere. There is a need for an efficient ventilation system that can remove these toxins, circulate fresh air into the car park, and assist firefighters in the case of a fire emergency. There are two options for this task, ducted or ductless ventilation.

While ducted ventilation has been the standard for many years, innovation in the field of ventilation has shifted the conventional ventilation system towards ductless designs. Ductless designs use jet fans to dilute and remove contaminants and control the smoke. These systems provide greater control at a fraction of the cost of traditional ducted systems. The solution is ***Greenheck's GreenPark™!***

What is GreenPark™?

GreenPark is a ductless car park offering that combines products and services to provide reliable, energy efficient ventilation along with emergency smoke exhaust.

GreenPark is a system which consists of both services and components. These combine to provide ventilation during normal operation of the car park, as well as removing the smoke during emergency situations. GreenPark services include sensor placement, Computational Fluid Dynamics (CFD) analysis, and control sequencing. GreenPark components include supply and exhaust fans, GreenJet® (GJ) fans, Life Safety and Volume Control dampers, and sensors.

GreenPark Advantages

- **Simplified Design:** Eliminates the need to perform costly duct design.
- **Lower Construction Cost:** GreenJet fans have less height than ducted systems, resulting in less excavation and lower overall construction cost.
- **Lower Installation Cost:** A typical GreenPark system results in less installation time overall.
- **Improved Operational Costs:** Eliminating the ducts reduces the static pressure required and allows the GreenJet fans to run with less power. Additionally, the sensors allow running the system only when the demand requires.
- **Reduced Maintenance:** In addition to eliminating duct cleaning, GreenJet fans are more accessible for maintenance than traditional systems.
- **Enhanced Safety:** GreenJet fans are more efficient at removing noxious fumes and clearing smoke, resulting in a safer environment with the added benefit of minimizing potential damage caused to the building.

Design Partner

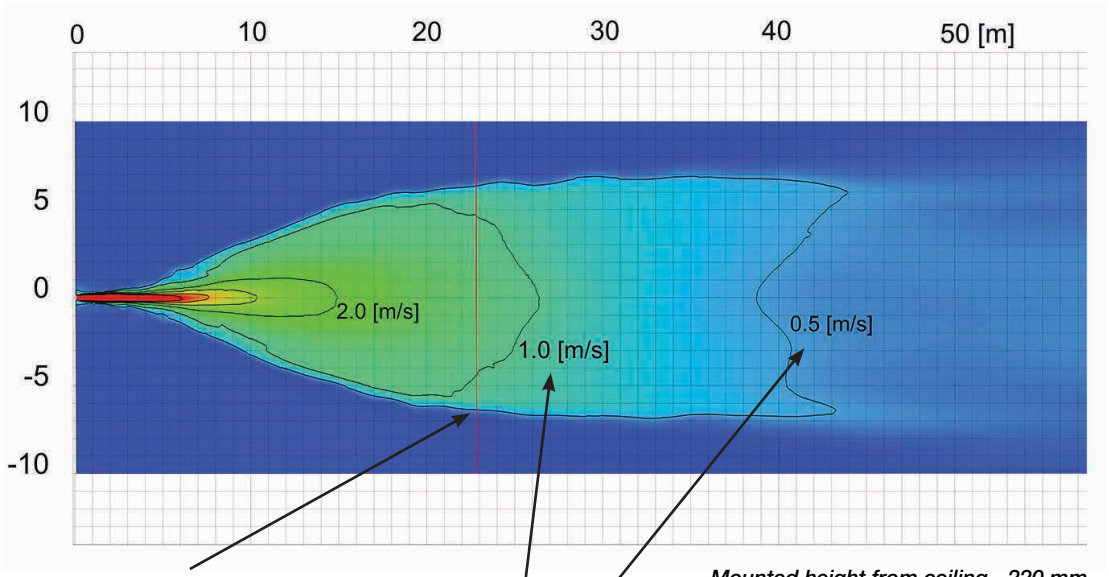
Greenheck knows that every enclosed parking structure has different requirements. This is due to varying geometries, different building types, or conflicting regulatory agencies. That is why GreenPark is a fully configurable solution providing you the highest quality, most cost-effective solution for your region. Greenheck's dedicated engineers will work with you from the beginning stages of building design and assist with decisions such as supply and exhaust shaft locations, fire zoning, and fan placement. As the design continues, the GreenPark solution can include control sequencing, switching diagrams, and even provide commissioning. The GreenPark team is ready to assist in order to provide the system you need! Contact your local sales representative for details.

Understanding Throw Diagrams

The following throw diagrams were created in a free field environment, and can be used to help guide the initial placement of GreenJet fans. GreenJet fans can cover 10-15 m^2/N of thrust, which is a basic approach in determining the total coverage area during initial GreenJet placement. Thus, if a parking garage is 5,000 m^2, and the GJ-AU315P GreenJet fan with 25N of thrust is being used, then each GreenJet fan can cover approximately 250 m^2 to 375 m^2 of area. Therefore, 13-20 jet fans are required. Once the number of GreenJet fans are determined, the initial placement can be completed by placing them in locations which generally guide the air from the fresh air supply to the area of exhaust. When moving the air in a linear direction, the fans can be spaced at the approximated throw termination point, or "typical fan spacing" point. A Computational Fluid Dynamics (CFD) report should always be completed in order to confirm that the correct number of GreenJet fans has been used and that they are placed in the optimal locations.

GJ-AU315E

Volumetric Flow Rate - 4200 CMH *(2472 CFM)*



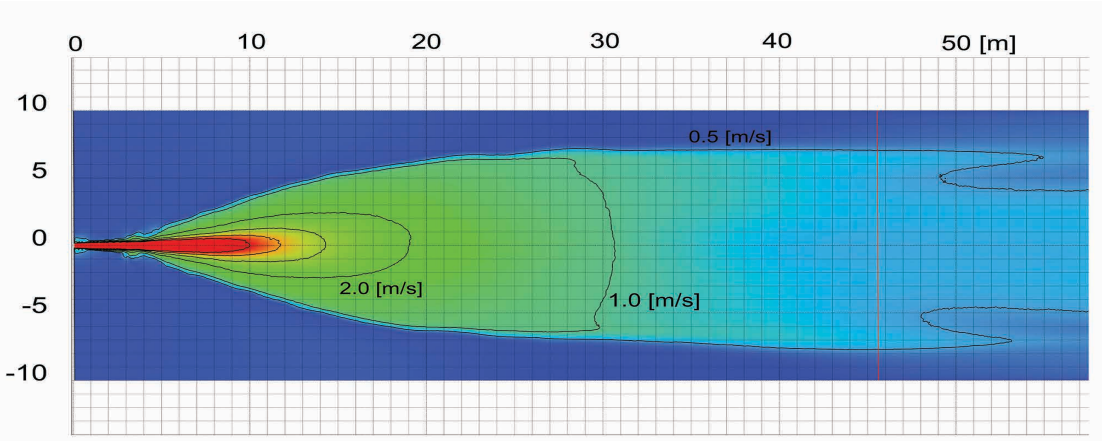
Typical Fan Spacing Line

Velocity zones determined by contour lines

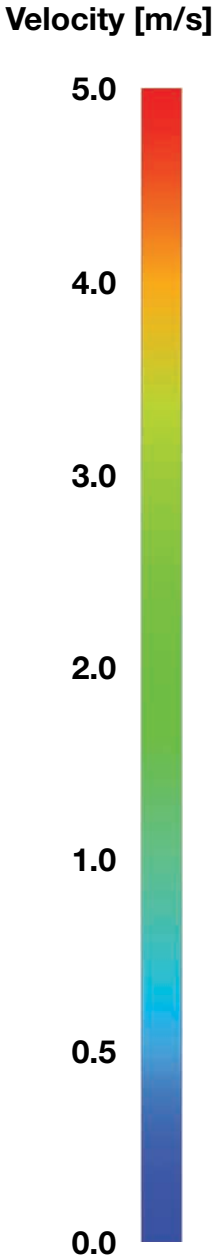
Velocity [m/s]

