



GEA VESTA[®] sterile valves



GEA VESTA® sterile valves

VESTA® sterile valves are a true asset for applications from laboratory up to highly complex process plants, especially in the pharmaceutical, biotech and cosmetics industry, but can also be used in the food industry.

The high-quality valve program provides everything required to ideally serve these industries. Thanks to the modular structure, the valves can be tailor-made for specific process conditions and still meet all requirements from a regulatory point of view.

From a technical and also economic point of view, VESTA® sterile valves are the ideal alternative to diaphragm valves.

Innovative valve concept

Thanks to the hermetic sealing of the valve stem by a single-piece PTFE bellow, VESTA® sterile valves safely separate product-wetted areas from the environment and thus significantly contribute to process and product safety. The valve line is based on a seat concept and further convinces by optimized flow and dead-space-free valve housing design.

Hygienic design

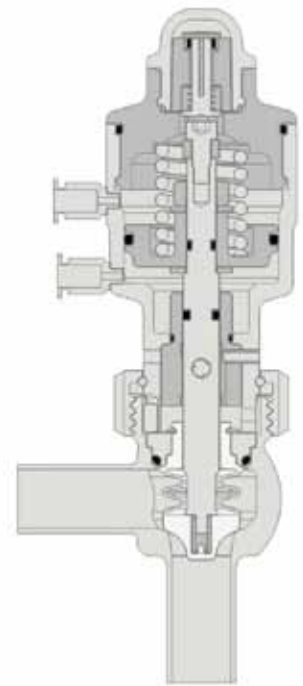
The consequent hygienic design of all relevant areas has been of great importance throughout the development of the VESTA® valve line. The closed outer design is free of unnecessary hollow spaces and drainable surfaces enable an easy outside cleaning.

Maintenance-friendly

The safe and easy handling enables a quick mounting/dismounting of VESTA® sterile valves and positively contributes to efficient routine checks and maintenance work. VESTA® sterile valves are free of loose parts and all maintenance steps can be executed with standard tools. PTFE bellows showing no wear during routine checks can be re-used without hesitation.

VESTA® sterile valves at a glance

- Optimized flow and dead-space-free design
- Optimized CIP/SIP cleanability
- Hermetic sealing of the product-wetted area by PTFE bellow
- Defined sealing pre-load by metallic stop
- Valve in accordance with EHEDG design guidelines
- Self-locking groove nut connection
- Safe and easy maintenance



Sectional view of VESTA® shut-off valve type HLA



VESTA® shut-off valve type HBA

MODULAR STRUCTURE OF VESTA® STERILE VALVES

PTFE bellow as key element

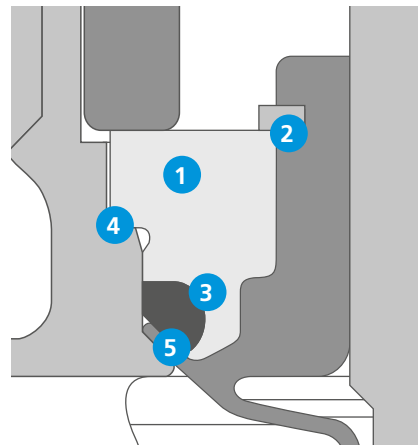
Key element of VESTA® sterile valves is a single-piece PTFE bellow made of the material TFM 1705. Adding to its excellent chemical resistance against almost all media, TFM 1705 also complies with all standards relevant for the pharmaceutical industry, such as e.g. FDA 21 CFR 177.1550 and USP class VI. The high-value surface finish ($R_a \leq 0,8 \mu\text{m}$), the seamless and hermetic sealing as well as the CIP/SIP optimized design are other characteristic features. The patented bellow sealing system safely separates the product-wetted area from the atmosphere in all process steps and furthermore seals the valve seat.



Internal assembly

Characteristics of the patented bellow sealing system

- 1 Compensation of forces from product overpressure by metallic thrust collar
- 2 Protection provided by circlip under vacuum conditions
- 3 Constant contact pressure due to elastomere o-ring
- 4 Defined pre-load due to metallic stop
- 5 Sealing of housing achieved by thin-walled PTFE sealing lip



Valve housing type HTA

Valve housing

The housings for VESTA® sterile valves are made of material 1.4435 / AISI 316 L, they come with a material certificate according to EN10204/3.1 by default and are labeled according to explanation note AD A4. The pipe connections enable orbital welding with closed orbital cartridge systems. The different valve types offer various housing options by default, and thanks to the modular valve structure customized housing solutions are possible.

