

GEMÜ



**Solutions for the pharmaceutical,
foodstuffs and biotechnology industries**



Gert Müller, Managing Partner

GEMÜ Group

Founded in
1964

Over
1900
employees worldwide

6
manufacturing sites

27
sales companies

GEMÜ structure



The GEMÜ Group is a leading manufacturer of valves, measurement and control systems employing over 1900 members of staff worldwide. With six manufacturing sites and 27 subsidiaries, as well as a large network of commercial partners, GEMÜ is now active in over 50 countries on all continents.

Reorganized – for even greater proximity to our customers

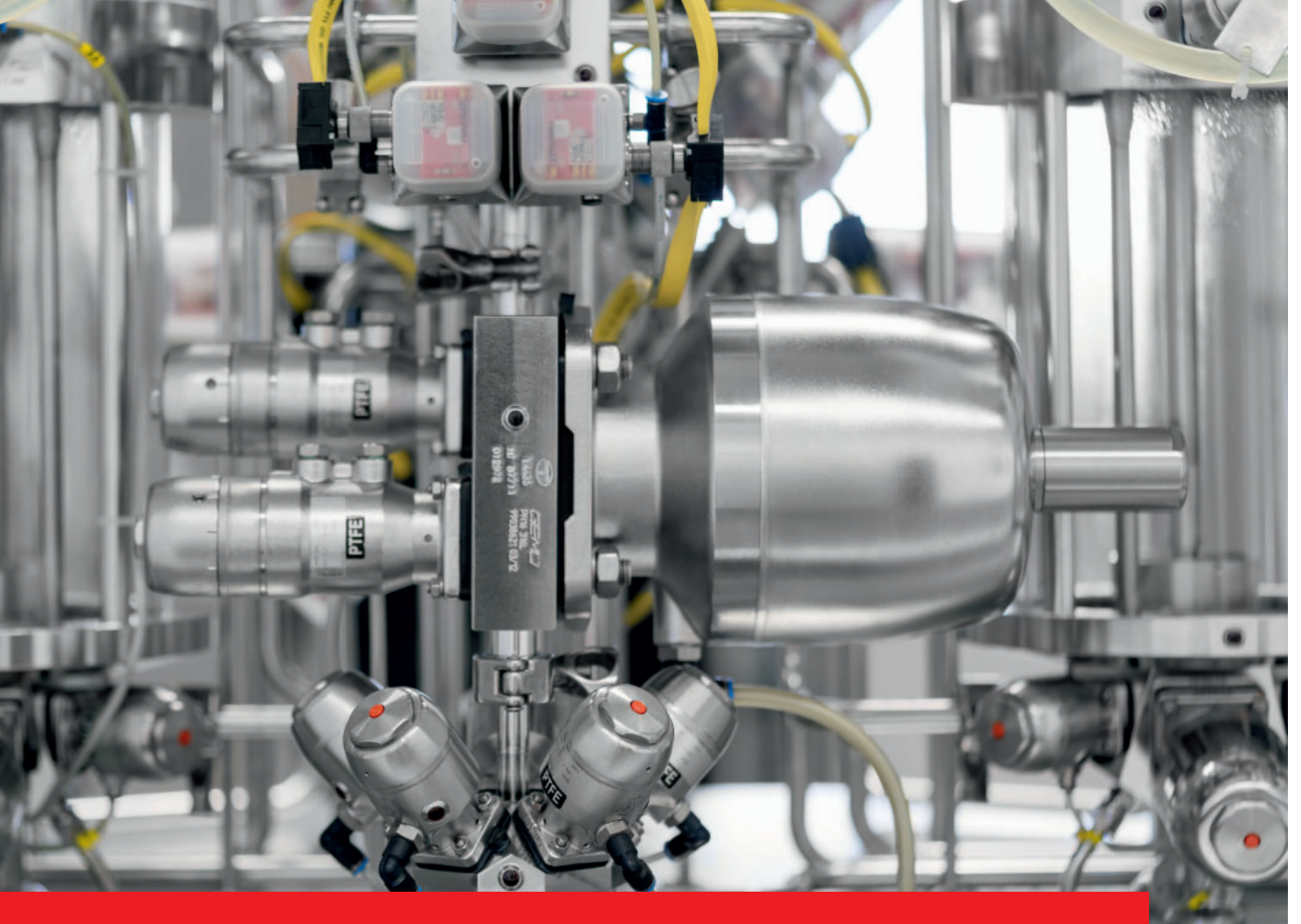
With our wide product range, we offer solutions for the most varied customer groups. We work close to the customer in our strategic business units:

- Pharma, Food & Biotech
- Industry
- Semiconductor
- Service
- Medical

The widely positioned modular system and the adapted automation components enable us to combine individualized standard products and customized solutions to create a large number of different configurations and variants.

Table of contents

Pharma, Food & Biotech Business Unit	4–5	Our product selection for your applications	27–51
Areas of application	6–19	GEMÜ diaphragm valves	28–29
Pharmaceutical industry	8–9	GEMÜ diaphragms	30–31
Foodstuffs	10–11	GEMÜ valve bodies	32–33
Beverages	12–13	GEMÜ multi-port valve blocks	34–35
Biotechnology industry	14–15	GEMÜ tank valves	36–37
Cosmetics	16–17	GEMÜ valve configurations	38–39
Auxiliary processes	18–19	GEMÜ single-use diaphragm valves	40–41
Added value	20–26	GEMÜ globe and control valves	42–43
Surface finish	20	GEMÜ filling valves	44–45
Documentation & traceability	21	GEMÜ ball valves	46–47
GEMÜ CONEXO	22	GEMÜ butterfly valves	48–49
Service & training	23	GEMÜ accessories	50–51
GEMÜ Green Engineering	24	Product overview	52–54
Customized solutions	25	Worldwide service	55
As flexible as you like	26		



Business Unit Pharma, Food & Biotech

Figures, data, facts – an overview

Active in more than

5

key sectors: Pharmaceutical industry, food-stuffs, beverages, biotechnology industry, cosmetics and their auxiliary processes

Over

25

years of experience in these sectors

References from the top

50

pharmaceutical industries

More than

900

specialists active worldwide for the sectors listed above

Over

270.000

diaphragm valve seats per year

Areas of application

Pharmaceutical industry



Foodstuffs



Beverages



Biotechnology
industry

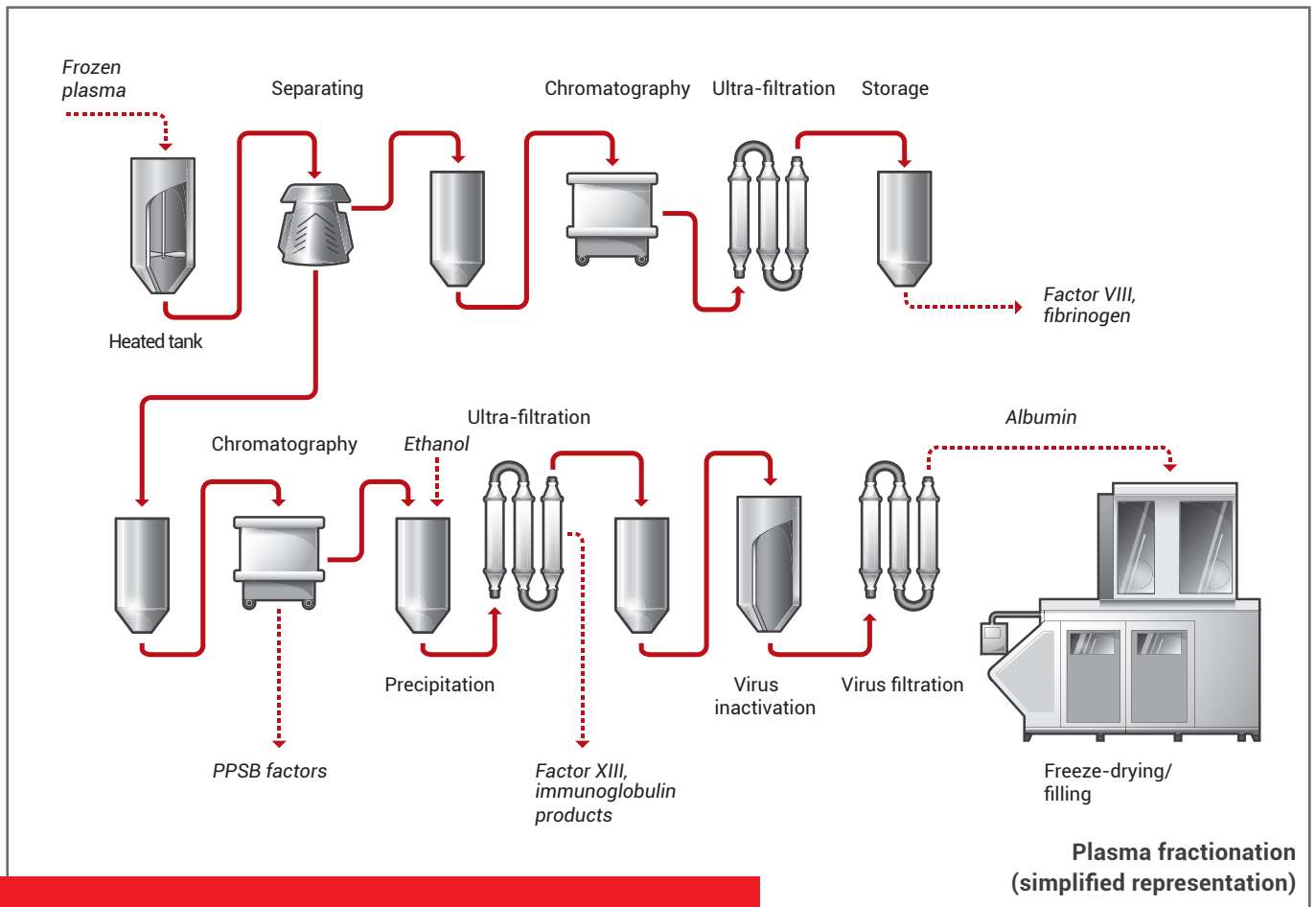


Cosmetics



Auxiliary processes





Pharmaceutical industry

Small molecules with a big impact

The production of medicines and vaccines without the use of living micro-organisms not only requires significant knowledge of the synthesis and isolation of active ingredients, but also a lot of delicate handling in the formulation. The structure of the molecules is crucial for the desired functionality of the active ingredient and is very sensitive to external influences, such as temperature. Sensitive products often lose their function, shelf life or quality as soon as the molecule structure changes or is destroyed.

