



GEA HYGIENIC PUMPS

Competence in pharma processes

HYGIENIC PUMP TECHNOLOGY

The Heart of GEA Flow Components.

Gentle product handling, continued reliability and economic efficiency are key characteristics of the state-of-the-art hygienic pumps in the GEA Flow Components range.

GEA Flow Components

The Flow Components Portfolio comprises hygienic pumps, valve technology and cleaning technology. Our products comply with the highest hygiene standards, such as EHEDG and 3-A. Our customers’ success depends on the quality and profitability of their products. That is why they rely on advanced technology and on our decades of experience in ensuring smooth processing of liquid products. Our sophisticated process components and service offers for everything that flows are available worldwide from the international GEA sales network.

State-of-the-art pump technology, made to our customers’ preferences

At the GEA Hygienic Pumps Competence Center we develop innovative pump products and processes together with our customers. Our decades of up-close experience with operations and systems at our customers’ production sites ensure optimum selection and configuration of the right pumps for every application.



Our heart pumps for you.

Maximum efficiency

Two product lines, GEA VARIPUMP and GEA SMARTPUMP, enable our customers to choose from a highly versatile pump range with a multitude of smart adaption options to achieve simpler operation, higher-quality production, and reduced consumption of valuable resources. Special construction features of our many types of pumps provide for exceptionally gentle product handling, delivering top-quality products to consumers.

Maximum reliability

Our customers rely on the safe, continuous operation of their production systems without unplanned breaks or disturbances. That is why GEA pumps are optimized for uncompromising reliability in all applications. Thanks to their robust design and long service life, they are known as “workhorses” for their ease of maintenance and outstanding service, proven over decades, and for the great number of pumps currently in operation. Of course, GEA pumps also comply with all relevant hygiene standards and norms, with continuous documentation and up-to-date certifications safely ensuring judicial security.

TWO MODERN PUMP LINES

The right solutions – technologically and economically – for each application

How to select your pump line

The first parameter to check for selecting the right pump is the complexity of the customer application with regard to the respective system pressures, temperatures and product media. The second pa-

rameter is the required degree of customer-specific adjustment. The overall system concept determines whether standardized pump types or customized engineering will be required.

GEA VARIPUMP

Choose GEA VARIPUMP if:

- Complex applications pose high demands
- Pumps need to be customized to individual specifications

Characteristics of the GEA VARIPUMP line:

- Developed for advanced application conditions
- Project-specific customization
- Surface roughness up to $Ra \leq 0.4 \mu m$ (not applicable for GEA Hilge MAXA)
- Selection of materials in contact with product according to specific requirements (e.g., no die-cast components, $Fe \leq 1\%$)

GEA SMARTPUMP

Choose GEA SMARTPUMP if:

- Complexity of your application is low
- Pre-defined pump variants can cope with your tasks

Characteristics of the GEA SMARTPUMP line:

- Application for common and clearly defined “standard” process tasks
- Simple selection and configuration
- Fast delivery
- Standardized spare parts
- Surface roughness up to $Ra \leq 0.8 \mu m$ (not applicable for GEA Hilge DURIETTA)

OVERVIEW OF PUMP TYPES

GEA is a full-line supplier of premium pump solutions. Our range has a variety of models suited to different stages of the industrial process. We can outfit your entire application with general process pumps capable of handling your product with care and precision, dosing solutions and sanitary pumps that fulfil the strictest hygienic criteria.

GEA Hilge HYGIA / HYGIA H

The “Swiss Knife” among the hygienic pumps: premium quality, reliability and highest flexibility of customization as well as 3-A certification. Wet end parts are designed according to EHEDG standards. Fully encapsulated mechanical seal with the GEA-unique face design. Also available as high-pressure execution.



GEA Hilge HYGIA

GEA Hilge MAXA

A single-stage centrifugal pump designed for high flow operation in industrial processes. Especially used in fermentation broth, filtration facilities and transportation of condensate, hot and cold water.



GEA Hilge MAXA

Single-stage end-suction centrifugal pumps

GEA VARIPUMP
Wide model range with numerous variants.
Customization to specific customer requirements

GEA SMARTPUMP
Clearly defined list of models,
limited to standard requirements, no other variants

GEA Hilge TP



GEA Hilge TP

The GEA Hilge TP is the smart solution for standard applications saving time in maintenance and cleaning. The single-stage centrifugal pump suits a wide range of applications and offers uncompromising hygiene and quality (e.g., 3-A and EHEDG certificates).

