PACKAGING AND DISINFECTION

Capability Brief

Water Bottling Lines (Still + Carbonated) | Cold Chain Disinfection (Farm to Shelf)

Biozone designs and integrates engineered packaging and hygiene systems built around stable treatment performance, controlled disinfection stages and practical plant operation.

Water treatment is configured from water analysis to achieve SANS 241 / WHO drinking water standards.

ENGINEERED PACKAGING AND HYGIENE SYSTEMS

Biozone delivers end-to-end water packaging and disinfection systems that align treatment performance with real operating environments. Our solutions are engineered from verified inputs (water analysis, hygiene objectives, throughput requirements) and built to maintain reliable output across changing conditions.

Water Bottling Lines (Still + Carbonated Water Only)

Biozone supplies complete bottling lines. From manual and semi-automated systems through to fully automated packaging lines, including treatment integration to meet drinking water standards.

Cold Chain Disinfection (Farm to Shelf)

Biozone integrates ozone in air and water to support contamination control, odour reduction and shelf-life protection across cold chain environments, from packhouses and logistics to distribution and retail zones.

Treatment selection depends on the client's water analysis. Ozone expertise supported by UV, reverse osmosis, and nanofiltration where required.

CAPABILITY AT A GLANCE

Coverage across bottle formats, automation levels, packaging and cold chain hygiene.

Bottled water line scope

- Still water and carbonated water lines
- Bottle formats supported: 330 ml to 5 L (and larger formats by request)
- Full suite integration: rinse → fill → cap → label → shrink wrap → shrink pack → conveyance / handling
- Semi-auto: ±2,000–3,000 bottles/day
- Fully automated: ±2,000–50,000 bottles/hour

Throughput bands (typical):

- Semi-automated lines: ± 2,000–3,000 bottles/day (operator and shift dependent)
- Fully automated lines: ± 2,000–50,000 bottles/hour (line configuration dependent)

Treatment integration (analysis-driven):

Based on source water results, systems may integrate ozone, UV, reverse osmosis, nanofiltration and filtration stages to achieve SANS 241 drinking water standards.

Built-in hygiene stage (standard):

All lines include ozone bottle rinse and disinfection prior to filling.

Optional product configuration:

Clients may select ozonated product water for bottled water resale where required.

Brand + Site Setup (Optional Add-On)

Biozone can support full market launch readiness, including:

- Logo and brand design
- Label design and compliance-ready packaging artwork
- Retail shop setup design (fridges, signage, merchandising, display)

Cold Chain Disinfection (Farm to Shelf)

- Industries: produce, abattoirs, dairy, beverage plants

Core applications:

- **Packhouse rinse water disinfection** using ozonated water
- **Air decontamination and surface disinfection** using EcoBlasters (ozone-in-air)
- **Transportation airspace hygiene support**
- **Distribution and ripening room applications** (including ethylene management where applicable)
- **Retail hygiene reinforcement** for freshness and shelf-life support





WATER BOTTLING LINE CONFIGURATIONS

Manual, semi-automated and fully automated lines designed around your target throughput, staffing, and footprint.

Manual Lines Entry-Level Production	Semi-Automated Lines Operator-Assisted Throughput	Fully Automated Lines High Throughput Systems
Low-volume production. Start-up bottlers, remote community supply, pilot operations.	±2,000–3,000 bottles/day (operator and shift dependent).	±2,000–50,000 bottles/hour (line configuration dependent).
Ozone Rinse Disinfection	Ozone Rinse Disinfection	Ozone Rinse Disinfection
Fill + cap stations	Semi-automated filling and capping	Automated rinse/fill/cap with integrated conveyance
Basic conveyance / handling	Label + shrink wrap/shrink pack integration	Labelling, shrink wrapping, and shrink packaging
Simple operation, low complexity, upgrade-ready layout.	Stable output with consistent hygiene control.	Repeatable performance, scalable architecture.

All lines are engineered from project requirements and integrate upstream treatment where needed.