3500 RPM

Volumetric Flow Rate - 5450 CMH *(3208 CFM)*

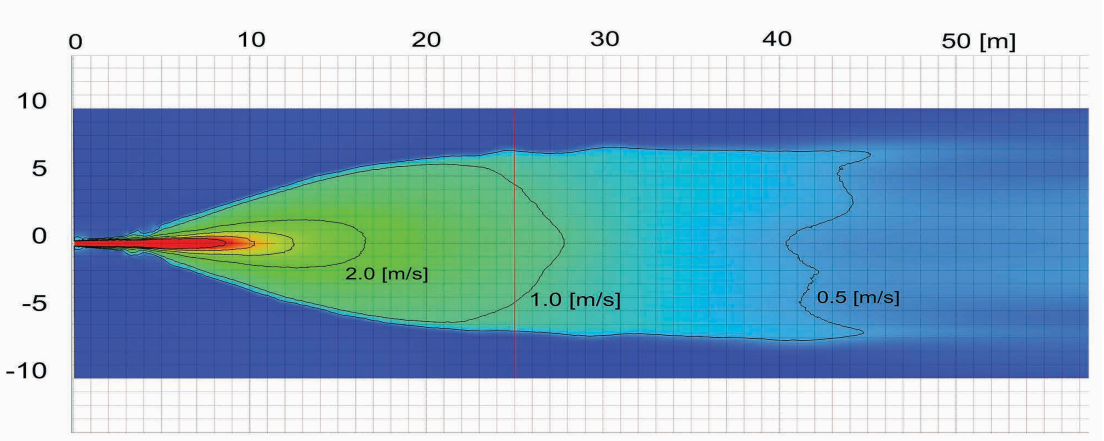


Mounted height from ceiling - 206 mm



2900 RPM

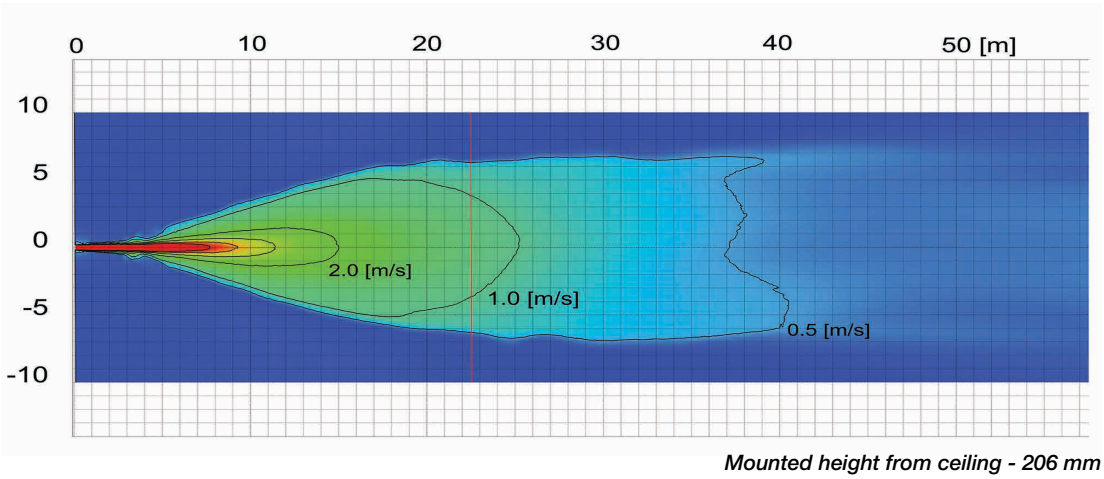
Volumetric Flow Rate - 4500 CMH *(2649 CFM)*



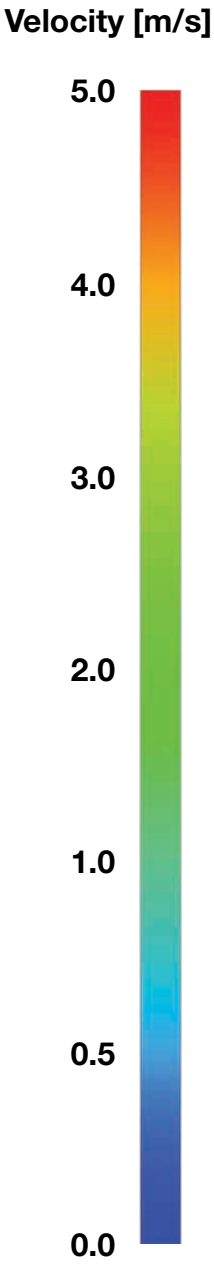
Mounted height from ceiling - 206 mm

3500 RPM

Volumetric Flow Rate - 3900 CMH *(2295 CFM)*

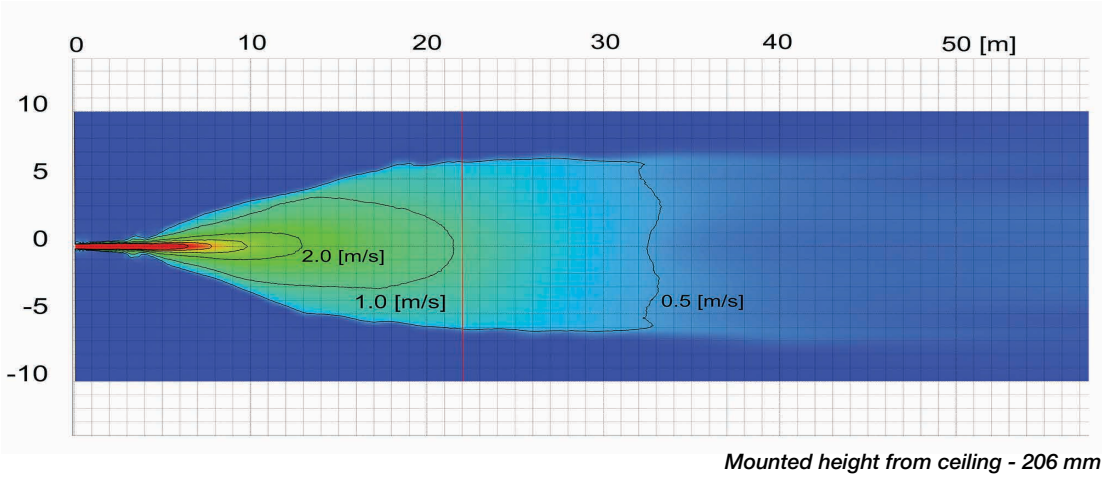


Mounted height from ceiling - 206 mm



2900 RPM

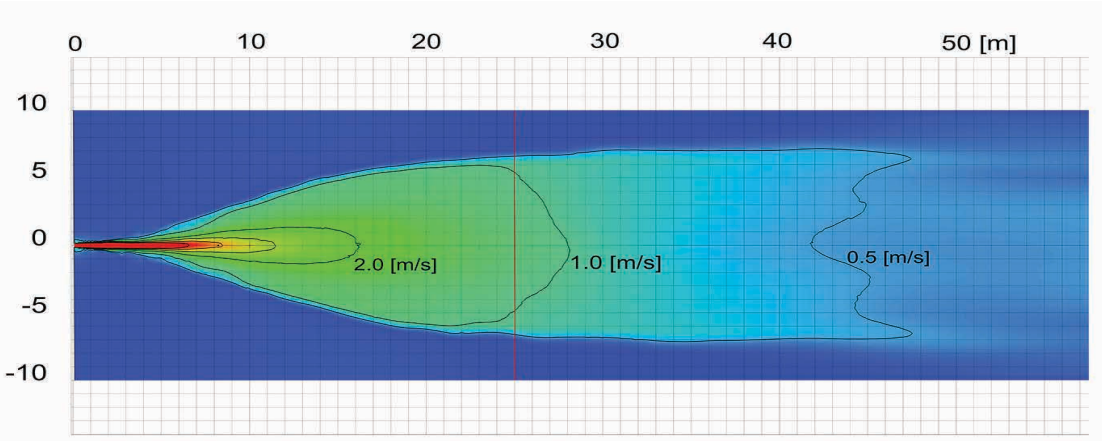
Volumetric Flow Rate - 3200 CMH *(1883 CFM)*



