



Biora Walk-In Grow Chambers

For Plant Science and Agricultural Biotechnology

Controlled environments designed to sustain precise conditions, as well as maximise production capabilities, product quality and security.



Fully customisable Grow Chamber and Environmental Control Room solutions.



Company Profile

MineARC Systems have been at the forefront of controlled environment design, development and manufacture for over 20 years; striving to improve the health and safety standards within the mining, tunnelling, chemical processing, disaster relief and extreme weather industries worldwide. MineARC Systems' industry leading refuge chambers and safe havens are present in over 60 countries and have been used in multiple real-life emergencies to keep occupants safe.

MineARC's key focus on quality control and product development has meant that all MineARC Refuge Chambers and Safe Havens comply with the highest international regulations and recognised 'world's best practice' industry guidelines.

In-house research and development with our team of engineers, electrical designers, technical experts, as well as production and service technicians has allowed us to branch out into multiple industries over the years. Our knowledge and proficiencies have now given us the opportunity to gain recognition beyond our refuge chambers and safe havens and expand into the science and research industries. Our Biora Grow Chamber is a perfect solution for controlled environment agriculture and climatic stability testing.

As advocates of innovation, our dedication to ongoing research and development is driven by our emphasis on client satisfaction. MineARC listens to and understands the needs of our clients, whilst never compromising on safety and quality. Placing a high importance on building strong relationships with our clients allows us to develop unique and customised solutions. This approach enables us to improve research and growth facilities, reduce costs and simplify operations.

MineARC's manufacturing facilities in the United States, Australia and Africa, as well as offices in Europe, China, Mexico and Chile allow us to provide local technical support to all clients.

www.minearc.com



MineARC's Biora offers multi-functional Walk-In Grow Chambers and Environmental Control Rooms for all plant science and agricultural biotechnology applications.

Enjoy the benefits of innovative functionality, versatility and the replication of any environmental condition within a secure and robust shell.

MineARC offers a consultative design process enabling clients to have control over all aspects of the design process.

Proven accurate monitoring systems for the efficient production of controlled environment agriculture.

For use in the research of:

- Plant Growth
- Germination
- Tissue Culture
- Crop Sciences & Diseases
- Algae
- Arabidopsis
- Entomology
- Seeds Storage and Drying
- Medical Cannabis

- ✓ Precise environmental control based on required specifications
- ✓ Remote monitoring and inter-chamber connectivity
- ✓ Purpose-engineered gas monitoring and atmosphere control
- ✓ Dedicated Engineering team to provide customised configurations and internal features
- ✓ End-to-end service with local after sales support and maintenance schedules
- ✓ ISO 9001:2015 certified company



TRC ISO 9001:2015 Quality Management Systems



Australian C-Tick Standards: AS4100-1998, AS3570.1-18, AS2208, AS3000, AS1716-15



Canadian Standards Association (CSA)



United States National Electrical Code (NEC) 2013/14



Quality Management System (QMS)



European CE Certified to Machinery Norms

Biora Walk-In Chambers



Customisable. Secure. Robust. Modular.

Biora Walk-in Chambers provide the control and repeatability needed to efficiently sustain precise conditions, maximise production capabilities, product quality and security, whilst conserving water and energy use.

Building on MineARC's successful capabilities in creating controlled environments for industrial safety, Biora's componentry allows for the development, refinement and repetition of specific growth and testing conditions. Cooperating with clients and ensuring we understand their requirements and specifications guarantees Biora Walk-in Chambers provide maximum flexibility to meet changing research requirements. Clients benefit from high involvement in every aspect of the design and manufacture process, enabling us to provide the solution to best suit their needs.

All components are designed, manufactured, installed, commissioned and serviced by MineARC Systems, including:

- Portable and insitu chambers
- Temperature & humidity control
- Lighting
- Carbon dioxide control
- Irrigation
- Security & control systems

Biora Walk-In Chambers - Configurations

Portable Grow Chambers

Biora Portable Grow Chambers are pre-built at one of MineARC's three manufacturing locations, then shipped to site ready for immediate use.

Ideal for both outdoor and indoor locations (with enough access), the fully portable design eliminates the hassle of onsite installation and certification.

The structure is framed with fully welded 6.4mm (1/4") steel members that are painted in an epoxy primer and two component industrial top coat. Transportable via integrated forklift slots or ISO container corner castings; each chamber has undergone inhouse analysis to ensure compliance with local building codes.

