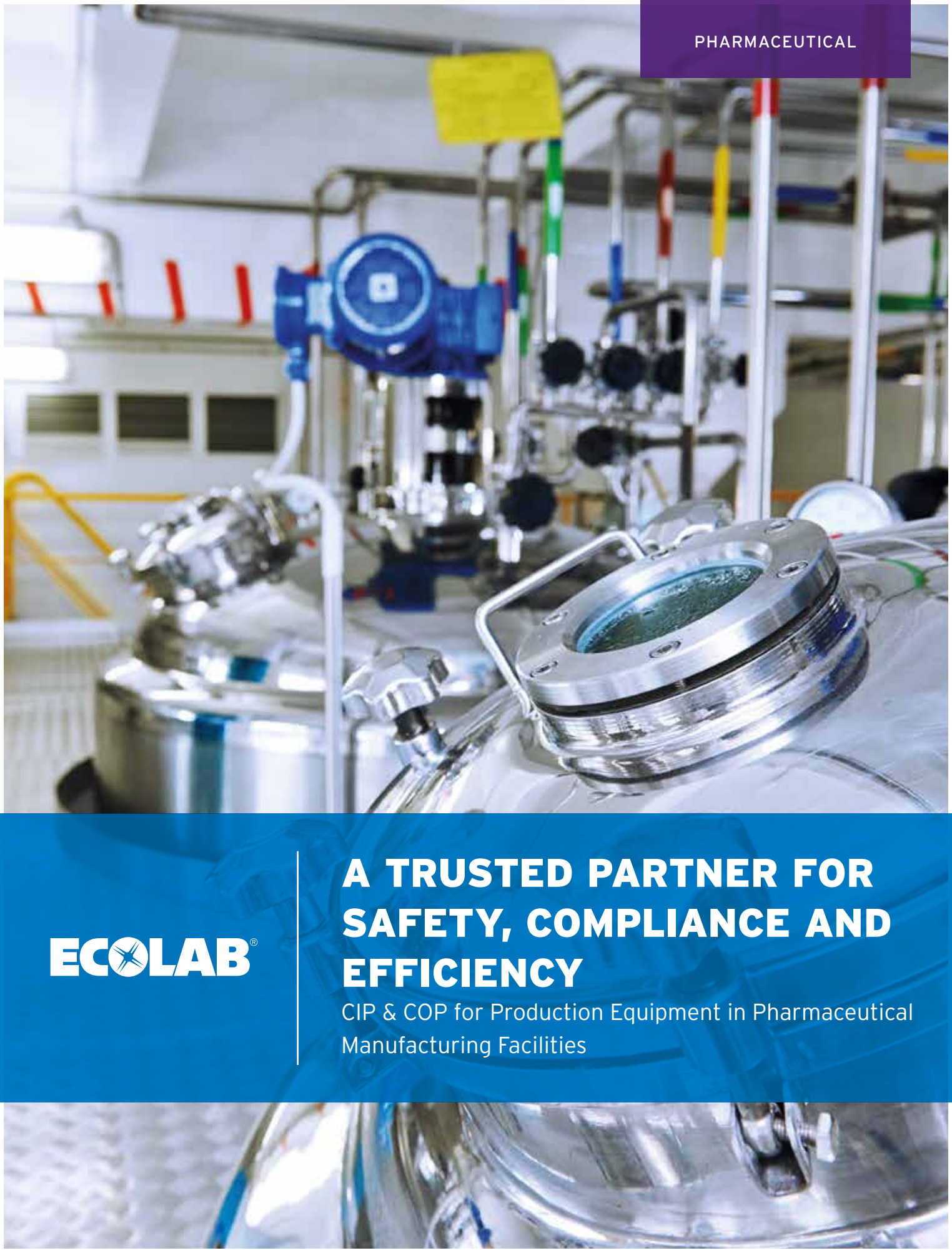
PHARMACEUTICAL



ECOLAB®

A TRUSTED PARTNER FOR SAFETY, COMPLIANCE AND EFFICIENCY

CIP & COP for Production Equipment in Pharmaceutical Manufacturing Facilities

Addressing Your Needs with **Our Solutions**

The **Ecolab** Benefit

At Ecolab, we provide our customers with the support of a global organization renowned for the most effective programs combined with the highest levels of service.

