

BRIEF COMPANY GUIDE

- Industrial water purification ■
- Laboratory water purification ■
- Pharmaceutical water purification ■
- Technological waste water purification ■
- General separation technologies ■
- Industrial filtration ■
- Pipelines and automation ■

Introduction

Chempharma Ltd. has a well determined name and reputation in water purification and separation technologies, mainly in Hungary. We provide diversified and wide ranges of purification solutions, and products in different areas, with high level of design and implementation.

The problem and solution oriented approach makes possible to choose the best technology, with the best working timeframe for our customers. We work on complex projects, however simply sell useful, compact, and ready to use products. We have our own innovations, and we always continuously work on new ideas. The best initiations always come from our partners, and we are flexible to tailor our solutions to unique customer requests. We carefully follow the technological research and development worldwide and continuously adjust our approach to new expectations, in order to implement the best economic and cost saving state-of-the-art systems or solutions.

Major activities

Chempharma Ltd. has high knowledge and experience in following business segments:

- **Laboratory water purification system families**

Fit for all possible demands in different laboratories (research, QA-QC, in-process control)

- **Industrial water purification systems**

Compact instruments or uniquely developed complex system in general industrial, chemical, and pharmaceutical applications. The right system for the right industrial segment tailored to expectations and budget.

- **Container developed water systems**

Purifying potable water from ponds and well for small communities. Every system is different depending on initial water quality.

- **Industrial filtration technologies**

Wide ranges of cartridge and bag filters with different pore sizes, length, materials. Developing and implementing complete filtration technologies for a given technological filtration task, system sizing, and long term expense calculations.

- **Technological waste water systems**

Innovative new technologies (MBR) to purify technology waste water and circulate back to the technology. Different systems for different applications.

- **Pipelines and automation**

Technology pipelines in different materials, with online measurement sensors, data collection, controlling and automating complete technology lines.

human System Family
CORPORATION

ASTM TYPE III quality water production. Reverse osmosis systems



- 15, 25, 35 litres/hour flow rate
- Reverse osmosis technology
- Compact design

ASTM TYPE II quality water production RO-EDI systems



- 10 litres/hour flow rate
- Reverse osmosis + Electro-De-Ionization Technology, compact design

ASTM TYPE I quality water production. Ultrapure water systems



- 1,2 - 1,5 litres/min flow rate
- Ultrapure water technology
- Compact design

Technologies - Products

Laboratory water purification systems

Combined ASTM Type III and ASTM Type I water purification systems

- 15, 25, 35 litres/hour ASTM type III water
- 1,2-1,5 liter/min ASTM type I water
- Reverse osmosis - ultrapure water technology
- Compact design



Combined RO + UP systems

- 15, 25, 35 litres/hour ASTM Type III water
- 1,2-1,5 liter/min ASTM Type I water
- Reverse osmosis - ultrapure water technology
- Two systems in one chain



Systems main features

- SST and PP buffer tanks with level switch in 20, 30, 60, 100 l volumes
- Sterile and ultrafiltration
- Germicide and photooxidation UV
- TOC measurement
- Flexible point of use

Water system developed by our own

SYNETIC AQUARIUS

ASTM Type III and ASTM Type II quality water systems



- 10 litres/hour flow rate
- 20 litres buffer tank with level switch
- Conductivity measurement
- Attractive price

ASTM Type III and ASTM Type II quality water systems



- 0,7 liter/min flow rate
- 3 litres internal pressure tank
- Flexible point of use gun
- Sterile and ultrafiltration
- Attractive price

Water system developed by our own

SYNETIC HYDRA

ASTM Type I quality water system



- 1,2 - 1,5 liter/min flow rate
- Ultrapure water technology
- Flexible point of use gun
- Sterile and ultrafiltration

Technologies - Products

Pharmaceutical water systems

Pharmapure

WATER PURIFICATION SYSTEM

**Platform developed
technology and design by Chempharma**

Compact PURIFIED and HIGHLY PURIFIED water purification systems according to pharmacopeias

- 60, 125, 250, 500, 750 litres/hour flow rate
- Compact platform developed design
- Upgradeable system
- RO+EDI technology with degassing membrane
- UV technology
- Colored touchpanel with internal PLC control
- Data storing and SCADA communication
- Programmable parameters according to customer requests
- Wifi communication



Water for Injection - WFI - systems according to pharmacopeias

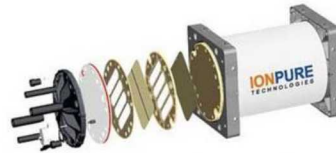
- Based on distillation method
- Electrical or steam heated design
- Different flow rates
- Multieffect set-up
- WFI and PS (Pure Steam) production
- customer tailored storage and distribution
- Hot or cold system implementation
- Colored touchpanel with internal PLC control
- Data storing and SCADA communication



