

**WHATEVER THE
INSTALLATION
REQUIRES,
CLARAGE CAN
PROVIDE THE
SOLUTION.**

Tunnel Ventilation



CLARAGE 
INDUSTRIAL FANS & SERVICES

CATALOG 5050
JULY 2024



CUSTOM IS OUR STANDARD

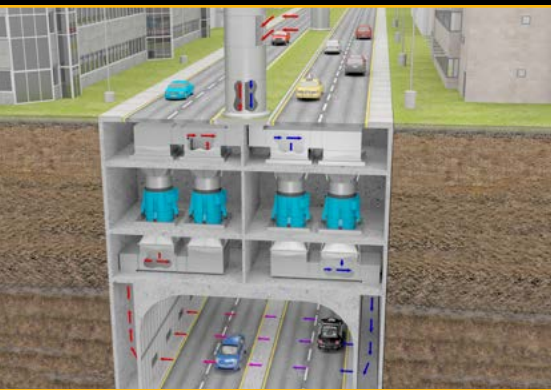


WHO WE ARE

Clarage is the heavy-duty division of Twin City Fan Companies Ltd. that specializes in designing custom ventilation solutions, from manufacturing centrifugal and axial fans, dust collectors and tunnel ventilation, to providing related accessories, including transitions, sound attenuators and fan monitoring panels. With over 150 years of experience, Clarage's long-standing reputation and market expertise has made us the industry-leading manufacturer for countless industries and thousands of process applications. That is why our customers continually turn to us for project-specific solutions regardless of the size, scope or complexity.

Founded in 1874, Clarage is the oldest operating fan company in the United States. Our history, reputation and market expertise make us uniquely qualified to provide custom-designed air movement products of exceptional quality and value. This history, coupled with our state-of-the-art test and manufacturing facility, our project management and engineering, means you will get your fans built to your specifications when you need them.

TUNNEL VENTILATION OVERVIEW



The need for tunnel ventilation is critical for the life and safety of any person utilizing the metro, rail or road tunnels throughout the world. Typically the equipment is used for smoke extraction or control for the time it takes people to evacuate the tunnel under emergency conditions. They are also utilized to control exhaust fumes and to provide standard ventilation when required. Primary standards for tunnel ventilation include NFPA 130 – *Standard for Fixed Guideway Transit and Passenger Rail Systems* and NFPA 502 – *Standard for Road Tunnels, Bridges and Other Limited Access Highways*.

The three basic types of control that can be applied are shown below. Fans utilized are axial and jet fans, both reversible and unidirectional, as well as centrifugal fans.

PORTAL TO PORTAL

The concept of portal to portal is typically completed with the use of jet fans. These specially designed units are inclusive of an attenuator on either end and direct the air from one portal to the other by inducing the air to move. These units are rated on the thrust imparted to the surrounding air in the tunnel. This air movement is sustained by the thrust being energized repeatedly down the length of the tunnel by various banks of jet fans. The principal objective is to have the

smoke-contaminated air move in the opposite direction of the evacuation route. This will allow the people to exit with fresh air blowing in their face.

SHAFT TO SHAFT

The shaft to shaft concept is a push pull system. The air is forced in the required direction by either a single unit or a station of fans on either side of the fire event. It is standard for the air to be injected from one station and extracted at the other. Thus the equipment utilized for this type of arrangement must be reversible. The principal objective

is the same as in portal to portal.

PORTAL TO SHAFT

The concept of portal to shaft is a combination of portal to portal to shaft to shaft. The air is forced into the tunnel and then extracted out of the portal via jet fans. Or, depending on the location of the fire event, the airflow may be reversed. Hence, the equipment utilized for this type of arrangement must be reversible. Again, the principal objective is to have the air contaminated with smoke move in the opposite direction of the evacuation route.



APPLICATIONS

All applications have their own specific set of national and international standards. The customers also have a unique set of specifications that vary from contract to contract. With its many years of experience, Clarage can proudly service all of these needs.

Road Tunnels require powered ventilation for control of smoke in case of fire and to remove pollution caused by vehicles.

Metro & Underground Railways and Stations require powered ventilation to provide climate control as well as to serve as smoke control in case of fire.

Tunnel Construction / Mining requires powered ventilation for the safety and comfort of the workers in the tunnel/mine.

Aircraft Hangers require power ventilation to assist in the removal of exhaust fumes created during routine maintenance of aircraft engines. These units can also be utilized to control smoke in the event of a fire emergency.

FACTORS AFFECTING SYSTEM DESIGN & FAN SELECTION

- > Temperature ratings and smoke control
- > Ventilation requirements
- > Tunnel length
- > Tunnel ceiling height
- > Installation and operation costs
- > Traffic flow (one or two way)
- > Density of ambient air
- > Required sound levels
- > Wind velocity at portal of tunnel
- > Portal location with respect to tunnel depth and sea level
- > Air volume and thrust requirements
- > Friction losses due to tunnel construction
- > Real estate limitation - overall size of mechanical room
- > Requirement for directional control of air flow

TUNNEL VENTILATION
EQUIPMENT FOR

SAFETY



A PARTNER SINCE 1874

©2009-2024 Twin City Fan Companies, Ltd., Minneapolis, MN. All rights reserved.
Catalog illustrations cover the general appearance of Clarage products at the time of publication and we reserve the right to make changes in design and construction at any time without notice.



CUSTOM-ENGINEERED CENTRIFUGAL & AXIAL FANS
Forced Draft | Induced Draft | Process Fans | Pressure Blowers | Industrial
Exhausters | Material-Handling Two-Stage | Adjustable-At-Rest and
On-The-Fly | Variable Pitch Axial Fans

DUST COLLECTORS
Standard Sizes Up Through 2 Million CFM | 6", 9" and 11.5" Tube Availability
| Standard or Totally Accessible (TA) Design

DAMPERS
Opposed Blade | Parallel Blade | Nested Variable Inlet Vane | Bolt-On Radial
Blade | Butterfly | Shut-Off

TESTING SERVICES
Performance & Mechanical Run Testing | Seismic Testing | Non-Destructive
Testing | Rotor Balancing | Aerodynamic Performance Testing | Thrust
Testing | Sound Surveys | High Temperature Testing | Overspeed Testing

FIELD SERVICES
Installation Advisors | Inspection | Performance Testing | In-Field Balance &
Laser Alignment | Operational Training | Vibration Analysis | Troubleshooting

TURNKEY SERVICES
Installation & Commissioning | Retrofits - All Brands | Demolition | Repair
& Rebuild | Duct Work Modification Damper Installation | Inlet Cones |
Motor/Turbine Alignment | Coupling Alignment | Preventive Maintenance |
Technical Services | Material Upgrades

**202 Commerce Way
Pulaski, TN 38478
(931) 424-2500**

www.clarage.com