- Founded in the US in 1923
- Operational in over 170 countries
- Over 48,000 employees
- Over 3,000,000 customers worldwide
- Largest sales and service force in the industry

Experienced, highly trained and backed by the full resources of the global leader in sanitation, our dedicated Life Sciences team will deliver the proven solutions customers need to:

- Produce safe, compliant products that exceed your customers' standards
- Continuously and measurably improve operational efficiency
- Help achieve sustainability goals, including reducing water and energy consumption

We are a trusted partner to over 20 of the world's top pharmaceutical manufacturing companies.

By identifying our customers' specific needs, we are able to provide the best way forward from our Total Plant Solutions offering. This comprises:

CLEANING & DISINFECTION PROGRAMS

We go beyond identifying the right chemistry - our innovative site-specific programs help manage risk and improve process efficiency.

CLEANING & DISINFECTION VALIDATION SUPPORT

We assist our customers in navigating the complex process of validation and change control with validation efficacy project management and optimization based on environmental and economic targets.

TECHNICAL LAB SUPPORT

We support our customers with a variety of laboratory testing to identify the right cleaning procedure for our customers' specific processes, soils and products.

REGULATORY & SCIENTIFIC INSIGHTS

We understand the regulations and evolving regulatory environment, and have the tools to ensure compliance with cGMP to assure product safety and quality and to help implement validations that meet regulatory expectations.

SITE SURVEYS

We have a service available from our IRCA (International Register of Credited Auditors) accredited subject matter experts to assess the compliance and effectiveness of customer cleaning and disinfection programs.

CUSTOMER TRAINING

We develop and deliver materials to train our customers' staff on critical topics including new process implementation, regulatory requirements and standards, as well as safety.

EXPERTISE IN LIFE SCIENCES

Our business has a strong track record in Europe where we are leaders in the cleaning and disinfection market for the Pharmaceutical industry, including partnerships with the leading global Pharmaceutical, Biopharma and Contract Drug Manufacturing organizations.

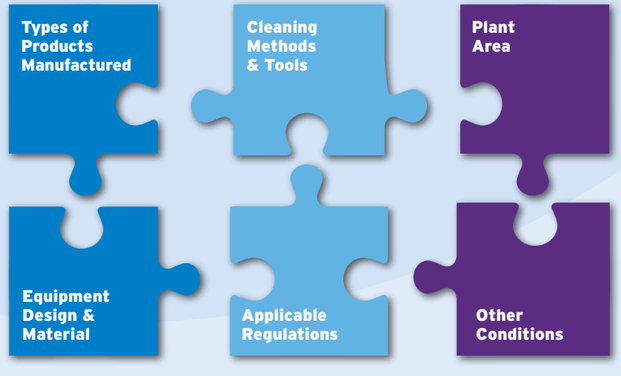
We provide our customers with complete cleaning and disinfection programs for external surfaces of manufacturing equipment and cleanrooms, and for direct product contact surfaces.

These programs meet the latest regulatory standards and our dedicated products are manufactured in fully auditable and traceable production facilities.

With years of industry experience, our Validation and Technical Support teams will assist you in developing and implementing the best programs for your facilities.

CLEANING AND SANITIZATION PROGRAMS

Developing a customized cleaning, sanitization and disinfection program for your facility's specific needs involves various aspects of your production, including:



Successful Solutions Start with Understanding Your Processes...

Production of pharmaceutical products requires the implementation of a qualified cleaning & disinfection procedure that prevents any carry-over of the cleaning or disinfection chemicals onto the next production batch, and applies a reliable detection method to guarantee consumer safety. This incorporates both the appropriate manufacturing equipment and the development of the best production process.

Successful implementation of 'cleaning validation' can be obtained by combining:

Ecolab's specialized knowledge about cleaning and sanitization programs, and engineering applications for pharmaceutical manufacturers

Your knowledge, expertise and standards as a pharmaceutical manufacturer

We partner with you at every step, beginning with the production start up to develop a best-in-class cleaning validation process that fits your specific standards and production needs.

Before Implementation

Framework Parameters of Cleaning ⋈ Cleaning Validation Protocol

- Specialist assistance throughout the creation of the cleaning validation protocol
- Support on the systematic collection of cleaning process parameters
- Complete consideration of current legislation and guidelines

Laboratory Tests ⋈ Bracketing

- Systematic division of product groups to identify worst case scenarios
- Identification of the various dynamics involved in the removal of multiple residues and ingredients as a function of temperature, time and chemistry
- Interpretation of the results and formulation of a cleaning plan

Limit Calculation ⋈ Cleaning Procedure

- Calculation of product residue limits based on toxicological data of the applied cleaning chemicals
- Account for rates of recovery
- Constant and assured limits through Ecolab's formulation guarantee for each of our cleaning products

...and then Applying Our **Technical** and **Validation Services**

After Implementation

We can offer assistance with thorough, plant-specific training on hygiene and safety. In addition, batch specific Certificates of Analysis are available for all COSA products, as are cleaning validation data, instructions and methods.

