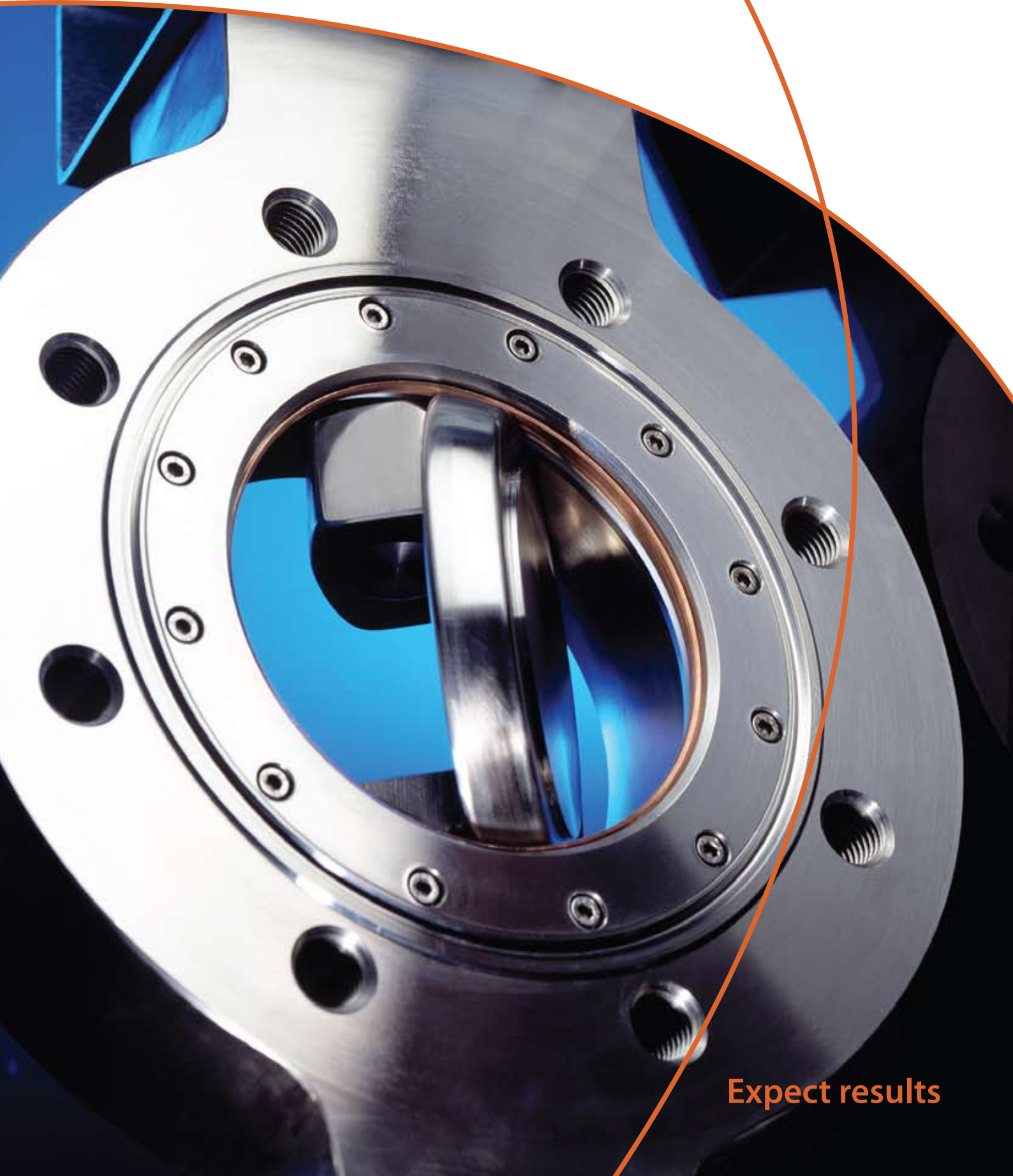
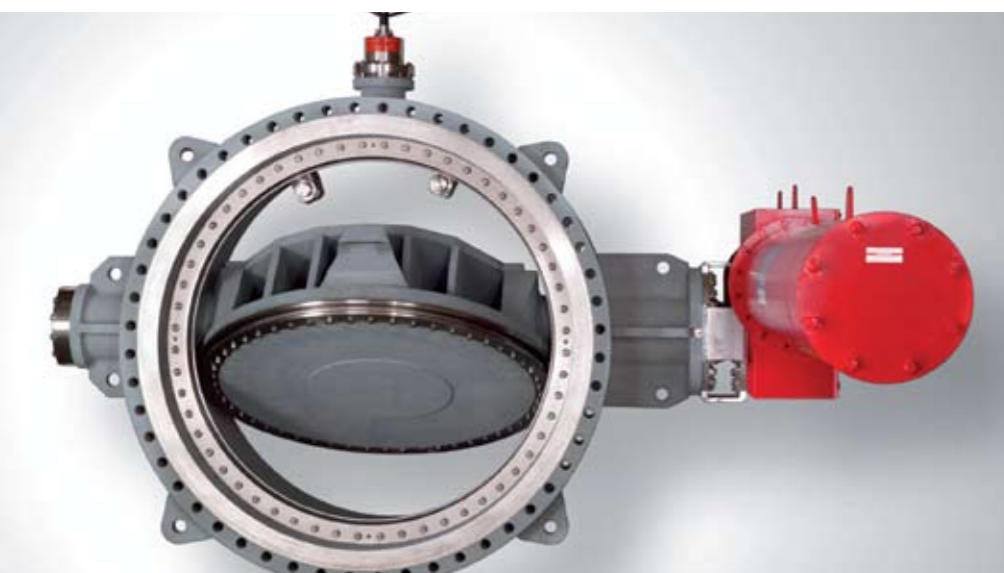