GEA Hilge SIPLA

This single-stage self-priming side channel pump is especially suited for SIP/CIP return systems and applications with high gas content. Right- and left-hand rotation can be freely adjusted for additional application options. This pump is robust and top casing connections ensure that it is not drained when not running.



GEA Hilge SIPLA

Single-stage self-priming centrifugal pumps

GEA Hilge TPS



GEA Hilge TPS

This self-priming centrifugal pump is the solution of choice, especially for emptying vessels conveying products with air or gas inclusions, e.g., CIP return systems. Media contacting parts meet the requirements of the 3-A, QHD and EHEDG standards.

GEA Hilge CONTRA

Available as single- and multi-stage centrifugal pumps. The pumps offer extremely reliable operation under tough operating conditions. The hygienic, aseptic design in every detail and the use of pore-free materials provide perfect solutions to numerous tasks in sterile and hygienic processes, especially WFI loops.



GEA Hilge CONTRA

Multi-stage centrifugal pumps

GEA Hilge DURIETTA



GEA Hilge DURIETTA

This end-suction single- or multi-stage centrifugal pump in a very compact design has been created for applications with low flow rates at high flow heads.

GEA Hilge NOVALOBE

This rotary lobe pump has been specifically designed for highly viscous media – and for applications where gentle pumping is required (e.g., personal care). The pump is fully drainable and EHEDG certified. Heatable front cover and rotor case are available as options.



GEA Hilge NOVALOBE

Rotary lobe pumps
Twin-screw pumps
Positive displacement pumps

GEA Hilge NOVATWIN

The flexible 3-A certified twin screw pump range allows production and CIP operation with one pump. It fulfills the highest hygienic requirements and ensures reliable production. The system pressure of 30 bar enables also high-pressure applications.



GEA Hilge NOVATWIN

GEA IN PHARMA PROCESSES

GEA Hygienic Pumps – reliable operation and documented safety

For every conceivable pump application in pharmaceuticals, biotech and personal care, the full GEA pump range gives you peace of mind and high energy efficiency. There are many possible ways to customize a GEA pump to suit specific requirements. Tell us what you need to pump, and we will deliver a fully-documented, hygienic solution to do the job.

Pharmaceuticals

For a reliable supply of water for injection (WFI), we have a range of aseptic pumps dedicated to pharmaceutical processes. We supply all relevant certification for your validation process.

Biotechnology

In upstream and downstream processes, our range of pumps offers the highest aseptic standards and gentle product handling.

Personal care

Lotions and creams benefit from the excellent viscosity handling capability of the GEA pump range. From extremely viscous mixtures, to crystallines and corrosive or abrasive media, there's nothing we can't move gently and reliably.

GEA Hygienic Pumps

- Specific know-how for pharma processes
- Wide range for all production sections
- Highly specialized for individual applications
- Adjusted to maximum hygienic and aseptic requirements



Difficult liquid characteristics and high regulatory standards pose some special challenges for pharma and biotech.

With the combination of our expertise, quality pumps and a wide range of customized components, we can help you meet every demand, from full drainability to prevention of contamination risks. Your assurance is that every component is a standard component – proven, tested and used in different configurations.

Fully drainable pumps

Hygienic design without dead legs and vertical pump installations or casing drains are various ways to ensure that your system is fully drainable.



GEA Hilge HYGIA K Super with drain



GEA Hilge NOVALOBE vertical



GEA Hilge NOVATWIN



GEA Hilge CONTRA vertical

No-contamination surface finish

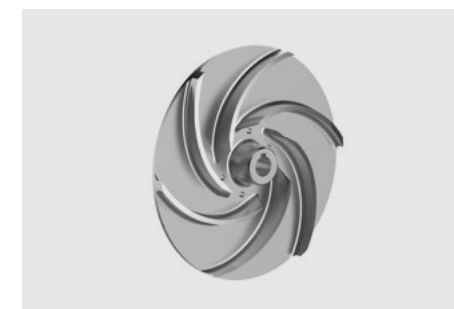
All GEA Hygienic Pumps are made of rolled stainless steel that provides a robust, homogenous and pore-free surface. The surface is electro-polished/passivated to provide a smooth surface down to the molecular level.

