

6.12.1. Lined control valves

Lined control valves have gained more and more acceptance in recent years. Particularly valve bodies made of spheroidal graphite iron with PTFE or PFA lining will usually replace increasingly expensive and exotic materials. Figure 6.12.1.-1 shows a control valve with PFA lining and PTFE-bellows seal. The seat and plug are interchangeable as for a conventional valve. An additional safety stuffing box avoids leakages, if the PTFE-bellows should break or suffer a leak for any reason. All medium-exposed parts are, in this case, covered by a thick-wall, non-corroding synthetic fluorine material layer. The body made from spheroidal graphite iron ensures a sufficient strength and makes the considerable cost reduction possible.

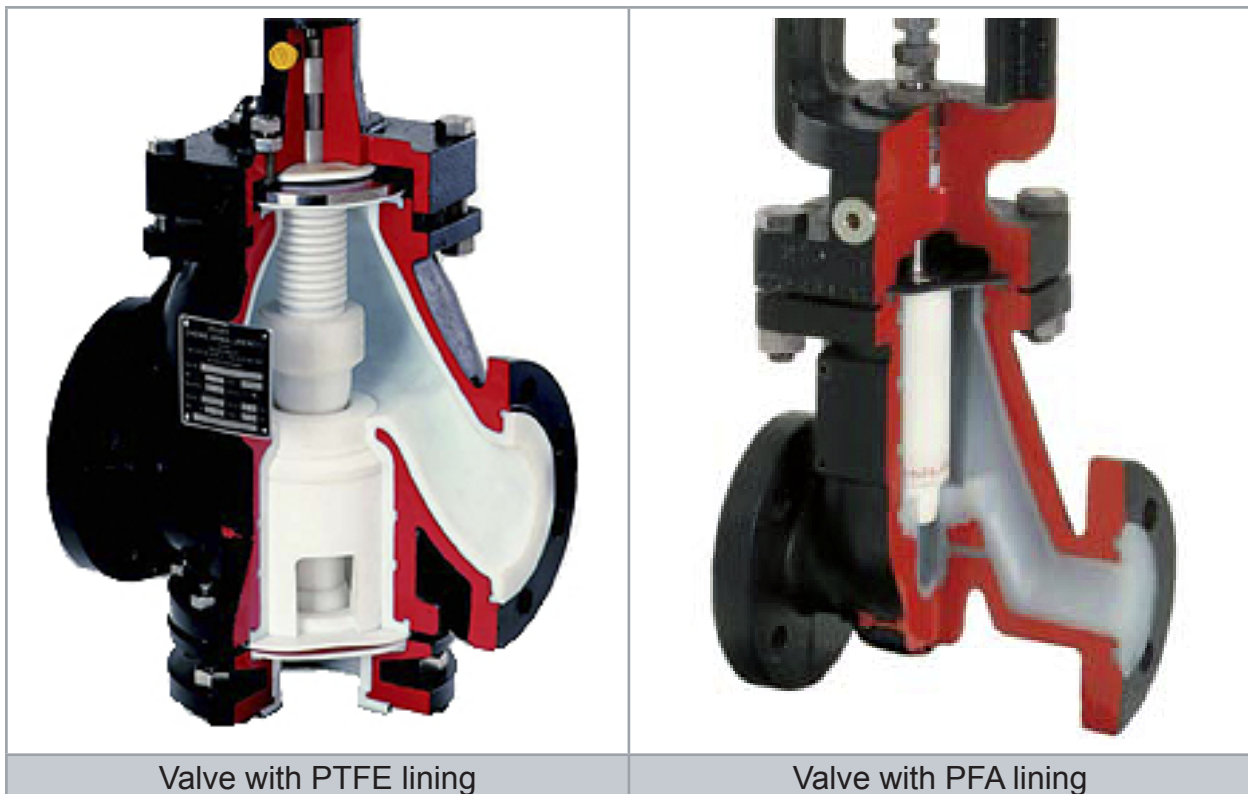


Figure 6.12.1.-1: Lined control valves

Universal material PTFE

Although a material employed for almost all media, PTFE is particularly resistant against chlorine and its compounds.