Pneumatic actuators made of plastic and stainless steel

For automated applications the VESTA® valve line offers pneumatic actuators made of plastic. The actuation system is made of high-performance plastic PPS. This plastic material offers a high chemical resistance, it withstands temperatures up to 180 °C, has good mechanical properties and is furthermore resistant to aging. Alternatively, VESTA® sterile valves can also be equipped with pneumatic actuators made of stainless steel. These actuators offer the same design characteristics as actuators made of plastic and are furthermore autoclavable.

Pneumatic actuators are maintainable, and thanks to their intelligent modular structure no danger from the release of spring forces is present. The fail-safe position is reversible and the modification can be easily executed on-site. Pneumatic actuators of the VESTA® valve line provide integrated fittings for air hoses $\varnothing 6 \times 1 \text{ mm}$ / $1/4''$ and a visual valve status indicator. A bore hole in the lantern area enables the safe visual detection of leakages.

Accessories

With two types of stroke limiters (open or close) and an open feedback unit for external proximity switches for the automated surveillance of the valve position, the VESTA® valve line offers useful options for pneumatic actuators. Further options for enhanced process integration are described in the section "Control and feedback systems".



Pneumatic actuators made of plastic and stainless steel



Open feedback unit for pneumatic actuator



Stroke limiter for pneumatic actuator



TVIS® V-1 position indicator TVIS® V-1 control head TVIS® P-1 positioner

Control and feedback systems

The TVIS® V-1 / V-20 has been specifically developed for VESTA® sterile valves and can be either executed as position indicator or control head. The automated end position programming can be achieved within seconds by using the buttons or the integrated programming input. The TVIS® P-1 / P-20 is a compact positioner for pneumatic process valves. By defining a setpoint (4–20 mA) the process valve can be set to any position. The position is monitored via a measuring system with a resolution of 0.01 mm and controlled by two integrated solenoid valves. VESTA® sterile valves in larger nominal diameters can be optionally equipped with a manual TVIS® M-15 or an automated TVIS® A-15.

Manual actuators

VESTA® sterile valves can also be equipped with manual actuators, based on a particularly simple technical concept. An integrated spring package provides a defined pressure at the PTFE bellow in the closed position and avoids unintended deformation of the bellow. The spring force only appears shortly before reaching the fully closed position, and in intermediate positions manually actuated valves can be operated with minimum effort. Also, changes in the seat area of the bellow due to ingress of process conditions have no impact on the leak-tightness: the spring automatically adjusts the system to the new conditions. Furthermore, VESTA® sterile valves equipped with a manual actuator offer the possibility of a lock.



VESTA® sterile valve with manual actuator

MANUFACTURING

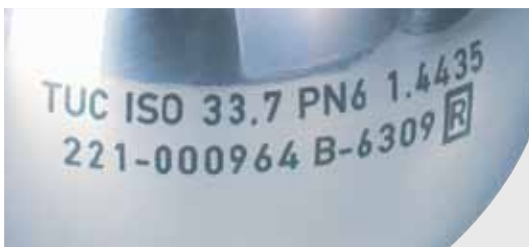
Surface quality

High-quality surfaces are a mandatory pre-requisite in sterile process technology to enable a safe and reliable process. VESTA® sterile valves provide a surface quality of $Ra \leq 0.8 \mu\text{m}$ (optionally electro-polished) in product-wetted areas by default. Higher surface finishes are available upon request.

Production quality and material traceability

VESTA® sterile valves are subject to the highest quality criteria in their production. A high production depth and a comprehensive quality management system offer a constantly high quality level and furthermore provide for the safe and seamless traceability of the parts.

- Continuous quality testing in manufacturing
- Labeling of all parts
- Valve labeling via nameplate



Labeling on valve housing



VESTA® SHUT-OFF VALVES

VESTA® shut-off valves are used for the controlled shut-off of pipelines in sterile process technology. The modular structure allows optimum valve adaption to process requirements and capacities.