Long-life seals

Customized seal solutions, such as encapsulated single mechanical seals, minimize the impact of abrasion. A double mechanical seal has been specially designed to counter the wear from abrasive liquids. A flushed seal (double shaft seal with rinsing chamber) is unbeatable at handling liquids with a high crystallization risk. Double mechanical seals in tandem arrangement or single seal arrangements in quench are available as flushed options.

Continuous availability

Keep your process running – for fast service and maintenance we have designed our hygienic pumps for easy access using standard tools. The components most susceptible to wear are designed to be removed and replaced quickly for fast turnaround.



Impeller



Double mechanical seal, tandem

PUMPS FIELDS OF PHARMA APPLICATIONS

A critical step in every pharma production process is to distribute water or other fluids at sanitized quality to all consumption points, without compromise.

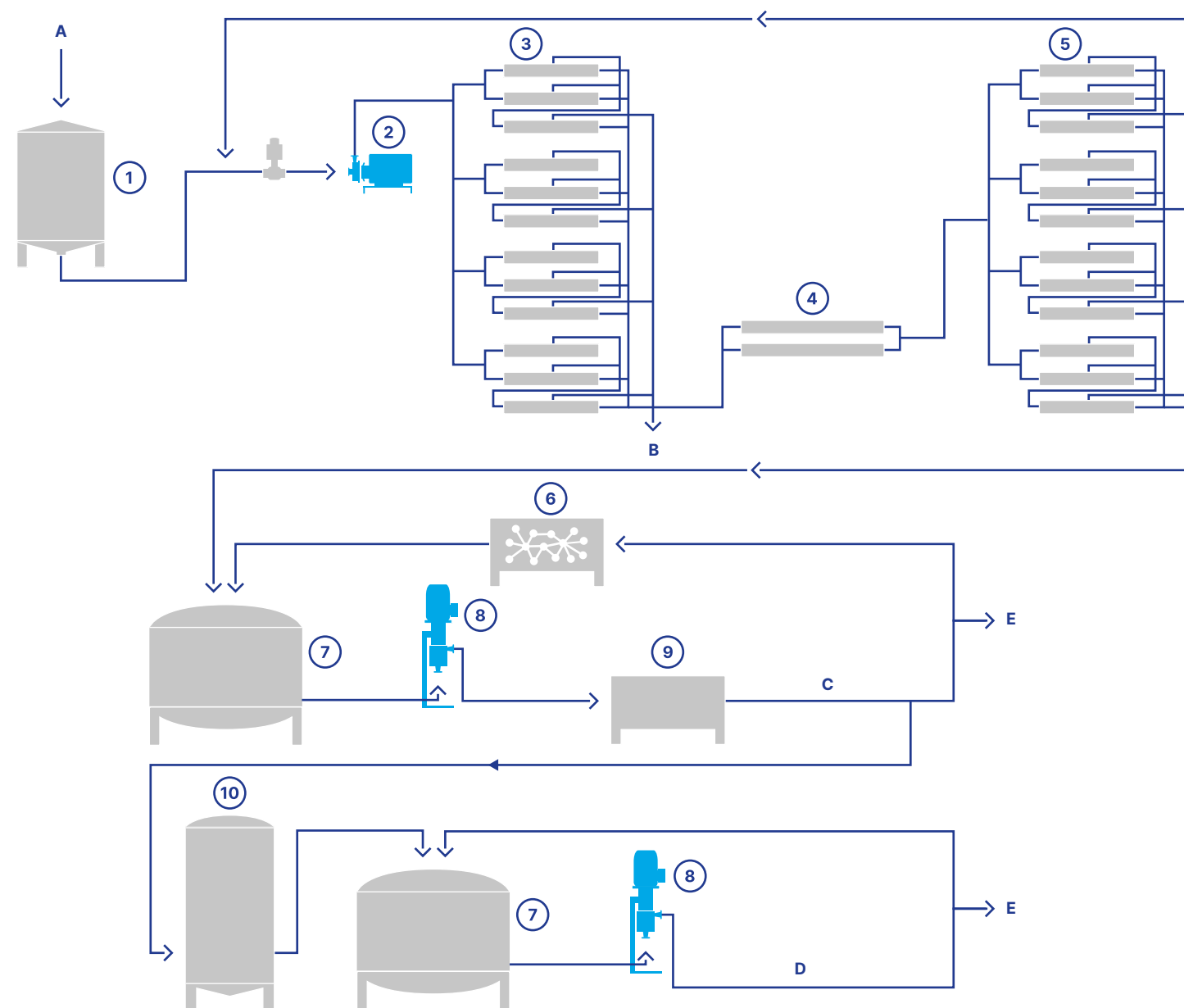
Ensured hygienic safety

In order to prevent microbial contamination in pharmaceutical production, specially equipped, CIP- and SIP-capable pumps keep the water in motion at all times. To safeguard the prescribed water quality (PW: Purified Water; HPW: Highly Purified Water; WFI: Water for Injection) according to international regulations, the pumps must be flawlessly designed and manufactured without any domes or dead zones. Electro-polished surfaces, anti-corrosive seal materials and numerous other technical features are prescribed to prevent roughing and corruption of hygienic standards.

A vital investment

Pump technology that provides maximum reliability is a vital component of successful new pharma systems because any decision to invest in pharmaceutical production equipment carries high risks. As global product research continues at a fast pace, optimum time to market is essential for newly developed products. Any glitch in the delivery, setup and implementation of process systems will likely result in great financial loss.