PTFE has been the first choice for our lined valves, especially with chlorine applications, for more than three decades. Further fluoroplastics such as linings of PFA may also be employed. In case of permeation, a greater wall thickness means everything.

As low-molecular media, such as chlorine in fluoroplastics, have a tendency to permeate and as influence factors such as density, crystallinity, cross-linking etc. are extremely difficult to vary, a greater wall thickness is the most economic solution.

One cannot totally do without metal.

The more than two decades of experience with valves in chlorine applications have led to diverse solutions in the choice of materials.

Special materials such as Tantalum, Hastelloy, Titanium, Zirconium, Inconel, Aluminium Oxide, Nickel etc. are employed in our valves as supplementary components respectively as an alternative.

German Clean Air Act (TA-Luft)

In order to fulfil the conditions concerning tightness to the atmosphere, our dynamic seals such as a maintenance-free cup spring live-loaded PTFE packing or the PTFE bellows in the standard version are ideally suited.

PTFE lining

The operating range is determined by the Pressure - Temperature - Diagram.

Process data and media can influence the values of the diagram. For process data above the limits of application please consult company Pfeiffer Chemie Armaturenbau GmbH¹.

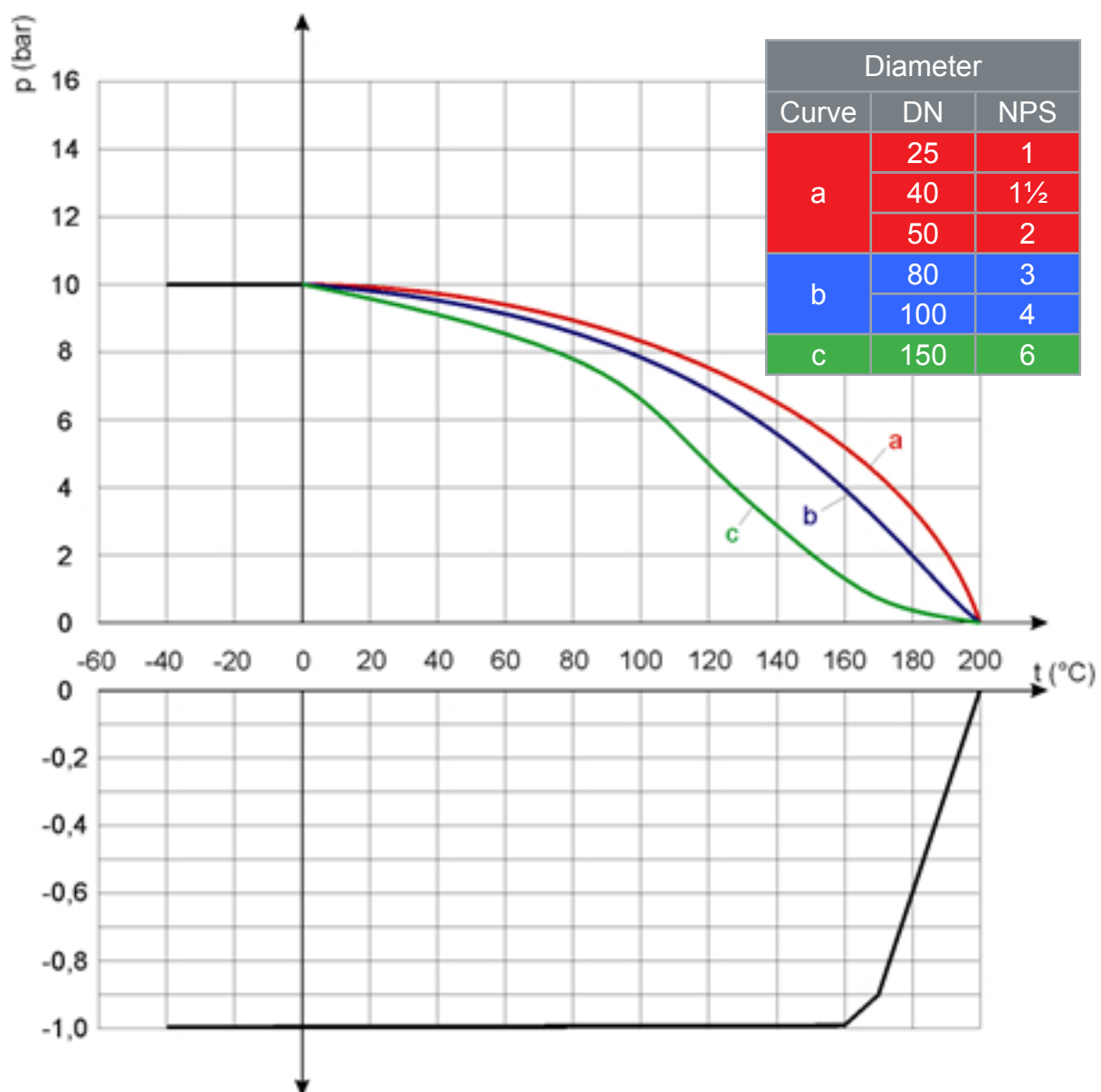


Figure 6.12.1.-2: PTFE Pressure-Temperature- Diagram

¹ <http://www.pfeiffer-armaturen.com>

PFA Lining

The operating range is determined by the Pressure - Temperature - Diagram.

Process data and media can influence the values of the diagram. For process data above the limits of application please consult company Pfeiffer Chemie Armaturenbau GmbH¹.