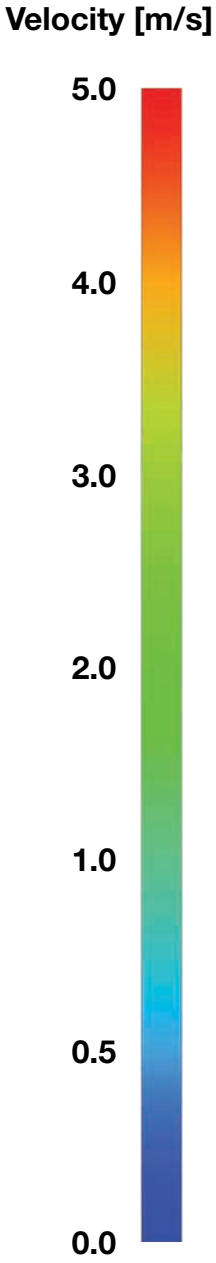
Mounted height from ceiling - 206 mm

3500 RPM

Volumetric Flow Rate - 4639 CMH *(2730 CFM)*

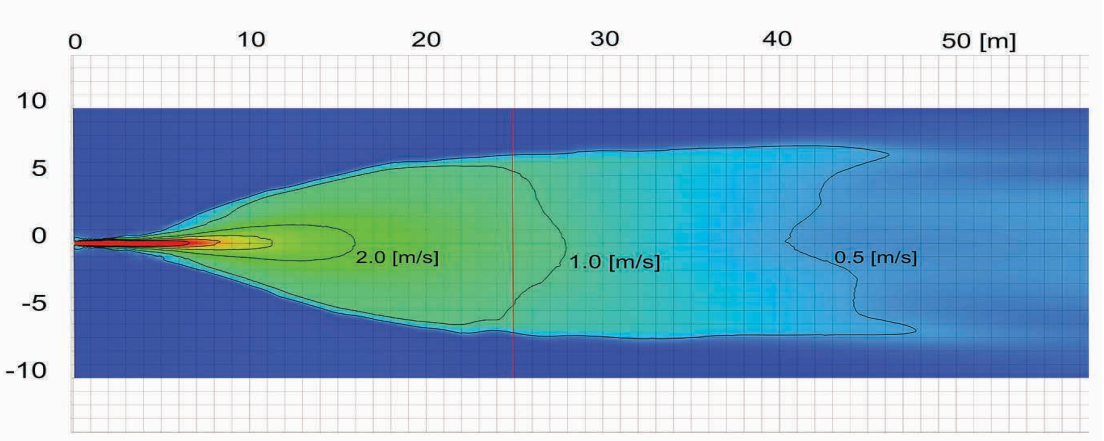


Mounted height from ceiling - 220 mm



2900 RPM

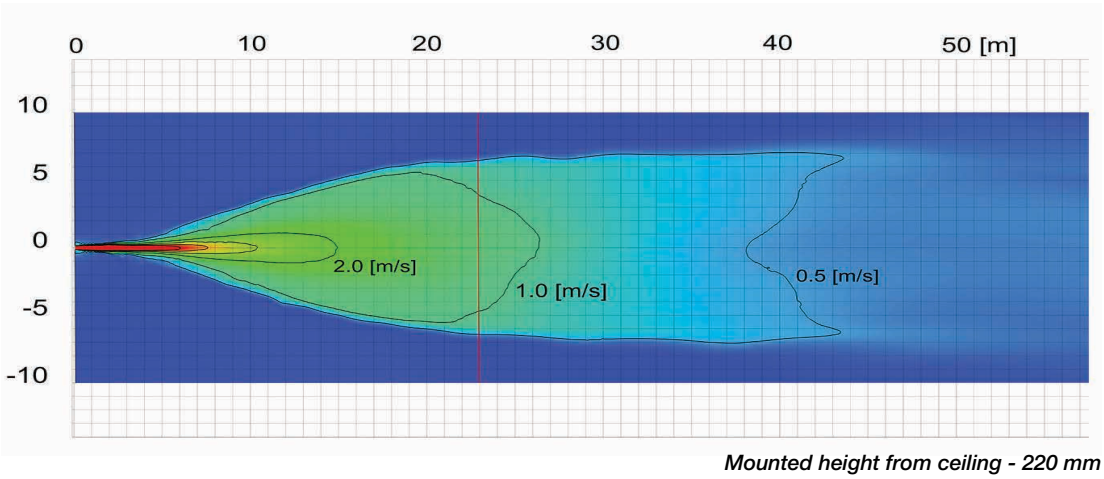
Volumetric Flow Rate - 4582 CMH *(2697 CFM)*



