

VESTA Sterile Valves



Pure valve technology by Tuchenhagen

VESTA sterile valves



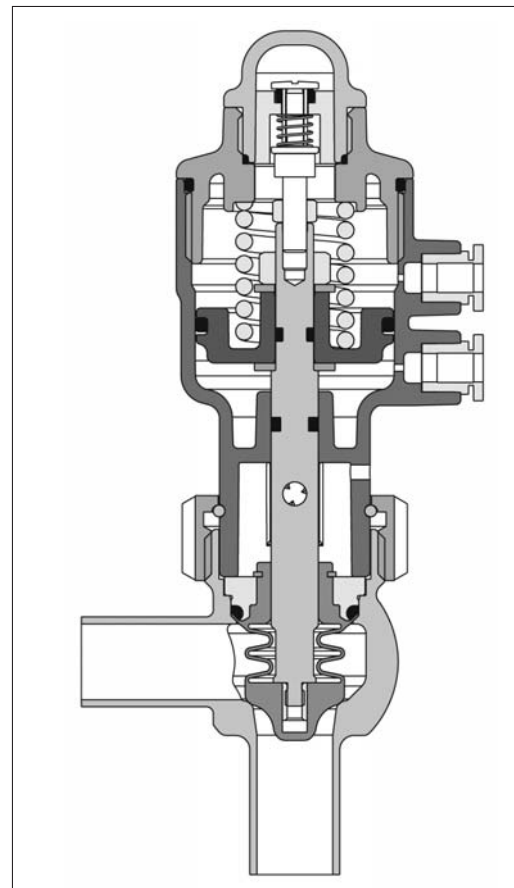
With its VESTA sterile valve series, Tuchenhagen offers the first practical, cost-effective alternative to diaphragm valves. The full benefits of VESTA sterile valves, both technical and economic, have yet to be fully realised as new applications become apparent. VESTA sterile valves fully meet the operational requirements for processes at the highest level, comply with the strictest safety regulations and provide a high quality product.

High demands are placed on process components for the pharmaceutical, biotech, cosmetics and food industries if the highest process reliability and product quality are to be achieved. Directives/regulations such as FDA, cGMP and EHEDG; and terms like qualification and validation are gaining more and more importance.

Innovative, valve concept

The VESTA sterile valve from Tuchenhausen now provides the market with a valve series which is suitable for applications from laboratory up to highly complex process plants. VESTA sterile valves prevent product contamination from the outside, ensure that the process system stays free of germs. VESTA sterile valves have the following design benefits:

- Pocket-free design, without domes and sumps
- Valve body drains completely in straight pipes
- PTFE bellows as shut-off element for universal applications
- High service life of the PTFE bellows
- A patented bellows sealing system hermetically, safely and permanently seals off the valve against the atmosphere
- Compact design due to newly developed actuator systems
- Reliable CIP/SIP cleaning thanks to optimised flow characteristics
- Hygienic outer design, meets EHEDG/cGMP standards
- Simple and safe maintenance



VESTA sterile valves

Size – the deciding

The VESTA sterile valve series now makes these different sizes available for the different pipe standards.

DIN – pipe standard DIN 11866, series A - DN 10; 15; 20 and 25

OD – pipe standard ASME BPE 2005 - 1/2"; 3/4" and 1"

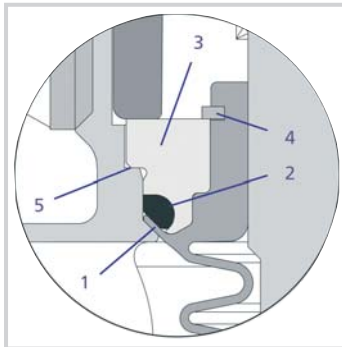
ISO – pipe standard DIN EN ISO 1127 - 13,5x1,6; 17,2x1,6; 21,3x1,6; 26,9x1,6 and 33,7x2

The PTFE bellows – the heart of the valve

The heart of the VESTA sterile valve is the PTFE bellows made of TFM 1705. Apart from its outstanding chemical resistance to almost all types of media, TFM 1705 is approved in accordance with the Code of Federal Regulations, Title 21 § 177.1550 "Perfluorcarbon resins" of the Food and Drug Administration (FDA).

The high-quality surface ($R_a \leq 0.8 \mu\text{m}$); the gap-free, hermetic seal; and the special design for optimum CIP/SIP cleaning are the characteristic features.

The patented Tuchenhausen bellows sealing system ensures that the valve interior is permanently and hermetically sealed off against the atmosphere, even during critical phases of the process.



The unique features of this bellows sealing system:

- 1 Sealing by a thin-walled sealing diaphragm
- 2 Permanent compression by an elastomer O-ring
- 3 Under excess pressure conditions, product forces are compensated by a metallic thrust collar
- 4 Under vacuum conditions, protection is provided by a circlip
- 5 Defined pretension by metallic stop



The valve body – a variable basis

The valve bodies of the VESTA series are made of solid material and are available in 1.4435 (AISI 316L). Valve bodies are generally supplied with a material certificate according to EN 10204/3.1 and have markings in accordance with AD data sheet A4.