Coordinated and reproducible processes as well as permanent monitoring of the production parameters are therefore essential. Hygienic and sterile plant components are the top priority for pharmaceutical processes.

Pharmaceutical industry application examples



Peptide synthesis

- So-called polypeptides are generated during the chemical reaction between several amino acids when water is separated off
- The development of the correct peptide structure is crucial for the desired function
- The reaction is supported or steered by the use of dewatering agents (e.g. DCC) and protective groups
- Solid phase peptide synthesis is mostly used for small to medium-sized polypeptides, such as insulin



GEMÜ 687



GEMÜ 673



GEMÜ 658



GEMÜ R690



GEMÜ 550



Plasma fractionation

- Separation of the blood plasma into its components of water and proteins, e.g. albumin or coagulation factors
- Precipitation of the proteins through variation of alcohol content, temperature, pH value, ionic strength and salt content
- Repeated cleaning of the intermediate products and use of procedures to inactivate or remove viruses
- Freeze-drying of the coagulation factors or packaging as ready-to-use solutions under sterile conditions



GEMÜ 740

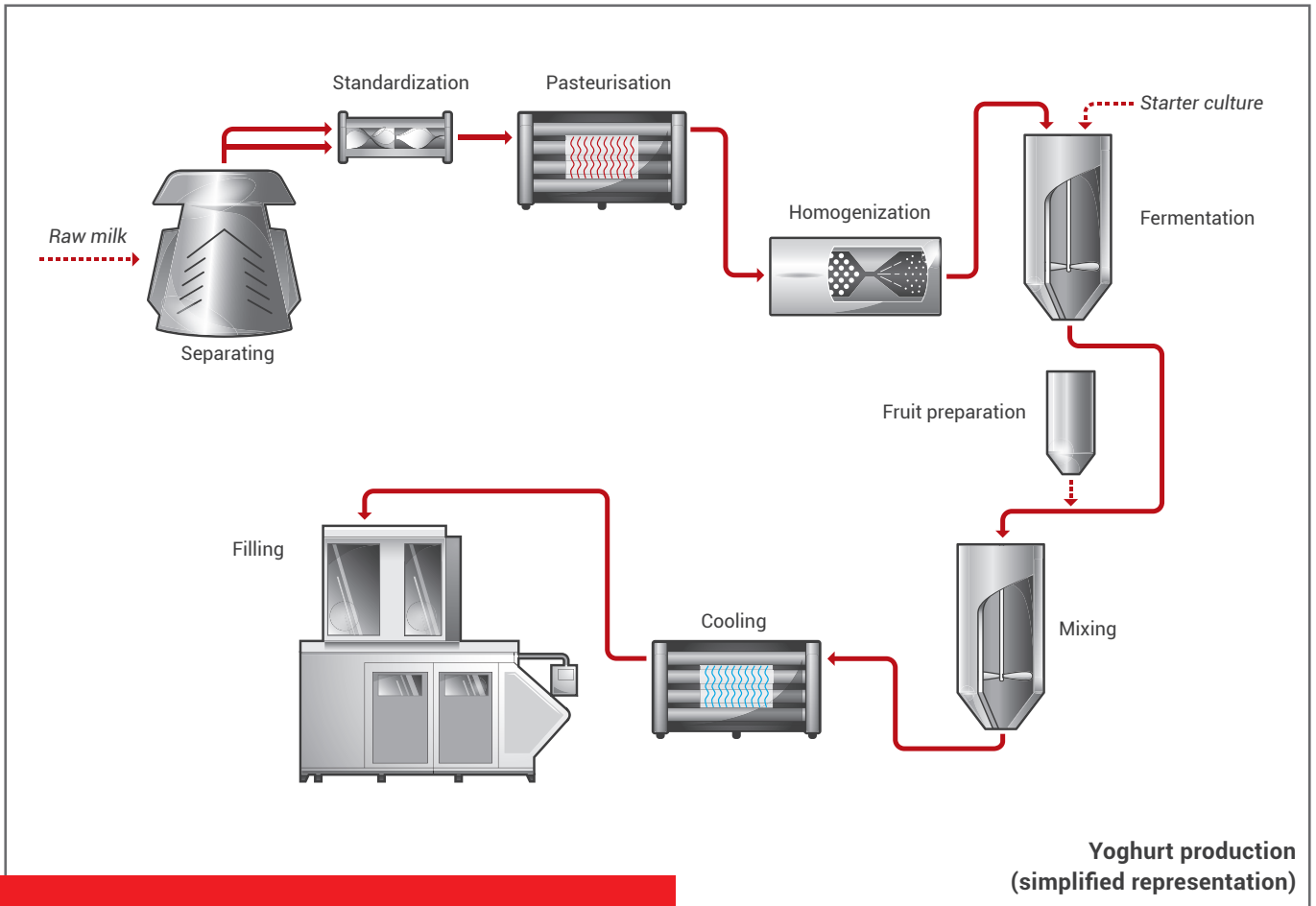


Production of cough mixture

- Production of an extract from dried and ground ivy
- Extraction of the active ingredients using the eddy current method and subsequent filtration to separate foreign matter
- Mixing of the components, such as ivy extract, ultra-pure water, sugar substitutes, preservatives, humectants and thickening agents
- Filling of the cough mixture following quality control



GEMÜ 481



Foodstuffs

Food safety in focus

Day in, day out, foodstuffs provide the energy needed to maintain the human metabolism. But the procedures used have become as varied and complex as the foodstuffs themselves.

To extend shelf life and improve tolerability, process steps such as fermentation, pasteurization, homogenization, mixing and filling are often used. Contamination must be avoided at all costs.

The process integrity and product reliability also play an important role in the production of foodstuffs, so that hygienic design is indispensable in ensuring the cleanability of the plants and their components.

Milk processing application examples



Milk treatment

- Separation of undesired solids and separation of raw milk into cream and skimmed milk using special centrifuges
- Mixing of skimmed milk and cream to achieve the required fat content according to the milk type
- Subsequent heat treatment process and homogenization extends the shelf life and prevents creaming



GEMÜ 660



GEMÜ 654



GEMÜ 567



Yoghurt production

- Fat content of the milk is adjusted, then it is pasteurized and homogenized
- Inoculation of the tempered milk with starter cultures, which are specific to the respective end product
- Lactic acid, which is produced during the breakdown of lactose, causes the milk to coagulate and acts like a natural preservation agent



GEMÜ 555



GEMÜ F40



Mixing and filling

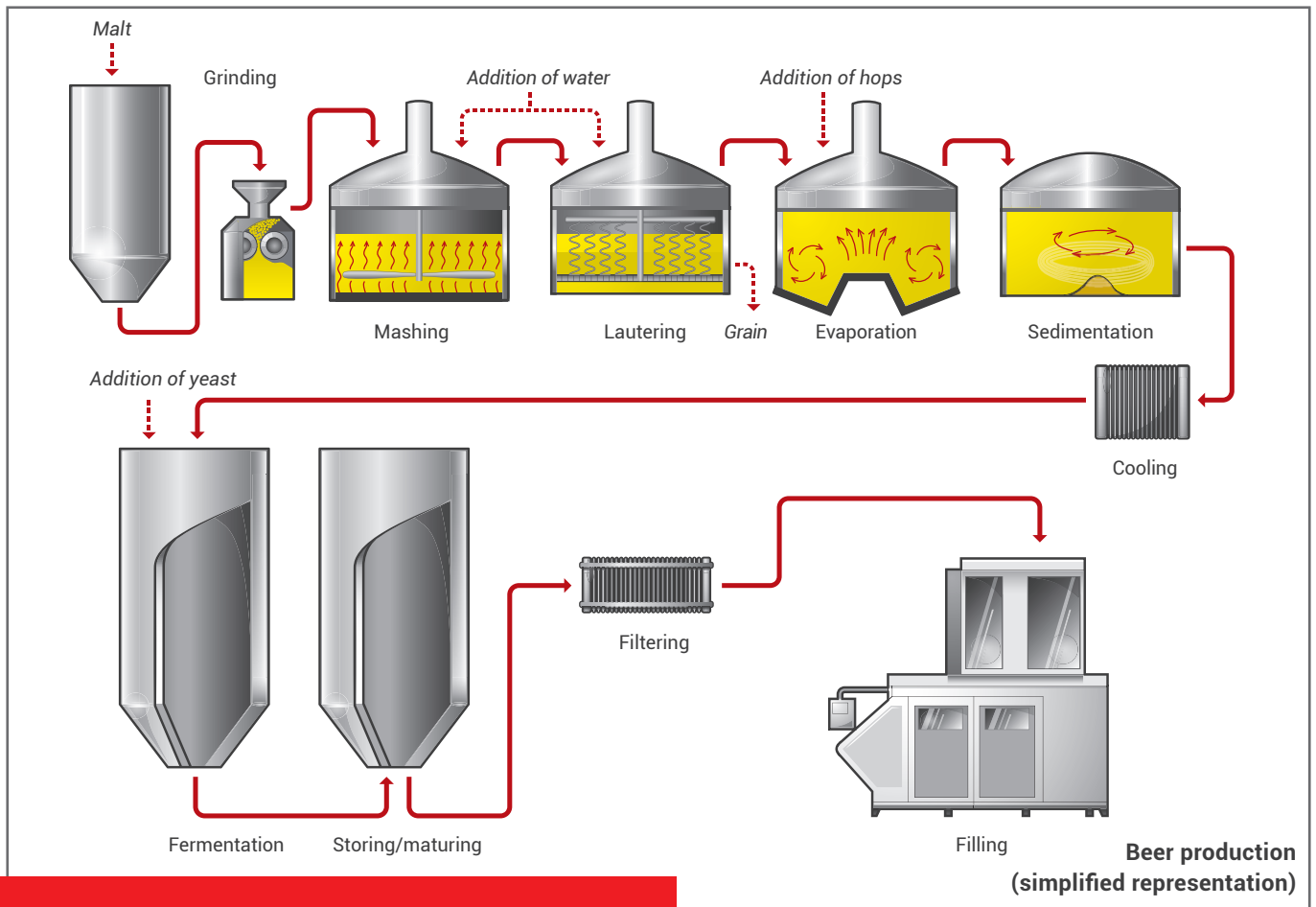
- Set yoghurt is filled into tubs, incubated and cooled down after a defined period of time
- If necessary, additives such as fruit preparations, binding agents or pro-biotic cultures are added to stirred yoghurt
- Cooling and filling of the yoghurt, when the desired acidity or pH value is reached



GEMÜ 740



GEMÜ 487



Beverages

Purity is our top priority

The beverage industry is among the three largest sectors in the foodstuff industry and is one of the industries with the greatest variety of products and forms. A distinction is made between non-alcoholic beverages, such as water, juices, soft drinks, smoothies, coffee or tea and alcoholic beverages, such as beer, wine, sparkling and fruit wines as well as spirits and liqueurs. These days, beverages are not only used to quench thirst and thus for vital water intake, but are often also consumed as a nutritional or luxury food.