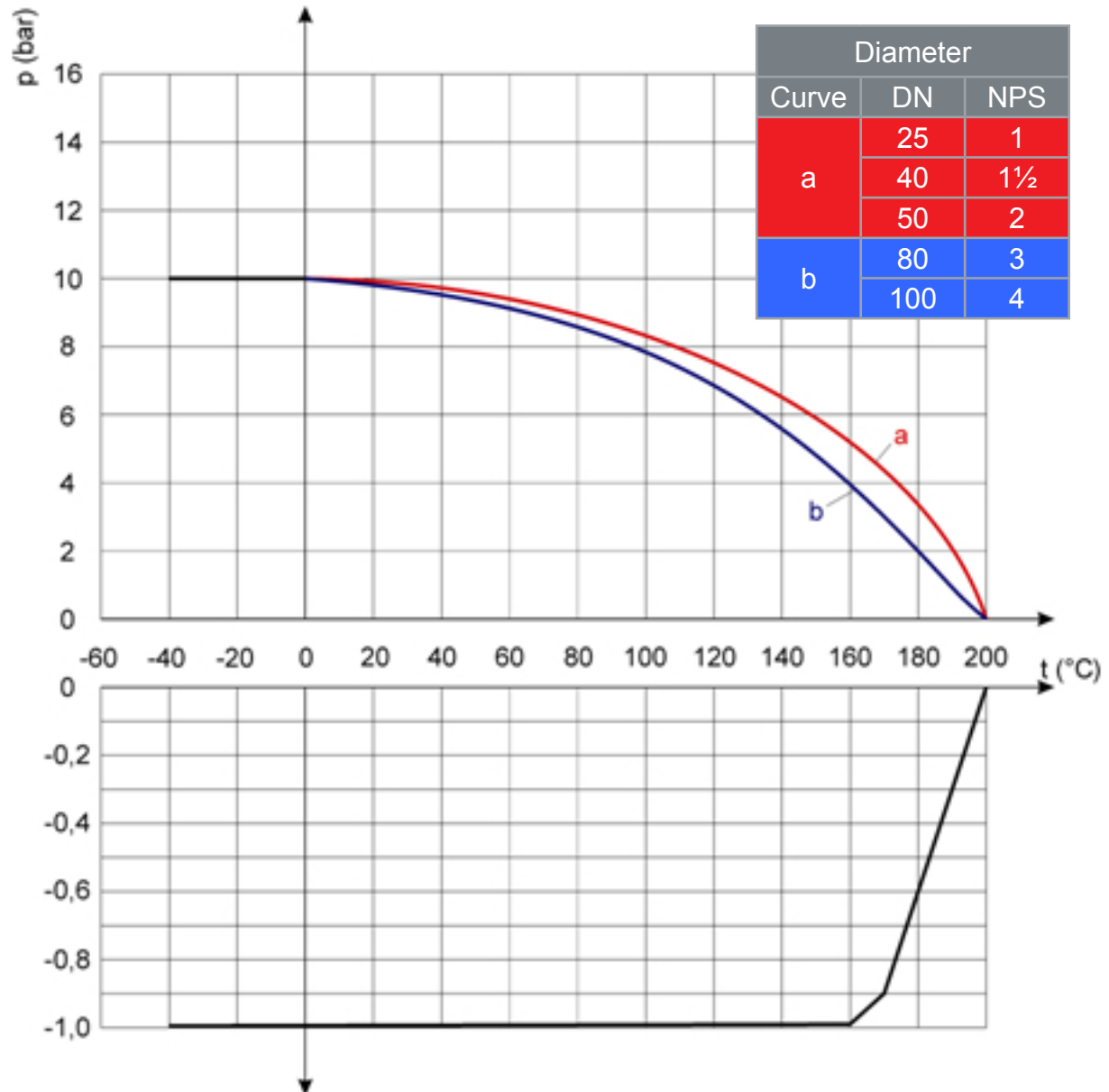


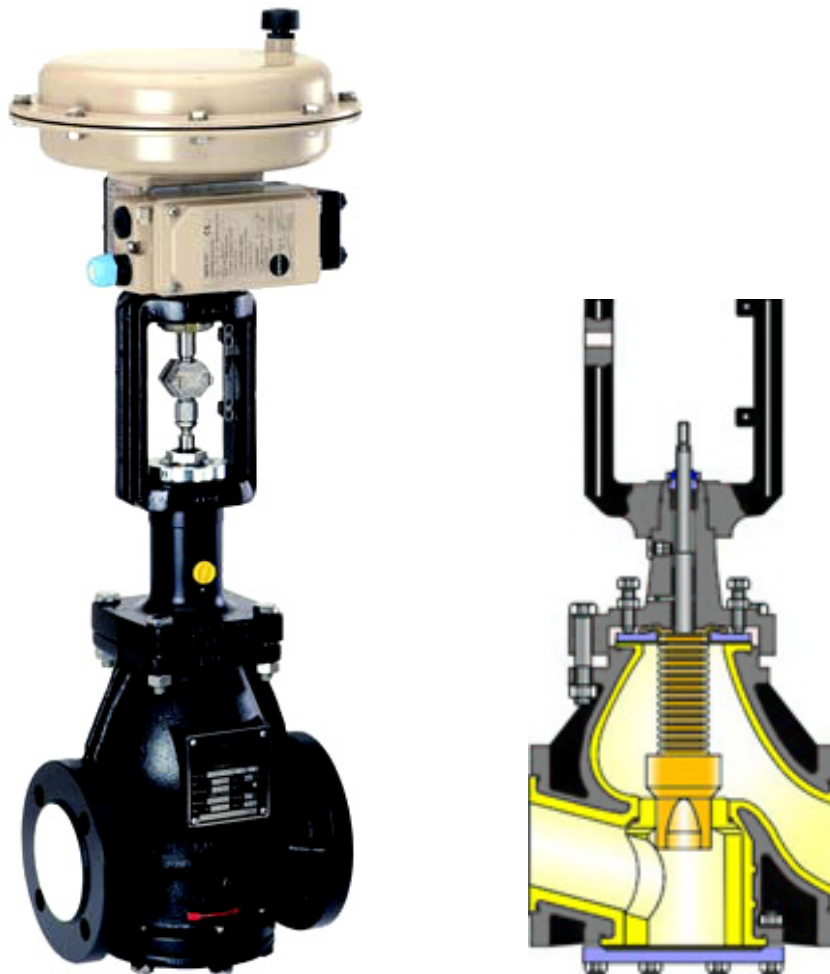
Figure 6.12.1.-3: PFA Pressure-Temperature- Diagram

Polymer Lining (PTFE & PFA Manufacturing)

Main Arguments:

- Economic savings.
- Broad spectrum of applications.
- In line with FDA (U.S. Food and Drug Administration) provision.