Custom dimensions are available on request.



Model	External Dimensions - m [ft] (H x W x L)	Internal Dimensions - m [ft] (H x W x L)	Weight - kg [lbs]	Shelves	Grow Area - m ² [ft ²]
BI-WI-PB-10-12-20	3 x 3.7 x 6.1 [10 x 12 x 20]	2.8 x 3.3 x 5 [9.2 x 10.9 x 16.3]	4,600 [10,000]	18	20.1 [216]
BI-WI-PB-10-12-28	3 x 3.7 x 8.5 [10 x 12 x 28]	2.8 x 3.3 x 7.4 [9.2 x 10.9 x 24.3]	6,200 [13,600]	30	33.4 [360]
BI-WI-PB-10-12-32	3 x 3.7 x 9.8 [10 x 12 x 32]	2.8 x 3.3 x 8.6 [9.2 x 10.9 x 28.3]	7,000 [15,400]	36	40.1 [432]
BI-WI-PB-10-12-40	3 x 3.7 x 12.2 [10 x 12 x 40]	2.8 x 3.3 x 11.1 [9.2 x 10.9 x 36.3]	8,200 [18,000]	48	53.5 [576]

Modular Grow Chambers

Biora Modular Grow Chambers are shipped and constructed onsite by a team of trained MineARC Technicians.

Suited for indoor locations where access is limited, they are modular in design; allowing for multiple rooms and sizes within a single facility.

The structure is framed with 3mm (11-gauge) steel, powder coated and bolted together with stainless steel hardware.

Custom dimensions are available on request.



Model	External Dimensions - m [ft] (H x W x L)	Internal Dimensions - m [ft] (H x W x L)	Weight - kg [lbs]	Shelves	Grow Area - m ² [ft ²]
BI-WI-BO-10-10-15	3 x 3 x 4.6 [10 x 10 x 15]	2.8 x 2.9 x 4.5 [9.2 x 9.7 x 14.7]	3,100 [6,625]	18	20.1 [216]
BI-WI-BO-10-10-20	3 x 3 x 6.1 [10 x 10 x 20]	2.8 x 2.9 x 6.0 [9.2 x 9.7 x 19.7]	3,900 [8,500]	24	26.8 [288]
BI-WI-BO-10-10-28	3 x 3 x 8.5 [10 x 10 x 28]	2.8 x 2.9 x 8.4 [9.2 x 9.7 x 27.7]	5,300 [11,500]	36	40.1 [432]
BI-WI-BO-10-10-32	3 x 3 x 9.8 [10 x 10 x 32]	2.8 x 2.9 x 9.7 [9.2 x 9.7 x 31.7]	5,900 [13,000]	42	46.8 [504]
BI-WI-BO-10-10-40	3 x 3 x 12.2 [10 x 10 x 40]	2.8 x 2.9 x 12.1 [9.2 x 9.7 x 39.7]	6,900 [15,000]	54	60.2 [648]

Biora Walk-In Chambers

- Major Features

HMI Control

MineARC's proprietary HMI control software allows visual control and display for temperature, humidity, lighting and airflow. Integrated audible alarms and fault logging is included as standard.

Shelving

Standard shelving is highly resistant stainless steel; designed to accommodate lighting from underneath the shelf. They are easily adjustable to variable heights for different stages of plant growth.

To accommodate rolling carts, ceiling mounted lighting banks are available with either a manual or electric pulley system to vary height.

Doors

Standard doors are outward opening swing doors; insulated and weather stripped with an observation window and key lock.

Sliding door options are available for locations where the swing radius will impede space.

Air Conditioning

Biora Walk-in Chambers are fitted with high quality split system ducted air conditioners. Inverter-driven DC motors ensure the units are extremely energy efficient; automatically switching between heating and cooling to accurately maintain the ambient temperature and humidity. Advanced heat pump technology permits use in outdoor climates down to -25°C (-13°F).

Optional individual ducting and zone control is available for different grow areas; ideal for eliminating micro-climates or enabling different grow areas to maintain varying temperature and airflow gradients.

Alternate refrigeration methods such as water cooled with hot gas bypass or centrally controlled are available depending on customer requirements.



Flooring

Flooring consists of aluminum tread plate with under-floor drainage. Under-floor radiant heating is available as an option for cold climates.

