



# Process Systems for Liquid Products

Ruland. Plant design at its best.









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# Ruland Engineering & Consulting. Customised. User-friendly. Practical.

The handling of all kinds of liquid products is the core competence at Ruland Engineering & Consulting. We provide turn-key solutions or unit parts as customised process systems. Our focus is on the food, beverages, pharmaceuticals, body and healthcare, chemicals and biotechnological industries.

From consulting, planning and manufacture up to start-up and hand-over – we provide our process plants as a complete solution – all from a single source. We answer complex requirements with future-oriented, tailor-made special solutions. This is one of our strengths. Being an independent company, we can select any component that suits your process best.

To secure a high level of long-term efficiency of the supplied process systems, our service department supports with maintenance and repair works, spare part supply and many other services.

On the following pages you will find more details on the services and solutions of Ruland Engineering & Consulting. We would be pleased to apply our company vision “We set unique measurements” to your process system as well and define and implement the optimal solution for your production process. Test it yourself.

We are looking forward to learning more about you and your project.

*The Ruland management:  
Jürgen Schütze, Florian Klein, Jens Schumann*



# Consulting

You wish to turn your ideas into reality? Our team offers you long-time experience. We analyse existing plant systems and check how to optimise your processes. If you need new production units, we establish concepts and budgets – and prepare the tender documents. Moreover, we assist you in the green-field planning of your facilities. Wherever you require consulting by Ruland, our competent and experienced process and electrical engineers will provide professional assistance.

## Ruland services

- Plant optimisation
- Recording the actual state
- Recording the requirements
- Concept design
- Basic and detail engineering
- Budget planning
- Tender documents
- Feasibility studies
- Profitability analyses



Understanding ideas and visions

*At the beginning of each project we take our time to understand your vision and requirements and consider your individual wishes.*



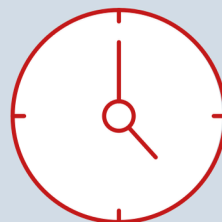
Working out alternative concepts

*In a second step we prepare various rough concepts and thus deliver the perfect basis for a sustainable decision.*



Preparation of plans and tender documents

*Now we concentrate on the planning of your plant. We also care for the preparation of all relevant tender documents.*



Finalise investment decisions

*Once we got all bid-dings, you and us together finalise the planning phase and define the further proceeding.*

# Engineering

One thing you can be sure of: We design your process plant exactly in accordance to your specific requirements. Our engineers select all unit parts, materials and measuring and control elements for your plant individually. They plan the layout and flow diagram and organise all interfaces to other tasks. Throughout the complete process – from the planning to the implementation – one fixed team is responsible for you and your project. This team will always act according to your needs and circumstances. International standards and regulations, as hygienic design according to EHEDG, are the basis for all of the described above.

## Ruland services

- Project management
- Process design
- Specification of components
- Layout
- Media supply and disposal
- Process descriptions
- Commissioning
- Platform construction
- Documentation
- Qualification



### Design and specifications

*After we have defined all further steps, we design the apparatus and specify the components.*



### Definition of process automation

*We now define the workflow for the programming which lists precisely what has to be done when and also describes all functions step by step.*



### Preparation and approval of production

*The components and the plant itself are now built and tested in our in-house assembly hall. So we can guarantee faultless engineering.*



### Start-up and documentation

*The plant is now started on-site and the documentation is made by our experienced technicians.*



*The fully automated production is centrally controlled and monitored in the control room.*

## Automation and IT-Solutions

Ruland offers you tailor-made solutions from a single source – from a simple control unit to animated visualisation with touch screen operation to the automation of complex productions with control room, ERP connection and capture of production data with batch tracing. It goes without saying that we adhere to all international standards and recommendations (e. g. GxP, GAMP 5, FDA, IFS) and carry out intense in-house tests on our solutions before they are put into operation on-site. That way we can react quickly to your needs.

### **Ruland services**

- Automatic control programmes
- Plant visualisations
- Control systems including connection to ERP systems
- Ruland Process Management System (RPMS)
- Raw material stock management
- Recipe administration
- Batch traceability
- Commissioning
- Software qualification
- PLC upgrades



# Manufacture and Installation of Electrical Control Cabinets

In close cooperation with our process engineering and electrical department, our experienced team designs application-oriented wiring diagrams. Supported by state-of-the-art E-CAD systems we develop the basis for our own electrical control cabinet construction. This enables us to produce the project-relevant control cabinets in time and pre-assemble the modules in our own halls. Again, we adhere to all applicable international standards.