Due to the ever-increasing requirements set by consumers and the intensive competition, increasingly productive and more significantly automated plants are required. Flexibility and speed are just as crucial as the precise control system during the filling process. Aseptic filling is a must for products that must not be heated due to the sensitive ingredients or for which no preservation agents are used. For beverages that contain fruit fibres, gentle product handling is also required. The demands on the plants and their components are correspondingly high.

Beer production application examples



Wort preparation

- Mixing of ground malt and water, with corresponding water hardness, in the mash tun
- Gradual temperature increase, to convert starch into water-soluble components through the enzymes contained
- In the lauter tun, soluble components are separated from the grain and added to the wort kettle with hops
- Evaporation of the wort to the desired original wort content



GEMÜ F60



GEMÜ 658



GEMÜ 660



GEMÜ 605



GEMÜ 550



GEMÜ 567



GEMÜ 536



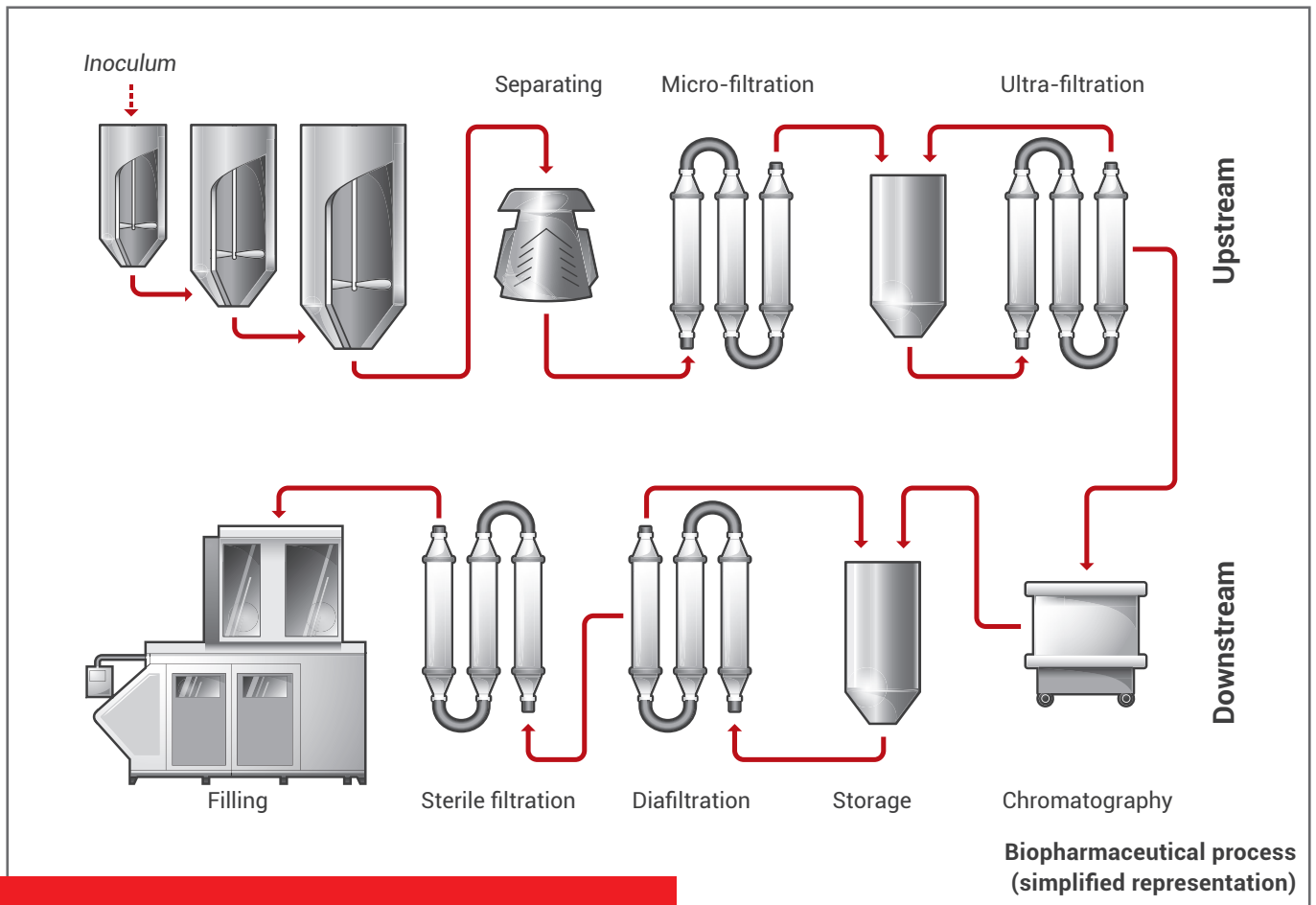
Fermentation and maturing

- Yeast is added to the cooled wort and fed into fermentation tanks or open fermentation vats
- Through anaerobic fermentation, alcohol and CO₂ are produced from the fermentable components, such as glucose and fructose
- The green beer is pumped into closed tanks and stored until final maturity
- Residual sugar is broken down further, allowing additional flavours and a beer saturated with CO₂ to develop



Filtration, separation and filling

- Separation of the yeast and other particles in several steps through separation (centrifugation, decanter, etc.), cake and deep filtration
- Filtration is not used for cloudy beers
- Pasteurization or sterile filtration ensures a long shelf life for the beer
- Aseptic filling into bottles or kegs is carried out under pressure and CO₂ supposition



Biotechnology industry

Strict demands for your standards

If active ingredients are so complex that they cannot be produced via chemical synthesis, biopharmaceutical processes are used. Biopharmaceutical products, such as monoclonal antibodies, vaccines and hormones are produced from genetically modified organisms. These include bacteria, yeast and mammal cells.

The more complex the active ingredient to be extracted, the more time consuming and fragile the required process. Even the smallest of changes in the process can have a significant influence on the properties and thus the effect. Production is therefore one of the most demanding procedures in the manufacture of medicinal products. To prevent contamination of the cell culture with viruses or foreign organisms and to optimize the yield of valuable active ingredients, aseptic production with minimal product loss is indispensable. Sterilizable and minimal deadleg plant components make a valuable contribution here.

Biotechnology industry application examples



Upstream

- Cultivation of cells and their subsequent multiplication in bioreactors via batch, fed-batch or continuous procedures
- Setting of the optimal conditions in the bioreactor in order to produce the maximum possible quantity of the desired substance
- Important parameters to be adjusted for this are, for example, pH value, temperature, oxygen or nitrogen concentration, glucose concentration and stirring speed



Downstream

- Isolation of the desired product from the cells and nutrient solution (Capture)
- If the product is within the cells, these must be opened before cleaning
- Purification of the product to the required concentration and purity is carried out in several steps (Polishing)
- Centrifugation, filtration and chromatography processes are usually used



Filling

- Filling of biotechnological active ingredients, injection solutions and other complex substances, such as monoclonal antibodies, into different containers
- Possible container types include syringes, cartridges or vials
- Optimized filling processes and coordinated plant components prevent the loss of valuable active ingredient solution