STILL AND CARBONATED WATER SYSTEMS

Coverage across bottle formats, automation levels, packagingand cold chain hygiene.

Biozone supplies water bottling lines for **still water** and **carbonated water** applications. Each line is configured to match the operating environment, packaging format, and production targets, with hygiene and water quality treated as engineered system functions.

Still Water Lines

- Consistent rinse/fill/cap performance across variable operating conditions
- Treatment stages integrated based on water analysis results

Carbonated Water Lines

- Line configuration supports carbonated water handling requirements
- Integrated control and packaging flow maintains process stability

Standard Hygiene Stage (All Lines)

- Ozone rinse and disinfection for bottles prior to filling

Supported Bottle Formats

- 330 ml to 5 L, all common formats; additional by request

WATER QUALITY ENGINEERING

Treatment architecture is configured from the client's water analysis to achieve SANS 241 drinking water standards.

Biozone does not apply one fixed treatment layout across all projects. System design is driven by the customer's **source water analysis**, required operating conditions and target output quality. This ensures treatment performance is stable, defensible, and aligned to drinking water standards.

- Source water variability (seasonal, borehole, municipal, blended supply)
- Contaminant profile and required removal targets
- Required treated water flow and operating schedule
- Site constraints (space, utilities, operator capability)

Treatment methods we integrate (as required):

- **Ozone** (disinfection and oxidation applications where appropriate)
- **UV** (supplementary disinfection and control)
- **Reverse Osmosis** (dissolved solids reduction / purification)
- **Nanofiltration** (selective removal / softening applications)
- **Filtration and conditioning stages** as required for stability and protection of downstream equipment

OUTCOME : A configured treatment train that supports SANS 241 drinking water standards and stable packaged-water production.

OPTIONAL CONFIGURATION: Clients may specify ozonated product water for bottling where required.

FULL PACKAGING LINE INTEGRATION (WATER BOTTLING)

End-to-end packaging capability integrated with rinse–fill–cap–convey systems.

Biozone supplies and integrates a complete packaging suite for water bottling lines. From bottle handling through to final packed product. Packaging modules are selected to match line speed, bottle format, and site constraints.

Labelling Systems
Pressure-sensitive or sleeve labelling, integrated with conveyor timing and sensor control for consistent label placement.

Date & Coding systems

Shrink Sleeving / Heat Shrink
Sleeve application and controlled heat tunnel integration for stable shrink performance and reduced rework.

Shrink Wrapping & Shrink Packaging
Single and multi-pack bundling, including film handling, sealing, and heat tunnel control.

Conveyor & Handling Integration
Guides, spacing, accumulation zones, and changeover logic to maintain throughput without bottle instability.

ENGINEERING OUTCOMES
- Stable packaging quality at target throughput
- Reduced packaging waste and rework
- Better line uptime through integrated control and layout logic

SYSTEM OPTIONS, CONTROLS & ADD-ONS

Upgrade paths and integration options to improve stability, monitoring, and operational control from compact setups to fully automated lines

Biozone lines can be configured with optional monitoring, control logic, and engineered upgrades depending on the operating environment, required throughput, and reliability targets. Add-ons are selected based on project requirements and available site utilities.

Control and automation options
- Timer-based control packages for simple, robust operation
- Sensor-based control (where required) for stability and fault prevention
- PLC-ready architecture on supported line series for automation, interlocks, and alarms
- HMI operator interface for status, alarms and guided operation

Monitoring and compliance add-ons
- Flow monitoring (feed and product water)
- Pressure monitoring across treatment stages
- TDS / conductivity monitoring for RO/NF systems
- Event logging for maintenance, alarms and operational review
- Remote monitoring readiness (where required and supported)

Treatment and disinfection add-ons
- Ozone bottle rinse integration (standard for bottling lines)
- Ozonated product water option (customer-selectable)
- UV integration (where analysis indicates)
- Reverse osmosis/nanofiltration integration (as indicated by water analysis)
- Pre-filtration and staged filtration for variable source water conditions
- CIP Systems

Operational upgrades
- Utility optimisation (pump sizing, recirculation, tank logic)
- Redundancy where required (critical pump/sensor strategy)
- Layout and changeover improvements for multi-format packaging

BRAND AND RETAIL LAUNCH SUPPORT

Practical launch support to move from installed line to sale-ready product, focused on execution, compliance readiness and retail presentation.

