



LIPROLINE

Process Solutions for the Pharmaceutical Industry

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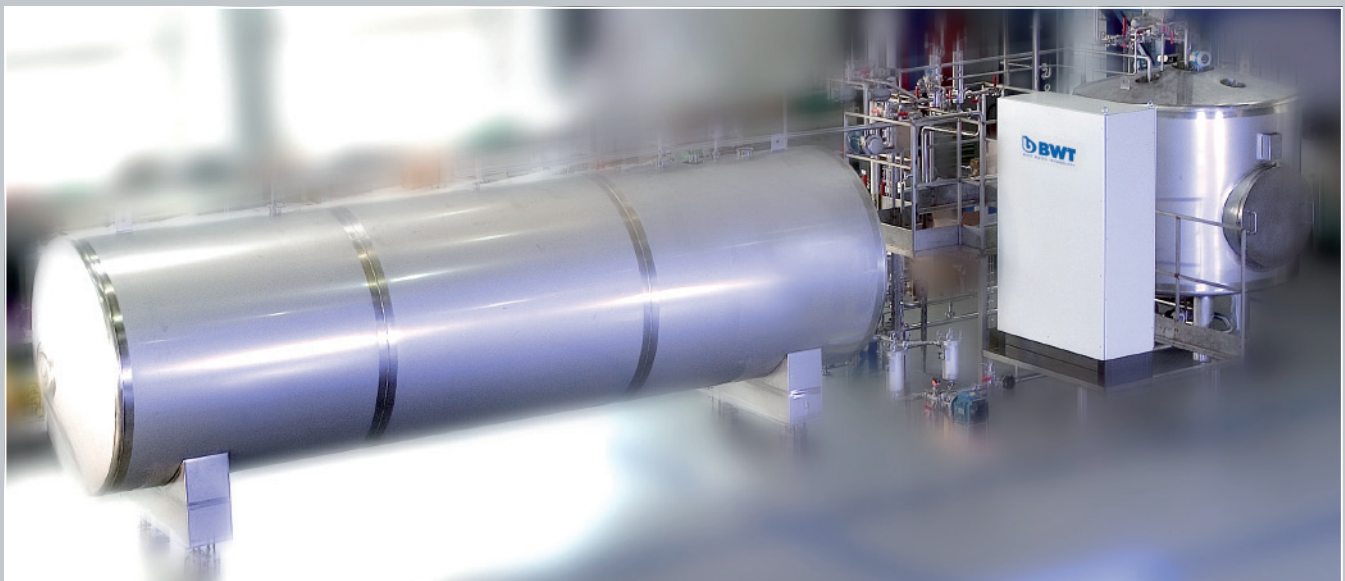
 **CHRIST**
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PHARMA & BIOTECH

 **BWT GROUP**

LIPROLINE is the product line for modern process equipment in the Pharma & Biotech industry by BWT Pharma & Biotech. The range consists of components and modules which can be assembled to form any desired overall system. It is thus possible, together with the BWT water treatment components, to construct a complete, sterile production facility from a single source – the perfect implementation of the BWT Pharma & Biotech turnkey philosophy.

The LIPROLINE product line comprises the following series:

- Cleaning systems (CIP/SIP/WIP)
- Deactivation of biologically contaminated waste water (batch and continuous decontamination)



CIP/SIP Systems from BWT Pharma & Biotech – Cost-effective Cleanliness

BWT cleaning systems are designed for a wide range of applications and are available in the following versions:

- Single-use CIP/SIP systems
- Recirculation CIP/SIP systems

Features

- Compact skid-mounted construction
- Orbitally welded pipes with complete documentation of the welded seams
- Material certificates for all product-wetted parts
- GMP-compliant design, completely self-draining, drying with compressed air
- Suitable for steam sterilisation at up to 135°C
- GMP- and FDA-compliant connections for the ultrapure media
- Mechanically and electrically pre-assembled, pre-qualified
- Comprehensive documentation

Single-use CIP/SIP systems

LIPROLINE single-use CIP and SIP systems are used for the so-called "throw-away" cleaning of sterile pharmaceutical production systems. The cleaning solution is prepared as needed and is discarded after use.

Up to three cleaning substances can be added in the appropriate proportions. Production systems with small internal volumes can be cleaned economically with this system.

The systems comply with the GMP guidelines, are completely self-draining and can be sterilised with steam. The connections for the supply of ultra-pure media are designed to comply with the GMP and FDA requirements.

BWT Pharma & Biotech Systems Treatment of Pharmaceutical Waste Water

Intelligent Recycling Solutions to Meet Every Need

Systems for treatment of pharmaceutical waste water

With the aid of LIPROLINE systems, pharmaceutical waste water can be treated effectively and afterwards be used for other purposes. Evaporator technology is used to concentrate aqueous solutions. This extracts the water in the form of a distillate which can then be used elsewhere in the plant. It also greatly reduces the amount of substances which need to be disposed of, thus considerably reducing the related disposal costs.