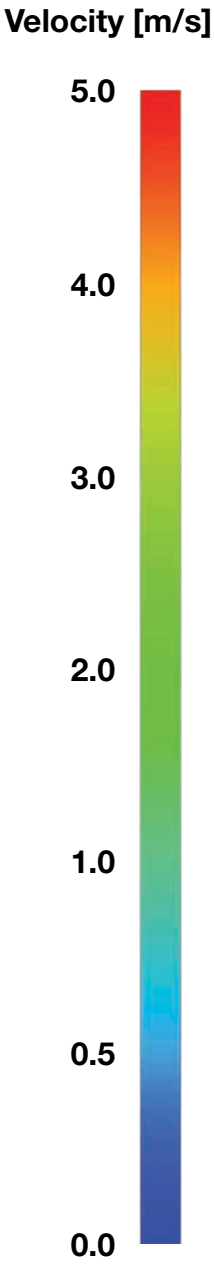
Mounted height from ceiling - 220 mm

3500 RPM

Volumetric Flow Rate - 4204 CMH *(2474 CFM)*

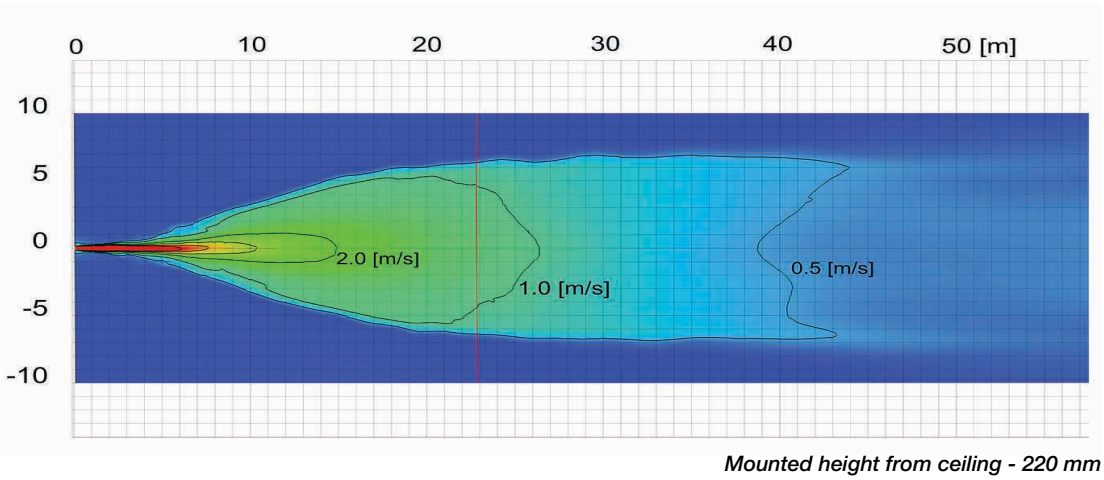


Mounted height from ceiling - 220 mm



2900 RPM

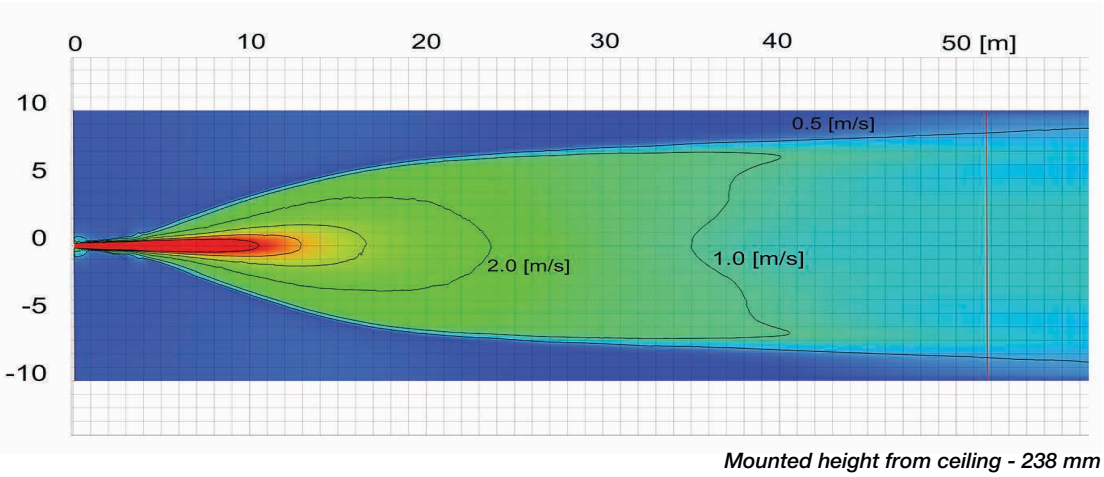
Volumetric Flow Rate - 4200 CMH *(2472 CFM)*



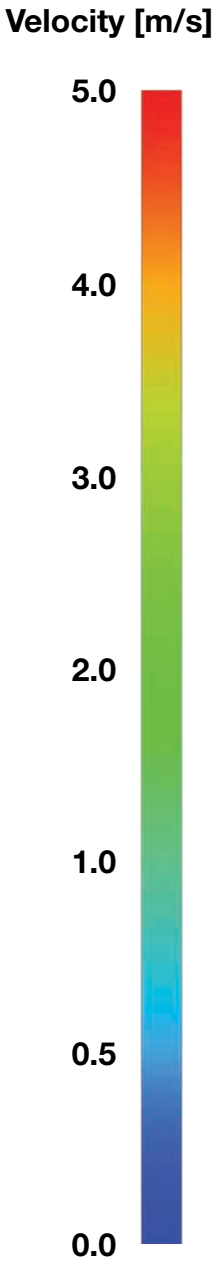
Mounted height from ceiling - 220 mm

3500 RPM

Volumetric Flow Rate - 8215 CMH *(4835 CFM)*

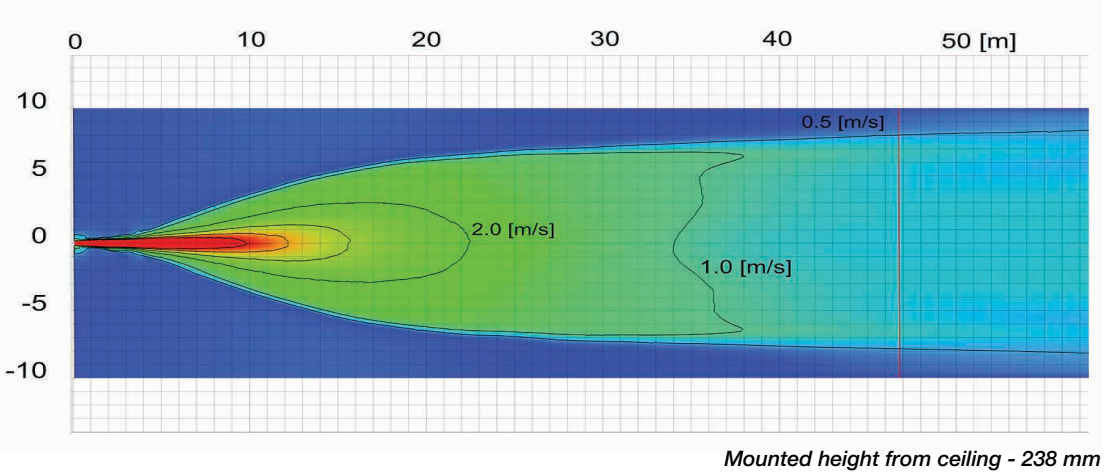


Mounted height from ceiling - 238 mm



2900 RPM

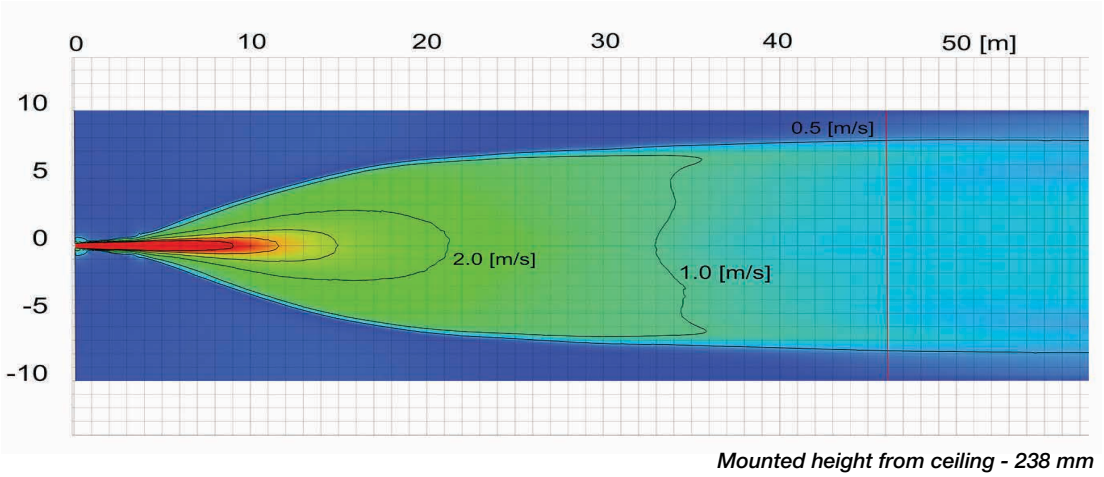
Volumetric Flow Rate - 7715 CMH *(4541 CFM)*



Mounted height from ceiling - 238 mm

3500 RPM

Volumetric Flow Rate - 7264 CMH *(4275 CFM)*



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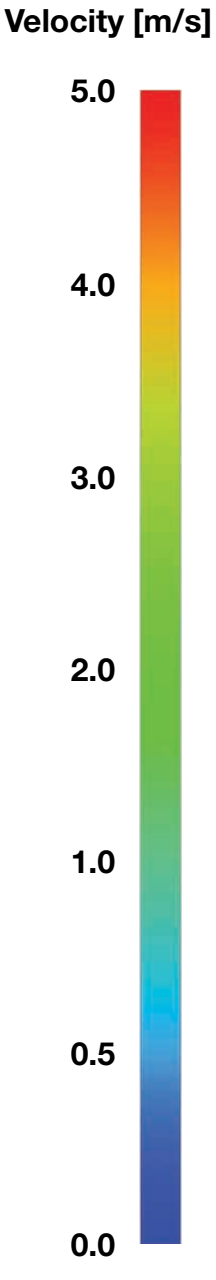
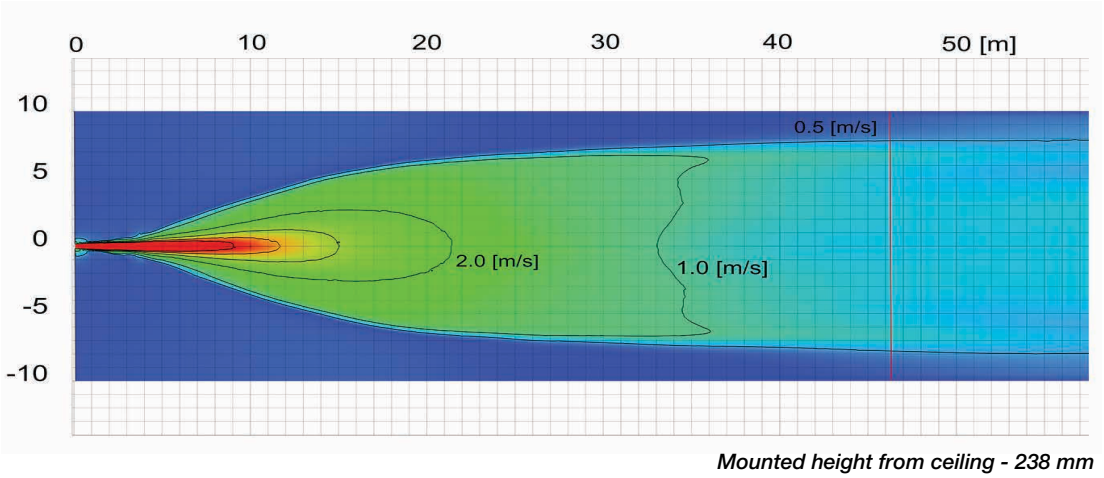