All valve bodies are fitted with pipe sockets that are suitable for orbital welding using orbital cartridge systems.

In addition to body types L+B (2 sockets) and T (3 sockets), other body variants are available for special applications.

Actuators made of synthetic material and stainless steel – *a real novelty*

Tuchenhagen offers novel single-acting pneumatic actuators made of synthetic material for automated processes. The actuator system is made of the high-performance material PPS. This material has a good chemical resistance, is temperature resistant up to 180 °C, has good mechanical properties and is highly resistant to ageing.

The actuator system is easy to maintain. Thanks to the special design, there is no risk of spring tension being relieved during dismantling. The actuator action is reversible, conversion from spring-to-close to spring-to-open or vice versa is possible and can be done easily on site.

Pneumatic actuators of the VESTA series are already provided with integrated air connections for plastic hoses, dia. 6x1 mm/1/4".

Visual detection of the valve position is possible. A relief hole separates actuator and product cavity, thus preventing contamination, and serves as a leakage outlet in the event of actuator defects or breakage of the bellows.

VESTA sterile valves from Tuchenhagen are also available with a pneumatic actuator made of stainless steel, with the same design features as the PPS actuators. Stainless steel actuator versions that are suitable for autoclave sterilization are available on request.



Manual actuators – *simple and ingenious*

VESTA sterile valves with manual actuator are available for manual processes. The special feature here is the design of the manual actuator. An integrated spring package ensures defined compression of the PTFE bellows seal in the closed position and prevents unintended deformation of the bellows. The spring force only becomes effective shortly before the closed position is reached; in intermediate positions, manual valves can be operated with the lowest effort. Any alteration of the bellows' seat contour due to influences by the process will not cause leaks – the spring automatically adjusts. VESTA sterile valves with manual actuator can be provided with a lead seal.



VESTA sterile valves

Optional equipment – *full of variants*

The T.VIS® V-1 is an electrical position indicator with feedback signals and optionally integrated solenoid valves.

Automated end position programming can be activated alternatively using the buttons or the programming input (integrated as a standard) in just a few seconds.



The T.VIS® P-1 is a small, compact position controller for pneumatic valves and corresponds to the design of the T.VIS® V-1. By specifying a setpoint (4-20 mA), transferred e.g. by the PLC, the process valve can be brought to any position. The position is detected by a position sensor with a resolution of 0.01 mm and adjusted by 2 integrated solenoid valves.

Service and maintenance – *the great strength*

A major feature is the easy on-site service and maintenance. For routine inspections or replacing the PTFE bellows simply release the groove nut, remove the complete



valve insert from the body – and that's it. VESTA sterile valves do not have any loose fixing elements, the groove nut is connected with the valve insert. All service work can be performed with standard tools no matter whether you are replacing the bellows or servicing the actuator systems.

Hygienic design – *also from the outside*

Special attention was paid by Tuchenhagen to hygienic outer design when developing the VESTA sterile valves. The design of the closed lantern, with self-draining surfaces (without cavities or gaps) irrespective of the valve installation position, ensures a lasting, hygienic valve exterior.

Surface quality – a important factor

In sterile processes, the high quality of the surfaces is the basic requirement for a safe and reliable process. In product contact areas, VESTA sterile valves generally have an inner surface roughness of $R_a \leq 0.8 \mu\text{m}$ (optionally electropolished); the outer surfaces have bright/finish-ground finish. Higher-grade surfaces are available on request. VESTA sterile valves are also suitable for use in cleanrooms.

Repeatable manufacturing quality – another quality characteristic

VESTA sterile valves are produced in accordance with the highest quality standards. This is ensured by Tuchenhausen's quality assurance system, which is certified according to DIN ISO 9001.

Permanent quality tests in the workshop, marking of all components, valve identification by means of type plate, are among the features that ensure a



constantly high quality level and enables reliable tracing.

VESTA sterile valves can be supplied by Tuchenhausen with certificates for the following quality characteristics:

- Body with material certificate acc. to EN 10 204 (on request 3.1)
- Surface roughness documented by factory test certificate acc. to EN 10 204 (on request 3.1)
- Delta ferrite content documented by works certificate acc. to EN 10 204 (on request 3.1)
- Bellows material certificated according to EN 10 204; conform to FDA 21 § 177.1550 (on request EN 10 204/3.1)
- Certificate for PTFE bellows (TFM 1705) as verification of biocompatibility according to USP Class VI (on request)

Technical data

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|-----------------------------|--------------------------|-----------------------------|---------------------------------------|
| • Product contact parts | | • Operating pressure | max. 6 bar |
| - body | 1.4435/ AISI 316L | • Control air pressure | |
| - PTFE bellows | TFM 1705 | | Actuator NC - min. 5 bar, max. 10 bar |
| • Non-product contact parts | | | Actuator NO - min. 5 bar, max. 6 bar |
| - Synthetic actuators | Polyphenylensulfid (PPS) | • Operating temperature | max. 135° C |
| - Stainless steel actuators | 1.4301/ AISI 304 | • Sterilisation temperature | max. 150° C |

VESTA Sterile valves in process applications

