



From Engineering to Commissioning Turnkey Solutions for Beverage & Brewery Industries

Water Treatment · Deaeration · Blending · Carbonation · Dealcoholization · CIP

Centec USA LLC
www.centec-usa.com



- PROCESS SYSTEMS & INLINE SENSORS

Process Systems & Sensors for Breweries

Engineered for stable product quality, hygienic operation, and scalable process performance.

Centec is a globally operating, privately owned engineering company with more than 50 years of experience in designing and manufacturing fully automated, skid-mounted process systems and high-precision inline measurement technology for breweries and the beverage industry. Engineered and manufactured in Germany, Centec combines process engineering, automation, and project execution in one integrated portfolio—covering water treatment, deaeration, cold block solutions, product treatment, CIP, and process analytics.

Supported by ISO 9001 certified production facilities and a high level of in-house manufacturing—including control panels and tank fabrication—Centec ensures maximum process reliability, consistent product quality, and operational efficiency. With subsidiaries on all continents and a global network of partners, Centec delivers reliable, turnkey solutions from concept and design through to installation and commissioning, serving both leading international beverage producers and growing craft operations.

— Why Centec

Centec delivers brewery process solutions from a single source. The portfolio combines process engineering, skid-based systems, automation, tank manufacturing, control panels, and inline measurement technology into one coordinated execution model.

INTEGRATED BREWERY PROCESS EXPERTISE

Critical brewery process steps are not isolated equipment purchases. They form one quality chain.

Centec focuses on the process areas that have the strongest impact on product stability, oxygen control, repeatability, hygiene and operating efficiency.

WHAT SETS CENTEC APART

- German manufacturer with high in-house manufacturing depth
- Strong focus on water treatment, cold block, and product treatment
- Own inline sensors for O₂, CO₂, density, and concentration
- Global support structure for international projects



VALUE CHAIN, NOT ISOLATED EQUIPMENT

ENGINEERING

Process-focused system design

AUTOMATION

Coordinated controls and startup

SENSORS

Inline visibility in critical steps

EXECUTION

From module to integrated project

Predictable product quality, optimized yield, reduced operation expenses, and an infrastructure designed to support future automation and digitalization.

— Portfolio at a Glance

Centec's brewery portfolio is structured around the process areas that define product quality and plant performance: water treatment, water deaeration, cold block preparation, product treatment, hygienic CIP and inline process control.

PROCESS LOGIC

WATER TREATMENT

Defined brewing water quality from raw water to process-ready supply

WATER DEAERATION

Low dissolved oxygen as the basis for product protection

COLD BLOCK

Blending, carbonation, nitrogen dosing, wort aeration, yeast support

PRODUCT TREATMENT

Dealcoholization and pasteurization within an integrated process concept

CONTROL LAYER

CIP, inline sensors, process analytics and automation readiness

Water Treatment

Defined brewing water quality through filtration, membrane treatment, and softening.

Water Deaeration

Very low residual oxygen in process water for stable downstream performance.

Cold Block / Product Preparation

High-gravity blending, multi-component mixing, gas dosing and recipe flexibility.

Product Treatment

Dealcoholization and pasteurization aligned with broader brewery process strategy.

Cleaning / CIP

Hygienic performance built into the system design, not added afterward.

Inline Sensors

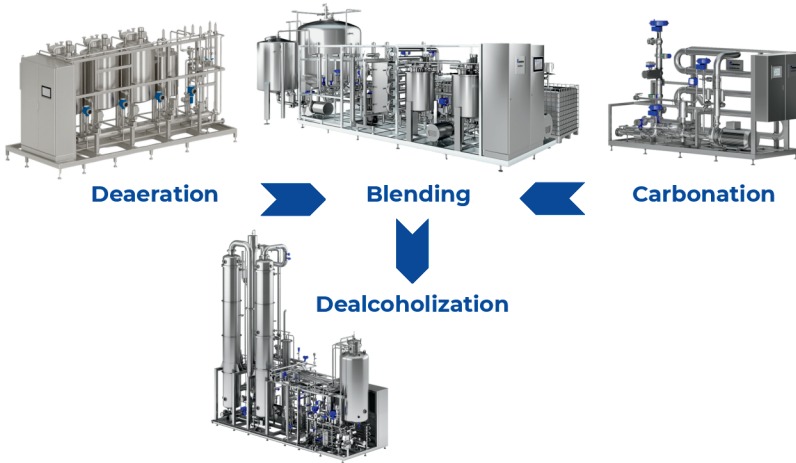
O₂, CO₂, density and concentration measurement for control and quality assurance.

