

## EXAMPLE OF HOW A SYSTEM WOULD WORK

Proper selection of fans dependent on system needs is key in reducing the safety hazards in mining applications. Primary fans can be used at both the intake side, where air is directed into the tunnel or shaft entryway (pushing air), and return side, where air flows out of the tunnel system (pulling air). The most important factor is directing air to areas currently in use, while cutting off areas not being used, which can help increase efficiency and decrease operating costs. Flow can be manipulated by use of regulators and walls, to reduce airflow into specific areas. Flow rate is measured to ensure proper ventilation, find and correct leaks, and to verify the operating point of all the fans in the system. Even with these measures, sometimes airflow or pressure is not adequate. Auxiliary or booster fans can be brought in to compensate for additional airflow.

The best way to ensure proper fan selection for primary, secondary and booster fans for mining applications is to speak with an experienced engineer. Detailed application information, such as flow and pressure requirements, as well as any challenges experienced with past installations, and details about the location and environment, should be provided upfront to steer selection. The New York Blower Company has the expertise and technological capabilities necessary to select the most efficient fans dependent on specific job requirements. Contact your local representative with any questions or inquiries about current projects, or visit [www.nyb.com/mining/](http://www.nyb.com/mining/) for more information.



THE NEW YORK  
BLOWER COMPANY

**THE NEW YORK BLOWER COMPANY** designs and builds the widest array of fans and blowers in the industrial process market. nyb's industry-leading fan selection/design software allows us to deliver the highest efficiency products, maximize fan availability and optimize life-cycle costs.

Our representatives work with plant engineers, maintenance and design teams to develop application-specific custom fan solutions that meet the exact requirements of the individual process. Our commitment to each customer is demonstrated by unrivaled site-support and continuing development of improved design, welding and fabrication techniques- all backed by our warranty. Our experienced field engineers and technicians are ready to assist, around-the-clock, for emergency repair, fan troubleshooting, fan assessment and preventative maintenance.

Further, we have the teams to service/repair/install replacement components or complete fans, regardless of the original manufacturer. Industries, processes and technologies continue to evolve. For over 130 years, The New York Blower Company will continue to evolve right along with them.

## PRODUCTS & SERVICES

- ▶ Axial/Inline Fans
- ▶ Centrifugal Fans
- ▶ Custom Designed Fans
- ▶ Plenums Fan Arrays
- ▶ Pressure Blowers
- ▶ Fiberglass Reinforced Plastic
- ▶ Double Width Fans
- ▶ Packaged Fan Systems
- ▶ Steam Coil Products Ventilator
- ▶ Products
- ▶ Replacement Parts Emergency
- ▶ Repair
- ▶ Fan Troubleshooting
- ▶ Finite Element Analysis (FEA)
- ▶ Computational Fluid Dynamics (CFD)

[nyb.com](http://nyb.com)

800-208-7918

# MINING & VENTILATION



**Centrifugal, Axial and Mixed Flow Fans**

**Main Mine, Auxiliary and Booster Fans**

**Abrasion & Corrosion-Resistant Designs**

**Retrofit for Upgraded Energy Efficiency**

**Repair & Replace Components for all  
Manufacturers' Designs**



THE NEW YORK  
BLOWER COMPANY

# HAZARDS AND SAFETY ISSUES

The airflow throughout an underground mine ventilation system must be monitored to ensure proper oxygen levels for the health and safety of mine workers. System designers need to be aware of potential hazards, such as causes of oxygen deprivation, particulate in the air, dilution and removal of toxic and flammable gases, and how changes in operating conditions affect temperature and humidity.

One major concern is safety, specifically supplying workers a continuous supply of oxygen at required levels. Oxygen displacement occurs from non-toxic gases like nitrogen, carbon dioxide, hydrogen and others; this dilution can cause asphyxiation. Carbon monoxide poisoning is another threat, as even small amounts over an extended time can cause conditions that limit the transportation of oxygen within your body. Carbon monoxide can be formed by internal combustion engines (small doses) or explosions or fires (large quantities).

In addition to oxygen supply, worker's safety is also a concern when it comes to keeping temperatures cool and humidity low enough for stable working conditions. Humidity is dependent on several factors, including the amount of water used for dust suppression, types of drilling equipment, and inherent moisture in the air; mines are predisposed for having higher moisture readings. Considerations must also account for water vapor added by evaporation, and the saturation of the air/vapor system.

Proper fan selection is needed to account for the removal and dilution of dust, particulate, and byproducts from underground tunnels and passageways to reduce or eliminate high concentrations. Both inspirable dust (large particles) and respirable dust (microscopic particles) need to be considered, as they pose potential threats to workers' safety. Diesel particulate matter (DPM) is formed by machinery that uses diesel gas. The exhaust contains both gas and particulate that cause health concerns based on exposure.

Another consideration is how to dilute and remove toxic and potentially flammable gases. Combustible gases can collect in a high enough concentration to cause concern for an explosion. For example, methane is highly combustible gas and therefore poses a serious threat. Areas with a high concentration can occur naturally from being released from layers of rock as it is excavated or by a fire or explosion. Methane combustion leads to the production of carbon monoxide. Carbon monoxide poisoning can lead to long term health problems or death.