Where required, Biozone supports clients beyond equipment delivery by helping prepare a sale-ready water offering. This support is structured to accelerate launch and reduce avoidable rework during commissioning and early production runs.

Label design readiness
Label dimensions, placement guidance and print-ready format coordination to match bottle selection and line handling.

Packaging presentation setup
Basic retail pack formats, shrink bundle configuration and product presentation consistency.

Retail setup planning (optional)
Practical layout support for refill stations or retail points — focusing on flow, hygiene, and equipment placement.

Visual assets for launch
Product mockups and simple rollout collateral aligned to installed equipment and product format.

Rollout consistency
Standardised look-and-feel across bottle, label and point-of-sale elements to reduce brand variability.
Important note (scope clarity)

Biozone's core deliverable is engineered treatment and bottling/packaging integration. Brand and retail launch support is offered as an add-on service for clients who need a complete go-live pathway.

Label Design

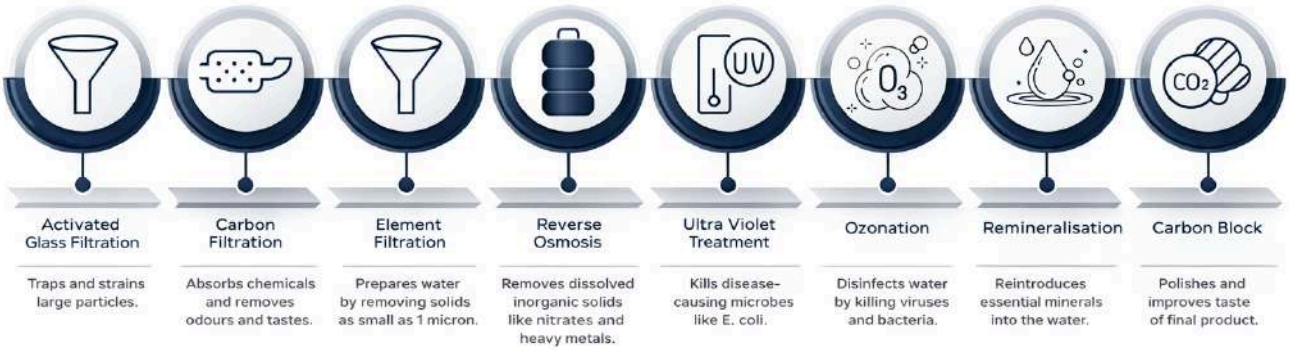
Shop Front Design

Outdoor Advertising

RETAIL FILLING AND KIOSKS

Unlike basic retail filtration setups, Biozone's approach is engineered for consistency, protection, and repeatable output. Each stage in the treatment train is designed to support the next, creating a multi-barrier purification process that remains effective even if one stage encounters variable source water conditions.

- **AFM® (Activated Filter Media):** Removes larger particles down to 1 micron while resisting bio-slime formation.
- **Activated Carbon:** Absorbs chlorine, pesticides and organic compounds that affect odour and taste.
- **Sediment Filtration:** Provides a physical barrier that protects downstream treatment stages.
- **Reverse Osmosis (RO):** Removes dissolved salts, heavy metals, and a broad range of contaminants.
- **Smart Remineralisation:** Restores only the essential minerals required to achieve balanced, premium-tasting water.
- **Ozone Disinfection:** Provides fast, high-level disinfection as a core Biozone specialty.
- **UV Sterilisation:** Adds a secondary microbial barrier through UV exposure.
- **CTO Polishing:** Final taste polishing for a clean, crisp finished water product.