Housing

Housings for VESTA® shut-off valves are available with two, three or four connection ports and can be executed with either one or two housing sections.

Internal assembly

Internal assemblies for VESTA® sterile valves consist of bellow, pressure disc, o-ring and circlip. The internal assembly is screwed onto the valve stem of the actuator and is replaced as a unit if required. PTFE bellows for shut-off valves up to DN 25, OD1" and ISO 33,7 include a tapered tip. All other valve dimensions have a regular flat seat area.

Actuator

The actuator can be executed pneumatically or manually.

The manual version is made of plastic in all cases. Pneumatic actuators are available in plastic or stainless steel, and the fail-safe (normally close or normally open) position can be easily reversed.

Control and feedback systems

Pneumatic actuators include a visual valve status indicator by default. Alternatively, visual indicators can be replaced by an open feedback unit or by using the adequate adaptor plate with a T.VIS® control and feedback system in various executions.



VESTA® SHUT-OFF VALVES GRADUATED

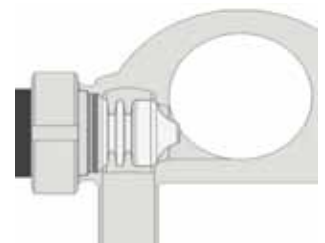
VESTA® shut-off valves of the type HCA graduated are used for the controlled shut-off of pipelines in sterile process technology. They are used when different connection port sizes are required for transit and diversion to ideally adapt the valve to the installation. VESTA® shut-off valves of the type HCA graduated offer the seamless and cost-effective integration of VESTA® sterile valves in larger pipelines at low extraction volume. These valves can be installed in almost all orientations and provide for optimized cleaning processes. The improved piping as well as the integration of additional sterilization ports furthermore reduces dead space. The significantly reduced pipe volume on the extraction side and the improved drainability are further advantages compared to conventional solutions.

Main components

The main components as well as the available options for VESTA® shut-off valves type HCA graduated are almost identical to the regular VESTA® shut-off valves. They differentiate themselves by their valve housing options.



Sectional view of HCA housing graduated in centric execution



Sectional view of HCA housing graduated in eccentric execution

Housing

The housings are available in centric and eccentric executions. The eccentric option offers the full drainage of the transit pipeline in horizontal installations via the extraction port.



VESTA® shut-off valves type HCA graduated in various sizes

VESTA® TANK-BOTTOM VALVES

VESTA® tank-bottom valves are used for the controlled shut-off of liquid media at vessels. The positioning primarily takes place at the lowest point of a vessel, although the valve is also fully drainable when installed horizontally. It is characterized by its flush-mounted design, eliminating the possibility of any sump. The dead-space-free design offers the complete emptying of the vessel and optimum CIP/SIP cleaning. The robust design of the housing (respectively the housing connection flange) enables the seamless integration into processes. Due to its remarkably compact design, VESTA® tank-bottom valves can also be used in tight space conditions.

Housing

Housings for VESTA® tank-bottom valves are available with two or three process connections. The housings are produced from one solid piece of stainless steel. The two options available are one-piece housing and flange combined or housing with loose flange. The loose flange execution consists of two parts which are connected to each other with four screws, and these are safely sealed with an additional o-ring.

Internal assembly

PTFE bellows for VESTA® tank-bottom valves are executed with a flat seat area for all valve sizes. They distinguish themselves from other VESTA® valve types by their extended cone at the seat area.

Actuator

The actuator can be executed pneumatically or manually. The manual version is made of plastic in all cases. Pneumatic actuators are available in plastic or stainless steel, and the fail-safe (normally close or normally open) position can be easily reversed.

Control and feedback systems

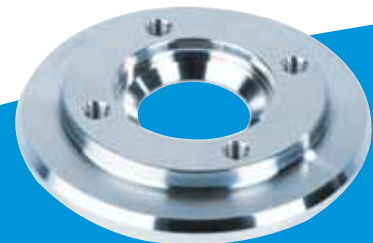
Pneumatic actuators include a visual valve status indicator by default. Alternatively, visual indicators can be replaced by an open feedback unit or by using the adequate adaptor plate with a T.VIS® control and feedback system in various executions.



