Transforming damaged, worn or second-hand chambers into fully functioning, certified refuge chambers

The MineARC Refurbishment Program

Refuge Chamber

MineSAFE Standard Design
Refuge Chamber

The world’s leading manufacturer of emergency life-saving refuge

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MineARC Systems is the global leader in the manufacture and supply of emergency safe refuge solutions for the mining, tunnelling, chemical processing and disaster relief industries.

With over 15 years’ experience, our dedication to ongoing research and development is driven by our key focus to continually offer the best and most advanced safety solutions on the market.

Our team of qualified engineers, electrical designers and technical experts form a global network across six international locations including;

- Perth, Western Australia
- Johannesburg, South Africa
- Dallas, Texas
- Santiago, Chile
- Beijing, China
- Barcelona, Spain

This allows MineARC to provide 24 hour service and engineering support to our expanding list of clients in over 40 countries across the world.

All MineARC Refuge Chambers and Safe Havens comply with the highest international regulations and recognised ‘world’s best practice’ industry guidelines. Our key focus on quality control and product advancement has meant that MineARC Refuge Chambers have successfully saved lives in multiple real life industrial emergencies around the globe.

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The MineARC Refuge Chamber Refurbishment Program transforms damaged, worn or second-hand chambers into fully functioning, certified refuge chambers that look as good as new.

All refurbishments are conducted at one of MineARC’s state of the art manufacturing facilities by qualified workshop technicians. Following a refurbishment, one of our service technicians will conduct a comprehensive 50-Point Safety Audit, ensuring the chamber is commissioned, certified and meets MineARC’s stringent safety standards. This will give you peace of mind and the reassurance that your chamber is covered by our AU$20 Million product liability insurance.

The MineARC Refuge Chamber Refurbishment Program is available to MineARC and non-MineARC Refuge Chambers alike, thus converting your non-MineARC chambers into a fully functioning part of your MineARC fleet.

- Ensure your refuge chamber fleet is recertified and complies with MineARC Standards
- Dramatically reduce refuge chamber operating & maintenance costs
- Receive a full service and 50-Point Safety Audit, conducted by a qualified MineARC technician
- Receive regular product support and access to readily available spare parts
- Enjoy peace of mind that your Refuge Chamber fleet is operating optimally in case of an emergency
Refuge Chamber Refurbishments

The MineARC Refurbishment Program involves a number of vital stages in order to bring a refuge chamber back into certification and optimal working condition.

Every refurbishment is different, and quoted based on factors such as:

- Extent of damage or wear to the chamber
- Age of the chamber
- Brand of refuge chamber

Most refurbishments however, will include some fabrication work to the structure of the chamber, a new coat of high durability MineARC-spec paint and the repair and replacement of any necessary parts and componentry. Following this, a comprehensive audit and recertification will take place before it is commissioned back on site.

Fabrication

The first stage of a refuge chamber refurbishment is the fabrication of any sections of the chamber shell that have incurred structural damage due to negligence, accident or general wear and tear from years of sitting underground.

Our engineers and experienced workshop technicians will perform a comprehensive assessment of the state of the refuge chamber structure and condition of the skids, battery box and doors in order to ascertain what requires full re-fabrication or just repair.

Painting

After any necessary fabrication work has taken place, the outer shell of the refuge chamber is sand blasted and repainted. MineARC utilises a special high durability white paint for all of our refuge chambers. This aids in underground visibility, provides protection against corrosion and complies with AS/NZS 2312:2002.

Painting is performed by a qualified spray painter to ensure a quality finish and long life in any harsh industrial environment.
Componentry Repair and Replacement

After the shell of the refuge chamber has been repaired and the exterior repainted, all internal and external componentry is inspected and tested for damage and general wear and tear. Parts will be repaired or replaced based on the extent of damage to ensure the chamber is in full working condition once again.

Operational and performance checks include:
- Scrubbing and control system
- Compressed air filtration system
- Secondary oxygen supplies
- Air conditioning and dehumidifying
- Check valves
- Door and escape hatch seals (including vacuum test)
- UPS battery back up
- Strobe lighting and siren
- Internal lighting and communications
- Toilet, first aid kit, food and water

Service and Re-certification

During a standard refuge chamber refurbishment, MineARC technicians will conduct a comprehensive chamber service. During the service, the technician will perform a full 50-point safety audit and check; ensuring all lifesaving systems and parts within the chamber are operating at 100%. This service and audit is crucial to the continued optimal performance of your refuge chambers.