MAPAG butterfly valves
Range of Products



Expect results



An extensive list of references proves the reliability and economy of the complete range of MAPAG's products.

Metso Automation's MAPAG product line offers engineered valve solutions

- superior sealing element lifetime speciality selected materials and body mounting provide protection from erosion
- bubble tight testing to API 598
- emission prevention-qualified stuffing box design and live loaded to exceed requirements of US Clean Air Act Amendment and Germany's TA-Luft
- casting quality-foundry methods qualified to ANSI B 16.34 (DIN EN 1559-1)
- industry best flow coefficient special shut-of disk design

Product Range – Butterfly Valves

The current range of butterfly valves covers operating temperatures from $-270\text{ }^{\circ}\text{C}$ ($-454\text{ }^{\circ}\text{F}$) up to $+1450\text{ }^{\circ}\text{C}$ ($+2642\text{ }^{\circ}\text{F}$) and pressure from vacuum up to 400 bar (CL 2500). The butterfly valve diameter sizes range from 50 mm (2 inch) up to 2500 mm (100 inch) in different materials.

The pneumatic actuators have a proven record of success in control and safety driven applications operating with torques up to 60 000 Nm (531 000 lb/inch).



Applications

MAPAG's products are used across a wide spectrum of industry, for example, chemical and petrochemical, natural gas, offshore and LNG, as well as nuclear and conventional power stations. The products include a special range for "safety critical" applications for example fire and earthquake shut-down systems, which are all patented as well as special "rapid closing emergency shut-down valves".

Research, development and design

In addition to the standard production range MAPAG is able to offer turn-key solutions for difficult problems.

New products are designed using CAD-CAM systems. They are fully tested and the design is optimized through computer simulation thus ensuring their reliability.

Production

MAPAG has a modern computer-controlled production process, ensuring the products meet the exact specifications and highest quality.