Airflow

Uniform airflow is introduced to the chamber through variable speed fans. The air changes can be reduced or halted to support CO₂ enrichment practices with minimal waste. A replaceable HEPA filter ensures minimal cross contamination (<1%) between entering and leaving air streams.

For extreme temperature climates, an optional energy recovery system will ensure fresh air is appropriately cooled or heated before being injected into the chamber.

Lighting

Standard lighting consists of dimmable LED or fluorescent lighting ideally suited for plant growth. Lights of varying spectrums and intensities are available as an option for specific vegetation and flowering applications.

Each bank of lights can have its own on/off timer, controllable via the HMI.

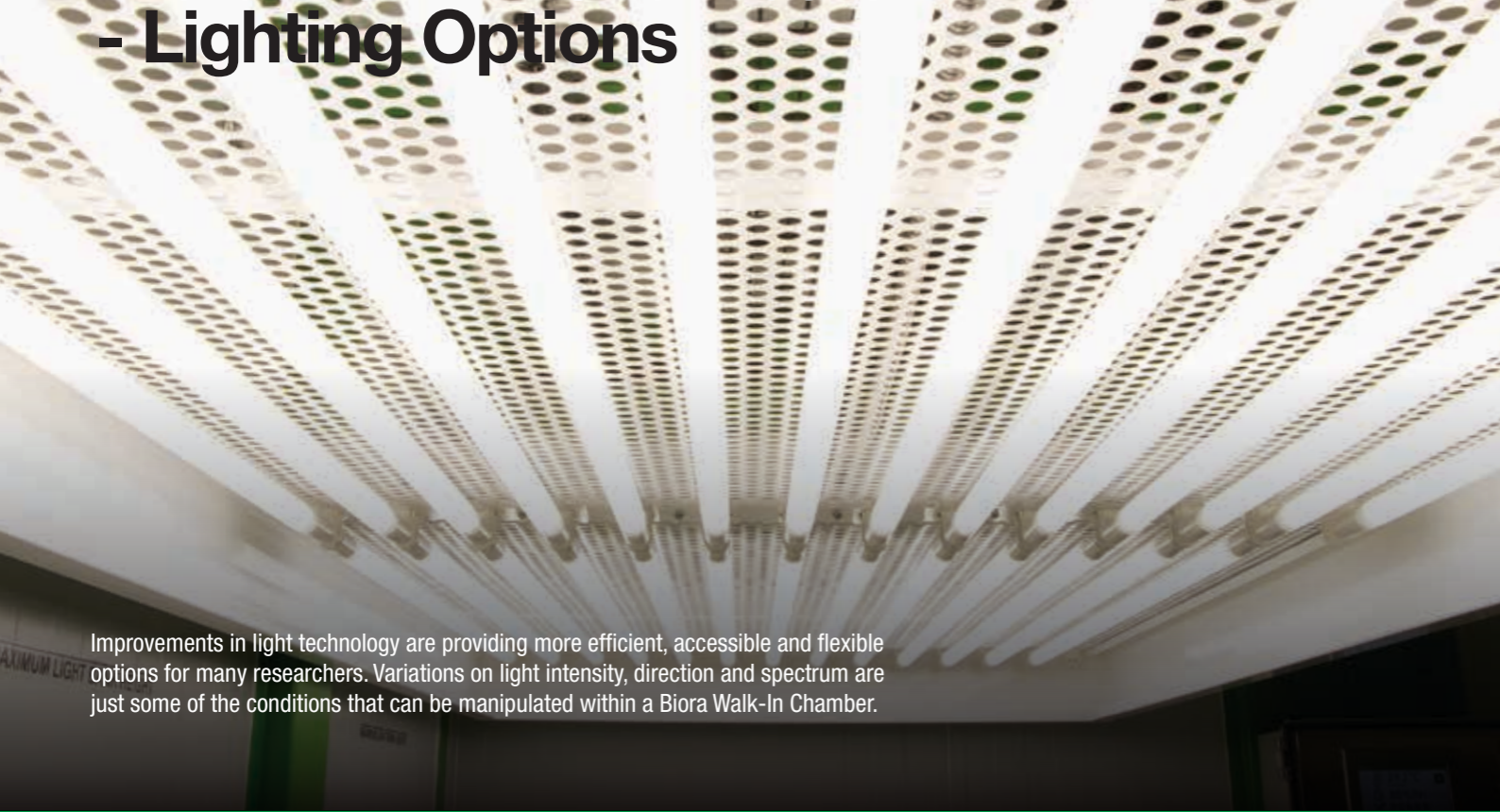
Insulation

All surfaces of the Biora Walk-in Chamber are constructed of insulated metal panels, composed of a polyurethane foam core. With a high thermal insulation capacity and standard R-Value of 16 for built onsite and R-22 for pre-built chambers; the panels meet the most demanding temperature control requirements.