GEMÜ 650



GEMÜ 654



GEMÜ M600



GEMÜ B600



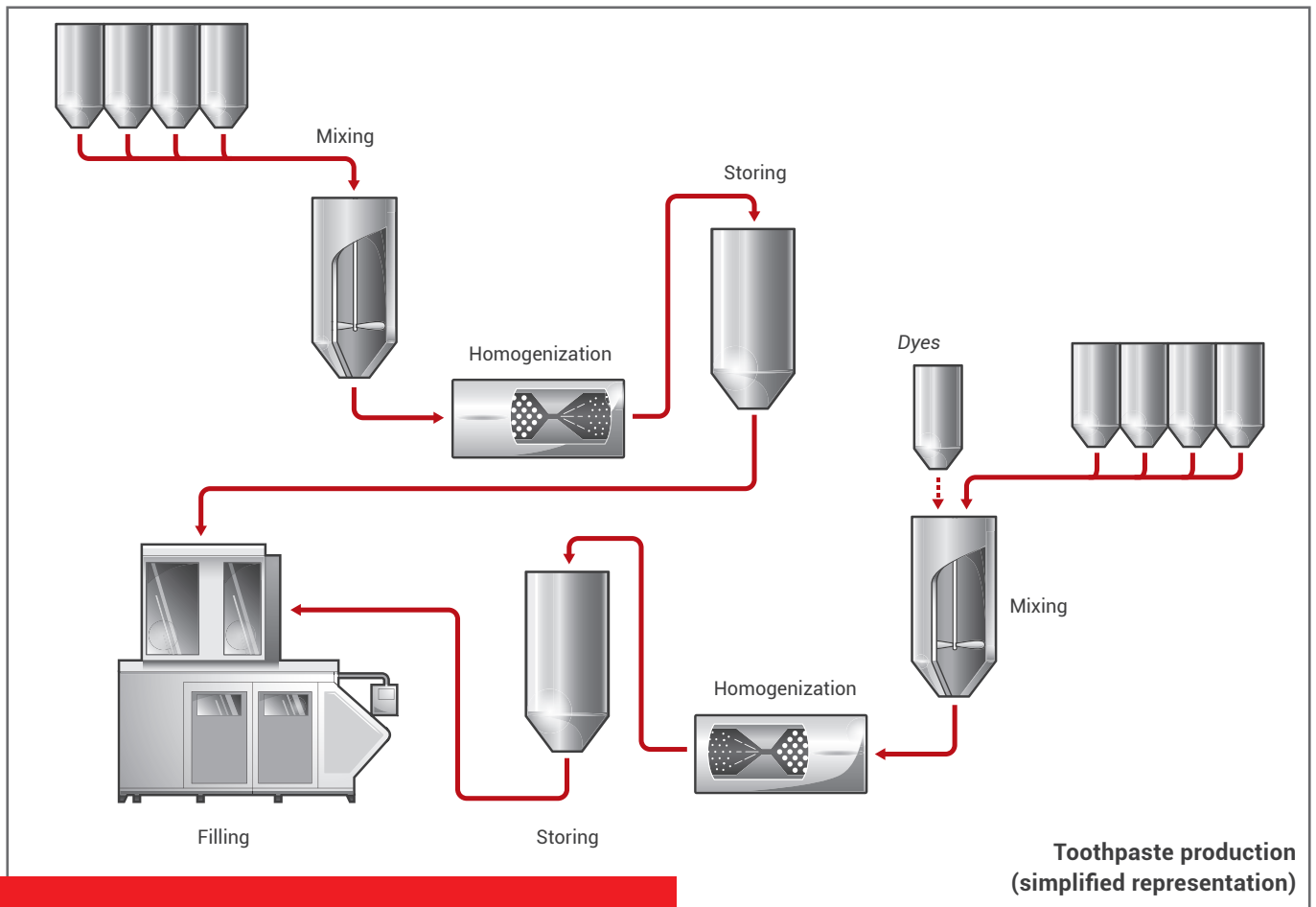
GEMÜ SUMONDO



GEMÜ F60



GEMÜ 567



Cosmetics

Beauty in perfection

Cosmetics clean, nourish, deodorize or perfume the skin, nails or hair. The different products are used in cleaning, as well as care and protection, dental and oral hygiene, hair treatment and for decorative applications. Although no approval is required for cosmetics, the legal requirements are high and, like foodstuffs and other consumer goods, are subject to official verification. Manufacturers themselves are obligated to ensure careful production of the cosmetics and to have the product safety tested by a relevant expert before market launch. Random product testing and plant inspections by responsible authorities to monitor the manufacturing method are commonplace, with the result that good manufacturing practice (GMP) is crucial in the cosmetics industry too.

Cosmetics application examples



Toothpaste

- Weighing and mixing of the main components, such as abrasives, foaming agents, humectants, binding agents
- Addition of further ingredients, such as fluoride, aromas and, if necessary, colourings, if a multi-coloured toothpaste is being produced
- When the desired fineness & consistency is achieved, the toothpaste is discharged into a container and filled



GEMÜ 650



GEMÜ 653



GEMÜ M600



GEMÜ B600



GEMÜ 555



GEMÜ 514

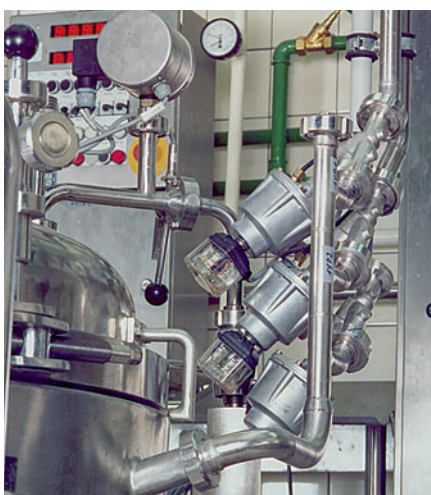


GEMÜ 497



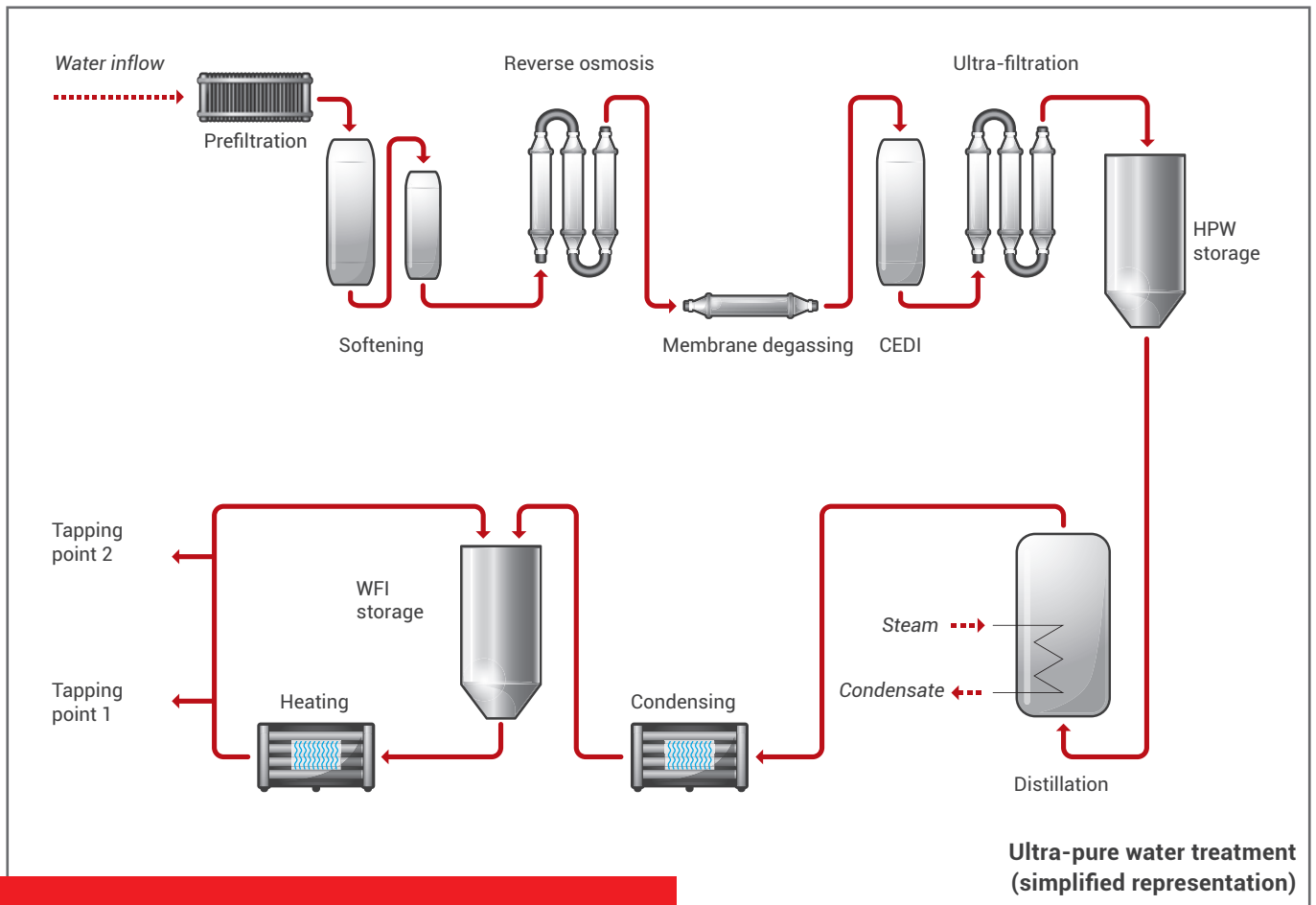
Eye ointment

- Protective blending and emulsification of the components under constant pressure in a sterile vacuum process plant
- Mixture is introduced into the mixer at the exposed place via a complex pipe system, in order to prevent a concentration gradient
- Forwarding of the finished eye ointment to storage tanks and subsequent aseptic filling



Hair dye

- Batch production of hair dyes due to the product variety based on different hair types and colour options
- Components such as dye coupler, emulsifiers, antioxidants, fragrances and care components are pumped out of supply containers in accordance with the formulations
- Mixing of the chemically corrosive components in a stainless steel pressure vessel with integrated agitator



Auxiliary processes

A fixed part
of every process

Auxiliary processes are essential to guarantee the necessary cleanliness and thus produce a high-quality product which is harmless to health. They are therefore a fixed part of the respective process in all areas of application from the pharmaceutical industry to cosmetics.

For example, pure and ultra-pure water of differing qualities are used in the manufacture of medicinal products and active ingredients. As of 2002, the European Drugs and Medicines Register has listed not only the water quality grades of PW (Purified Water) and WFI (Water For Injection) but also HPW (Highly Purified Water). This has to satisfy the same quality requirements as WFI, but its production is not restricted to distillation.

Cleaning-In-Place (CIP) and Sterilization-In-Place (SIP) are used wherever there are strict demands in terms of purity and sterility. Piping, containers and valves are cleaned with lyes and acids and then sterilized, with all relevant parameters (e.g. temperature, acting time) being checked, measured and documented.

Auxiliary processes application examples



Ultra-pure water treatment

- Pre-treatment of the feed water to remove impurities such as colloids, chlorides and sulphates
- Softening of the water via ion exchanger ensures a faultless procedure during the subsequent reverse osmosis
- Production of Highly Purified Water (HPW) through continuous electrochemical deionization (CEDI) and ultra-filtration
- Production of Water For Injection (WFI) with the aid of multiple-effect distillation or thermo-compression



GEMÜ 650



GEMÜ 687



650TL



R690



GEMÜ T-Ventil



GEMÜ 505



GEMÜ C60



Distribution of ultra-pure water

- Ultra-pure water is usually distributed via ringpiping systems (loops)
- Frequency-controlled pumps deliver the ultra-pure water in the loop to the tapping points and back again to the storage tank
- Continuous sanitization with hot storage via heat exchanger or ozonization and subsequent ozone destruction prevent contamination of the storage and distribution system



Cleaning-In-Place (CIP)

- Cleaning of plants, their components and piping, without dismantling them
- Influences such as temperature, cleaning agents and acting time are adjusted to the respective contamination
- Required concentration of the cleaning agent is set in stainless steel containers
- Flushed with water or ultra-pure water between cleaning steps with lyes or acid