## **Ruland services**

- Electrical instrumentation and control planning
- Construction of electrical control cabinets
- Measurement log
- Cable tray design
- Electrical installation

*Our central electrical control cabinets meet all international standards.*

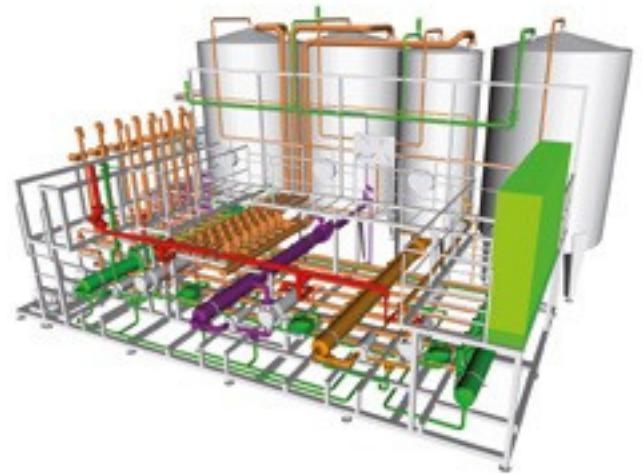




# Pipeline Construction and Mechanical Assembly

We provide the complete pipeline construction for your plant as well as consulting, planning, project management and the professional coordination of all on-site assembly services. Our experienced engineers control and supervise all relevant services in our in-house assembly hall.

When it comes to the relocation of a whole production site, we are your competent partners as well. This includes state-of-the-art planning and documentation tools – everywhere in the world.



*3D model  
of a CIP unit*

## **Ruland services**

- Dimensioning of pipelines
- 3D factory design, isometric drawings
- Installation of piping systems
- Operating platforms
- Endoscopy





# Service



*Together with our customers we define maintenance intervals to avoid unscheduled downtimes.*



Ruland offers customised services depending on your requirements. Our understanding of service is an extensive customer care which we continue after your plant was put into operation: We always hold on stock spare and wear parts for your plant and care for immediate procurement respectively. On top, we offer an extensive service and maintenance management. Our team provides quick support in case of any further question, system failures or production downtimes. With teleservice or remote access, we are able to react at short notice. We also consider the plant functions and propose optimisations which our team implements professionally on demand. Our long-time experience shows that stable production processes and a high level of plant efficiency are always based on the right service strategy.

## **Maintenance**

- Spare and wear parts
- Calibration
- Leak test
- Elimination of pressure peaks
- Inspection of steam traps
- Repair works

## **Service**

- Remote maintenance
- Hotline
- 24/7 service

## **Optimisation**

- Plant relocation
- Plant optimisation
- Software updates
- Staff training

# Acceptance and Storage of Raw Materials

Safe unloading and storage of raw materials is essential for the quality of ready products. Cooled or sterile – we design your storage capacities and conditions perfectly according to the needs of your product and the special requirements of your facility. We also use special materials (titanium steel, plastics etc.), and of course, we always meet all quality and hygienic standards.

## **Ruland solutions**

- Acceptance of raw materials
- Storage tanks
- Sterile storage tanks
- Mobile storage containers
- Valve technology
- Freeze thaw tanks

*Each tank contains 170,000 litres. The containers are customised and fit perfectly to the local requirements.*







*The state-of-the-art Ruland mixing units can dose and mix all different kinds of fluids.*

## Dosing and Mixing Technology

Mixing of components requires an exact dosing. The smallest of variations may result in a loss of quality. To safeguard precise dosing at any time, our fully automated mixing units work with a special Ruland software for material, recipe and storage administration. Thus we can guarantee handling of raw materials at minimised wastage and a consistently high quality of your mixing results.

### **Ruland solutions**

- Batch mixing units
- Continuous mixing units
- Dosing by
  - weight
  - volume
  - mass flow
- Colour and flavour dosing units
- Dissolving units for solid substances
- Carbonating units

*This flash pasteuriser with a multi-tubular heat exchanger is linked with a vacuum degassing unit.*



## Thermal Treatment

To ensure gentle treatment of your product, the thermal load is supposed to be as low as possible. This is why we focus on the optimal design. Apart from the heating, the cooling is also a vital part of many processes. Here again you profit from our experience with challenging products. We do not only see to the thermic and fluidic design, but also produce tubular heat exchangers and execute special solutions according to the individual needs of our customers. Whatever we do, we always focus on optimal energy savings by heat recovery as well as the complete cleanability of the whole plant.

### **Ruland solutions:**

- Flash and UHT pasteurisers
- Plate heat exchangers
- Tubular heat exchangers
- Scraped surface heat exchangers
- Steam infusion
- Steam injection
- Cooling systems
- Inactivation units
- Thawing units



# Filtration and Degassing Systems

Water is an extremely complex product. To adapt it to special processes or to change it accordingly, we produce water treatment units for numerous applications.