During Implementation

Site Implementation ⋈ Final Cleaning Validation

- Consultation during cleaning trials at your site to help optimize procedures and achieve the highest level of operational efficiencies
- Ensure robust processes are in place
- Assistance in generating Standard Operating Procedures (SOP) for sample taking, recovery rates, analytical methods for both CIP and manual cleaning sequences

Cleaning Trials ⋈ Validation Cleaning Techniques

We achieve total coverage of equipment surfaces with the cleaning agent combined with high mechanical action via the:

- Chemical power of our specialized products matched to the correct temperature profile
- Development of an alternative to the riboflavin method, which clearly shows the results of the mechanical parameter of cleaning, and gives testimonial evidence for its qualification

Analytical Methods ⋈ Transfer of Methods

- Fully validated analytical methods, including Total Organic Carbon (TOC) and High-performance Liquid Chromatography (HPLC)
- Transferred and validated for your needs
- Complete SOP including sample preparation for TOC and conductivity
- Ecolab Technical Experts are available to discuss your photometric and HPLC procedures and how to make the right choice on swab materials and sampling procedures

Providing the **Right Chemistry** for **Every Application**

Manufactured in accordance with cGMP conditions, our comprehensive range of cleaners and additives provides process optimization in your CIP and COP systems.

The COSA™ range is supported by a complete validation package including techniques for determining acceptable residual levels and analytical methods for residue quantification.

ALKALINE CLEANERS

Alkaline cleaners are specifically designed to remove typical residues found in the pharmaceutical industry such as oils, fats, proteins and other organic materials. For pigments and inorganic soils, additives such as chelants are used to aid in removal. For greases, oils, and other hydrophobic materials, surfactants are needed to help break up and emulsify these difficult-to-clean substances.

COSA™ CIP 90	Low alkaline, surfactant-containing cleaning agent for manual and CIP applications.
COSA™ CIP 92	Alkaline, surfactant-containing cleaning agent for the removal of emulsions and fat containing residues in CIP applications.
COSA™ CIP 94	Alkaline, surfactant-containing cleaning agent formulated to solubilize and suspend organic soils, emulsions, fatty residues, and oils.
COSA™ CIP 96	High alkaline, with sequestering agent, surfactant-free for CIP removal of alkaline soluble residues and biotech applications.

ACID CLEANERS

Acid cleaners are designed to remove acid soluble residues, such as minerals and hard water scale. The COSA acid cleaners are free rinsing products that can be used for improved stain-free finish to the equipment surfaces, as well as being used as a neutralizing agent.

COSA™ CIP 72	Acid cleaning agent based on organic acids for the removal of minerals and acid soluble residues.

ADDITIVES/BOOSTERS

Additives are highly concentrated agents designed to boost the performance of other cleaning solutions, giving an extra edge when cleaning specific soil targets.

Common additives are surfactant boosters and oxidizers. Most are created for use in alkaline detergents, but some can also be used with acid cleaners.

COSA™ PUR 80	Cleaning booster based on surfactants for the removal of high fat containing and water-free formulations and detergent for manual cleaning applications.
COSA™ PUR 85	Cleaning booster with oxidizing properties for the removal of burnt-on and strong odor residues.

MANUAL CLEANING

Manual cleaners are designed to generate stable foam without the aid of an additive. The stable foam allows for increased contact time, leading to effective cleaning.

COSA™ FOAM 40	Neutral product for manual cleaning or as a foam additive in cleaning solutions with COSA CIP detergents.

SANITIZERS & DISINFECTANTS

Sanitizers and disinfectants help plants combat microbes and are designed to achieve certain specified levels of reduction. Claims may include reduction of bacteria, fungi, viruses or spores.

To be labeled as a sanitizer or disinfectant, a product must be registered with the appropriate regulatory agencies such as the Environmental Protection Agency (EPA), Biocidal Products Regulation (BPR) and/or the Canadian regulatory authorities. Label claims have been reviewed by these regulatory authorities and must be followed exactly as directed.

COSA™ OXONIA ACTIVE™	Peroxyacetic acid antimicrobial agent for use in the pharmaceutical and cosmetic industries. COSA Oxonia Active is supported by a complete validation support package, including methods for residue quantification.

