



HARD ROCK MINES



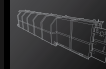
TUNNELING PROJECTS



COAL MINES



BUSH FIRE



PETROCHEM PLANTS



OTHER PRODUCTS

HARD-ROCK MINES Permanent Refuge Chambers

AIR CONDITIONING SYSTEM
 Split-system air conditioner.

DIGITAL GAS MONITORING

Provides real time gas monitoring for O₂, CO & CO₂.

Ensures safe and accurate air quality.

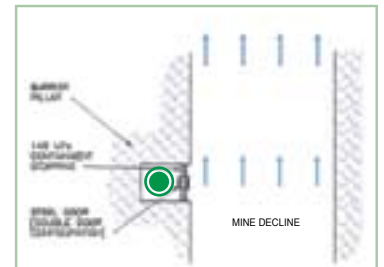
Hand-held device – user friendly, robust and reliable.

SCRUBBER SYSTEM

Patented CO₂ and CO scrubbing system.

Designed to clean air of harmful gases and toxins from within confined spaces.

Easy to use, extended time periods between chemical change-outs and colour-coded instructions.



Hard Rock Permanent Chamber Layout

AIR SUPPLY

Filtered and silenced compressed air.

Medical oxygen cylinders. (To be supplied by client).

Removable cylinder rack for easy transport.

EXTERNAL BATTERY BACK-UP UPS

In case of mains power failure.

Provides power for up to 36hrs, or 48hrs upgraded.

CONTROL SYSTEM

Purpose built MineARC® Control System.

Internal, external and battery temp. sensing.

One touch emergency operation.

Automatic programmable testing.

Keypad control.



MORE ABOUT OUR HARD ROCK PERMANENT CHAMBERS

MineARC's patented permanent hard-rock refuge chamber unit features the most advanced technology of its kind in the world.

The self contained unit is designed to clean air of harmful gases and toxins from within confined spaces. MineARC developed the technology to provide occupants with ease of use, extended time periods between chemical change outs, and protection from deadly carbon dioxide (CO₂) & carbon monoxide (CO) - present in smoke filled environments. MineARC Systems recognises that the chamber's environment must be cooled due to the potentially fatal buildup of metabolic heat created by occupants in confined spaces. MineARC permanent hard-rock refuge chambers are designed to be easily transported and placed within underground lunch rooms and excavations.



**HARD ROCK
MINES**



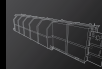
**TUNNELING
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**OTHER
PRODUCTS**

HARD-ROCK & COAL MINES Permanent Refuge

The MARCis®

World's first intrinsically safe CO/CO₂ scrubbing system with combined air-conditioning.

INTRINSICALLY SAFE CO₂ AND CO SCRUBBING

Scrubber requires no electrical power to operate (intrinsically safe).

Designed to clean air of harmful gases and toxins from within confined spaces.

Sublimated gas drives pneumatic fan to create scrubber flow.

Pre-filled absorber chemical cartridges – sealed, easy to handle, store for long periods.

INTRINSICALLY SAFE AIR-CONDITIONING

Patented air-cooling and dehumidifying system requires no electrical power to operate.

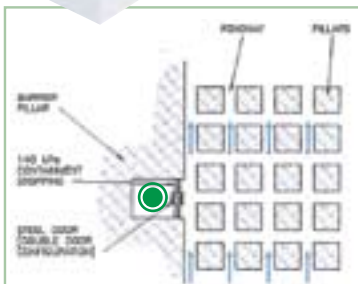
Built to US MSHA 2009 'Final Rule' (apparent temp must remain below 95°F / 80% humidity).



OPTIONAL AIR LOCK DOOR

Built to customer's requirement.

Single or double opening.



Typical Coal Permanent Chamber Layout

SECURE LIQUID CO₂ CYLINDER STORAGE

High pressure liquid CO₂ cylinders used to power scrubbing and cooling systems.

Separate cylinder rack for easy transport.

TESTING/CERTIFICATION

Design verification completed with human testing.

Multiple independent tests completed.

Independently monitored by ECS Corporate in Australia.

Independently monitored by IHST, Inc. in USA.

Mechanical and functional tests performed in excess of 200 hours.

US West Virginian certified, built to US MSHA 2009 Final Rule.

Intrinsically Safe.
 Built to 2009 MSHA
 'Final Rule'
 West Virginia Certified

MORE ABOUT OUR COAL PERMANENT CHAMBERS

MineARC's patented permanent powerless refuge chamber features an intrinsically safe (non-electrically powered) carbon dioxide (CO₂) and carbon monoxide (CO) scrubbing system, with integrated air-conditioning. MineARC Systems recognises that cooling is essential for combating the potentially fatal effects of metabolic heat buildup. MineARC's permanent refuge chamber unit will maintain internal apparent temperatures below 95°F / 80% humidity - as stipulated under US MSHA 2009 'Final Rule'. MineARC permanent refuge chambers are designed to be easily transported and placed within underground lunch rooms and excavations.