— A Holistic Brewery Process Approach

Centec does not treat brewery process steps as isolated equipment packages. Water treatment, deaeration, cold block execution, product treatment, hygiene, and inline measurement are engineered as one connected process architecture. That is where stable quality, lower oxygen risk, and repeatable plant performance start.

Integrated Brewery Process Architecture

Engineered process systems for water, cold block and product treatment.



Water Treatment | CIP Integration | Automation | Process Control

Centec Solution Philosophy

The strongest technical and commercial results are achieved when critical process steps are aligned from the beginning. Instead of separate upgrades with interface risk, Centec structures water quality, oxygen control, gas management, cleaning, and inline process visibility into one coordinated brewery solution.

- Defined process conditions instead of unstable compromises
- Modular solutions that still follow one engineering logic
- Better scalability from individual skid to integrated project
- Stronger fit for automation and digital process control

Water as a Process Input

Water quality is configured to match brewing and downstream product requirements rather than treated as a utility topic only.

Low-Oxygen Thinking

Deaeration, gas management, and transfer logic are aligned to reduce oxygen pickup across the brewery process chain.

Cold Block Precision

Blending, carbonation, nitrogen dosing, and related steps are designed for repeatable execution under defined process conditions.

Hygiene by Design

CIP, hygienic routing, and sensor integration are considered part of the process architecture, not an afterthought.

Stable product quality is not only a matter of equipment selection. It depends on how well the full process chain is configured and controlled.

Holistic Approach

— From Process Analysis to the Right Solution

Centec's role is not limited to supplying modules. The task is to understand where quality, efficiency, or hygiene are being lost, translate that into a clear process concept, and implement the right solution architecture for the brewery's capacity, product mix, and expansion path.



HOW CENTEC WORKS

ANALYZE

Review plant conditions, targets, interfaces, and process risks

CONFIGURE

Define the right module combination and engineering depth

ENGINEER

Translate the concept into a hygienic, automation-ready system

COMMISSION

Bring the system into operation under real process conditions

SUPPORT

Maintain performance with service, training, and optimization

Modular Where Useful

Individual process skids can solve targeted challenges without losing integration capability.

- Fast implementation for defined process needs
- Clear interfaces to existing brewery infrastructure
- Expandable into broader solution concepts

Integrated Where Necessary

When process quality depends on multiple interfaces, Centec combines solutions into one coherent architecture.

- Fewer coordination losses between isolated systems
- More stable end-to-end process conditions
- Lower risk during future expansion steps

Measured and Controlled

Inline sensors and automation are used where they improve process transparency and control quality.

- Direct visibility into critical process parameters
- Faster response to drift and quality deviations
- Foundation for tighter operational control

Centec combines solution design, system engineering, automation, and inline measurement into one execution model — from process analysis to long-term support.

Execution Model

— Water Treatment

Centec's brewery portfolio is structured around the process areas that define product quality and plant performance: water treatment, water deaeration, cold block preparation, product treatment, hygienic CIP, and inline process control.



FILTEC M

Media filtration for the removal of iron, manganese, heavy metals, and turbidity from raw water.

- Stable brewing water quality throughout the year
- Low operating effort through automatic backwashing
- Simple integration through skid-based design

Typical Features: Typical applications include raw water treatment and brewing water polishing.

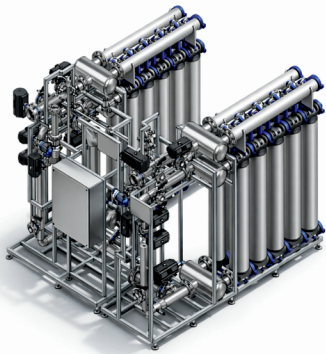


REVOTEC

Reverse osmosis for controlled reduction of salinity and precise adjustment of water composition.

- Reproducible water quality for different beer styles
- Energy-efficient design with recovery concept
- Fully automatic operation with trend monitoring

Typical Features: Designed for brewery-specific permeate demand and continuous operation.



ULTRATEC

Ultrafiltration for hygienic process water and as a pretreatment step for downstream membrane or deaeration systems.