Quality

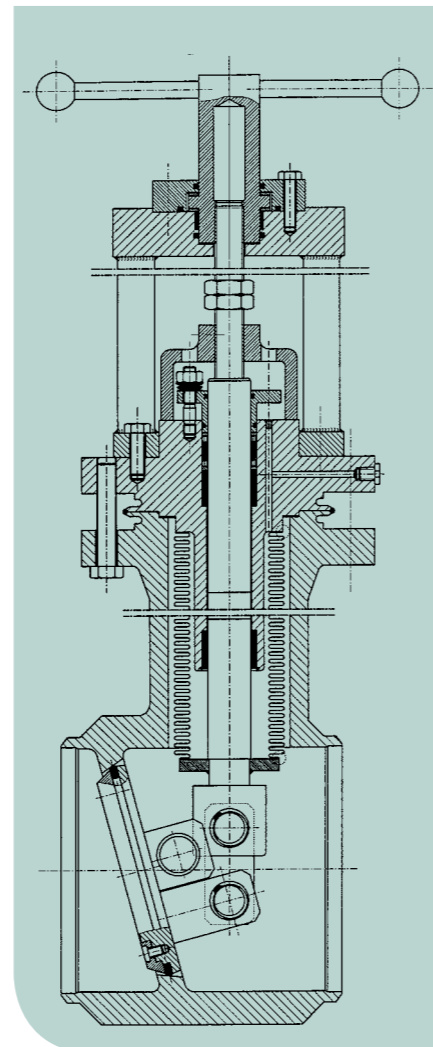
MAPAG is operating its own quality management systems according to ISO 9001 (EN 29001), certified by the accredited body. Pressure equipment directive 97/23/EC module H and module H1.

Service

Maintenance can be carried out at the customer's plant by fully qualified technicians, or if necessary at MAPAG works.


References

An extensive list of international references proves the reliability and the economy of the complete range of MAPAG's products.




Cross sectional view of a MAPAG bellow sealed butterfly valve


High performance switch and control butterfly valves for hydrogen applications

Type: A	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 36 CL 150, 300, 600	Carbon Steel Stainless steel	-10 °C to 200 °C, 14 °F to 392 °F	Pressure swing adsorption plants: processing of refinery off-gases; recovery of high pressure hydrogen; up to 2 million cycles
Seat-Disc design no.: 4				


Bellow sealed butterfly valves

Type: C	Size and pressure range	Materials	Temperature range	Application
	NPS 6 - NPS 36 CL 150, 300, 600	Carbon Steel Stainless Steel Duplex SS Special Materials	-40 °C to 600 °C, -40 °F to 1 112 °F	Off-shore, toxic media, hot oil, nuclear power plants
Seat-Disc design no.: 1,2,4				


Flow control valves

Type: D	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600, 900, 1500, 2500	Carbon Steel Stainless Steel Duplex SS Al-Ni-Bronze Special Materials	-40 °C to 1450 °C, -40 °F to 2642 °F	For flow control, sulphur recovery, chemical plants, power plants, ethylene plants, desalination plants
Seat-Disc Design No.: (swing through + step seated design)				

Cryogenic flow control valves

Type: E	Size and pressure range	Materials	Temperature range	Application
	NPS 2 NPS 100 CL 150, 300, 600, 900, 1500, 2500	Stainless Steel Aluminium	-270 °C to 200 °C, -454 °F to 392 °F	For flow control in cryogenic media, LNG plants, air separation, liquid oxygen, nitrogen, helium and hydrogen, space exploration
Seat-Disc Design No.: (swing through + step seated design)				

Soft seated butterfly valves for high pressure applications

Type: G	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600, 900, 1500, 2500	Carbon Steel Stainless Steel Duplex SS Special Materials	-40 °C to 250 °C, -40 °F to 482 °F	Soft seated butterfly valve for high pressure applications; chemical plants, power stations, ethylene plants
Seat-Disc design no.: 4				

MAPAG lever valves

Type: H	Size and pressure range	Materials	Temperature range	Application
	NPS 8 - NPS 100 CL 150, 300, 600	Carbon Steel Stainless Steel Duplex SS Special Materials	-40 °C to 600 °C -40 °F to 1 112 °F	Valve opens at precise pressure differential without use of separate monitoring. Air separation, chemical plants, cement and steel, industry, safety valve
Seat-Disc design no.: 12				