2900 RPM

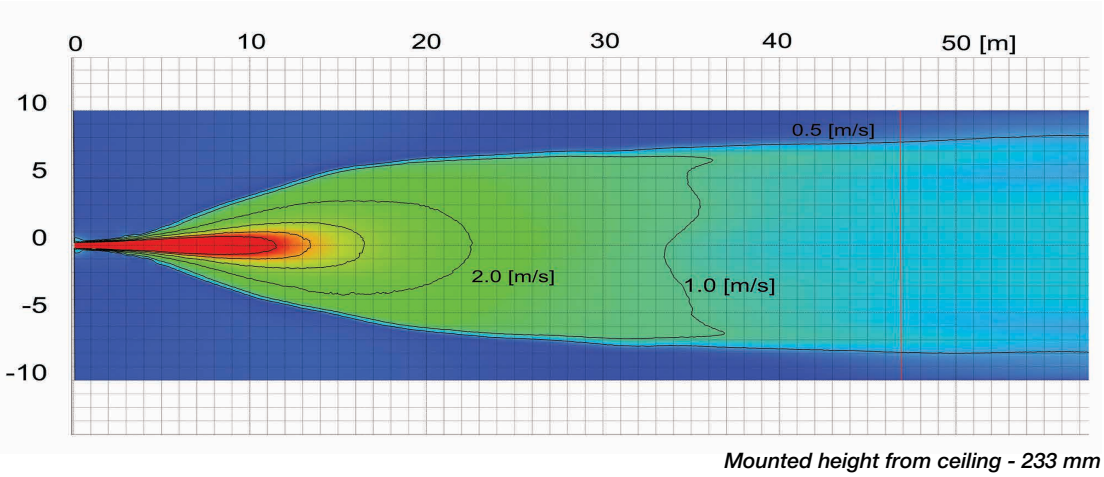
Volumetric Flow Rate - 7329 CMH *(4314 CFM)*



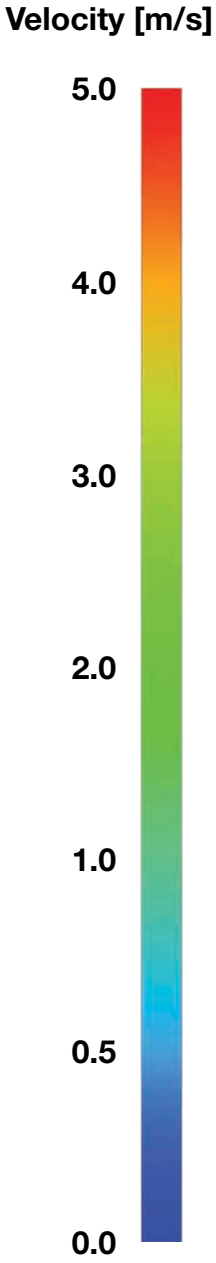
Mounted height from ceiling - 238 mm

3500 RPM

Volumetric Flow Rate - 7650 CMH *(4503 CFM)*

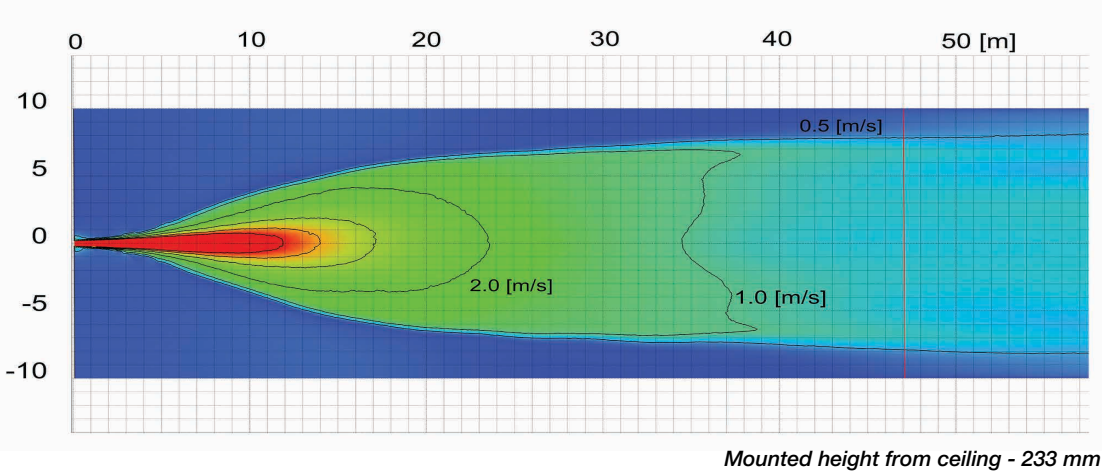


Mounted height from ceiling - 233 mm



2900 RPM

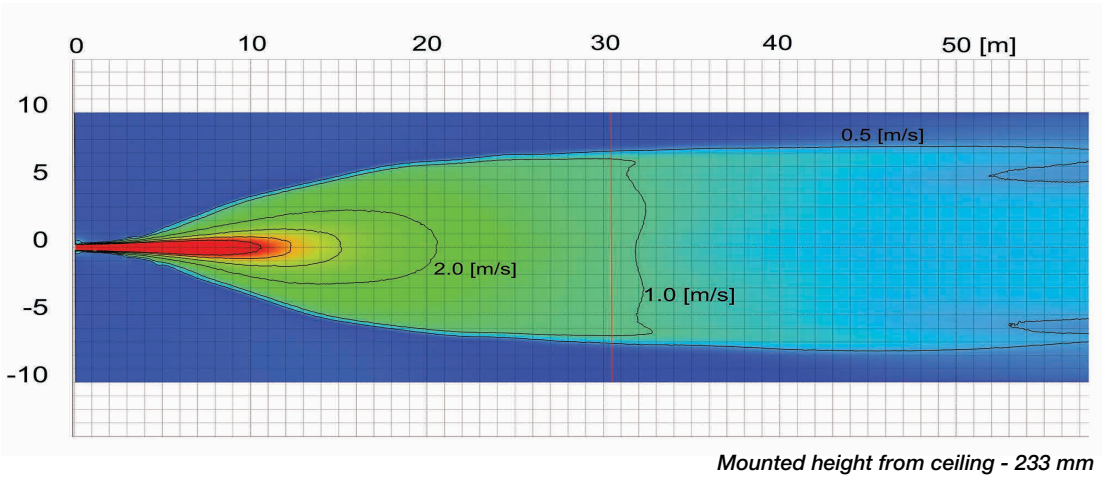
Volumetric Flow Rate - 8000 CMH *(4709 CFM)*