Panels are available in additional thicknesses up to an R-value of 44 for extreme climates.

With excellent aesthetics the panels are easily washable and resistant to chemical spills and corrosion.

Biora Walk-In Chambers - Lighting Options



Improvements in light technology are providing more efficient, accessible and flexible options for many researchers. Variations on light intensity, direction and spectrum are just some of the conditions that can be manipulated within a Biora Walk-In Chamber.

Common Types of Lights

High-Pressure Sodium (HPS)

The High-Pressure Sodium (HPS) light is a specific, more efficient type of gas discharge light. HPS lights are better suited to promote flowering and fruiting and are most commonly used in broad coverage areas, such as greenhouses and shelters with access to natural light.

Fluorescent Lighting

Historically, the most common type of light for indoor plant growth, fluorescent lamps have been surpassed by LED lighting. Fluorescent lights are best used to germinate growth indoors and propagation situations where low light levels are required.

LED Lighting (Light Emitting Diodes)

LEDs provide the most considerable spectral variation and can be mixed to create the required conditions. LED Lighting is fast becoming the single choice for many researchers, due to their longevity, flexibility and energy efficiency.

Determining the correct spectral mix can be one of the main challenges when it comes to maintaining a fit-for-purpose controlled environment.

MineARC's engineers and lighting partners can advise clients on the best lighting solution for their application.



Biora Walk-In Chambers - Lighting Options

Lighting Options

Regardless of the chamber's size or configuration, MineARC can build a customised lighting solution that will meet client specifications and spectrum requirements.

Our engineers can provide varying levels of lighting control; all accessible from the chamber's HMI and remote control system.

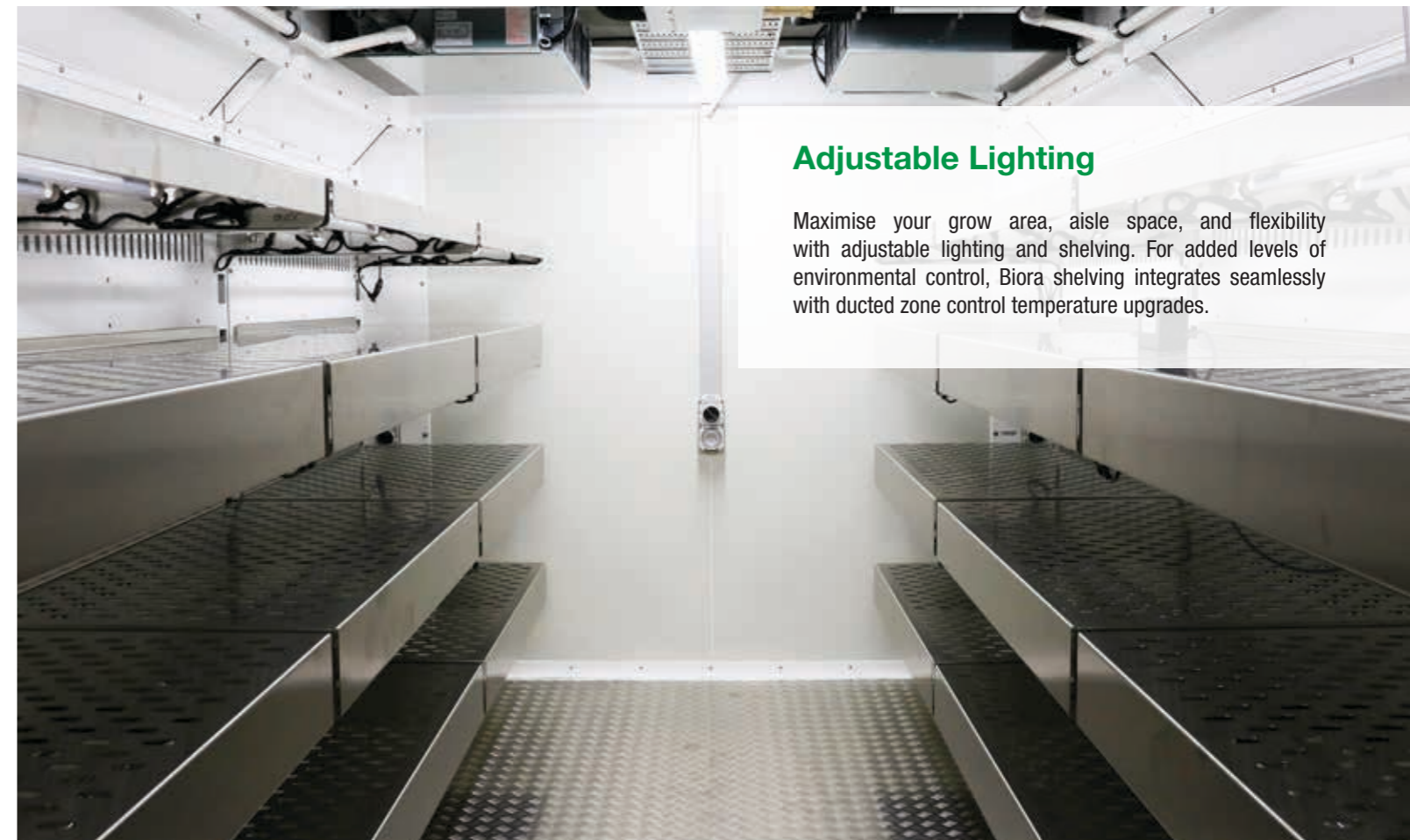
MineARC offers a range of LED, HPS and fluorescent lights, of varying intensities; providing complete flexibility for any project.