- High microbiological safety as a core process principle
- CIP-capable membrane modules for hygienic operation
- Compact, modular design for flexible expansion

Typical Features: Suitable for product, process, and rinse water applications.



IONTEC

Water softening to remove calcium and magnesium and reduce scaling in utility and cleaning-related systems.

- Longer service life for downstream equipment
- Automatic regeneration with efficient resource use
- Robust system concept for reliable daily operation

Typical Features: Typical applications include boiler water and bottle washer supply.

— Water Deaeration

Low-oxygen process water is a basic requirement for product protection in modern breweries. Centec water deaeration systems reduce dissolved oxygen to very low levels and create a stable base for oxygen-sensitive downstream steps.



DeGaS-Cold

Column-based water deaeration at ambient temperature for medium to higher capacities.

- Strong fit for larger performance ranges
- Optional vacuum operation to support gas reduction
- High energy efficiency in suitable recovery concepts

Typical Features: Counter-current operation with CO₂ or N₂ for low residual oxygen values and economical gas use.



DeGaS-Hot

Hot water deaeration concept combining low residual oxygen values with integrated thermal disinfection and an energy-efficient process layout.

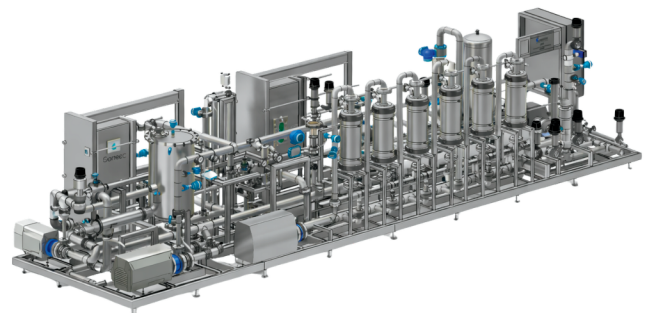
- Combines deaeration and thermal hygiene in one process step
- Lower stripping gas demand compared with cold-water concepts
- Strong fit for breweries with heat recovery strategy

DGS

Membrane deaeration for compact cold block installations and retrofit-friendly layouts.

- Compact skid design for limited space conditions
- Easy integration into existing cold block environments
- Flexible upgrade options such as O₂ measurement, UV treatment, and cooling

Typical Features: Hollow-fiber membrane concept for very low residual oxygen with low stripping gas consumption.



Deaerated process water is a practical quality lever for blending, carbonation, and oxygen-sensitive downstream steps.

PROCESS RELEVANCE

— Cold Block / Gas Management & Yeast Support

This is where repeatability, flexibility and product protection become operational advantages. Centec integrates gas dosing, aeration, and yeast-related process support into hygienic, automation-ready system concepts.



Carbonation Systems

Controlled CO₂ dosing for stable carbonation levels in beer and related beverage applications.

- Stable final product specification
- Reduced variability in downstream filling performance
- Seamless integration into the cold block

Typical Features: Designed for automated operation within broader process skid concepts.

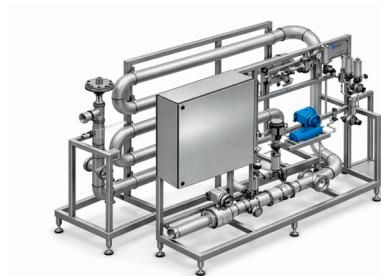


Nitrogen Dosing Systems

Inline N₂ dosing for product concepts that require controlled nitrogen integration.

- Reliable gas dosing under repeatable process conditions
- Consistent product presentation and process behavior
- Flexible integration into existing line concepts

Typical Features: Implemented as part of modular gas management in the cold block.



Wort Aeration Systems

Controlled wort aeration prior to fermentation support steps.

- Stable process conditions for downstream fermentation-related targets
- Controlled oxygen input instead of manual approximation
- Hygienic, automated operation within the brewery process chain

Typical Features: Integrated into broader brewery process architecture.



Yeast Propagation Systems

Support for controlled yeast handling and propagation-related process requirements in brewery production.

- Better repeatability in biologically sensitive process steps
- Structured and hygienic process execution
- Scalable implementation according to brewery size and process scope

Typical Features: Aligned with modular project execution and automation concepts.

— Cold Block / Product Preparation

Centec covers key cold block processes in a modular and scalable way. The portfolio supports consistent recipe execution, controlled gas management, hygienic operation, and easy integration into existing or new brewery layouts.