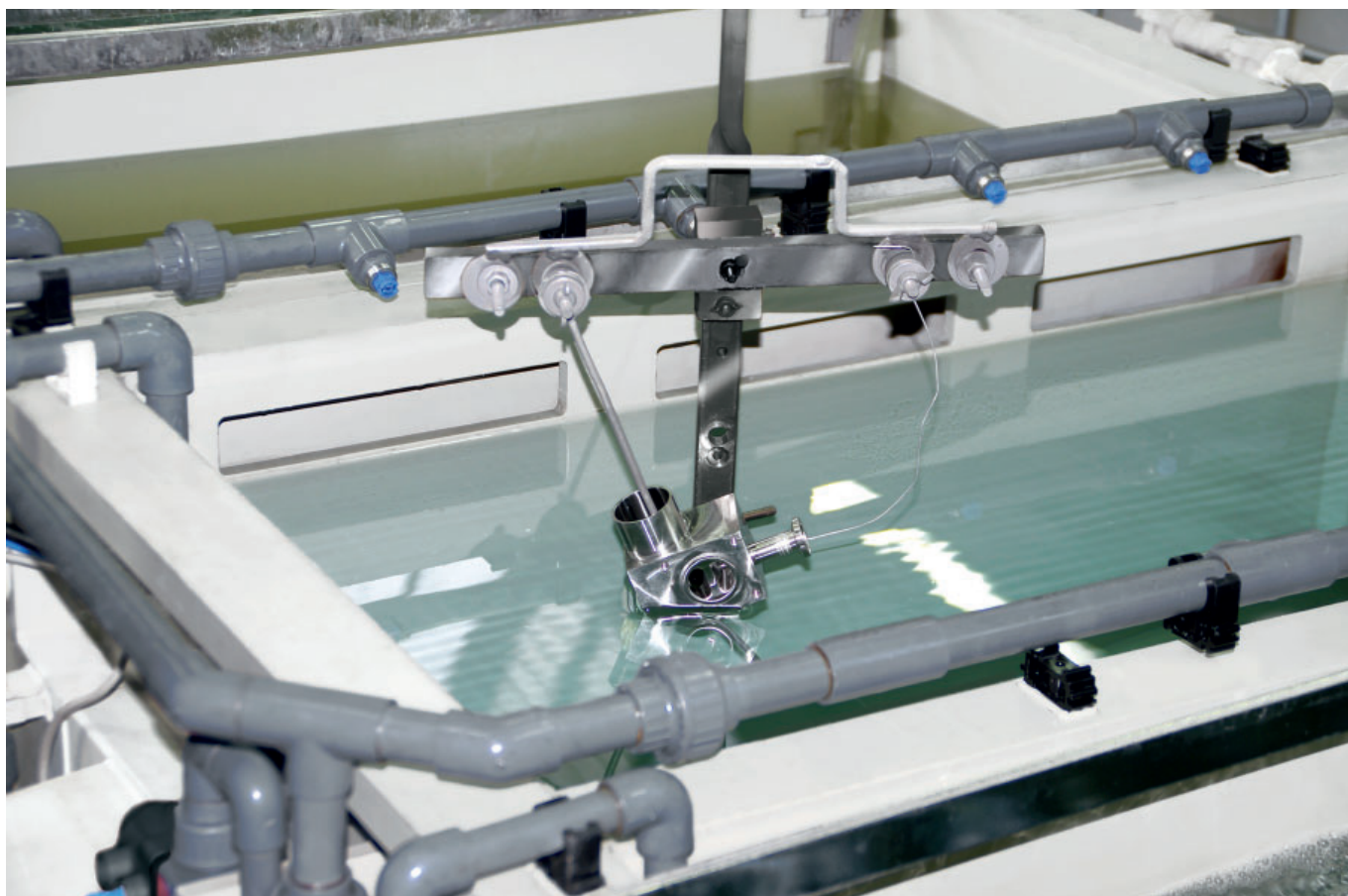
Added value for you – a matter of course for us

Surface finish

Perfection down to the smallest detail

Optimal surface quality is crucial for the cleanability and corrosion resistance of components. Media-wetted surfaces in particular have high quality requirements to prevent an accumulation of micro-organisms and to rule out influences on the quality of the product. The surface roughness and the formation of a passive layer are crucial here.

At GEMÜ, the foundations for the best possible surface finish are laid during design and implemented by modern machinery. Based on the optimal design of the valve body, good surface finishes are already achieved during mechanical processing. During the subsequent mechanical polishing, all media-wetted areas are reached and thus the required surface finish is guaranteed everywhere. All media-wetted areas are subsequently mechanically polished and thus the required surface finish is guaranteed. Subsequent electro polishing also evens out the surface and, by using passive acids, a homogeneous passive layer is formed.



Documentation & traceability

Transparency on all levels

Batch traceability is crucial in manufacturing processes and extends from the raw material to production and on to the finished items for sale. The quality must be guaranteed at every stage of the production process and of course must also be checked accordingly. Clear identification and documentation is also crucial, in order to ensure seamless traceability.

For diaphragms, this is achieved by embossing the material. In this way, the year of manufacture, the production batch, the tool mould and the tool nest can be determined. Through our internal production documentation, it is possible to trace every single diaphragm back to the raw material batch. The required FDA certificate, the 3.1 certificate and the Certificate of Conformity are enclosed with the pharmaceutical diaphragm as standard.

All forged and investment cast bodies can be continuously tracked using the batch number enclosed by the raw materials manufacturer. Via the RFID chip, which will be introduced in all forged bodies in the future, electronic documentation can also be called up.



GEMÜ CONEXO

Increased process reliability through RFID

The interaction between valve components equipped with an RFID chip and the corresponding IT infrastructure actively increases process reliability.

Thanks to serialization, every valve and every relevant valve component such as the body, actuator or diaphragm, can be clearly traced and read at any time using the RFID reader – the CONEXO pen. The CONEXO app, which can be installed on mobile devices, not only facilitates and improves the "installation qualification" process, but also makes the maintenance process much more transparent and easier to document. The app actively guides maintenance technicians through the maintenance schedule and directly provides them with all the information assigned to the valve, such as test reports, testing documentation and maintenance histories. The CONEXO portal acts as a central element, helping to collect, manage and process data.



Clear, traceable identification by means of an RFID chip

Service & training

Our experts working for you

For us, the customer is our main interest. Our mission is to fulfil specific customer wishes and requirements in relation to the point-of-sale throughout the entire life cycle of our products. Issues such as technical support, servicing and repair work are of the utmost importance.

Qualified experts also hold training courses at our headquarters in Ingelfingen-Criesbach or directly on site at the customer's premises. We therefore guarantee practical and interactive participation with our products. An experienced team of service engineers takes care of our customers' concerns – even maintenance and installation tasks.

As for our products, quality takes top priority for our support services too.



GEMÜ Green Engineering

For a
sustainable future

Think before you print

We offer paperless certificates for our products.

Short transportation routes

With our new surface technology centre, we can achieve the requirements for surfaces in-house for you.

Motorized actuators

Our focus is on more energy-efficient drive options. So, in future, we will be depending on electro-motorization.



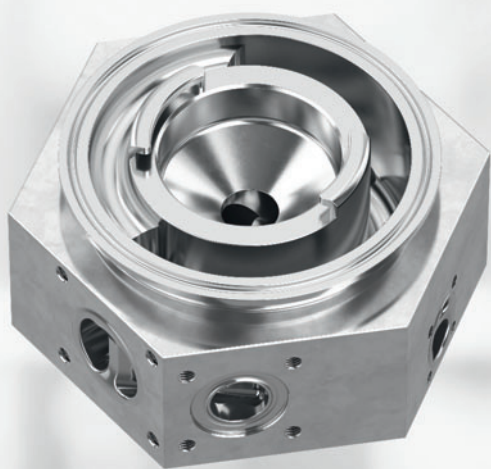
Customized solutions

Application-focussed configurations

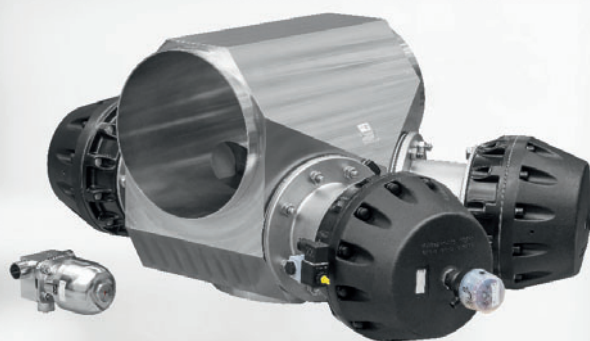
"Customized Units" are specifically developed, designed and produced according to the individual specifications and requirements of the customer. GEMÜ customers benefit above all from the wide range of production options, a flexible design and the modern machinery.

Thanks to the extensive expertise of our employees, new and customized valve solutions are implemented every day, which are adjusted to the respective application.

Continuous optimizations throughout the entire process chain guarantee the best possible delivery times.



Filter block M600 06-04.Z



GEMÜ M-block with T-function DN 250 compared to DN 25

Modular system

As flexible
as you like

The GEMÜ modular system can be used to create an individualized standard product that meets customer requirements and fulfils the intended application.

Components and accessories that are specifically synchronized with each other enable the combination of different bodies, diaphragms and actuators.



Our product selection for your applications

Our product range includes the following product groups. At the end of the brochure, you will find a table containing an overview of the illustrated products and their designs

Diaphragm valves



Single-use diaphragm valves



Diaphragms



Globe and control valves



Valve bodies



Filling valves



Multi-port valve blocks



Ball valves



Tank valves



Butterfly valves



Valve configurations



Accessories





GEMÜ diaphragm valves

Stainless steel diaphragm valves

- Hermetic separation between medium and actuator
- Optional flow direction
- CIP and SIP capable
- Autoclavable, depending on actuator version
- Various certificates and approvals available (e.g. ATEX)

Metal and plastic diaphragm valves

For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

The following is just a selection of products from our product range.



GEMÜ 650

Pneumatically operated diaphragm valve

- All control functions available (NC, NO, DA)
- Stainless steel actuator free from non-ferrous metals
- Compact design for tight spaces
- Optimal cleanability, in particular also as D-version
- Individually configurable on request



GEMÜ 654

Manually operated diaphragm valve

- Handwheel in stainless steel or high temperature and chemically resistant plastic
- Patented seal adjuster for increased diaphragm service life
- Configurable with proximity switches for position feedback
- Electrical or mechanical locking device possible
- Geometry-based optimal heat dissipation at the handwheel



GEMÜ 649

Motorized diaphragm valve

- Energy and cost savings through motorized actuator
- Individual process adaptation (variable force and speed)
- Outstanding control characteristics
- Easy operability via eSy-Web web interface
- Extensive diagnostic facilities



GEMÜ diaphragms

Diaphragms made of EPDM

- Peroxide-cured (vulcanized) EPDM diaphragms
- Various EPDM mixtures available for different areas of application
- Also suitable for abrasive media
- Threaded pin vulcanized in place with integrated screw-in stop as standard
- Conformities and approvals available (e.g. FDA, USP Class VI)

Diaphragms made of PTFE

- Chemically modified second generation PTFE (TFM™) as standard, for lower permeability
- One-piece (fully laminated) and two-piece PTFE diaphragms with EPDM support piece available
- Insensitive also at higher temperatures
- Conformities and approvals available (e.g. FDA, USP Class VI, 3-A Sanitary Standard)

Diaphragms made of NBR and FKM

For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

The following is just a selection of products from our product range.