- ✓ Custom lighting design based on requirements, including LED, HPS and fluorescent
- ✓ Control over canopy, intensity and spectrum for day time and seasonal replication
- ✓ Single and multi-tier opportunities
- ✓ Optional high-quality built-in light measurement equipment for refinement of testing conditions



Adjustable Lighting

Maximise your grow area, aisle space, and flexibility with adjustable lighting and shelving. For added levels of environmental control, Biora shelving integrates seamlessly with ducted zone control temperature upgrades.



Biora Walk-In Chambers - Research Grade Options



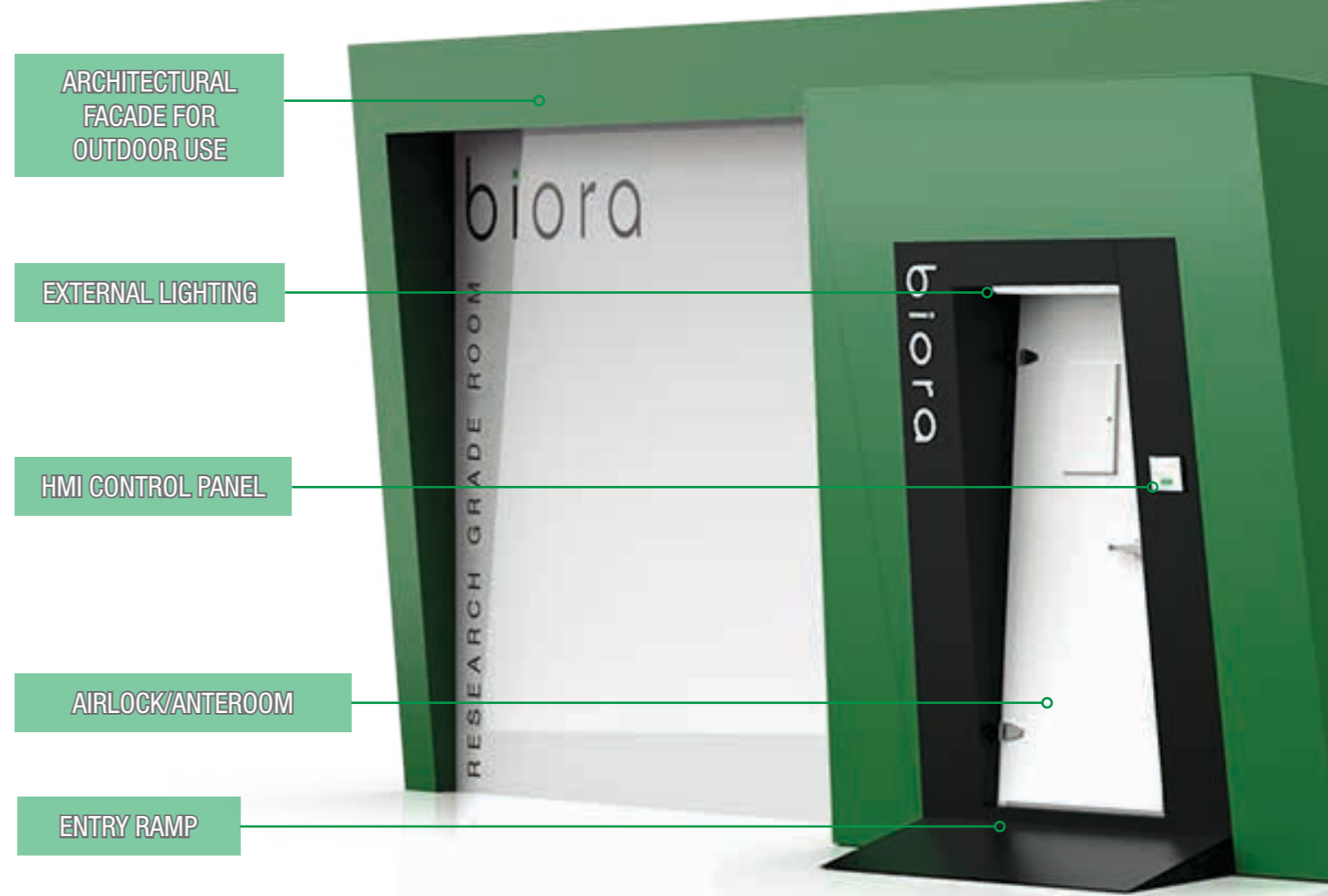
Biora Walk-In Chambers can be engineered to cater specifically to science and research applications.