High-Gravity Blending Systems

Controlled dilution and recipe adjustment from high-gravity beer to final target specification.

- Reproducible product quality from batch to batch
- Lower losses through stable process control
- Flexible adaptation to different brands and production scenarios

Typical Features: Integrated as part of modular cold block process systems.



Multi-Component Mixing Systems

Precise inline blending of water, beer, and additional liquid components where recipe flexibility and consistent target values are required.

- Reliable execution of defined product targets
- Reduced manual intervention in recipe handling
- Scalable concept for product changeovers and portfolio growth

Typical Features: Suitable for modular skid implementation and automated process control.

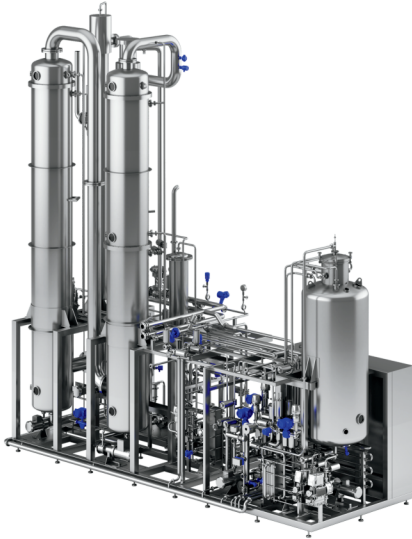
Cold Block Priorities

- Recipe consistency under defined process conditions
- Lower oxygen exposure across critical steps
- Modular integration into new or existing brewery layouts



— Product Treatment

Product treatment systems help breweries respond to quality targets, shelflife requirements, and changing market expectations. Centec's focus is centered on dealcoholization and pasteurization within a broader process and automation framework.



Dealcoholization Systems

Alcohol reduction or removal for alcohol-free and low-alcohol product concepts.

- Supports portfolio expansion into growing product segments
- Integrated process design for controlled product handling
- Strong fit within a broader cold block and product treatment strategy

Typical Features: Executed as part of Centec's brewery product treatment portfolio.

Pasteurization Systems

Thermal product treatment for stable downstream handling and shelf-life support where process strategy requires it.

- More stable process results under defined treatment conditions
- Stronger product security in the final production chain
- Engineered integration into existing brewery layouts

Typical Features: Positioned as part of Centec's product treatment offering for breweries.



Integrated Treatment Logic

The value does not come from isolated equipment. It comes from how treatment technology, product routing, automation, and quality control work together in one coordinated process environment.

— Cleaning / CIP

Reliable cleaning is a core requirement for stable production, product safety, and repeatable plant operation. Centec integrates CIP thinking into brewery process design so that hygiene supports performance instead of slowing it down.



Hygienic CIP Systems

Central or local cleaning concepts for brewery process systems and cold block installations.

- Repeatable cleaning performance across defined process steps
- Hygienic design aligned with automated plant operation
- Reduced operational risk through structured cleaning routines

Typical Features: CIP-capable system design across relevant process modules.

CIP-Ready Process Design

Engineering of process systems with hygiene, accessibility, and cleaning integration in mind.

- More reliable daily production performance
- Easier compliance with defined hygiene standards
- Better long-term maintainability of the installed process base

Typical Features: Designed to fit modular skids, pipework concepts, and automated process sequences.



— Inline Sensors & Measurement Technology

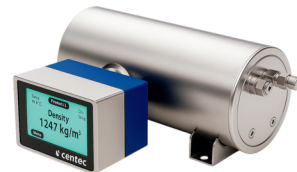
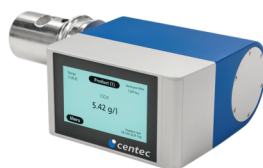
Centec's inline sensors are not an add-on. They are part of the value proposition. O₂, CO₂ density, and concentration measurement support tighter control, better consistency, and a stronger basis for automation and future digitalization.

Typical Brewery Challenges

- Oxygen pickup is often detected too late, after product quality is already affected
- Carbonation drift leads to unstable final product specification
- Critical process values are still checked too often only offline or too late
- Operators need direct process visibility during filtration, blending, and filling-related steps

Centec Sensor Logic

Inline measurement moves quality-critical values directly into the brewery process. Instead of reacting after deviations are visible in the finished product, operators and managers gain earlier insight into oxygen, carbonation, density, and concentration behavior.