Large industrial high purity water systems with cost effective EDI technology



- High purity water ($<1\mu\text{S}/\text{cm}$) low c.f.u value
- 24-7 continuous operation



Traditional ion-exchange technologies



- Industrial softeners
- Desalination systems
- Mixed bed ion-exchange systems
- Resin selective ion-exchange systems

Tap water and waste water treatment with membrane separation technologies

- Reverse osmosis desalination systems
- Nanofiltration systems
- Ultrafiltration technology for waste water treatment
- Membrane degassers



Technologies - Products

General industrial purification and filtration

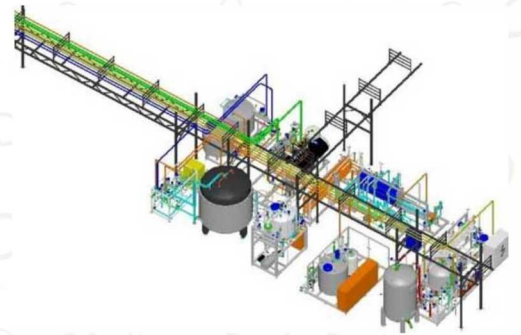
Column loaded filtration systems

- Active carbon adsorption columns
- Iron and manganese removal columns
- Arsenic removal columns
- Ammonia removal systems
- Multimedia filtration systems
- Nitrate, nitrite, sulphate, heavy metal removal columns
- Colloid filtration systems



Technology pipelines storage and distribution

- SST, PP and PE buffer tank manufacturing
- Technology pipelines design and installation
- PVC - CPVC - PP - INOX materials
- pumps - circulation loops, pipelines
- Technology cooling systems
- UV sterilization systems
- VHP decontamination systems for clean and sterile rooms
- Technology automation



Filtration technologies – Membrane filtration

Pre and final (sterile) filtration in technology processes

- Validated cartridge filter technologies in different length pore sizes and connections
- Sophisticated filtration technologies for sensitive industrial productions
- Autoclaveable membrane filters for multiple use



Ultrafiltration - Pharmaceutical TFF systems

- Industrial and laboratory ultrafilters in different NMWL values, with 5 log reduction capability
- TFF systems for biotechnological fermentation downstream process
- Pyrogen free ultrafilters



Disposable capsule filters

- Disposable filters in 2.5 - 30" length with different pore sizes
- Sterile filtration of gas and aqueous solutions
- Pharmaceutical and microelectronic usage



Sterile SST In-line and T housings

- Different sizes, connections and material quality
- In-line sterilizable feature





- Hardware software development
- Controller, PLC, industrial PC
- Technology process control
- Remote access and control



- In-Line analyzers, monitors
- TOC, pH, hardness, chlorine
- Technology sensors, analogue/digital
- pressure, conductivity, flow meter, temperature
- Regulation and dynamic control of valves
- Proportional, magnetic and pneumatic valves

Applications and references

Pharmaceuticals - Pharmacopeia water systems

- PURIFIED WATER and WFI for production purposes
- Pharmaceutical sterile filtrations
- Aseptic technology pipelines, and automations
- Laboratory water systems

Power industry

- Power plant water treatment
- Industrial boiler water treatment and conditioning
- Industrial cooling water treatment and conditioning
- Pure water for climate equipment
- Chemical agents sales

Microelectronic industry

- ASTM type I quality "ULTRAPURE WATER" production
- Disposable capsule filters

Energy, Utility, Oil, Automotive, Chemical industry

- Technology water production in very large volumes
- Process waste water treatment
- Filtration technologies for large throughputs

Mineral water, alcoholic and non-alcoholic beverages

- Technology water for different sector of Food and Bev.
- Purifying water after technology process (recycling)

Food and Cosmetic industry

- Hygienic/Aseptic filtration and water technologies
- TFF systems for fermentation

Medical, Research and development

- Laboratory scale filtrations
- High purity water systems for clinical labs (analysers)
- Laboratory water purification systems



Pharmaceutical "Purified water" purification system in a Pharmaceutical plant



Humancorp water purification system in a university research lab



Pharmpure RO+EDI compact water unit with pharmaceutical storage and distribution system