Research Grade Chambers are customised during the design and manufacturing process to suit client requirements, industry recommended standards and best practice.



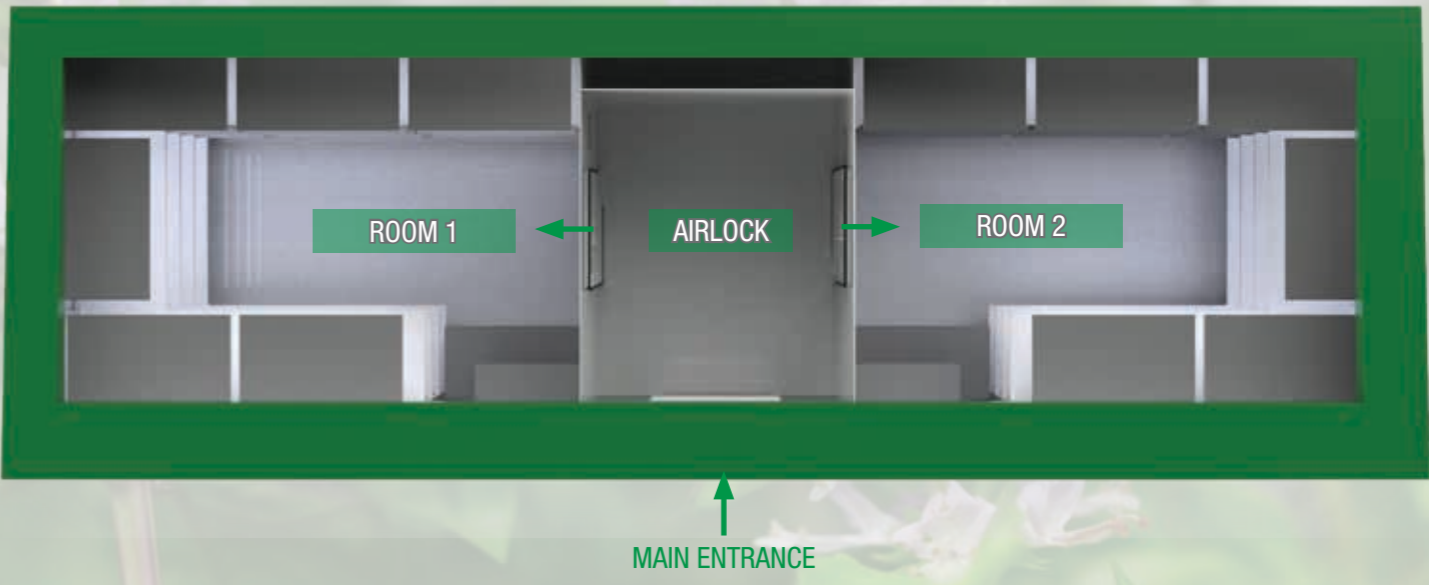
Available Options

- ✓ Airlock/anteroom options
- ✓ Exterior architectural facade
- ✓ Customisable HMI control system and programming
- ✓ Automated irrigation and fertilisation
- ✓ CO2 monitoring and regulation
- ✓ Cold temperature environmental conditions
- ✓ Variable spectrum lighting
- ✓ PC (PPC) -2 and -3 laboratory certification
- ✓ Security and data protection options
- ✓ Customized dimensions and modular solutions
- ✓ External lighting and entry ramp



PC (PPC) -2 and -3 Certifiable Solutions

MineARC can offer PC (PPC) -2 and -3 certifiable laboratory for working with plant pests. This can include a pressurized airlock designed to protect the internal environment upon entry, removing the risk of contamination. Alternatively, passive anterooms are also available, allowing a multi-room configuration with individual environmental control.



Biora Walk-In Chambers - Cleanrooms

Cleanroom Standards

Biora Cleanrooms can be designed and built to comply with various standards and classes, including ISO 14644-1, GMP EU, British Standard 5295, BS EN ISO 14644-1, or the Therapeutic Goods Association

Cleanrooms by Biora offer portable or modular solutions to any application that requires a high level of environmental control, including manufacturing, scientific research, pharmaceutical and medical.

- ✓ Modular and Portable options that allow expansion over time
- ✓ Multi-room or zone options based on requirements
- ✓ Specialised temperature and humidity control
- ✓ Cleanroom-grade insulated external panelling