Elastomer diaphragms

Code 17

- Very good "all-round" elastomer
- High tear resistance/low cracking
- Available in diaphragm sizes 8 to 100
- High thermal load capability (hot/cold)



Code 19

Code 19

- Optimized for use in steam applications
- Low signs of wear and optimized setting behaviour
- Longer service life due to improved material properties
- Reduced adhesive properties and virtually non-existent creasing/cracking thanks to innovative compound
- Available in diaphragm sizes 8 to 100

Code 36

- Good mechanical stability due to core material with Kevlar fibres
- Replacement for diaphragm code 6A/16 (tried and tested design)
- Available in diaphragm sizes 8 to 50



PTFE diaphragms

Code 5M

- High chemical resistance due to PTFE face
- Improved long-term impermeability through contour optimization
- Improved vacuum compatibility and service life
- Sintered-in threaded pin with integrated screw-in stop as standard
- Leak detection holes in the support piece as standard, for early detection of a leak



GEMÜ valve bodies

Valve bodies in stainless steel

- Available in material 1.4435/316L or 1.4539/904L as standard
- Connections available in accordance with common standards (e.g. butt weld spigots, clamps, unions)
- Surface finishes up to $Ra \leq 0.25 \mu\text{m}$, also electropolished
- Available with manual, pneumatic and motorized actuators as well as EPDM and PTFE diaphragms from the GEMÜ modular system

Valve bodies in metal and plastic

For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

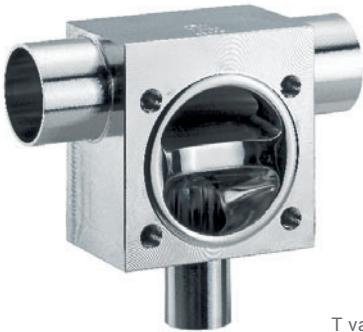
The following is just a selection of products from our product range.



Forged body

2/2-way valve bodies

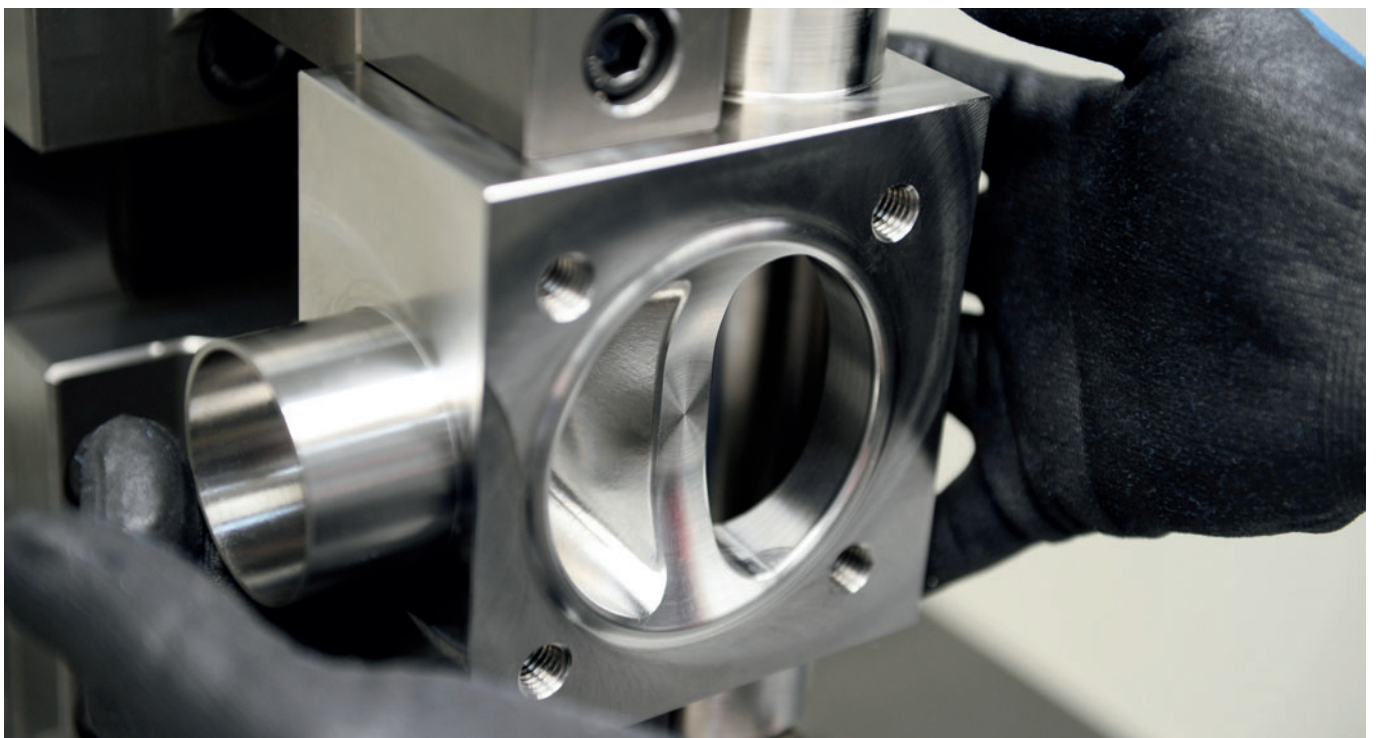
- Forged or investment cast bodies in different designs
- Optimized geometry for best possible media flow
- Optional flow direction
- Vertical and horizontal installation possible
- Optimized draining with horizontal installation via defined angle of rotation
- Individually configurable (material & connections)



T valve

T and Y-valve bodies

- Produced from high-quality block material
- Vertical, minimal deadleg extraction of the medium
- Compact design
- No weld seams in the media-wetted area
- Nominal sizes for through flow and outlet are individually configurable





GEMÜ multi-port valve blocks

Stainless steel multi-port valve blocks

- Individual and customized design
- Space-saving design
- Much greater product reliability
- Low L/D ratio for best cleaning results, minimal deadleg
- Optimized draining design
- Machined from one block of material

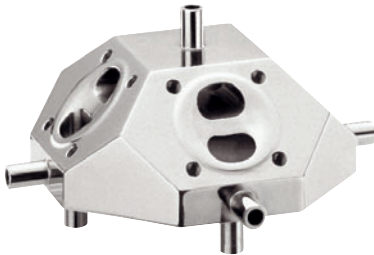
PVDF multi-port valve blocks

For more information, see our "Solutions for microelectronics, semiconductors and battery production" brochure or go to our homepage.

Plastic multi-port valve blocks

For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

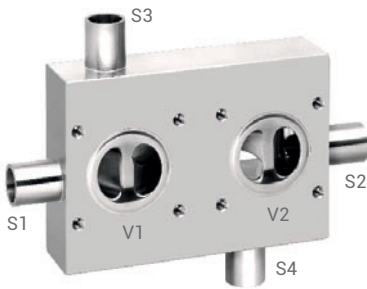
The following is just a selection of products from our product range.



M600 09-04.B

Multi-function blocks

- Multi-functional uses, e.g. for sampling or condensate withdrawal, ring draining, sterile steam supply, CIP/SIP, mixing, distribution
- A wide range of installation positions can be produced
- Machined from one block, compact valve interfaces, no weld seams
- Ratio of the length of a cavity to its cross-section $< 1xD$ can be achieved



M600 04-04.N1

Double block & bleed

- Implementation of different processes at the connections S1 and parallel at S2
- Compact design, in particular when using actuator type GEMÜ 9650 BioStar
- Avoidance of cross-contamination of non-compatible products due to the double isolation through valve seats V1 and V2
- Possibility of a sterile steam isolation via connection S3 to S4
- S4 can be used as leak indicator

Sampling bottle



M600 05-02.BP

- Sterile sampling due to the closed system through multi-port solution
- Enables CIP/SIP of the complete sampling path before the actual sampling process
- Individual adaptation to existing sampling points
- Contamination-free transport of samples to the laboratory
- Autoclavable
- FDA-compliant materials
- Also available with stainless steel bottle for higher pressures



GEMÜ tank valves

Stainless steel tank valves

- Compact design for installation in tight spaces
- Available as individual or standard version
- Simple welding into the tank bottom via integrated welding neck
- Minimal deadlegs and optimized draining capabilities
- CIP and SIP capable
- Special materials and customized test requirements are possible

The following is just a selection of products from our product range.



B600 02-01.H

Tank valve for the tank cover

- As a supply or feed valve
- As a venting valve
- Also available in modified versions, e.g. with welded-on or integrated 2/2-way valve for CIP/SIP or condensate removal



B600 03-02.FL

Sampling valve for tank wall

- Harmonic transition of the valve body to the tank wall
- Customized adaptation to the respective tank radius is possible
- Avoidance of cleaning or spray shadows during tank cleaning
- Possibility of mounting or integrating a CIP/SIP valve for sterile sampling
- Can also be used as a supply/feed valve in the tank wall
- Sterile sampling process in combination with the GEMÜ sampling bottle



B600 02-01.TM

Tank bottom

- Individual adaptation to the respective mixer or agitator product with flange or directly fully machined pin
- Can be produced without weld seams
- No shape deviation due to impact of heat on the valve body
- Can be welded directly as tank bottom
- Particularly well suited to small tanks, available up to 300 mm disc diameter



GEMÜ valve configurations

Stainless steel valve configurations

- Different standard configurations available
- Reduces the on-site effort with moulded parts, as already integrated
- Designs for optimized draining are available
- Cost-effective
- Compact and with minimal deadleg

i-bodies

- Valve body material 1.4435/F316L or 1.4539/F904L available in forged and block material as standard
- Compact and with minimal deadleg
- Reduced weight
- Available with spigots or pipe bend
- Draining in vertical installation position possible if adhering to the 3D-rule
- Various grades of surface finish available
- Actuators & diaphragms from the GEMÜ modular system

The following is just a selection of products from our product range.



W600 C07

Welding configurations

- 18 different valve configurations are possible
- Also available as machined 2/2-way valve with pipe or clamp
- 3xD rule possible for selected configurations
- Cost-effective product



W600 I0R

i-bodies

- Patented product: Forged 2/2-way valve bodies with additional integrated seat
- No weld seams in the product area between the three connections
- 2xD rule possible for selected configurations
- 12 different valve configurations are possible
- Connection S3 with pipe, pipe bend, clamp or only drilled



W600 I0B

Bypass valve bodies

- 2/2-way valve bodies in forged or block material with integrated seat connected in parallel
- No weld seams in the product area between the two connections
- Variable volumetric flow
- Continuous minimum flow rate can be adjusted
- Precise dosing option
- Large control range thanks to parallel connection of two different seat sizes in one valve



GEMÜ single-use diaphragm valves

Single-use diaphragm valves

- No cleaning and cleaning validation costs for media wetted area
- "Ready-to-use" design
- Fast production of small batch sizes and reduced set-up times and downtimes for frequent batch changes
- Avoidance of contamination through laser welded connection of the diaphragms
- Reduced environmental load due to omission of laborious cleaning processes (optional)
- Low capital investment

The following is just a selection of products from our product range.