O₂ Measurement

Inline oxygen monitoring in quality-critical brewery process steps.

- Greater protection against unwanted oxygen pickup
- Better basis for stable product quality and shelf life
- Faster process response through direct measurement in the line

Typical Features: Integrated into Centec's own sensor portfolio for brewery applications.

CO₂ Measurement

Inline carbon dioxide monitoring for carbonation-relevant process control.

- More stable final product specification
- Better control of gas-related process performance
- Reduced dependency on indirect or delayed checks

Typical Features: Designed for inline process monitoring within brewery operations.

Density & Concentration Measurement

Inline measurement of density and concentration values in brewing and beverage-related process steps.

- Supports repeatable recipe execution
- Improves process transparency in critical product phases
- Creates a stronger basis for automated control loops

Typical Features: Part of Centec's sensor positioning for brewery and beverage process systems.

— Inline Sensors for Brewery Applications

In breweries, sensor value is application-specific. The key question is not only what a sensor measures, but where it helps stabilize the process, reduce losses and protect final product quality.

Where Breweries Need More Visibility

- Before the filler, where dissolved oxygen and original gravity directly affect the final product
- During filtration, where product specification must remain stable under operating conditions
- During wort production, where extract values influence brewing consistency
- In blending and final adjustment, where multiple quality values matter at once



EXTRACT MONITOR

Precise determination of extract content typically during lautering or wort boiling.

- Better transparency in upstream brewing steps
- Supports more stable wort-related process control
- Creates a stronger basis for repeatable brewing performance

Typical Features: Hygienic design, CIP-capable, virtually maintenance-free; based on sound velocity or density measurement.

BEER MONITOR

Simultaneous inline determination of alcohol, extract, and original gravity in brewery applications.

- Combines several relevant beer values in one measurement point
- Supports tighter control of blending and final product adjustment
- Strengthens process visibility where multiple values matter at once

Typical Features: Combined density and sound velocity measurement with hygienic, CIP-capable execution and optional integrated pump.

PLATO MONITOR

Precise determination of original gravity typically during beer filtration and in front of the filler.

- Stronger control of final product specification
- Earlier response to process drift before packaging
- Reduced dependence on delayed verification steps

Typical Features: Hygienic design, CIP-capable, virtually maintenance-free; based on sound velocity measurement.

WHY BEER MONITOR MATTERS

When alcohol, extract, and original gravity are measured together, breweries gain a stronger control point for final product adjustment, specification stability, and process transparency in high-value product streams.

— From Measurement to Brewery Process Control

A sensor value alone does not create improvement. The real value comes from how measurement is embedded into process decisions, control strategy, and the broader brewery execution model.

Sensors only create value when they change decisions.

For breweries, this means fewer blind spots before the filler, tighter carbonation control, more stable brewing and filtration, and a stronger basis for automation. Centec connects inline measurement with skid-based systems, process engineering, and startup support so that sensor data becomes operational control.

Practical Brewery Outcomes

- Lower oxygen-related product risk
- More stable final product specifications
- Faster reaction to process deviation
- Less reliance on delayed lab-only feedback
- Stronger basis for future digitalization

MEASURE

Capture the relevant process value directly in the line

INTERPRET

Detect drift in time to act before it reaches the final product

CONTROL

Connect measurement with process adjustment and operating discipline

STABILIZE

Reduce variability, losses, and quality-related intervention

SCALE

Build a stronger basis for automation and digital process control



— Project Approach

Centec supports brewery projects from the first process discussion to commissioning and lifecycle support. The project approach combines process analysis, system configuration, automation, site integration and training in one coordinated model.

ANALYZE

Review current process conditions, goals, and boundary conditions

CONFIGURE

Define the right process concept and modular plant architecture

ENGINEER

Coordinate mechanics, automation, and hygienic process logic

COMMISSION

Startup support, training, and site integration

SUPPORT

Service, maintenance, and spare parts across the operating life



— Let's Discuss Your Brewery Project

Whether you are planning a targeted process upgrade or a broader brewery investment, Centec can help define the right process architecture for your requirements. The strongest results come from combining proven modules with the right engineering depth for your plant, your products, and your growth targets.

Talk to Us About the Full Process Chain

Water quality, low-oxygen processing, cold block performance, product treatment, hygiene, and inline process control work best when they are engineered as one coordinated brewery solution.

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