- ✓ Clean-room grade internal panelling, designed to withstand cleaning chemicals and agents
- ✓ 99.99% HEPA filters

Biora Cleanrooms (also known as clean rooms or clean spaces) are engineered and manufactured to meet your unique conditions and required standard. With a range of established sizes and made-to-order designs to fit your application and configurations needs.

- ✓ Heavy-duty, bio-security, anti-static vinyl flooring
- ✓ Concealed ducting and electrical within ceiling - accessible via external panels
- ✓ Coved joints and right-angle corners to prevent settling of dust
- ✓ Drop seal on doors, with a positively pressurised interior; preventing contamination ingress
- ✓ Rugged external structure, allowing manoeuvrability and placement outdoors



Biora Walk-In Chambers - Control and Security Options

Biora's industry-leading control system allows for intuitive programming and remote, web-based management. Enjoy real-time monitoring of all control processes, with the ability to access 12 months worth of historical data.

The 7" high resolution, user-friendly touch screen can also be customised with various levels of security to ensure your project is kept safe and secure at all times.



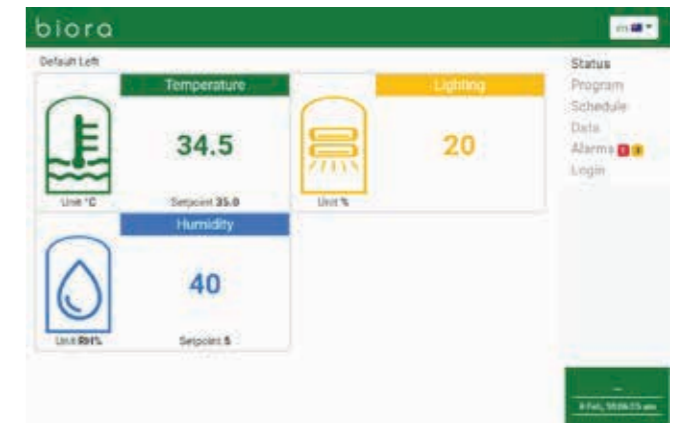
- ✓ Web-based software with both local and remote access
- ✓ Real-time monitoring of all control processes
- ✓ 12 months of historical data accessible
- ✓ Limitless customisable programs

- ✓ Data export and import options
- ✓ Push notifications based on custom alert settings
- ✓ Data protection and security options
- ✓ Customised HMI options and local engineering support

Chamber HMI Control

In addition to its remote capabilities, Biora's Control System can also be accessed by a user-friendly touch-screen HMI Panel, located on the face or inside of each Biora Chamber.