GEMÜ SUPM

Pneumatically operated single-use diaphragm valve

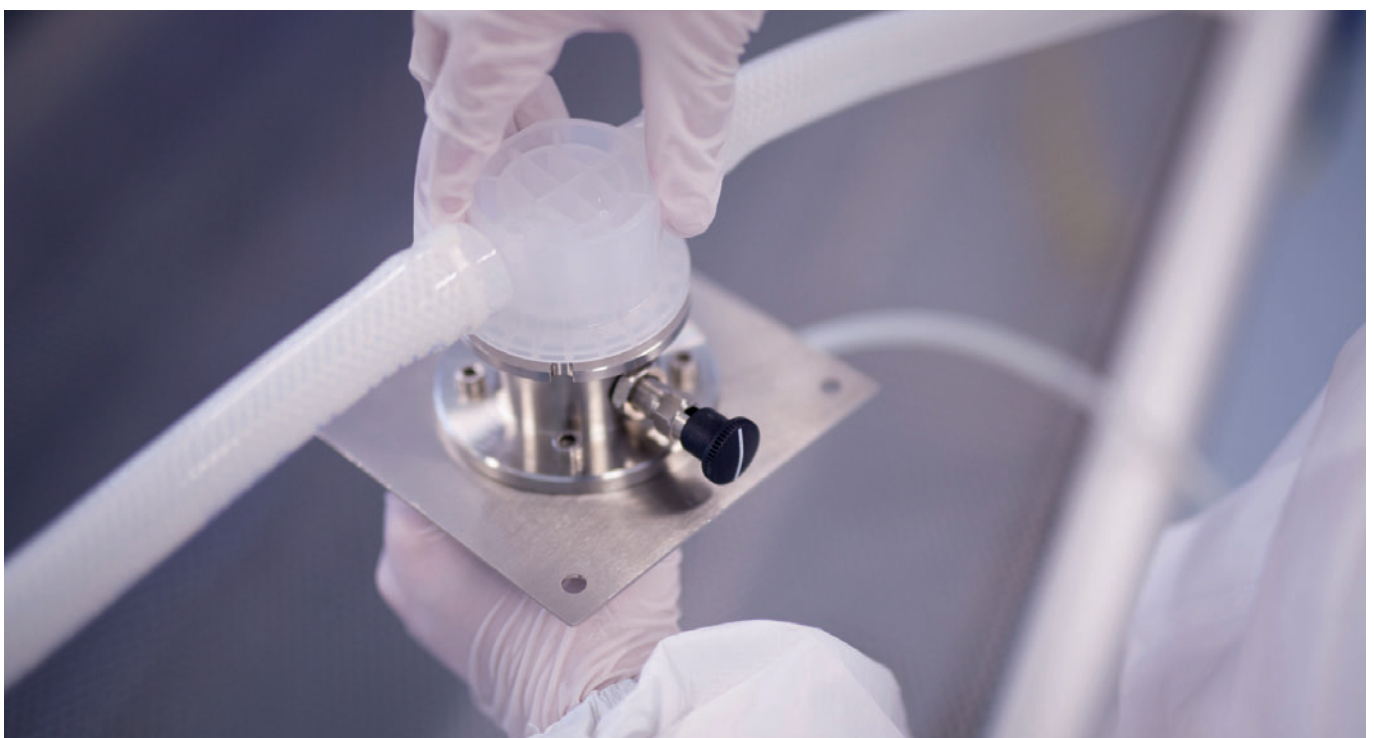
- Controlled process reliability through tried and tested diaphragm technology
- Safe operation due to robust, high purity valve bodies
- Extended plant operating times due to 1000 qualified switching cycles
- Low total microbial count of the media-wetted valve bodies
- Reduced documentation due to availability of optional validation guide



GEMÜ SUHK

Manually operated single-use diaphragm valve

- Manual flow control possible
- Controlled release of the opening cross section in comparison with the pinch valve
- Multiple use of the actuator is given (washable and autoclavable)
- Simple installation in operation





GEMÜ globe and control valves

Stainless steel globe and control valves

- Suitable for high cycle duty
- Good control characteristics
- Suitable for high temperatures and pressures (depending on version)
- 2/2-way or 3/2-way valves available
- Various connections and body materials available
- Corrosion resistant, since it is free of nonferrous metal
- CIP and SIP capable

Control valve for small volumes

- Hermetic separation of the actuator from the media flow
- Unique sealing concept via PD diaphragm (plug diaphragm)
- Possible integration of a bypass function
- Very good control characteristics
- High surface finish (standard $Ra \leq 0.4 \mu\text{m}$, optional $Ra \leq 0.25 \mu\text{m}$) available
- CIP and SIP capable

Metal globe and control valves

For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

The following is just a selection of products from our product range.



GEMÜ 550

Pneumatically operated angle seat globe valve

- "All-rounder" – universal valve in stainless steel, can be used for all liquid and gaseous media
- Available as Open/Close or control valve
- Very good control characteristics with wide Kv value range and versatile control cone versions
- Suitable for vacuum applications
- Low maintenance and long operating time due to self-adjusting valve spindle sealing



GEMÜ 505

Angle seat globe valve with stainless steel bellows

- Manually or pneumatically controlled valve
- Perfectly suited to pure steam and gaseous media
- Fixed seat plug (without threads) for hygienic applications
- All media-wetted components from a single batch and traceable



GEMÜ 567 with bypass

Control valve for small volumes

- Suitable for aseptic and sterile applications
- Proven, reliable actuator design (manual, pneumatic & motorized)
- First globally available real-time control valve with motorized actuator (up to 300 mm/s)
- 3A-compliant version available
- Simple and effective cleaning possible, even with small nominal sizes (through bypass function)



GEMÜ filling valves

Innovative filling valve platform with PD design

- Actuator is hermetically separated from the product area by PTFE PD (plug diaphragm)
- High number of switching cycles (over 10 million switching cycles possible)
- Simple, fast and faultless servicing
- High Kv value
- CIP and SIP capable
- Optimized draining design
- Individual, customized block designs possible
- Standard surface finish $Ra \leq 0.8 \mu\text{m}$,
optional: Valve body made from block material up to
 $Ra \leq 0.25 \mu\text{m}$, electropolished

The following is just a selection of products from our product range.



Pneumatically operated filling valve

- All control functions available (NC, NO, DA)
- Fast switching times
- Compact design due to control air connector at top
- Stroke limiter, electrical position indicator and positioner optionally available
- Efficient cleaning possible



Motorized filling valve

- Different actuator speeds can be achieved (25 to 300 mm/s)
- Extremely high positioning accuracy (approx. $\pm 20 \mu\text{m}$; 6 mm total stroke)
- Optional filling curves can be produced
- Controller function (when using MID, MDM, weigh cells, etc.)
- Can be integrated into any BUS and control environment
- Stainless steel version in IP69K



The innovative GEMÜ cartridge replacement part system

Simple, fast and faultless servicing thanks to the patented GEMÜ cartridge maintenance system:

- Quick-Lock connection system
- Innovative cartridge replacement part system
- Only one assembly tool required
- No retightening of the seal after sterilization



GEMÜ ball valves

Stainless steel ball valves

- Good flow capability
- Suitable for high operating pressures and temperatures
- Suitable for vacuum applications
- TA Luft (German Clean Air Act) and ATEX version available depending on version
- FDA-compliant seal material available

Plastic ball valves

- For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

The following is just a selection of products from our product range.



GEMÜ 740

Manually operated ball valve

- Plastic-sleeved hand lever with locking device
- Actuator can be replaced later through top flange
- FDA-compliant
- Cavity-filled PTFE seal to reduce excess volume in the ball cavity



GEMÜ 741

Pneumatically operated ball valve

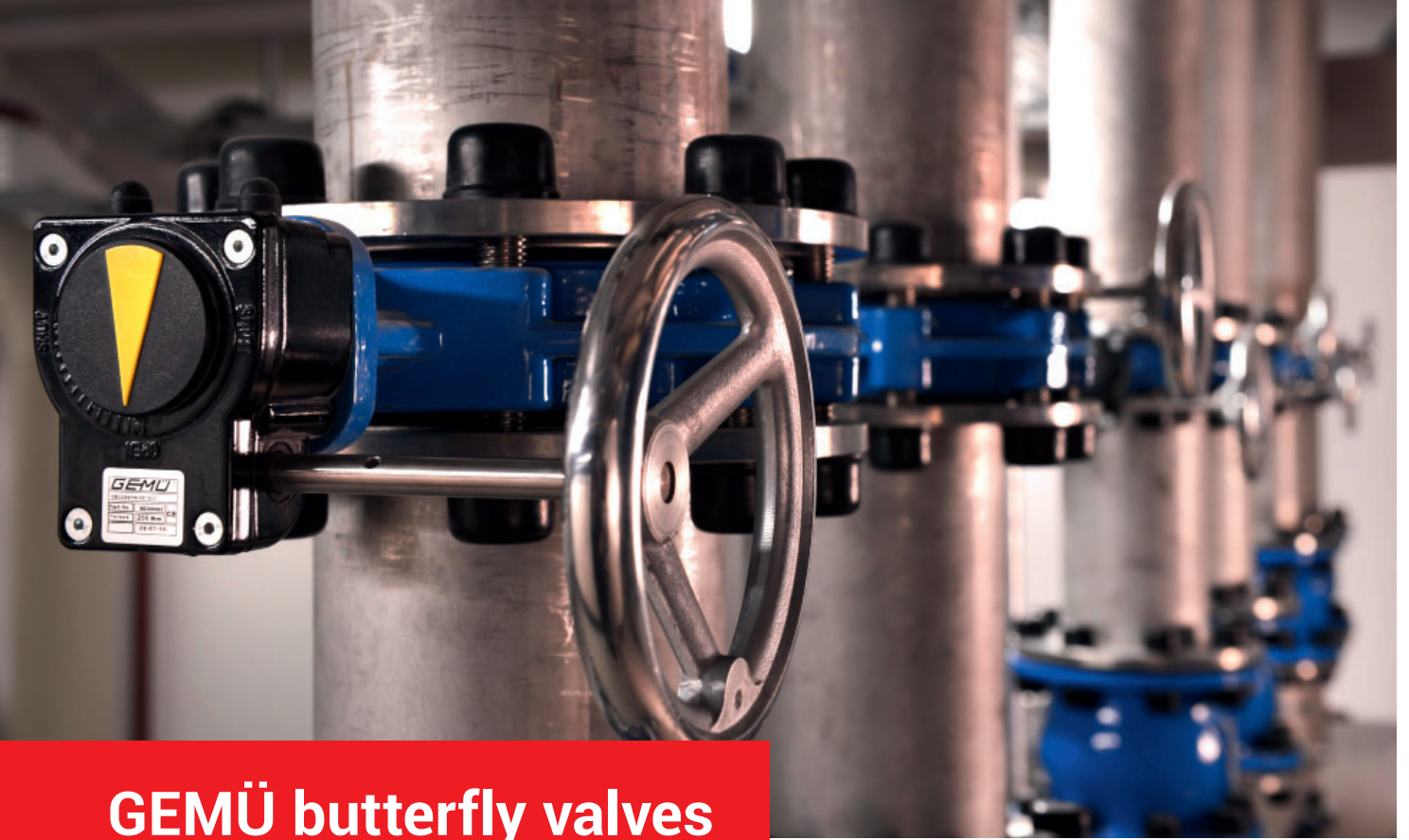
- Low maintenance piston actuator
- Available as single-acting, spring return or double acting
- Robust Alodur-coated aluminium housing
- Optical position indicator is integrated as standard