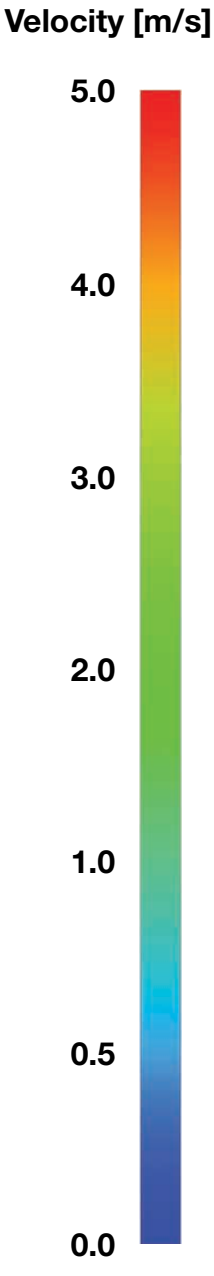
Mounted height from ceiling - 233 mm

3500 RPM

Volumetric Flow Rate - 6800 CMH *(4002 CFM)*

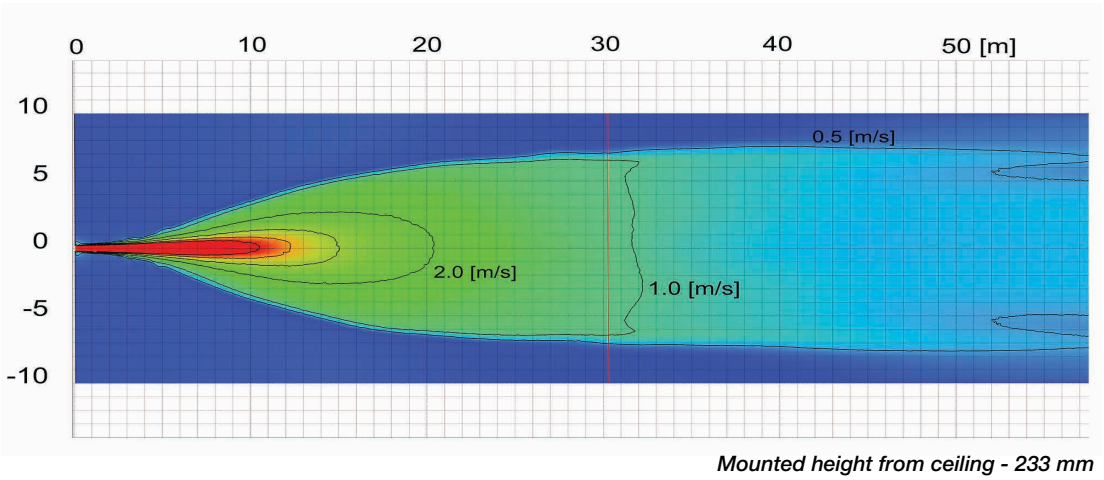


Mounted height from ceiling - 233 mm



2900 RPM

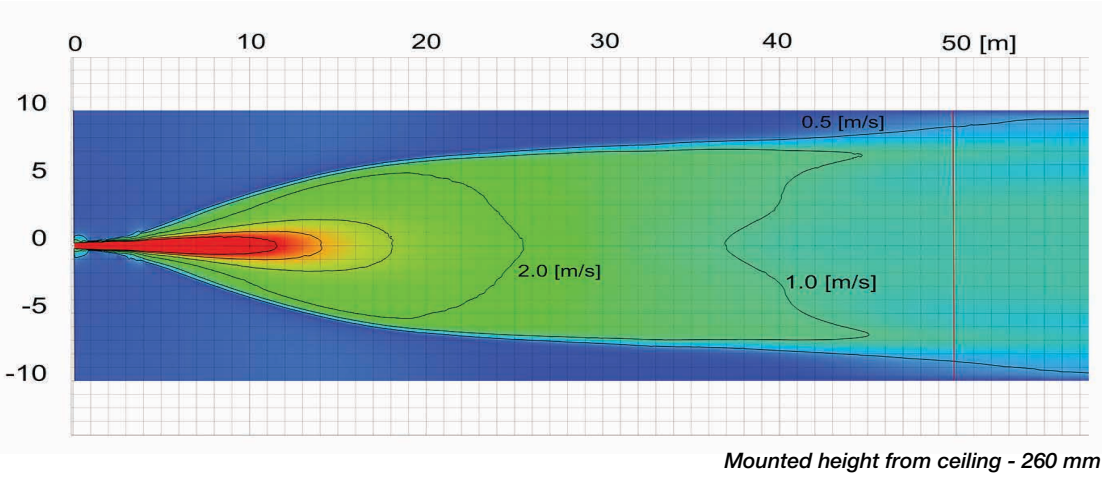
Volumetric Flow Rate - 6700 CMH *(3943 CFM)*