Production, storage and distribution of PW and WFI



1 Softening

2 Centrifugal pump

3 Reverse osmosis stage 1

4 Membrane degasification

5 Reverse osmosis stage 2

6 Ozone system

7 Pure water tank

8 Centrifugal pump in Hygienic Design (FDA- und GMP-compliant)

9 UV system

10 Distillation system

A Potable water

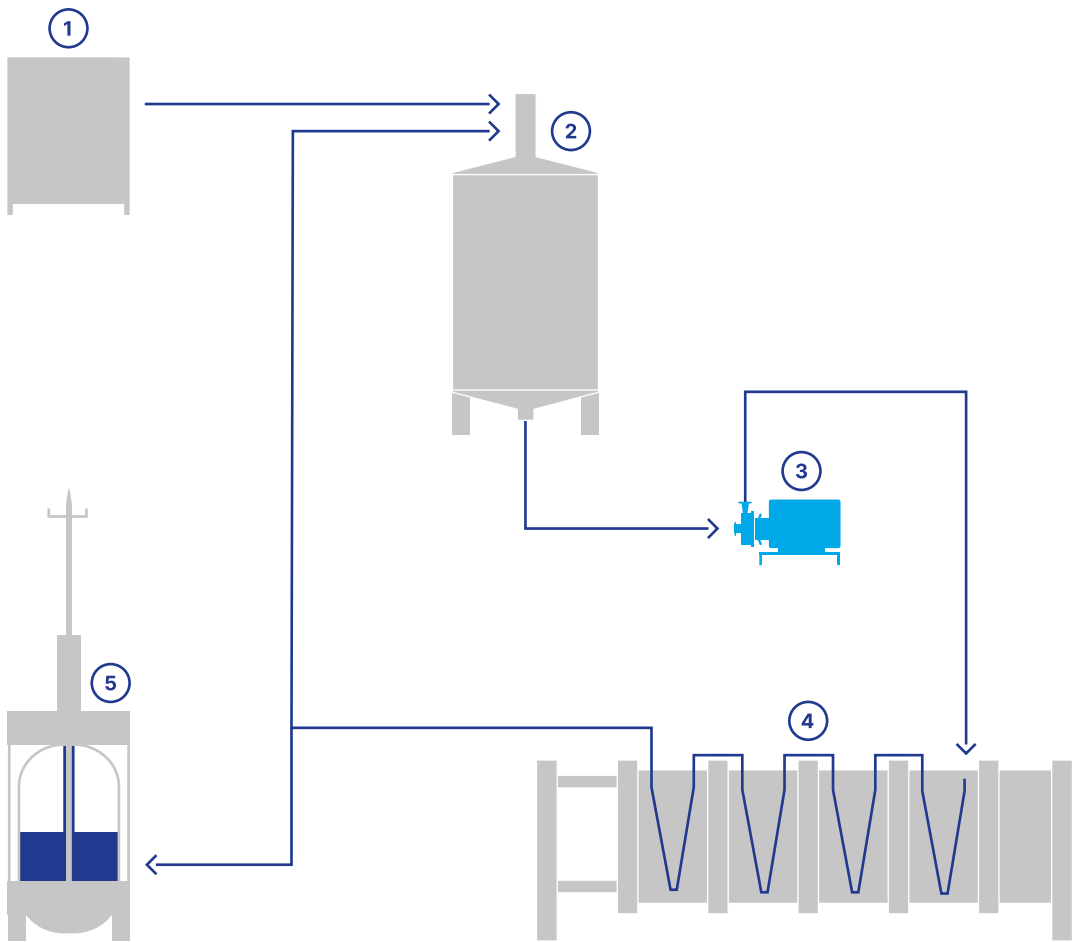
B Residual water

C Purified water

D Water for injection purposes

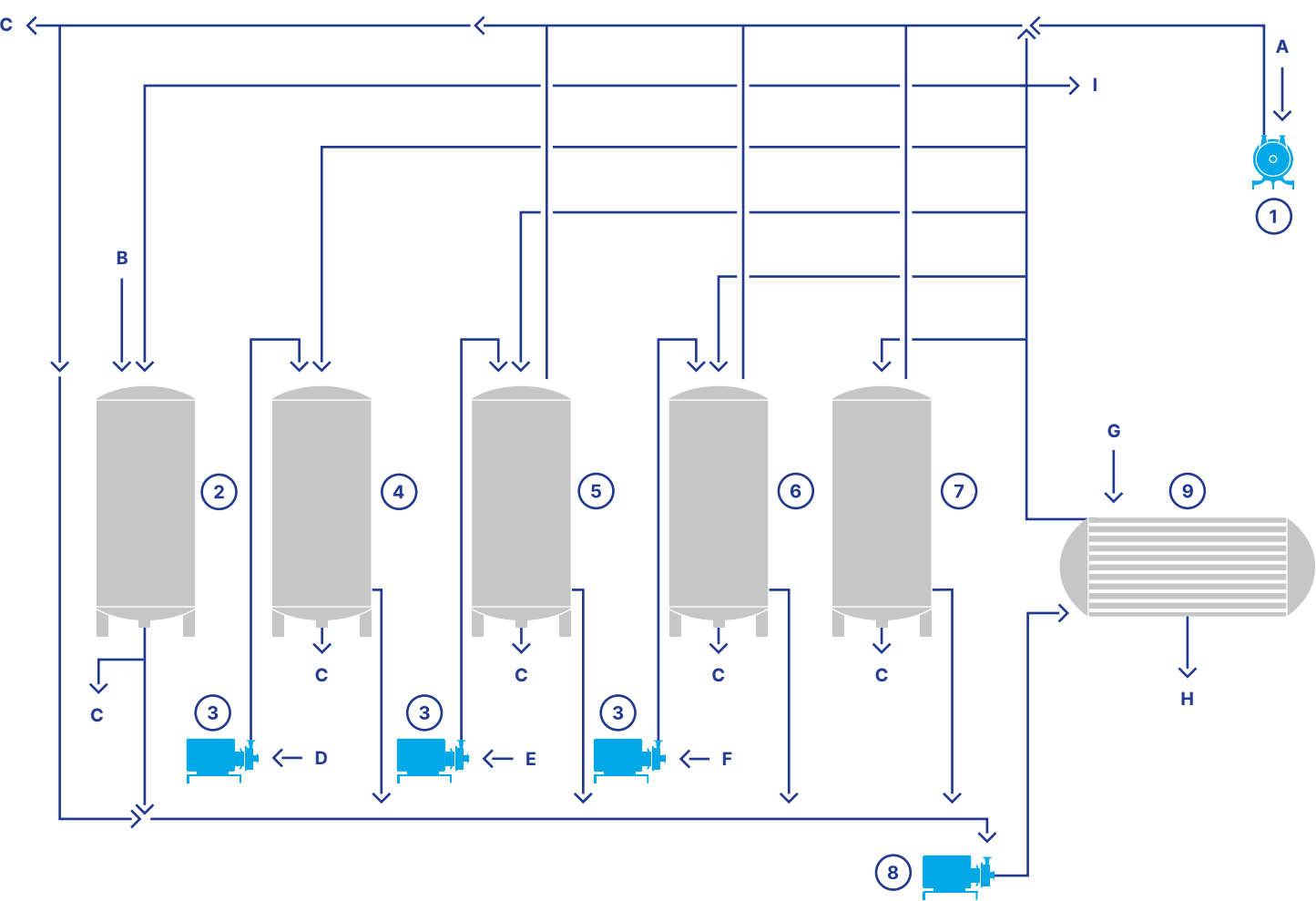
E Consumer

Dialysis system



- 1 Reverse osmosis system
- 2 Tank
- 3 Centrifugal pump in Hygienic Design
- 4 Continuous-flow heater
- 5 Dialysis device