Cryogenic butterfly valves

Type: K	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600, 900, 1500, 2500	Stainless Steel Aluminium	-270 °C to 200 °C, -454 °F to 392 °F	Cryogenic and LNG applications, air separation, nitrogen, helium and hydrogen, space exploration
Seat-Disc design no.: 5, 9				


Nuclear butterfly valves

Type: N	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 36 CL 150, 300, 600, 900, 1500, 2500	Stainless Steel Aluminium	-10 °C to 200 °C 14 °F to 392 °F	Nuclear and fossil power stations
Seat-Disc design no.: 4				


High performance butterfly valves for oxygen recovery

Type: O	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 36 CL 150	Carbon Steel Stainless Steel	-10 °C to 200 °C, 14 °F to 392 °F	Pressure swing adsorption plants for low pressure oxygen and nitrogen in up to 2 million cycles with opening and closing time <1 s
Seat-Disc design no.: 4				


Combined non-return and shut-off valves

Type: R	Size and pressure range	Materials	Temperature range	Application
	NPS 8 - NPS 100 CL 150, 300, 600	Carbon Steel Stainless Steel Duplex SS Special Materials	-40 °C to 600 °C, -40 °F to 1 112 °C	Fire-fighting, seawater in petrochemical plants, oxygen for blast furnaces, chemical plants, power plants
Seat-Disc design no.: 1				


Standard butterfly valves

Type: S	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600	Carbon Steel Stainless Steel Duplex SS Special Materials	-40 °C to 350 °C, -40 °F to 662 °F	Standard butterfly valves with: EPDM, VITON, PTFE and metal seating for general application
Seat-Disc design no.: 1, 3, 4				

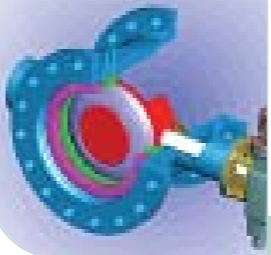
Metal seated butterfly valves for high pressure applications

Type: W	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600, 900, 1500, 2500	Carbon Steel Stainless Steel Duplex SS Special Materials	-40 °C to 1450 °C, -40 °F to 2642 °F	High pressure applications in power plants, ethylene plants, refineries, aero engines, chemical plants, slurries, polymerizing fluids, styrene, acrylic acid, natural gas
Seat-Disc design no.: 1, 6				


High performance valve with double block and bleed sealing system

Type: Y	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600, 900, 1500, 2500	Carbon steel Stainless steel Duplex SS Special materials	-40 °C to 1 000 °C, -40 °F to 1 832 °F	Alternative for ball valves in power plants, ethylene plants, refineries, aero engines, chemical plants, slurries, polymerizing fluids, styrene, acrylic acid, natural gas
Seat-Disc design no.: 2, 7, 8, 10				

Double block and bleed with steam purging

Type: MAPABLOC	Size and pressure range	Materials	Temperature range	Application
	NPS 6 - NPS 100 CL 150, 300	Carbon steel	-40 °C to 600 °C, -40 °F to 1 112 °F	Ethylene plants, transfer line valve and decoking valve
Seat-Disc: Double block and bleed with steam purging				

Safety shut-off system

Type: SH	Size and pressure range	Materials	Temperature range	Application
	NPS 4 - NPS 100 CL 150, 300, 600	Carbon steel Stainless steel Duplex SS	-40 °C to 600 °C, -40 °F to 1 112 °F	Natural gas and critical applications
Seat-Disc design: no.: 8				


4 way valves

Type: 4W	Size and pressure range	Materials	Temperature range	Application
	NPS 8 - NPS 100 CL 150, 300, 600	Stainless Steel Special materials	-40 °C to 600 °C -40 °F to 1 112 °F	Sulphur recovery
Seat-Disc design no.: 11				