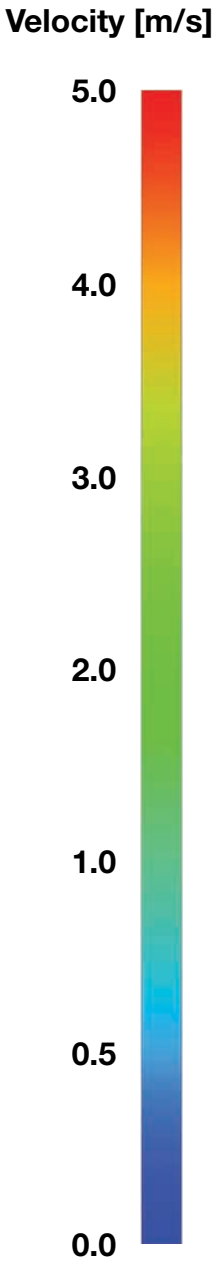
Mounted height from ceiling - 233 mm

3500 RPM

Volumetric Flow Rate - 10380 CMH *(6109 CFM)*

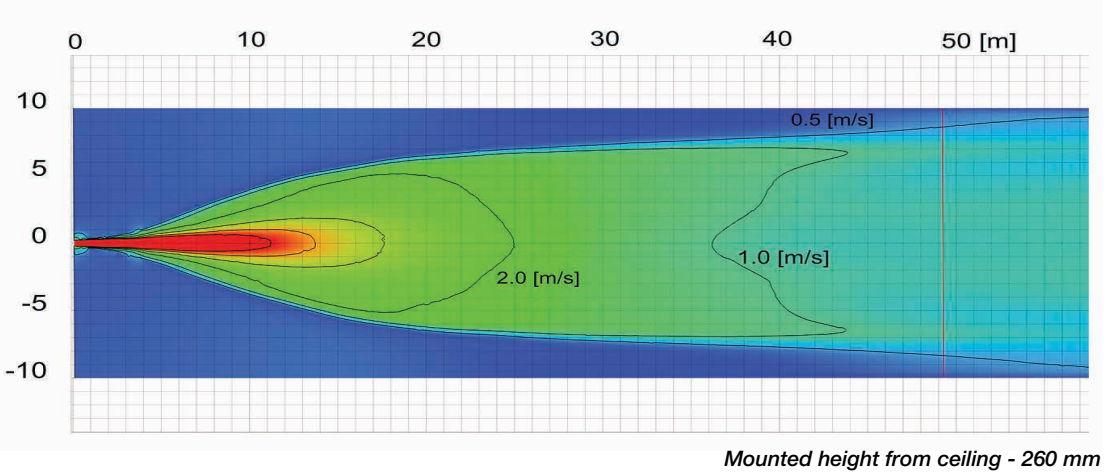


Mounted height from ceiling - 260 mm



2900 RPM

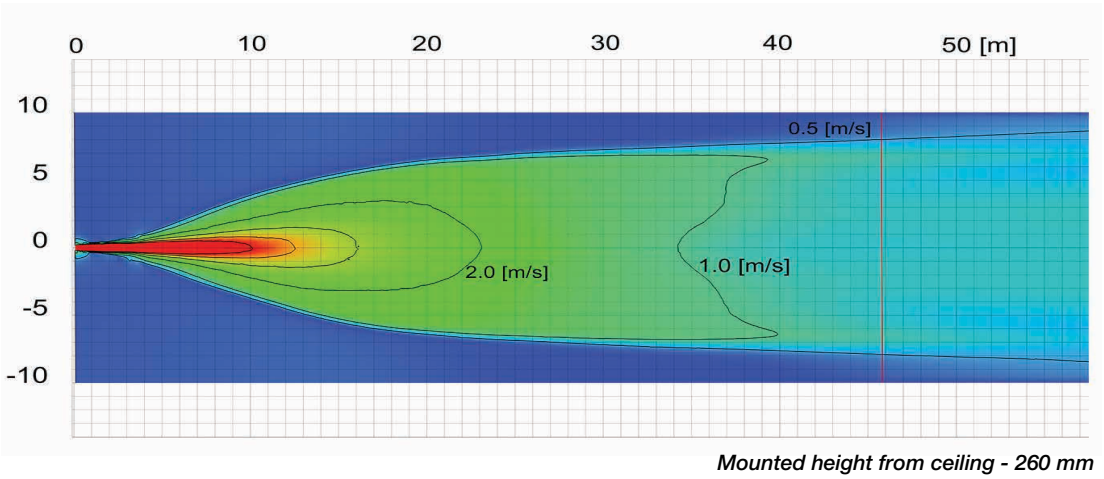
Volumetric Flow Rate - 10103 CMH *(5946 CFM)*



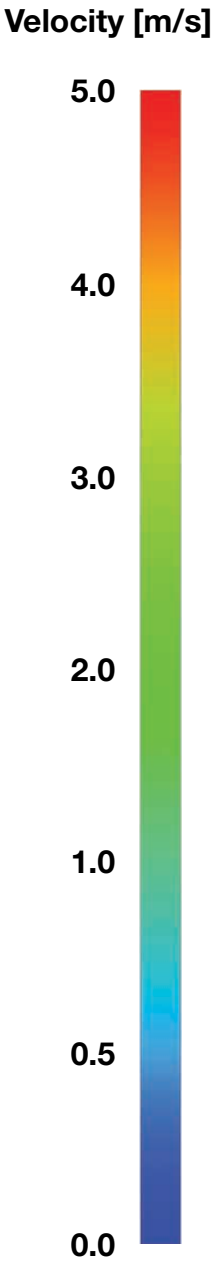
Mounted height from ceiling - 260 mm

3500 RPM

Volumetric Flow Rate - 9087 CMH *(5348 CFM)*

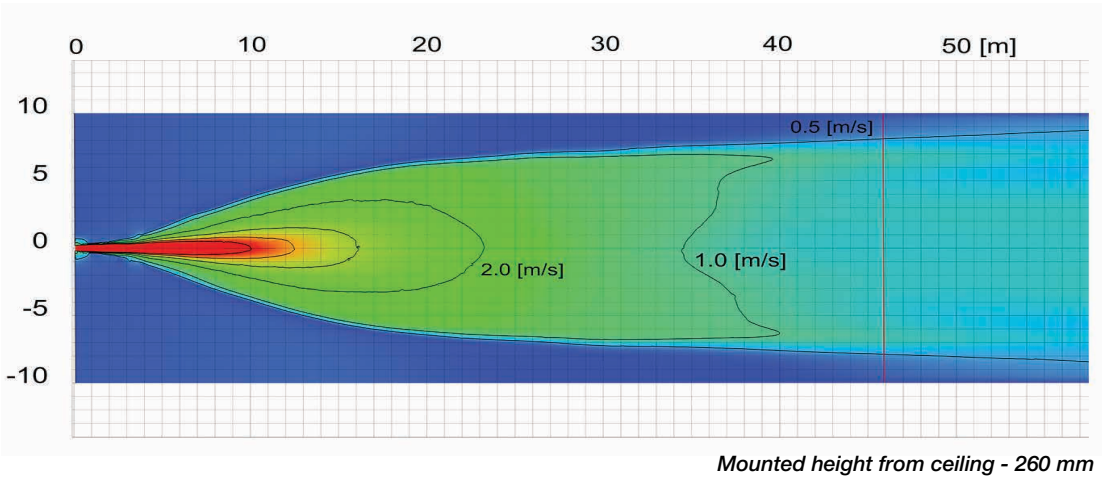


Mounted height from ceiling - 260 mm



2900 RPM

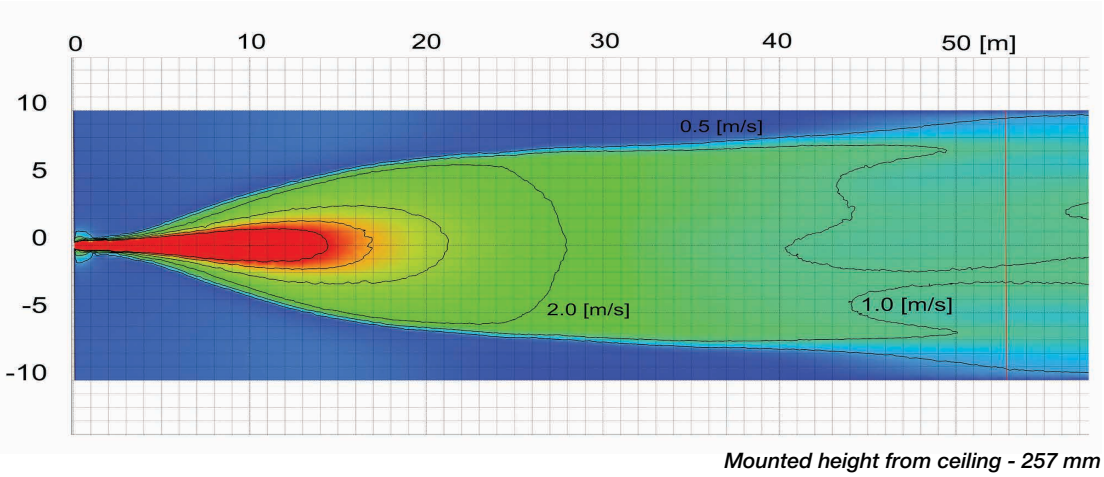
Volumetric Flow Rate - 9161 CMH *(5392 CFM)*