CIP-System



- | | |
|--|--------------------------|
| 1 CIP-return pump
(self-priming centrifugal pump) | 9 Tubular heat exchanger |
| 2 Fresh water tank | A CIP-return |
| 3 Concentrate pump
(centrifugal pump) | B Fresh water |
| 4 Disinfectant tank | C Drain |
| 5 Acid tank | D Disinfectant |
| 6 Caustic tank | E Acid concentrate |
| 7 Batch water tank | F Caustic concentrate |
| 8 CIP-feed pump (centrifugal pump) | G Vapor |
| | H Condensate |
| | I CIP-feed |

GEA HILGE CONTRA

The Sterile Multi-stage Pump.

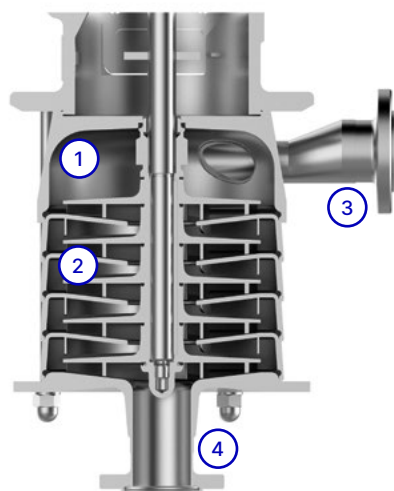
The GEA Hilge CONTRA range in the GEA VARI-PUMP line offers single- or multi-stage, end-suction centrifugal pumps with EHEDG certification. The pumps are CIP- and SIP-capable, meeting the world's highest hygiene standards.

GEA Hilge CONTRA pumps have open impellers, the multi-stage pumps also have open diffusers. The O-ring seal locations for the casing and impellers meet hygienic design criteria with metal-to-metal contact seal areas and no pump casing dead ends. The vertical versions of the GEA Hilge CONTRA pumps are fully self-draining through the suction port.

Apart from ASME and ANSI connections, a flexible range of custom connections is available upon request.

- Shaft seals in sterile design for single and double mechanical seal systems

- Elastomers with certificates (FDA, USP Class VI, BSE and ADI free)
- Surface finish down to $Ra \leq 0.4 \mu m$
- Stainless steel with Ferrite content down to $Fe < 1\%$
- High variety on sterile connections



1. No dead legs

The pumps comply with the most stringent hygienic demands to prevent contamination

2. All wetted parts are electro-polished

High corrosion resistance and surface finish

3. Fully drainable

Quick and easy cleaning at vertical position and excentric discharge port

4. Multiple flange options

Easily adaptable in any system

Due to the integrated frequency converter, the pump can be installed for variable duty points and applications (e.g., part load operation on weekends).



GEA Hilge CONTRA
with frequency converter vertical



SURFACE ROUGHNESS AND DOCUMENTATION

Requirement profile for WFI pumps

The sterile pumps of the GEA Hilge HYGIA and GEA Hilge CONTRA series are available in the following surface/sterile standards and materials, with the surface roughness being defined in accordance with ISO 468 for biotechnology.

Documentation

Documentation is an important component of validation and FDA approval of a pharmaceutical system. GEA supplies the following options for the sterile pumps of the GEA Hilge HYGIA and GEA Hilge CONTRA series as a certified operation pursuant to ISO 9001 for the specified standards:

- 3-A Sanitary Standard (only for GEA Hilge HYGIA)
- FDA declaration of conformity for the gasket materials and other materials used
- Measuring record surface roughness
- Measuring record ferrite content

- EHEDG test certificate
- Further inspections and certificates are available on request

One trusted name deserves another

Healthcare professionals need to trust pharmaceuticals enough to recommend them to their patients. Consumers have to feel safe using lotions and creams. They trust your brands. GEA has a range of renowned pumps that help safeguard product quality and brand reputation. And this is how:

The interior of GEA sterile pumps are hygienic because they don't give bacteria or residue anywhere to cling or hide. The pumps are free of edges, seams, screw-heads and dead ends where bacteria particles can accumulate. And an optimized design keeps the fluid in constant circulation.