VESTA® tank-bottom valve with one-piece housing



VESTA® tank-bottom valve with loose flange



Housing connection flange

VESTA® TANK-BOTTOM VALVES WITH CIP/SIP SIDE VALVE

VESTA® tank-bottom valves can be executed with an additional side valve. This option impresses with its compact design and ideal cleanability, which significantly contributes to process optimization. The side valve can be used for CIP/SIP supply as well as for drainage.

Housing

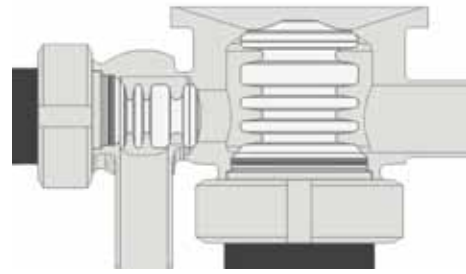
The valve seat of the side valve is directly integrated into the side wall of the tank-bottom housing. Therefore, the additional lateral entry can be sealed free of dead space. All options available for the regular VESTA® tank-bottom valves are also applicable with this solution.

Internal assembly

The PTFE bellow for the side valve is always executed with a flat seat area, and due to the housing depth the seat area has an extended cone. In total, the bellow is therefore slightly longer than bellows for VESTA® shut-off valves and valve blocks.

Actuation and Control

All options of the VESTA® valve line in terms of actuation and control are also available for the side valve. Therefore, VESTA® tank-bottom valves with a side valve can ideally be adapted to process conditions.



Sectional view of VESTA® tank-bottom valve with CIP/SIP side valve



VESTA® tank-bottom valve with CIP/SIP side valve

VESTA® SAMPLING VALVES

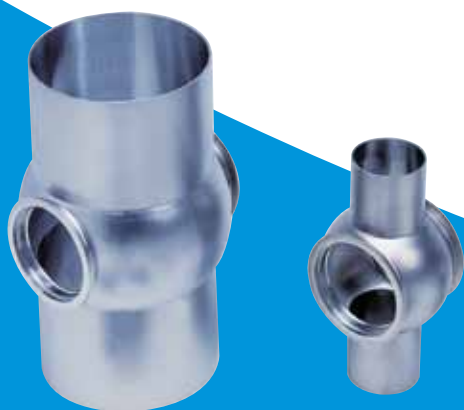
VESTA® sampling valves are used for sampling from product pipelines or vessels. VESTA® sampling valves impress with their modular structure as well as their dead-space-free and compact design. Furthermore, the optimized flow design offers an ideal basis for efficient CIP/SIP processes.

Housing

Housings for VESTA® sampling valves can either be executed with a housing connection flange or with a VARINLINE® transfer housing. On the extraction side, valve housings with one (execution L) or two (execution T) connection ports are available. The connection ports on the extraction side are available in three different pipe classes and two nominal diameters each:

Pipe class	Available nominal diameters
DIN – pipe class DIN 11866, series A	DN 10 / DN 15
OD – pipe class ASME BPE, series C	OD 0.5" / OD 0.75"
ISO – pipe class DIN EN ISO 1127, series B	DN 10 / DN 15

The housing connection flange is used for the flush-mounted, dead-space-free adaption of VESTA® sampling valves in the vessel wall or in the dished vessel end. The T-flange is used for installations in dished vessel ends with up to 8 mm wall thickness. The U-flange is designed for installations in vessel walls and for any wall thickness greater than 8 mm. Process integration via a VARINLINE® housing can be achieved with process connections of different sizes; the housing for the process line is always designed for media transfer.



VARINLINE® housings

Internal assembly

The PTFE bellows for VESTA® sampling valves distinguish themselves from others by an extended cylindrical section in the seat area. Furthermore they always have a flat end towards the product pipeline.



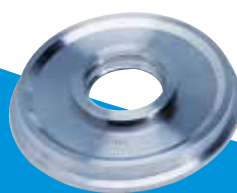
Sectional view of VESTA® sampling valve execution L with VARINLINE® housing

Actuator

The actuator can be executed pneumatically or manually. The manual version is made of plastic in all cases. Pneumatic actuators are available in plastic or stainless steel, and the fail-safe (normally close or normally open) position can be easily reversed.

