![SULLAIR]

USING COMPRESSED AIR IN THE MINING INDUSTRY

By Sullair

From the Gobi Desert in Central Asia, to Bingham Canyon in the southwestern United States, to diamond-rich mines in South Africa, the mining industry is one of the largest in the world. Every day – 24 hours a day – mining operations work to extract the Earth's most precious minerals and natural resources. Gold, diamonds, platinum, titanium, coal, chrome and zinc are only some of the sought-after minerals and resources.

Working in both surface-level and underground mines – many of which can stretch for miles – presents harsh and unforgiving environments. When working to extract these precious minerals and natural resources, as well as maintain safety for work crews, mining companies rely on durable, energy-efficient and safe mining equipment. Compressed air is an important source of power in nearly all mining operations. Mining companies often rely on industrial compressed air systems or portable air compressors for electric and pneumatic tools.

From exploration and ore processing to smelting and refining, the entire mining process requires some form of compressed air. Typical mining applications requiring compressed air include:

- **Exploration drilling –** air drilling uses compressed air to drive a slowly rotating percussion drill bit, which operates in a similar manner to a jackhammer. The drill bit is typically fitted with numerous hardened protrusions – usually tungsten – that crush the rock at the bottom of the hole. Truck-mounted rigs with one or two support vehicles to carry drill rods and an air compressor are typically required. Most drill holes can be completed in a single day.
- **Instrumentation –** instrument air needs to be clean and dry, for pneumatic instrumentation
- **Agitation –** air agitation is introduced through spargers (bottom of tank piping) with small orifices spaced evenly throughout the tank for air distribution
- **Smelting –** smelting is used for the extraction of metal from ores using melting and heating. Processing or smelting plants are normally situated close to mining operations. Processing plants use compressed air for instrumentation, agitation, cooling, and so forth.
- **Refining –** refining processes extract valuable metals from ores and other raw materials to increase the grade or purity of a metal. After separation from the slag, the metal is heated in a furnace to 700 degrees for softening, and compressed air is blown into the metal to oxidize other alloys which may be present.
- **Pneumatic tools –** in surface and underground mines, air compressors are used as a source of energy for power tools such as drills, wrenches, pneumatic loaders, saws and other vital mining equipment needed in deep underground mining environments
- **Ventilation systems –** in underground mining, compressed air provides ventilation within deep mine tunnels. Compressed air provides safe and breathable air. Refuge bays are provided as a place of safety for fresh air and ventilation supply for workers during hazardous underground emergencies such as fires.
- **Blasting –** drilling and blasting is the controlled use of explosives to break rock for excavation. The result of rock blasting is often known as a rock cut, which is very often seen in granite/marble quarrying.

Most mines utilize more than one compressor. Some compressed air systems consist of more than one compressor station, otherwise known as a compressor house. The compressed air generated is distributed across the mine via an extensive piping network – some of these pipe sections span up to 40 kilometers (25 miles). The surface piping network is also sometimes referred to as a compressed air ring.

The heavy-duty use and harsh environments of the mining industry require compressed air equipment capable of withstanding such use. The Sullair oil-flooded rotary screw air compressors and portable air compressors are recommended to the mining industry to provide a reliable air flow to power tools, equipment and ventilation systems critical to mining operations around the world.