To reduce dissolved gases, we use water degassing units. For the separation of particles and micro-organisms we offer various kinds of filtration units, based on crossflow or dead-end filtration methods. Depending on your individual needs we work with micro- or ultra-filtration.

To reduce the oxygen level in food or beverages, we have developed a hygienic product degassing system with aroma recovery.

**Ruland solutions:**

- Water treatment
- Water degassing
- Particle and sterile filtration
- Product degassing and aroma recovery

*Reverse osmosis unit with an output of 120 m<sup>3</sup>/h.*



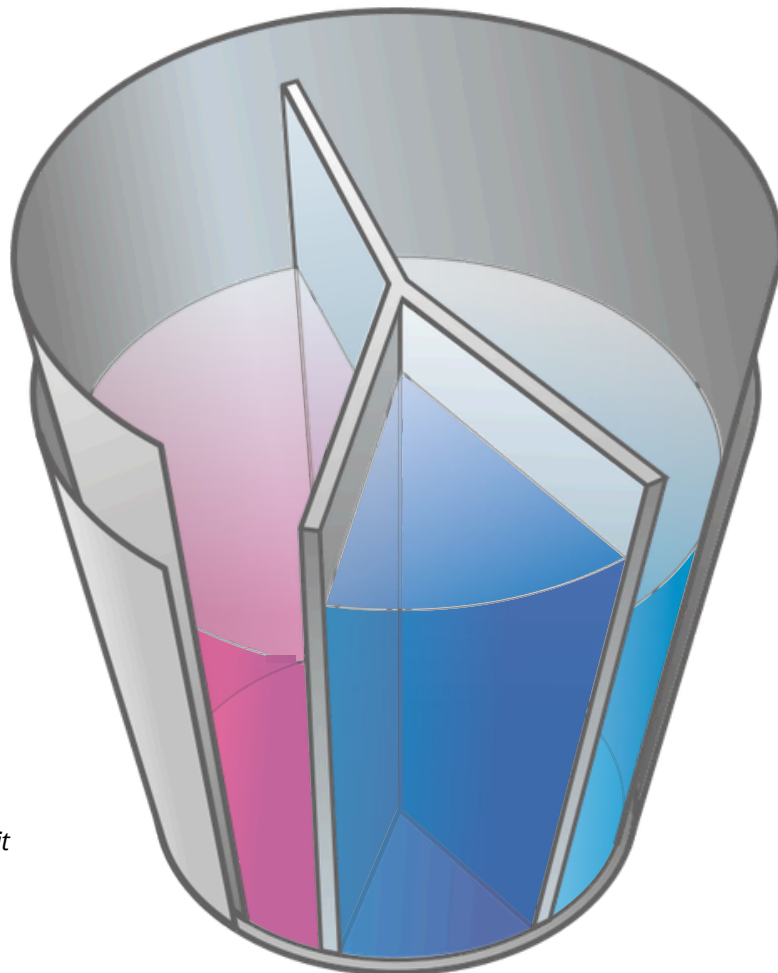
# Cleaning Units

For cleaning of your process plants, we manufacture Cleaning in Place (CIP) modules which are designed especially for your needs. We thus reset the production back to ideal condition. No matter whether non-circulatory or batch cleaning: Our modular CIP units are available both in the classic version and as a compact unit, in any case with optimised cleaning parameters. The advantages are highly efficient cleaning processes, low water consumption, resource-friendly detergent consumption, reproducible cleaning processes as well as logging of all cleaning parameters.

Other methods to restore the original production conditions such as Sterilisation in Place (SIP) and Drying in Place (DIP) can also be integrated into the plant concept.

**Ruland solutions:**

- Modular CIP/SIP units
- Centralised and decentralised CIP units
- Mobile CIP units
- CIP tower for outdoor installation
- DIP units
- Storage tanks farm for cleaning concentrates



*3-chamber tank CIP unit*



# Plant Efficiency

Fast product changes and effective cleaning of pipelines are most important aspects of an efficient plant operation. To keep the level of mixing phases as low as possible and accelerate pipeline cleaning, we use pigging and Whirlwind technologies in addition to CIP cleaning.

With the pigging technology, a fitting body is set into the pipeline. It pushes the product forward and hereby separates the different phases.