Control and feedback systems

Pneumatic actuators include a visual valve status indicator by default. Alternatively, visual indicators can be replaced by an open feedback unit or by using the adequate adaptor plate with a T.VIS® control and feedback system in various executions.



T-flange



U-flange

Adaption to VARINLINE® housing

Available process connections:

Process connection	Available nominal diameters
F DN 25	DN 25 / OD 1" / ISO 33,7
N DN 50/40	DN 40 – 150 / OD 1.5" – 6" / ISO 42,4 – 114,3

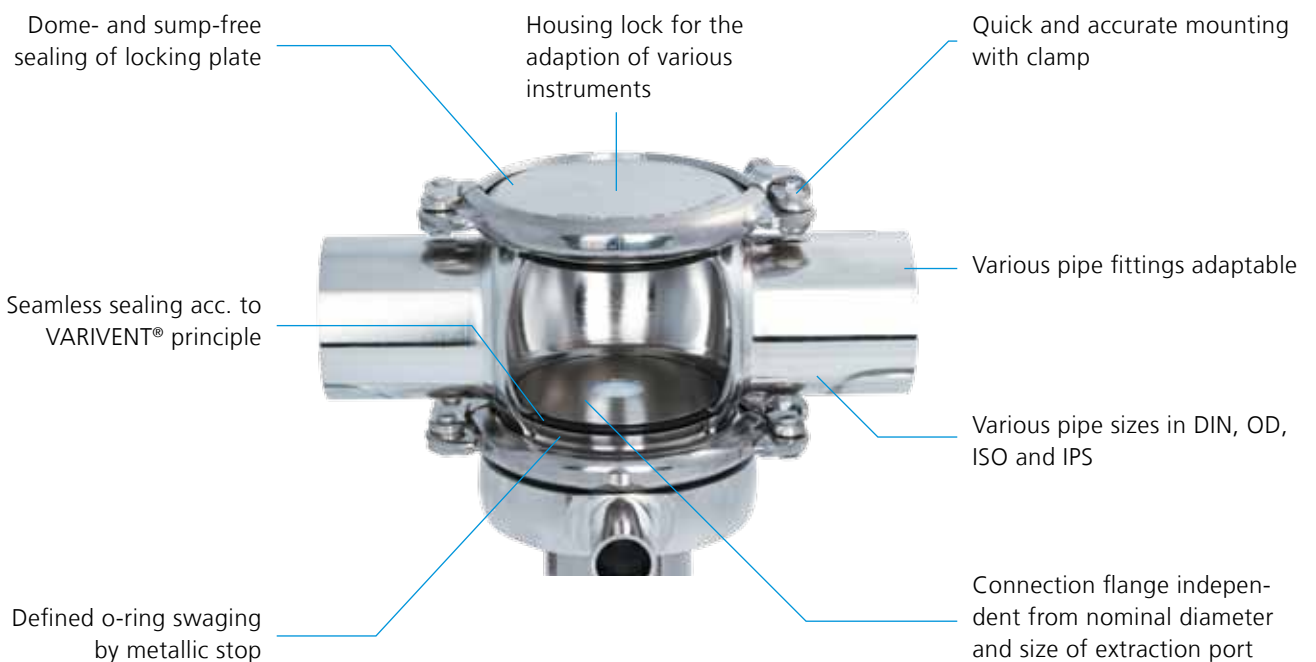
The VARINLINE® housing and its application

The VARINLINE® housing is the universal link between measuring, control or monitoring devices and the process installation. The consequent use of VARINLINE® housings provides the following advantages:

- A VARINLINE® housing is available with up to two process connections. This enables the integration of two instruments or, respectively, valves in the same housing
- The targeted positioning of VARINLINE® housings at critical points in a processing plant enables the retrofit of various instruments without additional welding work.
- VARINLINE® housings can be used as sight glasses by applying locking plates made of glass.



VESTA® sampling valve with VARINLINE® housing



VESTA® VALVE BLOCKS

VESTA® valve blocks are compact and versatile sterile valves with two independent actuators. The concept of the single-piece housing enables merging, separating or diverting of product flow in tight space conditions.

VESTA® valve blocks offer optimized piping by simultaneously reducing dead spaces. The significantly reduced pipe volume and the improved drainability are other characteristic features. In contrast to concepts with individual valves, solutions with VESTA® valve blocks reduce the required quantity of fittings and therefore also contribute to economical installation concepts.