GEMÜ 748

Motorized ball valve

- Low maintenance actuator
- Powerful DC motor
- Reduction gear causes rotation through 90°
- Optical position indicator integrated as standard
- Manual override included as standard



GEMÜ butterfly valves

Metal butterfly valves

- Butterfly valves
- Large nominal sizes up to DN 1600 are available
- Extensive applications due to large variety of materials for body and seal materials
- Extensive range of accessories available

Plastic butterfly valves

For more information, see our "Solutions for industrial applications" brochure or go to our homepage.

The following is just a selection of products from our product range.



GEMÜ 488

Modular butterfly valve

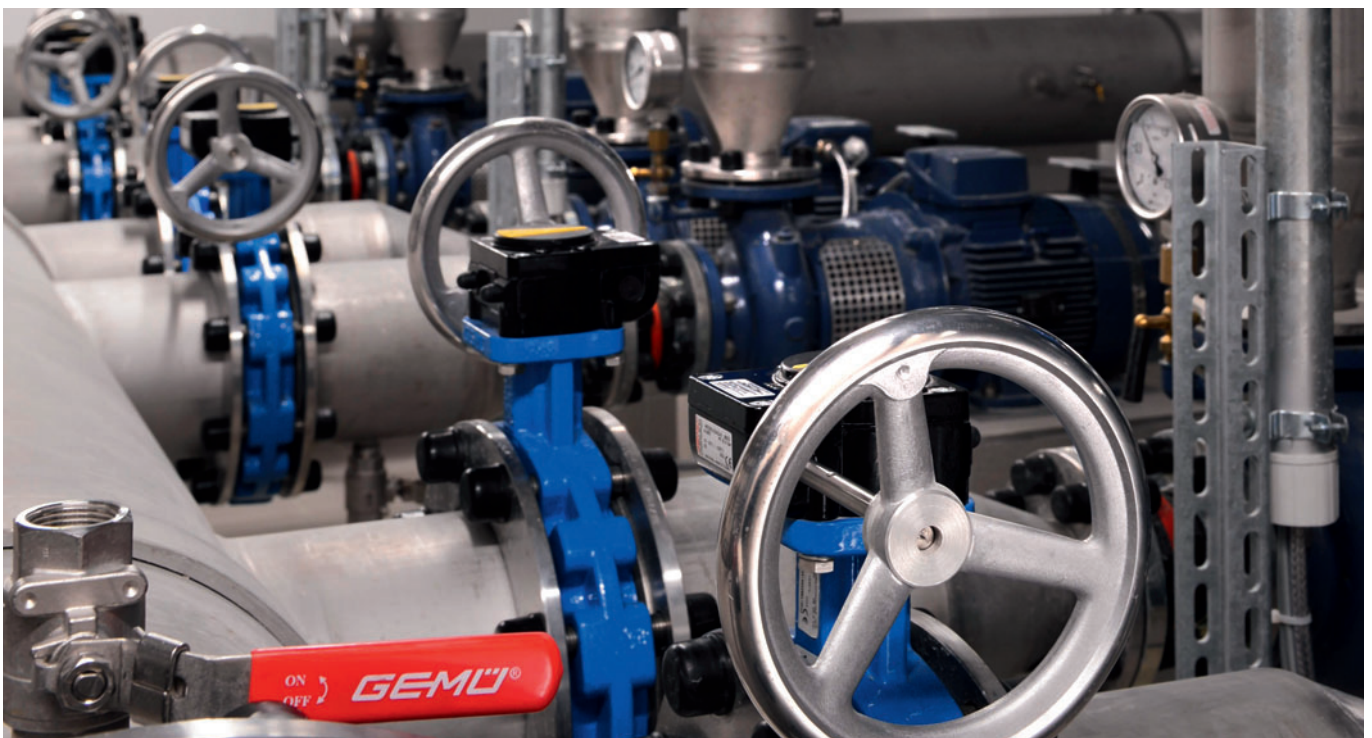
- Available with manual, pneumatic and motorized actuator
- Advanced seal design, even for larger diameters
- Simple installation
- Various approvals available, e.g.: ATEX



GEMÜ 497

Butterfly valve with highly resistant seal materials

- Available with manual, pneumatic and motorized actuator
- Suitable for inert and corrosive gaseous and liquid media in the chemical industry and in water treatment
- Possibility of optional combination of washer, seat and body
- High corrosion and temperature resistance
- Also suitable for high-purity applications
- Suitable for vacuum applications





GEMÜ accessories

Positioners and process controllers

- intelligent positioners available for linear and quarter turn actuators
- Remote mounting of positioner and travel sensor
- Quick installation and commissioning through automatic initialization (speed^{-AP} function)
- Positioner with high air output available for large actuators

Electrical position indicators and combi switchboxes

- Suitable for linear and quarter turn actuators
- Recording of the valve stroke without play and tension-free in every installation position
- Depending on version, available with manual/automatic setting of end positions or self-learning speed^{-AP} function
- Fieldbus connection optionally available
- ATEX versions available

Other accessories

Wide choice of accessories available for all valve types:

- Stroke limiters and seal adjusters, optical position indicators, various mounting kits, control air adapters and NAMUR mounting brackets, plugs and cable connectors, travel sensors for controllers and many other items
- Special angle gauge for diaphragm valves

The following is just a selection of products from our product range.



GEMÜ 1434 µPos

Intelligent positioner

- Simple commissioning due to automatic initialization
- No air consumption when idle
- Simple mounting to various valve actuators
- Simple operation, no settings necessary
- Available in stainless steel or anodized aluminium



GEMÜ 4242

Combi switchbox with integrated pilot valve

- Fieldbus connections such as AS-Interface, IO-Link and DeviceNet are available
- High visibility position indicator via LEDs
- Support with diaphragm replacement via manual override
- Available in stainless steel or anodized aluminium
- Available with piped air outlet



GEMÜ 1106

Stroke limiter and seal adjuster

- Limitation of the maximum flow via stroke limiter
- Travel stop serves to improve diaphragm life and enables a minimum flow rate to be set
- Available for pneumatic linear actuators for diaphragm, globe and control valves
- Available with plastic transparent cap or in stainless steel version

Product overview*

The following is just a selection of products from our product range.



		Diaphragm valves			
Properties	GEMÜ type	650	653/654	649	
	Operating pressure	max. 10 bar	max. 10 bar	max. 10 bar	
	Operating temperature	-10 to 150 °C	-10 to 150 °C	-10 to 100 °C	
	Nominal size	DN 4 to 100	DN 4 to 100	DN 32 to 50	
Configuration	Actuator	manual		•	
		pneumatic	•		
		motorized			•
	Housing/ body material	Stainless steel	•	•	•
		SG iron			•
		PP-R			
	Seal material	PTFE/TFM	•	•	•
		EPDM	•	•	•
		TPE			
		NBR			•
		FPM			•
	Disc material	Stainless steel			
		Cast steel			
		SG iron			
		Titanium			
		Hastelloy			
		PFA encapsulated			
		CF8M			
		Super Duplex			
	Connection	Butt weld spigot	•	•	•
		Clamp	•	•	•
Flange		•	•	•	
Hose barb					
others		•	•	•	
Accessories	Positioners and process controllers	•	•		
	Electrical position indicators & combi switchboxes	•	•		
Areas of application	Pharmaceutical industry	•	•	•	
	Foodstuffs	•	•	•	
	Beverages	•	•	•	
	Biotechnology industry	•	•	•	
	Cosmetics	•	•	•	
	Auxiliary processes	•	•	•	

* For complete technical information, see datasheets

¹⁾ Planned expansions

Product overview*

The following is just a selection of products from our product range.



		Ball valves	Butterfly valves		
Properties	GEMÜ type	740/741/748	480/481/487/488	490/491/497/498	
	Operating pressure	max. 63 bar	max. 16 bar	max. 10 bar	
	Operating temperature	-20 to 180 °C	-10 to 150 °C	-20 to 200 °C	
	Nominal size	DN 8 to 100	DN 25 to 600	DN 40 to 1000	
Configuration	Actuator	manual	•	•	
		pneumatic	•	•	
		motorized	•	•	
	Housing/ body material	Stainless steel	•		•
		SG iron		•	•
		PP-R			
	Seal material	PTFE/TFM	•		•
		EPDM		•	•
		TPE			
		NBR		•	
		FPM		•	•
		Silicone			•
	Disc material	Stainless steel			•
		Cast steel		•	
		SG iron		•	
		Titanium			•
		Hastelloy			•
		PFA encapsulated			•
		CF8M		•	
		Super Duplex		•	
	Connection	Butt weld spigots	•		
Clamp		•			
Flange			•	•	
Hose barb					
others					
Accessories	Positioners	•	•	•	
	Electrical position indicators & combi switchboxes	•	•	•	
Areas of application	Pharmaceutical industry	•	•	•	
	Foodstuffs	•	•	•	
	Beverages	•	•	•	
	Biotechnology industry				
	Cosmetics	•	•	•	
	Auxiliary processes	•			

* For complete technical information, see datasheets

¹⁾ Planned expansions

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 GEMÜ manufacturing site

 GEMÜ subsidiary