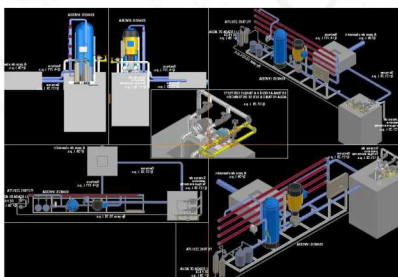


Hygienic pharmaceutical water storage and distribution system

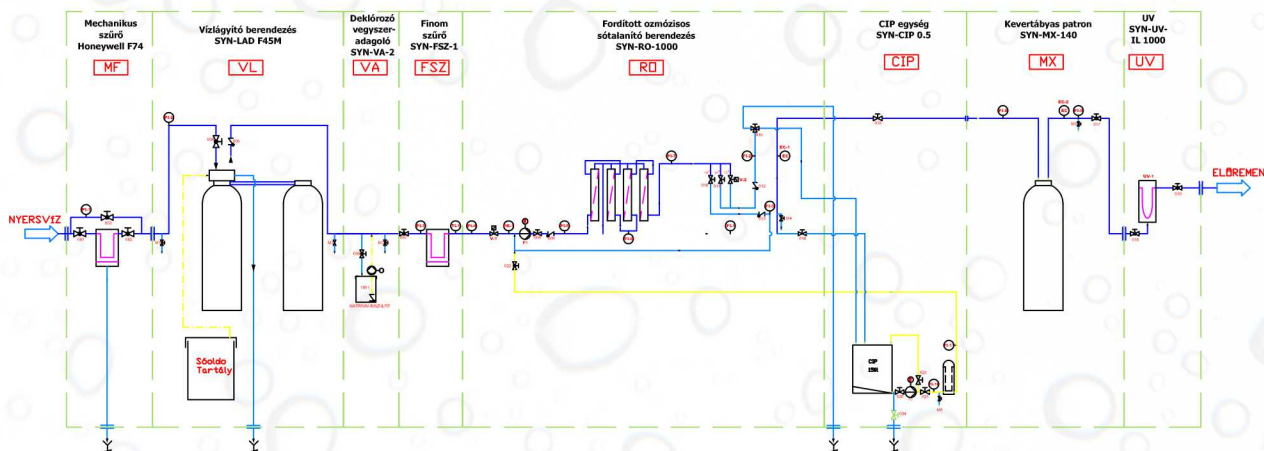
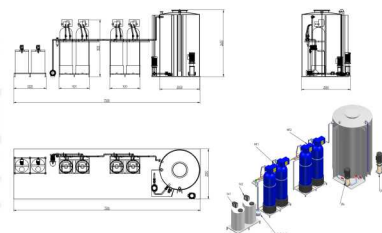
CHEM pharma PURITY INDUSTRIAL

On-site planning, surveying and chemical measurements

These three important steps makes possible the implementation of a perfect water system based on unique customer requirements. Consultation, and data collection followed by a detailed technical specification and quotation. After accepting the contract conditions from both sides, the implementation phase starts immediately. (production, delivery, installation) After the installation, the validation phase can be initiated (IQ, OQ, PQ) Closing the project, a complete documentation systems will be provided to customers together with education and training. Post service activities include a spare part and consumables supply for at least 10 years with advisory.



- Technical drawings, PIDs
- Electrical drawings
- Software development for industrial automation
- 3D design plans
- Consumables and maintenance cost calculations



Services

- Design, and planning
Design, planning, implementation of a technology water system would be 1-6 month depending on size and complexity.
- On-site surveying
- Consultation
System lifetime with professional maintenance: 10-15 years.
- Technical specification
We emphasize the sustainability and environmental protection in our technology design.
- Contract plans
We closely work together with you after the installation, providing maintenance, post service, advisory, training of new colleagues.

Own production facility

We have our own production site with well equipped facility. We work with experienced colleagues with more than 15 years of expertise.

We improve our competitiveness with continuous developments, and innovations.

- Units manufacturings
- Complex project implementations

We established our own test environment probing the implemented water and filtration systems preliminary before on-site installation.

We provide FAT documentations after that, and perform SAT during the installation.

We provide you a complete and careful delivery service. On-site installation implemented by our experienced employees.

We cooperate with your engineers, technicians before/after installation.

We train your people, and provide a careless, comfortable, secure system operation.

- Delivery
- Implementation
- Installation
- Validation
- Education training

Validation protocols and reports

A complete system documentation can include validation protocols and services upon customer request.

We provide tailored documentations and implementations.

- IQ (installation qualification)
- OQ (operational qualification)
- PQ (performance qualification)
- DQ (design qualification)
- SOP (standard operational procedure)

Authority licensing, water chemistry documentations



System support

A complex system support has several elements. The purpose is to provide a continuous listening and cooperation with users in order of the suitable long-term system operation, with the best parameters.

Moreover if your production frequency doesn't allow even a short time breakdown period, you absolutely need a high level and close cooperation with the service provider. In frame of system support we give you the following services.