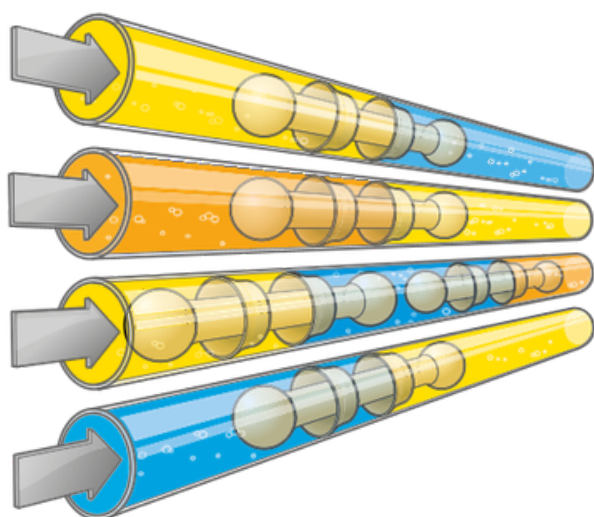
The Whirlwind technology may be used in plants where pigging is not applicable for reasons of installed components. Air streams clear the pipeline in several steps. In the cleaning phase, water or

detergent is added and afterwards, the pipeline can be dried. Both technologies are suitable to minimise product loss, to facilitate for rapid product changes and hereby to keep the production costs low.

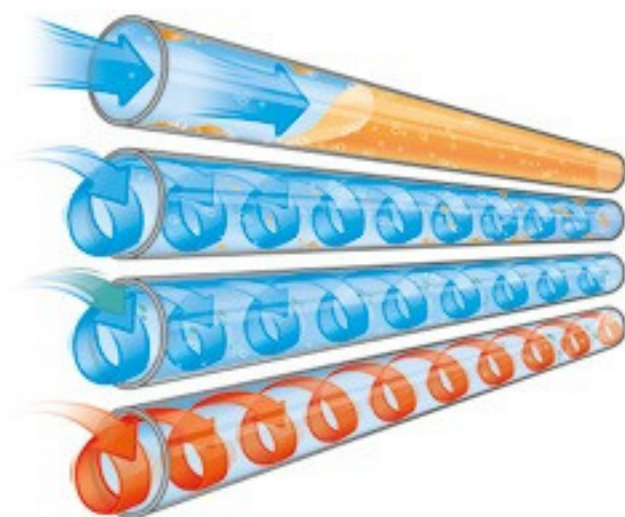
## Ruland solutions:

- Clearing and cleaning of pipelines
- Drying of pipelines
- Automated pigging units

*Schematic diagram of pigging and Whirlwind technology: Separation of phases by means of fitting body (left-hand) or air stream (right-hand)*



- Product 1
- Product 2
- Water



- Product
- Water
- Cleaning medium
- Tempered air

# Aseptic Product Transfer

Products meeting highest hygienic demands require an aseptic product transfer. In this field, the focus must be on utmost process safety, comfortable operation and perfect control. We furthermore pay special attention to fast and safe transfer and minimised product loss. We stringently implement hygienic design during planning and construction of the plants. The result: Optimised and reliable production processes.

**Ruland solutions:**

- Mobile and stationary storage systems
- Panel walls for clean rooms
- Protein thawing units
- Sterile filtration for liquid products
- Ultra-pure water and ultra-pure steam systems

*We implement special solutions for versatile requirements to mobile and stationary storage systems.*







*The Ruland container station: Comfortable operation, intelligent control system, customisable modules, high level of process safety.*

## Aseptic Filling and Discharge Stations

Taking benefit from our many years of experience, we have developed a special module which reduces the microbiological risk for aseptic filling and discharge of stainless steel transport containers. The process is fully automated, monitored and documented. The equipment was selected under ergonomic aspects; the valves meet aseptic requirements. In a second unit, the containers are sterilised with steam. In this step, temperature

and cycle time always depend on the product and the design data of the containers. Both systems are adjustable to suit individual requirements.

### **Ruland solutions:**

- Container station
- Container sterilisation





*Special products  
demand special processes.*



# Unique Solutions

Whatever we do, you and your products are always the main focal point for Ruland. Your individual needs, your special product and your complex production process are a very special challenge to us. We have developed and implemented unique process plants for a wide range of applications: From pilot and flexible small scale production plants up to process plants with higher requirements to product handling, e. g. handling of hazardous materials, working under hazardous conditions or in clean rooms. Whether in a turnkey project with Ruland as general contractor or for an individual module: You determine both the task and the volume. And you will get everything from a single source.

*We implement solutions for versatile special requirements.*



## **Ruland solutions:**

- Pilot plants for product development
- Encapsulation units
- Bioreactors for cell cultures
- Fermenters for bacteria cultures
- Polymer dissolving plants
- Plasma fractionation plants
- Vacuum driers for clarified butter
- Systems for optimised filler supply in hazardous areas
- Hydrolysis systems and cookers for seasoning and sauces
- Ketchup production plants
- Production plants for api-phyto products
- Batch systems for infusion solutions
- Dosing systems for special products

# Locations

Ruland offers tailor-made and practical solutions from a single source.

At present, we are operating from four locations. Our consultants and engineers will start from here to visit you at any place on earth.









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