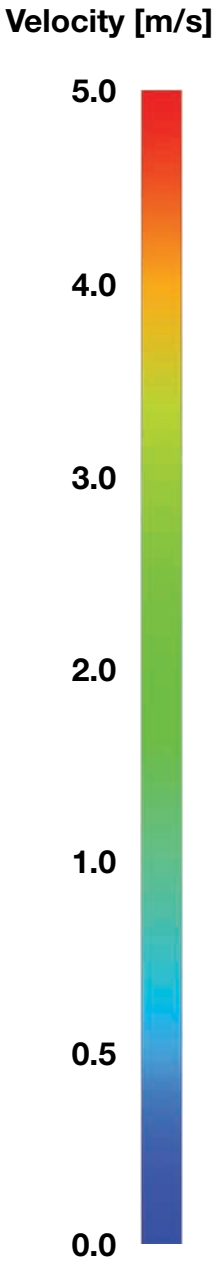
Mounted height from ceiling - 260 mm

3500 RPM

Volumetric Flow Rate - 12050 CMH *(7092 CFM)*

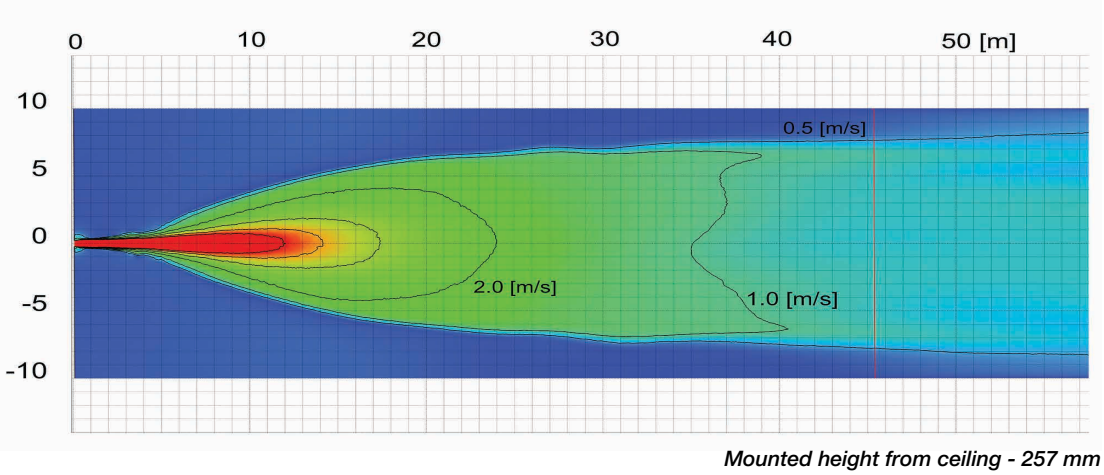


Mounted height from ceiling - 257 mm



2900 RPM

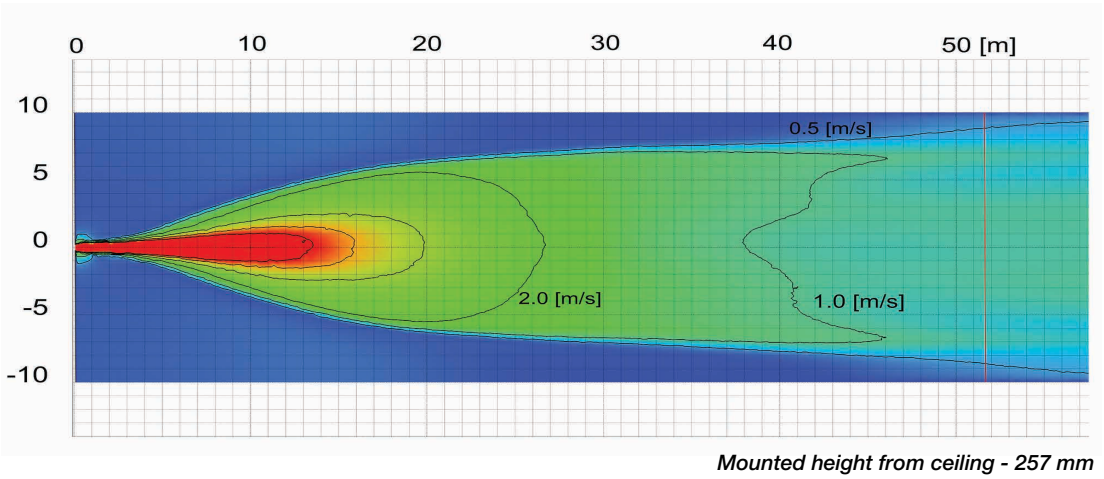
Volumetric Flow Rate - 9400 CMH *(5533 CFM)*



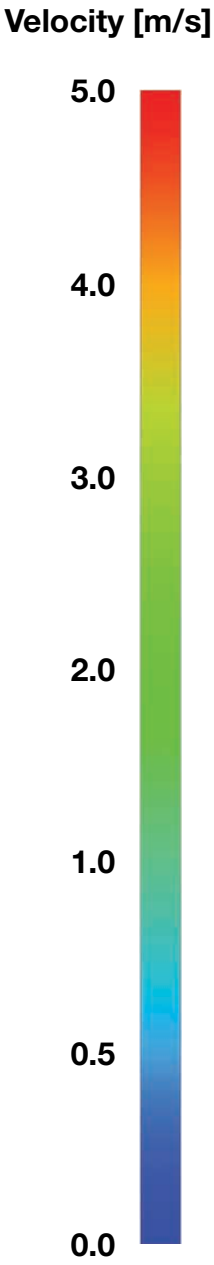
Mounted height from ceiling - 257 mm

3500 RPM

Volumetric Flow Rate - 11050 CMH *(6504 CFM)*

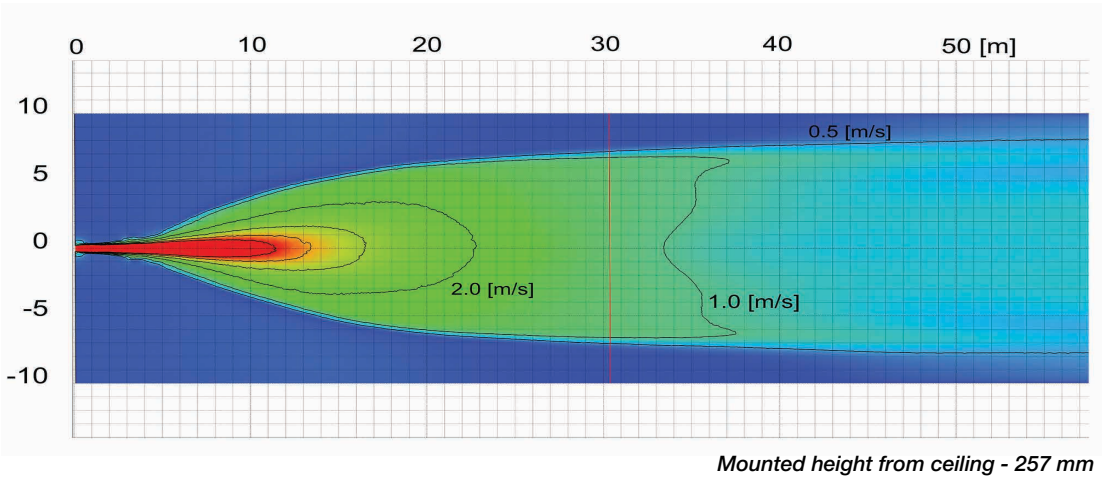


Mounted height from ceiling - 257 mm



2900 RPM

Volumetric Flow Rate - 8800 CMH *(5179 CFM)*



Mounted height from ceiling - 257 mm

Design and Selection Support

Enjoy Greenheck's extraordinary service, before, during and after the sale.

Greenheck offers added value to our wide selection of top performing, energy-efficient products by providing several unique Greenheck service programs.

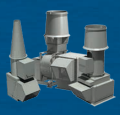
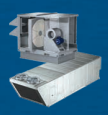
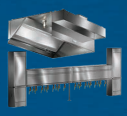
- Greenheck's free Computer Aided Product Selection program (CAPS), rated by many as the best in the industry, helps you conveniently and efficiently select the right products for the challenge at hand.

- Greenheck has been Green for a long time! Our energy-saving products and ongoing corporate commitment to sustainability can help you qualify for LEED credits.

Find out more about these Greenheck services at:

www.greenheck.com
www.greenheck.com.cn
www.greenheck.co.in





Building Value in Air

Greenheck delivers value to mechanical engineers by helping them solve virtually any air quality challenges their clients face with a comprehensive selection of top quality, innovative air-related equipment. We offer extra value to contractors by providing easy-to-install, competitively priced, reliable products that arrive on time. And building owners and occupants value the energy efficiency, low maintenance and quiet dependable operation they experience long after the construction project ends.

Our Commitment

As a result of our commitment to continuous improvement, Greenheck reserves the right to change specifications without notice.

Specific Greenheck product warranties are located on greenheck.com within the product area tabs and in the Library under Warranties.

Prepared to Support Green Building Efforts

GREENHECK
Building Value in Air.

Greenheck Kunshan: No. 1188 Pengqing Road, Huaqiao Town, Kunshan, Jiangsu Province, China • www.greenheck.com.cn
Greenheck India: 541/542, 5th Floor, Tower B, Spaze i Tech Park, Sector-49, Sohna Road, Gurgaon • www.greenheck.co.in
Greenheck U.S.A.: P.O. Box 410 • Schofield, WI 54476-0410 • Phone (715) 359-6171 • www.greenheck.com

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