Following this, your refuge chamber will then be recertified by a qualified MineARC technician. This stamp of approval indicates that MineARC is satisfied with the condition of the refuge chamber at the time of its inspection and ensures that it is fully compliant with MineARC’s stringent safety standards and covered by our AU$20 million product liability insurance.
The MineARC Series IV Electrical Scrubbing System is considered to be the most advanced safe refuge technology in the world. The Series IV boasts all of the improvements of the Series III system, plus a host of additional features including a superior digital control system, intelligent voice audio navigation (i.V.A.N) and the new Aura-FX digital gas monitoring system. Additional improvements include pre-packaged MARCISORB Chemical Cartridges, intuitive operation, motion sensor logging and a modular controller design.

All MineARC refuge chambers and safe havens currently installed with a Series I, II or III scrubber can be upgraded to a Series IV control system. MineARC technicians can also retro-fit most non-MineARC chambers with the Series IV.

Refuge Chamber refurbishments can be complimented by a range of additional chamber upgrades. The MineARC Client Upgrade Assist Program offers various upgrade options that will improve the operation and efficiency of your chamber, both during an emergency and while in stand-by mode. All upgrades can be conducted on-site, and in most cases do not require chamber repositioning. Our qualified service technicians will conduct a comprehensive chamber audit and certification following the upgrade, ensuring the chamber is officially recertified to meet industry standards.

Dramatically reduce refuge chamber operating costs
Improve the operation and safety of chambers
Achieve site-wide consistency of refuge chamber fleet
Increase the efficiency of training and logistics
Receive regular product support and access to readily available spare parts

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MineARC Systems is now offering all Series I, II and III owners the opportunity to upgrade to the latest CO/CO₂ scrubbing technology - pre-packaged MARCISORB Chemical Cartridges. MARCISORB Chemical Cartridges are an innovative alternative to the traditional ‘free-pour’ chemicals found in all MineSAFE Chambers with Series I, II and III scrubbing systems.

Cartridges are much safer and easier to load than free-pour methods; with no direct chemical handling, no spillage, and no uncertainty. The cartridges simply slot into place on top of a plenum tray - a simple upgrade to your existing system.

If your chemicals are due to expire, changing to the new MARCISORB Cartridge system will provide significant savings over the long term life of your chamber.
Client Upgrade Assist Program

MineARC GuardIAN, Aura-FX and CAMS form an integrated network known as MineARC System Intelligence. When utilised as a complete network, the System Intelligence suite ensures peace of mind by actively and remotely identifying faults or issues as they happen. For more information regarding MineARC System Intelligence, visit minearc.com/systemintelligence

GuardIAN Monitoring System Upgrade

MineARC’s GuardIAN Remote Monitoring and Diagnostics System is an exciting new development in refuge chamber technology. GuardIAN enables real-time monitoring, providing confidence that an operation’s fleet of refuge chambers are emergency ready at all times.

GuardIAN is an on-board system that continuously monitors all vital refuge operating systems. During standby mode GuardIAN checks for component faults and monitors refuge chamber integrity.

All MineARC refuge chambers and safe havens currently installed with a Series IV or ELV scrubbing system can be upgraded to include the GuardIAN Remote Monitoring and Diagnostics System. With simple “plug and play” installation, set up and connectivity is fast and easy.

Multiple Refurbishment Options

Face to face connection to operations
• Reduced costs for troubleshooting
• Centralised operational monitoring of entire fleet
• Direct communication during emergency operation
Aura-FX Digital Gas Monitoring

MineARC’s new Aura-FX Digital Gas Monitoring System is a proprietary fixed gas monitoring unit, designed specifically for use in refuge chambers and safe havens. A vast improvement on current digital gas monitors (DGMs) on the market, Aura-FX provides a more convenient solution to internal refuge gas monitoring. Aura-FX has the ability to individually monitor up to four gases via a series of user-friendly, digital screens.

- Greater servicing efficiency and reduced calibration costs
- Dedicated, reliable sensors specific for refuge chamber use
- Reduced risk of human error during an emergency

CAMS Upgrade

The MineARC Compressed Air Management System (CAMS) is a dedicated air management unit designed specifically for MineARC Refuge Chambers. CAMS offers a range of features aimed at reducing running costs and improving operational safety during an emergency.