Advisory - consultations

Cost-effectiveness calculations, quality issues, advisory for new challenges of a development or production. Calibration services, education of new technologies, seminars.

Maintenance services

We closely work together with you after the installation, providing maintenance, post service, advisory, training and education of new colleagues.

- Timing preventative maintenance service
- Sanitation / passivation methods
- CIP process implementation
- Continuous spare part and consumable background

24-7 service background

Depending on maintenance contract, we provide fast system diagnosis, and urgent service.

System supervisory

A more sophisticated system include a supervisory PLC system. It provides easy system diagnosis, traceability, data storing, and communication with customers SCADA systems.

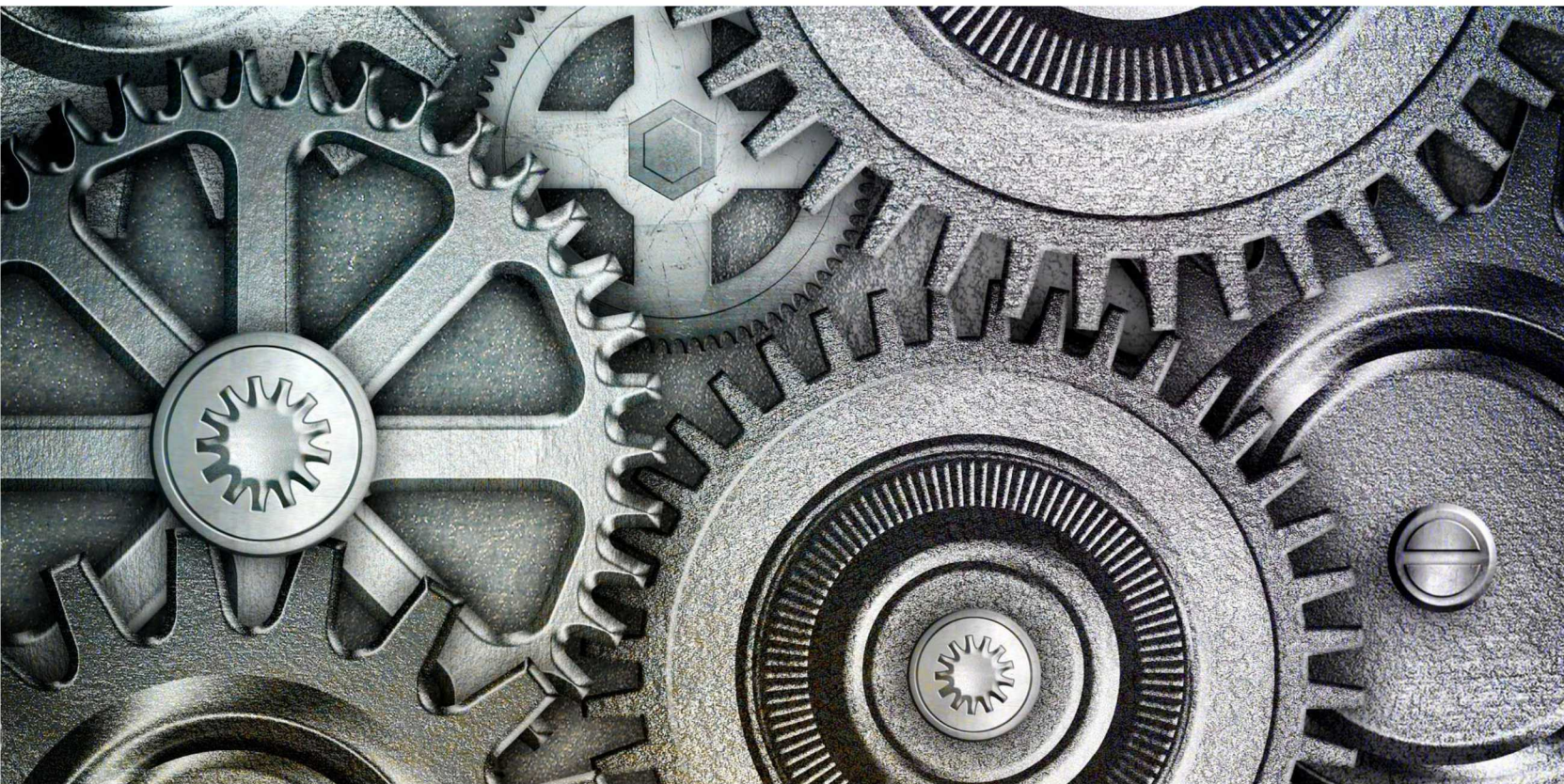
- System parameters collection, storing, transmission
- Integration into central SCADA systems.
- Considering QA-QC point of views in automation.
- Client system on HTML web surface.



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