Valves designed for special applications


Type: X	Size and pressure range	Materials	Temperature range	Application
	NPS 2 - NPS 100 CL 150, 300, 600, 900, 1500, 2500	Carbon steel Stainless steel Duplex SS Titanium Hastelloy Aluminium-bronze, Special materials	-270 °C to 1450 °C, -454 °F to 2642 °F	Special design according to customer specification
Seat-Disc design no.: 11				

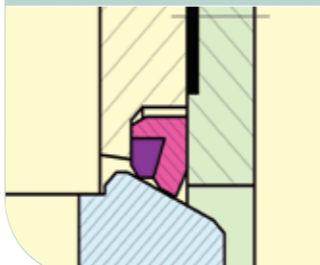
Valves designed for special applications

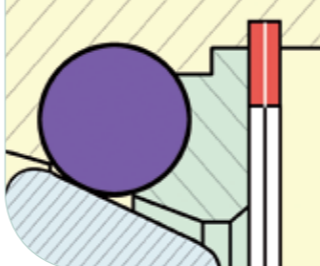
Type: A/F	Torque range	Materials	Action	Application
	up to 60 000 Nm (531 000 lb/inch)	Aluminium Carbon steel Stainless steel Special materials	double action, single action	On-off, control, safety
Pneumatic actuators				

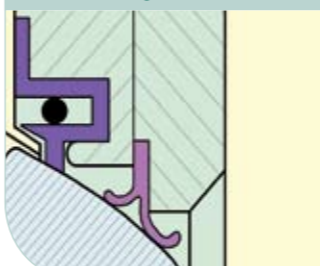
MAPAG is able to offer turn-key solutions for very challenging requirements.


Seat-disc design - number 1	High temperature to cryogenic
	<ul style="list-style-type: none"> • Metal sealing • - 200 °C to +1 000 °C • Pressure to ANSI 600 (100 bar) • Tested bubble tight (API 598) • Design tightness to ANSI/FCI 70-2 Class V • Variable material combinations • Fire safe design

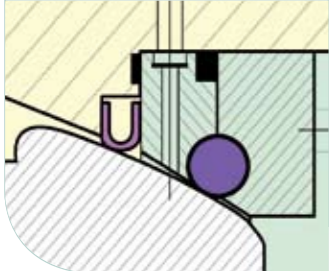
Seat-disc design - number 2	High pressure fire resistant design
	<ul style="list-style-type: none"> • Double Sealing • -40 °C to +250 °C • Pressure to ANSI 600 (100 bar) • Tested bubble tight (API 598) • Design tightness to ANSI/FCI 70-2 Class V & VI • Variable material combinations • Extremely tight sealing applications <ul style="list-style-type: none"> • Available for block and bleed • Fire safe design

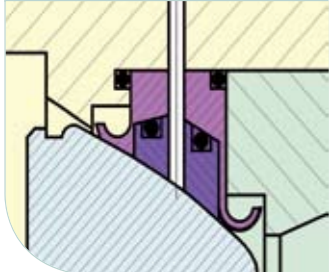
Seat-disc design - number 3	Compact seal for wafer valve
	<ul style="list-style-type: none"> • Double Sealing • -40 °C to +250 °C • Pressure to ANSI 300 (50 bar) • Tested double tight (API 598) • Design tightness to ANSI/FCI 70-2 Class V & VI • Extremely tight sealing applications

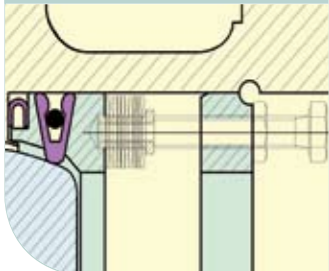
Seat-disc design - number 4	High pressure polymeric 'O' ring PTFE/Viton/EPDM/PEEK
	<ul style="list-style-type: none"> • -40 °C to +250 °C • Pressure to ANSI 600 (100 bar) • Bubble tight sealing as standard (API 598) • Design tightness to ANSI/FCI Class VI • Low torques small actuators • Nearly all known sealing material can be used