All existing MineARC Refuge Chambers can be retro-fitted with CAMS. Installation requires a simple upgrade to the rear of the chamber, conducted on-site by a qualified MineARC Service Technician, who will complete a full chamber audit and service at the same time.

- Improved four-stage filtration
- Flood protection valve for automatic air shut off
- Improved operational safety
- Lower energy costs through the optimisation of mine air usage
- Faster service time

LED Strip Light

A vast improvement on current fluorescent tube lamps, MineARC LED Strip Lights provide a more convenient and powerful solution to internal refuge chamber lighting.

With a much longer life expectancy, LED Strip Lights have been designed as a high-quality, direct replacement for fluorescent tube lamps. Drawing lower power, LED Strip Lights are a cost saving option for sites.

- Longer life expectancy
- Electronic ballasts compatible
- Energy saving, improving efficiency
- Cost effective, lower power draw on larger chambers

Automated Oxygen Delivery System

The MineARC Automated Oxygen Delivery System (AODS) is designed to maintain a safe, breathable atmosphere within the refuge chamber.

Once the system is activated, the AODS disperses metered amounts of Oxygen supplied by a compressed Oxygen cylinder. The AODS maintains Oxygen levels between 18.5% and 23% inside the refuge when the external fresh air supply has been compromised or is unavailable.

- Helps to maintain a breathable atmosphere
- Maintains oxygen between 18.5% and 23%
- Powered by hard-wired 24 VDC supply
Case Study: Successful Refurbishment of 13 Year Old Chamber

MineARC’s Refuge Chamber Refurbishment Program transforms damaged, worn or second-hand chambers into fully functioning, certified refuge chambers that look as good as new. In the first half of 2017, MineARC successfully refurbished 26 chambers. One of which, was thirteen year old chamber MA-80 from Gold Fields St Ives, a gold mine located 20km south-east of Kambalda, Western Australia.

Following a refuge chamber audit conducted on site, the Series II 12-Person HRM (the original Standard Design) Refuge Chamber with a free-pour chemical scrubbing system was returned to MineARC Australia’s manufacturing facility in Perth where it underwent a complete transformation by MineARC’s qualified workshop technicians.

With there being a chance that the refuge chamber had incurred structural damage from years of sitting in the harsh underground environment, MineARC’s engineers first performed a comprehensive assessment of the structural integrity of the chamber in order to ascertain what would require full re-fabrication or just repair. After being stripped completely of its internal components, batteries and air conditioning unit, MA-80’s battery box was refabricated and the entire exterior and interior of the chamber was then blasted with a new coat of high durability white paint. This paint aids in underground visibility, provides protection against corrosion and complies with AS/NZS 2312:2002.

The chamber was also upgraded to include MineARC’s Compressed Air Management System (CAMS). CAMS offers a number of features aimed at reducing running costs and improving operational safety during an emergency. Aside from providing clean breathable air through a superior four-phase filtration process, CAMS optimises mine air usage resulting in considerably reduced operational costs. Other features include guarantee against over pressurisation of the refuge chamber, gas toxicity monitoring, flood protection valves for automatic mine air shut off in the event of water ingress, and an efficient filter change-out process that reduces service time.
Internally, MA-80’s Series II Scrubbing System was upgraded to a Series IV Scrubbing & Control System with Aura-FX Digital Fixed Gas Monitoring and pre-packaged MARCISORB Chemical Cartridges for superior scrubbing capacity. The Series IV unit plays host to an intuitive digital controller interface to manage and monitor all chamber power and lighting, motion sensor logging, and an intelligent voice audio navigation (iVAN) system to guide occupants through operational procedures.

MineARC’s Aura-FX Digital Gas Monitoring System features dedicated, reliable sensors, and has the ability to individually monitor up to eleven gases via a series of user-friendly, digital screens. The system includes audible voice alarms which will prompt occupants to replace scrubbing chemicals or adjust oxygen supply levels into the refuge chamber as required, reducing the risk of human error during an emergency. Also included in MA-80 was a new air conditioning unit, a transformer, brand new external and internal stickers and the latest operating manuals. Following the refurbishment, a comprehensive 50-Point Safety Audit was conducted to ensure the chamber is certified and meets MineARC’s stringent safety standards and those of the industry.

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