BUILT, ENGINEERED & SUPPORTED BY BIOZONE

Because Biozone manufactures and engineers its own systems, retail filling and kiosk clients benefit from more than just installed equipment. They gain access to a treatment partner with deep expertise in ozone, UV, reverse osmosis, remineralisation, monitoring, and long-term system support. The result is a retail water solution designed for reliability, maintainability, and premium product consistency.

- **High-purity water with very low dissolved solids**
- **Protection against nitrates and agricultural runoff contamination**
- **Balanced pH through controlled remineralisation**
- **Sterile final water through ozone and UV "double kill" protection**
- **Locally engineered and manufactured systems**
- **Digital ORP monitoring for disinfection precision**
- **Proactive SLA and maintenance support**
- **Component availability through local stockholding**

COLD CHAIN DISINFECTION: FARM TO SHELF

Ozone-based air and water treatment integrated across handling stages to reduce contamination pressure and support shelf-life stability.

Biozone supports cold chain operations by integrating ozone in water and air where hygiene control directly impacts product quality, shelf-life, odour management and operational compliance.

Cold chain disinfection is engineered as a multi-stage hygiene strategy, applied across:

- **Water treatment at source and processing points**
- **Ozonated rinse water for wash steps**
- **Air and surface decontamination using EcoBlasters (ozone-in-air)**
- **Transport airspace disinfection**
- **Distribution hygiene control and ethylene management where applicable**
- **Retail environment hygiene reinforcement**

Biozone applies treatment based on site conditions and risk profile, not a one-size-fits-all approach.

FARM	PACKHOUSE	TRANSPORT	DISTRIBUTION STORAGE	RETAIL
Water risk management begins at source.	*Ozonated rinse water + air and surface decontamination to support hygiene consistency.*	*Airspace hygiene control during logistics and between loads.*	*Air and surface hygiene control, with ethylene management where applicable.*	*Supporting shelf-life stability and hygiene performance where product meets the customer.*
Water quality at farm level influences contamination loading throughout the supply chain. Biozone supports operations with treatment strategies aligned to the site's water analysis and intended use.	Packhouses and processing facilities require repeatable sanitation control to reduce cross-contamination and limit spoilage drivers. Biozone integrates ozone into both wash water and air/surface hygiene systems.	Transport environments can accumulate odours, microbial load, and residual contamination between loads. Biozone ozone systems support logistics hygiene by treating airspace under controlled protocols.	Distribution and storage environments require controlled hygiene to reduce spoilage pressure and contamination risk across large volumes of stored product.	Retail environments are the final point of exposure before purchase. Biozone supports hygiene reinforcement strategies that help maintain freshness and reduce contamination drivers.
• Source water conditioning where variability affects downstream washing or processing • Treatment selection: ozone, filtration, UV, membrane processes where applicable • Practical design for reliability in real operating environments • Reduces upstream contamination pressure before produce enters the packhouse	• Ozonated rinse water for wash and contact stages (configured for the process) • EcoBlasters (ozone-in-air) for air decontamination and surface hygiene control • Targeted application in high-risk zones: wash bays, conveyors, handling areas, cold rooms, waste zones	• Airspace disinfection during transport (where configured) • Deodorising and sanitising transport units between loads • Reduction of spoilage drivers in sensitive logistics chains • Systems selected and configured based on transport type, volume, and operational requirements	• Air decontamination and odour control • Surface hygiene support in storage zones • Ethylene management in ripening rooms where applicable • Treatment designs aligned to airflow dynamics, humidity, and operational schedules • Ozone systems positioned externally with controlled injection in high-humidity environments	• Maintaining freshness and reducing spoilage pressure • Supporting shelf-life stability • Surface hygiene control in key zones • Odour control in enclosed retail environments
All food chainenvironments	• Produce • Abattoirs • Dairy / cheese production • Beverage plants	• All cold chain logistics operators • Temperature-sensitive goods	• Cold storage operators • Ripening room operators • Food distribution centres	• Produce retailers • Food processing & packaging environments • Cold storage and logistics operations

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