What We Hear from Our Customers

"We don't know what regulators will want next."

"Revalidation is expensive, time consuming and difficult."

"It takes too long to manually clean my equipment."

"My plant was designed to produce a single product - we're being asked to produce seven."

"Once a system is in place, it doesn't change."

We go beyond identifying the right chemistry to address such concerns and develop site-specific programs focused on safety, compliance and increasing your total plant efficiency.

PHARMACEUTICAL

The **Benefits** of Ecolab's COSA™ Program

Helping you exceed your compliance goals

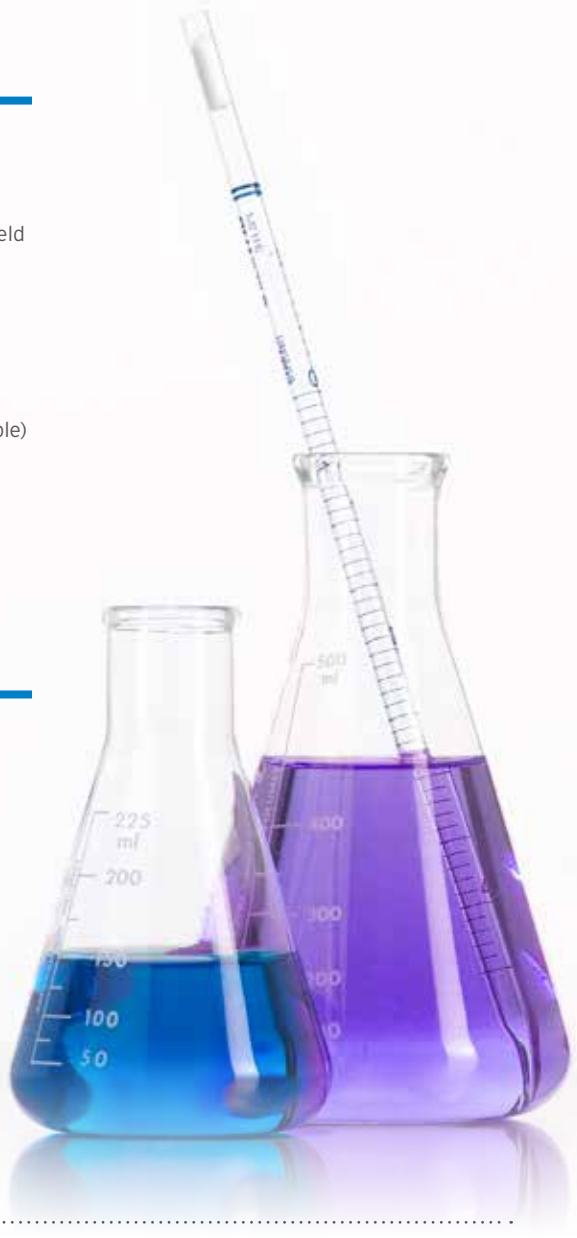
We aim to provide our customers with a product range designed to comply with the global documentation, manufacturing and compliance standards of the Pharmaceutical industry.

VALIDATION RESOURCES FOR COSA™ PRODUCTS

- Validated analytical method (SOP) for the detection of COSA products via TOC method
- Validated analytical method (SOP) for the detection of COSA products via conductivity
- Description of quick tests - Camphor test, surface tension for surfactants
- Selective methods for the detection of COSA products
- General information on sampling (SOP for swab test)
- Products manufactured under cGMP
- Easy to rinse and detect residues
- Laboratory scale cleaning trials and field implementation
- Formulation composition information
- LD_{50} data and PDE values for limit calculation of the acceptance criteria
- Material compatibility test (data available)
- Grouping support through cleaning studies

EXTENSIVE DOCUMENTATION ENSURING COMPLIANCE WITH GLOBAL STANDARDS

- Technical Data Sheet
- Safety Data Sheet
- Ecological Data Sheet
- Toxicological Data Sheet
- BSE/TSE Statement
- AOX Statement
- Organic Solvent Statement
- Certificate of Analysis
- Documentation Readily Accessible
- 21 CFR 211 - FDA
- PIC/S PI 006-3
- Annex 15 EU-GMP - Guideline
- Annex 2 EU-GMP - Guideline (manufacture of biological medicinal products for human use)
- ICH - Guideline Q7 GMP for active ingredients, (adopted in 2001 as Annex 18 EU-GMP-Guideline, currently part II of GMP-Guideline)



PLEASE SPEAK TO YOUR ECOLAB ACCOUNT MANAGER FOR FURTHER INFORMATION

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