A further application of the evaporator technology is its use for the deactivation of substances which may enter the waste water during the manufacture of pharmaceutical products such as antibiotics or steroid hormones. Such substances must be deactivated before the waste water enters a sewage treatment plant or waterways in order to prevent their possible negative effects on the

bacteria in the sewage treatment plant or on the reproduction of fish in waterways.

The LIPROLINE UV systems deactivate the active substances by oxidising them with UV radiation. This radiation has two effects: it excites the molecules of the active substances and, at the same time, causes them to be deactivated by the oxidants it generates. UV processes require only small capital investments and their operation costs are very low.

For each project, the suitability of the evaporator or UV technology for deactivation can be determined on the basis of the substances to be treated and their amount in the waste water. BWT Pharma & Biotech can offer the best solution for each and every application.

BWT Pharma & Biotech Complete Systems

The Whole is More than the Sum of its Parts

BWT Pharma & Biotech – everything from a single source

BWT Pharma & Biotech offers a complete range of water treatment systems, including piping, tanks and control systems, and can thus assemble a complete pharmaceutical production line from a range of modular elements – everything from a single source.

Turnkey systems offer many benefits:

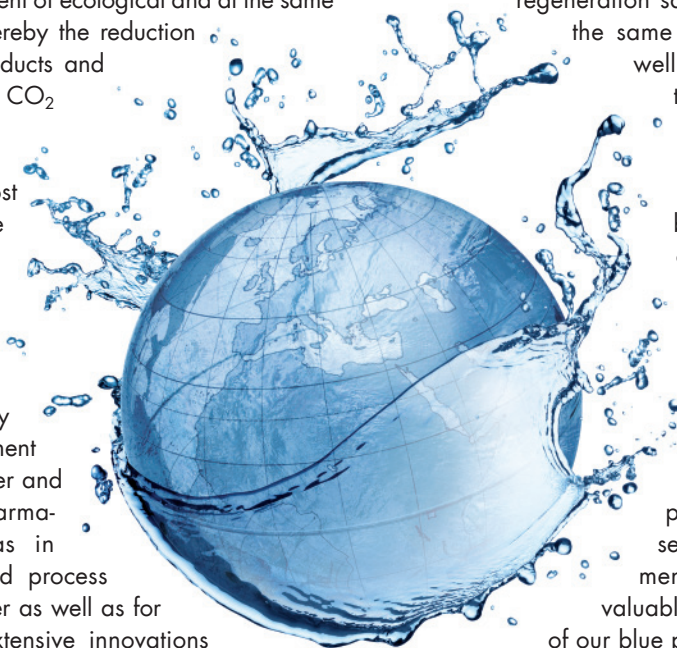
- Only one interface, with BWT Pharma & Biotech responsible for everything
- Complete documentation in a uniform layout for easier approval by the authorities
- Control systems can be tested and integrated far more easily
- Shorter project execution times and thus earlier start of production and quicker pay-back
- Reduced risk of faults



BWT – The Company

The Best Water Technology Group was formed in 1990 and is today Europe's leading water technology company. More than 2,800 employees in over 70 subsidiaries and associates together with thousands of service employees, plumbers, planners, architects and hygiene experts constitute the BWT water partner network. Employees in Research & Development work on new processes and materials using state-of-the-art methods to target the development of ecological and at the same time economical products. Thereby the reduction of energy consumption of products and the consequent minimisation of CO₂ emissions is a key issue.

When it comes to water, almost everywhere, whether at the entrance of the water pipe into a building – the Point of Entry - or at the tapping point – the Point of Use, the trend-setting products by BWT are in use and have proved their quality millions of times. For the treatment of drinking water, mineral water and ultrapure water for the pharmaceutical industry as well as in swimming pools, heating and process water, boiler and cooling water as well as for water for air-conditioning. Extensive innovations



guarantee our customers maximum security, hygiene and health in the daily use of water, the precious elixir of life. These innovations, among others, include SEPTRON®, the worldwide first electrode deionisation module (EDI) with spiral wrap, the MDA (manganese oxide activation) – method for effective manganese removal, the bipolar technology AQA total for chemical-free lime protection, SANISAL – the worldwide first regeneration salt for softening systems, which at the same time works as a disinfectant as well as the new, revolutionary Mg²⁺-technology for better taste of filtered water, coffee and tea. With unique high efficiency membranes for fuel cells and batteries, BWT is bringing about a cleaner and sustainable energy supply in the 21st century.

BWT – For You and Planet Blue is our mission to take ecological, economical and social responsibility, to provide our customers and partners with the best products, systems, technologies and services in all areas of water treatment and simultaneously contribute valuably to preserve the global resources of our blue planet.



For You and Planet Blue.

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