With VESTA® valve blocks a number of various applications can be achieved either as an individual valve block or with multiple valve blocks for complex product distribution tasks.



VESTA® valve block type HWA



VESTA® valve block type HXA

Housing

VESTA® valve blocks are available with three (type HWA) or four (type HXA) connection ports by default. With the type HXA the intermediate chamber is executed for media transfer. The single-piece housing includes three sections and is produced from one solid piece. Further housing configurations are available upon request.

Internal assembly

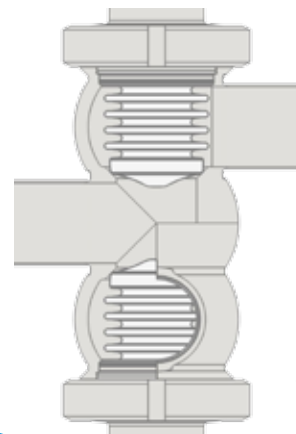
The PTFE bellows are identical with those for VESTA® shut-off valves. Bellows up to DN25, OD 1" and ISO 33,7 include a tapered tip. All other valve dimensions include a regular flat seat area.

Actuator

Both actuators can be executed pneumatically or manually. The manual version is made of plastic in all cases. Pneumatic actuators are available in plastic or stainless steel, and the fail-safe (normally close or normally open) position can be easily reversed. Differential configurations of the two actuators are possible.

Control and feedback systems

Pneumatic actuators include a visual valve status indicator by default. Alternatively, visual indicators can be replaced by an open feedback unit or by using the adequate adaptor plate with a T.VIS® control and feedback system in various executions.



Sectional view of VESTA® valve block type HWA

GENERAL TECHNICAL DATA

Area of application

Operating pressure:	max. 10 bar
Control air pressure:	Actuator NC – min. 5 bar, max. 10 bar Actuator NO – min. 5 bar, max. 6 bar
Operating temperature:	–10 °C up to max. 135 °C
Sterilization temperature:	max. 150 °C for 60 minutes

Materials

Product-wetted:	Housing, 1.4435 / AISI 316L; Bellow, TFM 1705, (PTFE)
Non-product-wetted:	Actuators made of plastic, polyphenylene sulfide (PPS) Actuators made of stainless steel, 1.4301/ AISI 304

Surface quality

Inner:	$R_a \leq 0.8 \mu\text{m}$ (Standard), $R_a \leq 0.6$ oder $R_a \leq 0.4 \mu\text{m}$ (optional)
Outer:	Machined (housing and stainless steel actuator) Actuators made of plastic – surface structure acc. to VDI 3400, roughness 30

Nominal diameters

DIN – DN 10 to DN 65; Outside diameter acc. to DIN 11850, series 2 / DIN 11866, series A
 ISO – ISO 13,5 to ISO 76,1; Outside diameter acc. to DIN EN ISO 1127 / DIN 11866, series B
 OD – OD 0,5" to OD 3"; Outside diameter acc. to ASME BPE / DIN 11866, series C

Certification housing

The following certificates are available upon request

- Housing with material certificate 3.1 acc. to EN 10204
- Measuring report of surface roughness acc. to EN 10204
- Measuring report of delta ferrite content acc. to EN 10204, optional

Material certificates for PTFE bellow

- Acc. to FDA regulations 21 CFR § 177.1550 and 3-A 20–25
- Acc. to USP class VI
- Acc. to Article 3 of regulation EC 1935/2004
- Acc. to BfR LII and LFGB § 2 Section (6), Nr. 1+5
- Free of animal derived ingredients and phthalates (ADCF, TSE/BSE)

Connection ports

Weld ends by default. Other fittings available upon request.

Identification

Nameplate



We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA is a global technology company with multi-billion euro sales operations in more than 50 countries. Founded in 1881 the company is one of the largest providers of innovative equipment and process technology. GEA is listed in the STOXX® Europe 600 Index. In addition, the company is included in selected MSCI Global Sustainability Indexes.

GEA Switzerland

GEA Aseptomag AG

Industrie Neuhof 28

3422 Kirchberg, Switzerland

Tel +41 34 4262929

Fax +41 34 4262928

sales.switzerland@gea.com

gea.com