Surface roughness	Material	Impeller, weldseams
R _a ≤ 0.8 µm	1.4404/1.4435	Impeller casted
R _a ≤ 0.8 µm	1.4404/1.4435	Weldseams ground, impeller milled
R _a ≤ 0.8 µm	1.4435 F _e <1%	Weldseams ground, impeller milled
R _a ≤ 0.4 µm	1.4435 F _e <1%	Weldseams ground, impeller milled

Processing with care

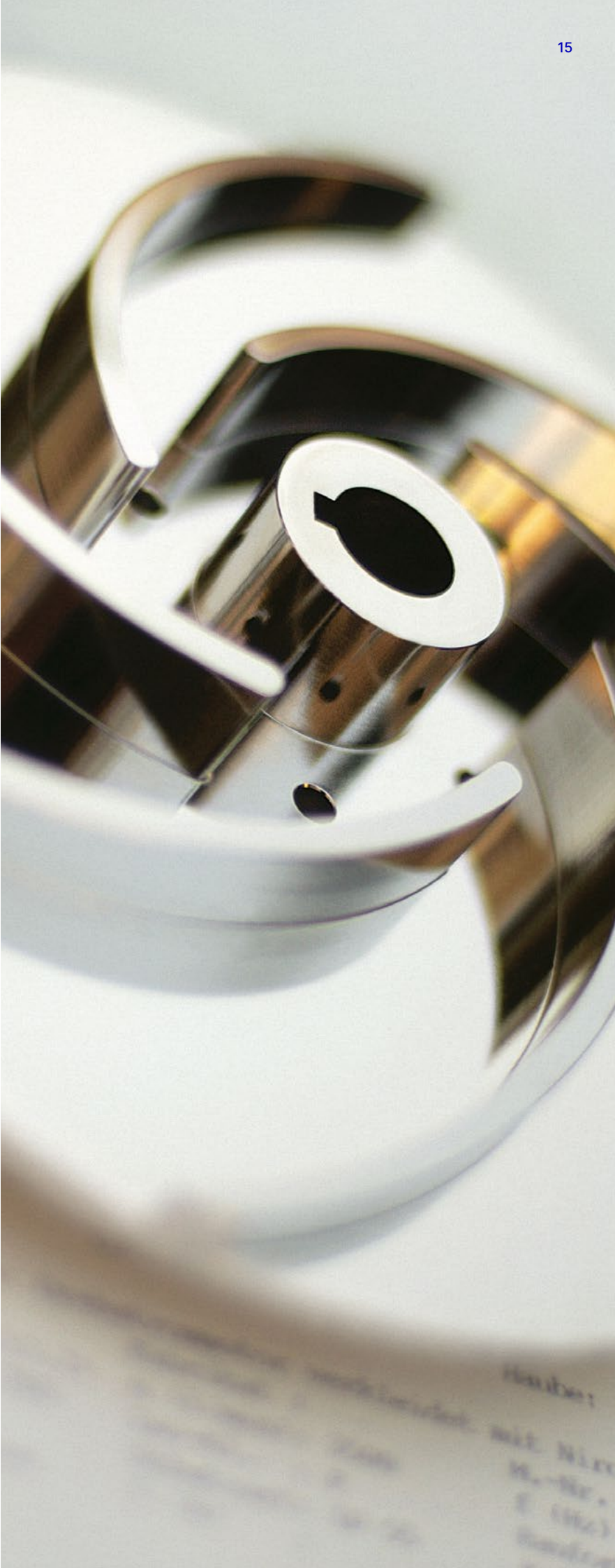
Besides fulfilling the strictest hygienic criteria, GEA Hygienic Pumps treat your product gently, maintaining purity and product characteristics without damaging even the most delicate ingredients.

Easier cleaning

All GEA Hygienic Pumps are designed for easier, 100%-thorough CIP (Cleaning In Place) and SIP (Sterilization In Place).

Peace of mind

The offshoot of all of the above is peace of mind. Not only can you be sure your product quality standards are being maintained, you will reap the benefits of less downtime and longer pump life.



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