Chamber status, historical data, alarms and programming can all be accessed and controlled via the HMI.



Remote Monitoring & Control

Biora's integrated control system enables real-time remote monitoring and control, providing confidence that your Biora Chambers are operating efficiently and effectively at all times.

The system provides web-based access to all chambers; sending alarms and push notifications (email and text message) via Ethernet and/or Wi-Fi.

The system's home page features a summary of your entire Biora fleet, with the ability to drill down to the status and historical data of each chamber. Set, schedule and adapt programs from afar, without the need to physically visit your chamber.

Security

The Biora Control System provides the added advantage of security within the grow chamber, with an internal IP camera; accessible remotely.

A number of optional security access solutions are available to protect your investment including:

- Electric smart key lockable door with PIN code or swipe access
- External IP cameras installed for both security and remote chamber monitoring
- Internal temperature, humidity and pressure sensors.

Biora Walk-In Chambers - Control Options

Carbon Dioxide and Other Gases

The monitoring and control of oxygen (O₂), carbon dioxide (CO₂) and nitrogen (N₂) is an optional feature of all Biora Walk-In Chambers.

For rapid CO₂ removal, MineARC scrubbing technology can be utilized to reduce levels within the system to below 250ppm (0.025%). Alternatively, CO₂ enrichment can be included within the chamber.

Handheld gas monitors are also available, providing a portable safety solution for individuals when entering a chamber.



Irrigation and Fertilisation

Automating irrigation improves productivity and plant quality through uniformity. MineARC's drip or ebb flow system can be connected into the HMI, allowing different automated irrigation options based on time and light intensity. Different grow areas can be set with different irrigation rates and frequency.



Biora Stand Alone Scrubber

The Biora Stand Alone Scrubber is a compact air regenerative system that 'scrubs' carbon dioxide (CO₂) from the air within enclosed spaces; allowing for complete control of CO₂ levels for research applications.

Compact in size, the unit stores for extended periods, and is easy to operate. The addition of the system permits an enclosed space that is ventilated from the outside to be converted to a fully isolated, controlled environment.



Biora Walk-In Chambers - Eye Protection

LED Eyewear Range



Agent 939 LEDFx

The world's first LEDfx lenses designed for full spectrum LED scenarios; blocking significant infrared heat energy.

- Polycarbonate, lightweight lens
- Large temple arm for peripheral protection
- Recessed rubber nose pad
- Flexible TR90 frame



Operator LED+

The world's first optics optimised for the magenta hue of LED environments, manufactured to exacting standards.

- Polycarbonate lens, 100% UV protection
- Flash Silver lens coating also allows for outdoor use
- Italian made, lightweight TR90 frame



Cultivator LED+

Providing great value and exceptional colour balancing for LED lighting with proprietary LED+ lenses.

- Polycarbonate lens, 100% UV protection
- Flash Silver exterior coating
- Asymmetrical lenses to eliminate distortion
- Rubber nose pad



Aviator Clip-On LED

Change the way you see your plants and grow room using your own prescription glasses.

- Polycarbonate lens, 100% UV protection
- Spring-loaded, rubber coated metal clips
- Aviator style fits over a wide variety of large lenses

HPS Eyewear Range



Evolution HPS+

German mineral glass HPS+ lenses provide perfect colour balance for HPS lighting as well as digital display screens.

- Full UV protection and scratch resistant lens
- Anti-reflective and Flash Silver coating
- Lightweight TR90 frame
- Concealed flex-hinges for comfort



Resistance HPS+

Utilises patented lens technology providing the perfect colour in large scale grow rooms above 10,000 watts.

- Silver lens coating for brighter spaces
- German mineral glass for optimal clarity
- Lightweight TR90 frame



Aviator Clip-On HPS

Change the way you see your plants and grow room using your own prescription glasses.

- Polycarbonate lens
- Spring-loaded, rubber coated metal clips
- Aviator style fits over a wide variety of large lenses

Biora Method Seven Photo Filters

Capture 'perfect colour' photos from within any grow room with HPS and LED photo filters. Housed in anodised aluminium and compatible with any camera with a Cokin 'P' filter holder.





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Biora by MineARC Systems

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