Seat-disc design - number 5	Flexible sealing system for cryogenic applications
	<ul style="list-style-type: none"> • Double Sealing • -254 °C to +100 °C • Pressure to ANSI (100 bar) • Design tightness to ANSI/FCI 70-2 Class VI • The flexible sealing system ensures that the sealing remains consistent and tight even when there is a rapid temperature change and a temperature differential within the butterfly valve

Seat-disc design - number 6	From high temperature to cryogenic, high pressures, slurries, polymerizing fluids, solid metal seat with hard faced option
	<ul style="list-style-type: none"> • Metal Sealing • -200 °C to +1000 °C • Pressure to ANSI 600 (100 bar) • Tested bubble tight (API 598) • Design tightness to ANSI/FCI 70-2 Class VI • Variable material combinations • Fire safe design

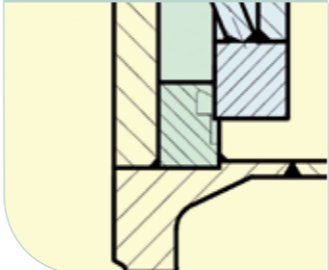
Seat-disc design - number 7	Block and bleed sealing systems
	<ul style="list-style-type: none"> • Double sealing with with block and bleed • -40 °C to +250 °C • Pressure to ANSI 600 (100 bar) • Design tightness to ANSI/FCI 70-2 Class V & VI • Variable material combinations • Extremely tight sealing for safety applications • Fire safe design

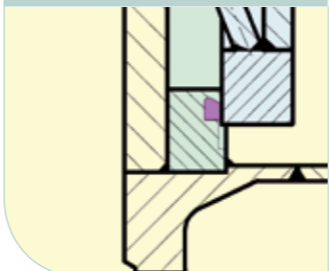
Seat-disc design - number 8	Fluid segregation
	<ul style="list-style-type: none"> • Double block and bleeding • -40 °C to +250 °C • Pressure to ANSI 600 (100 bar) • Tested double tight (API 598) • Design tightness to ANSI/FCI 70-2 Class VI • Variable material combinations • Fire safe design

Seat-disc design - number 9	Sealing system for cryogenic applications
	<ul style="list-style-type: none"> • Soft seat design • -273 °C to +200 °C • Pressure to ANSI (100 bar) • Design tightness to ANSI/FCI 70-2 Class VI • Because of optimal material pairing tight sealing is provided throughout the temperatur range.

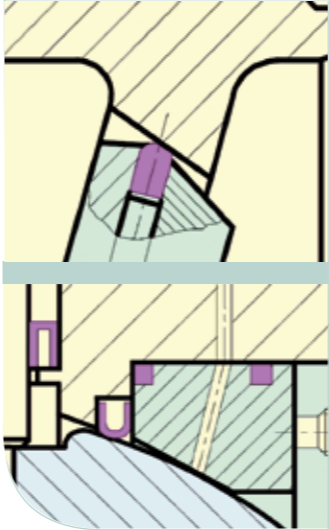
Seat-disc design - number 10	High pressure seat design
	<ul style="list-style-type: none"> • Metal Sealing • -40 °C to +1000 °C • Pressure to ANSI 2500 (400 bar) • Tested bubble tight (API 598) • Design tightness to ANSI/FCI 70-2 Class V & VI • Variable material combinations • Extremely tight sealing for safety applications • Fire safe design • Available for double block and bleed

Seat-disc design - number 12, seat-disc design for MAPAG lever valves

Soft seated design, PTFE/VITON/EPDM	
	<ul style="list-style-type: none"> • -40 °C to +250 °C • Pressure to ANSI 600 (100 bar) • Bubble tight design as standard • Design tightness to ANSI/FCI Class VI

Metal design	
	<ul style="list-style-type: none"> • -40 °C to +600 °C • Pressure to ANSI 600 (100 bar) • Tested bubble tight (API 598) • Fire safe design

Special seat design number X

Special seat design according to customer specification	
	

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