¹ <http://www.pfeiffer-armaturen.com>



Type	PTFE-lined Globe Control Valve Type 1a			
Application	PTFE-lined control valve for severely aggressive or corrosive media, especially for chemical processes.			
Valve data	Temperature: -40 to 200 °C (-40 to 392 °F)			
	Nominal size	Nominal pressure	C _v value	Lining
	DN 25 to 150 NPS 1 to 6	PN 10/16 ANSI Class 150	0.006 to 304	PTFE 5 to 8 mm thick
	Trim material: PTFE* optionally special material * when seat diameter 2 mm, only tantalum or other metals			
Technical data and accessories	The modular design of the control valves allows them to be equipped with various accessories: Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation.			
	For all further data and industry codes see the associated technical data sheet TB 01a_EN for details.			

Figure 6.12.1.-4: PTFE-lined Globe Control Valve Type 1a

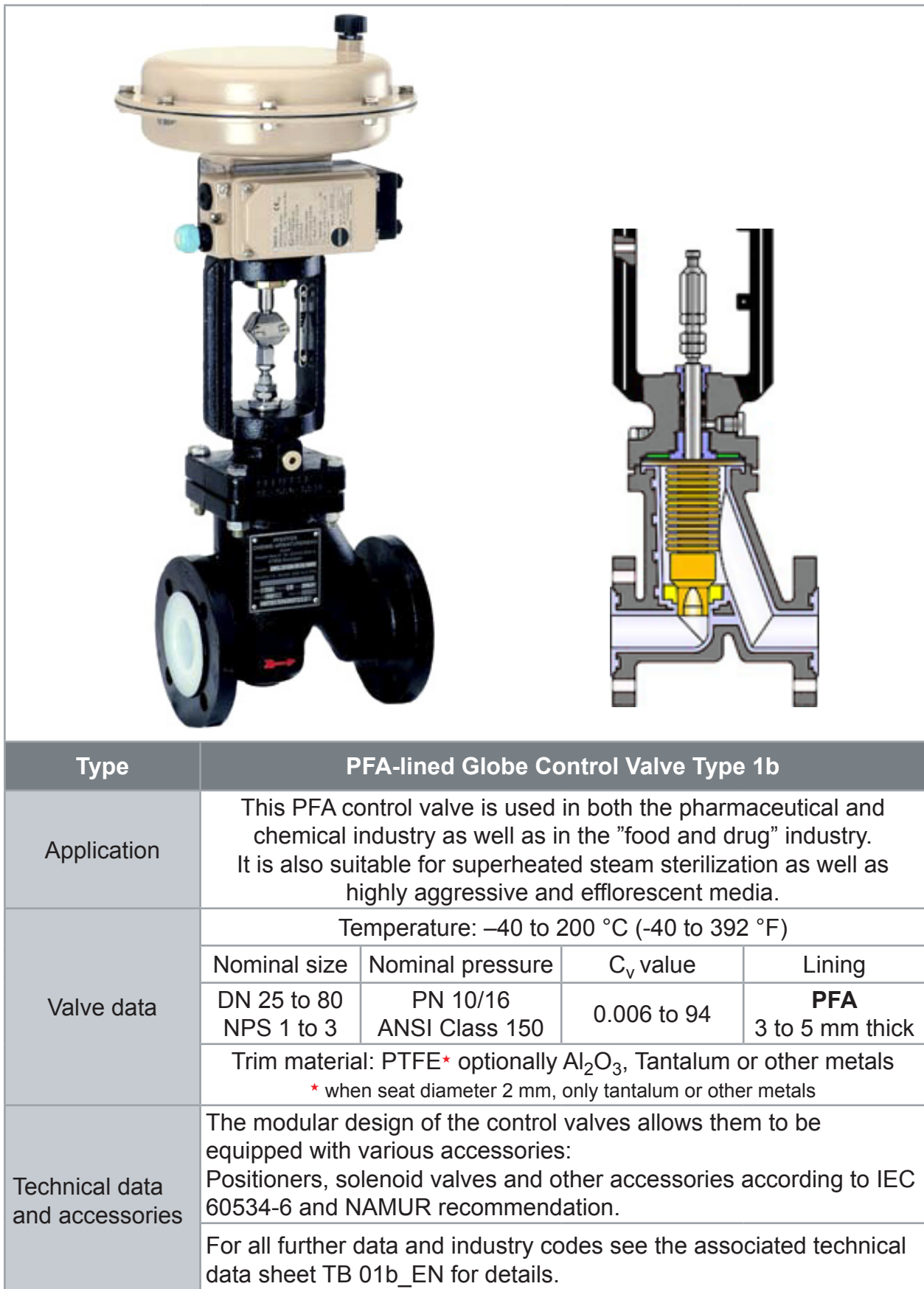
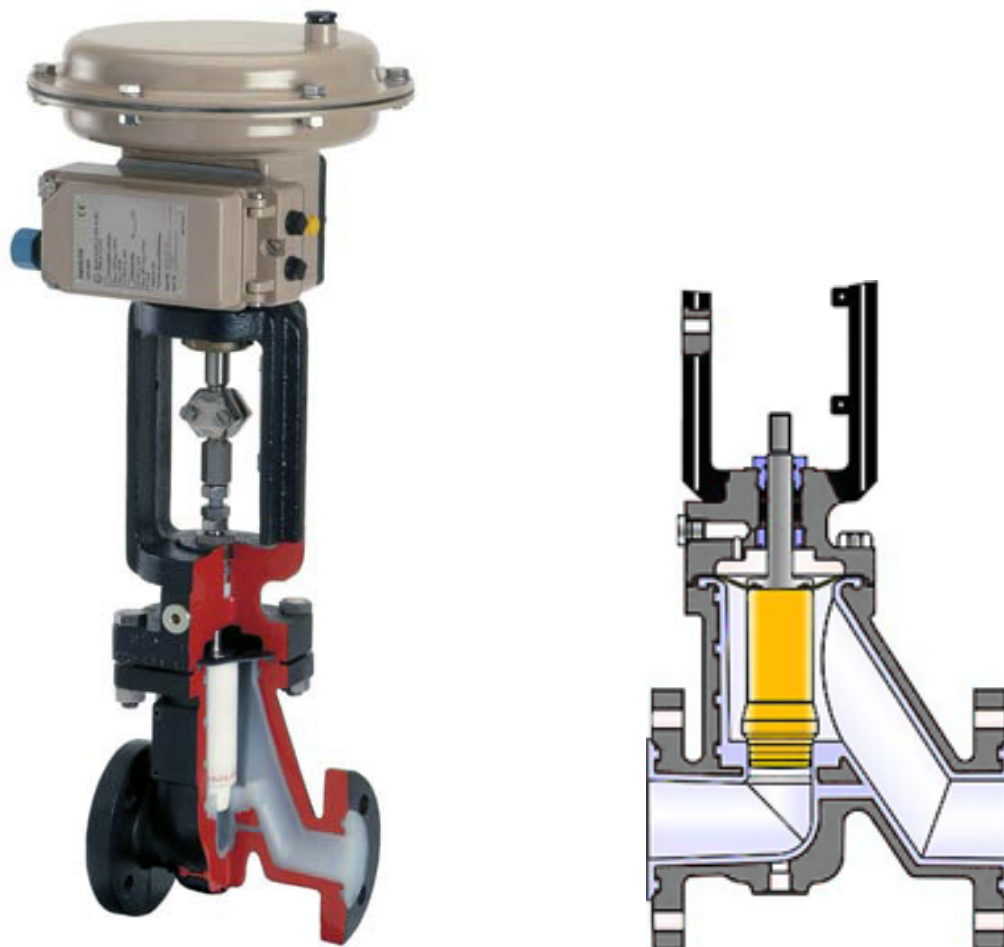
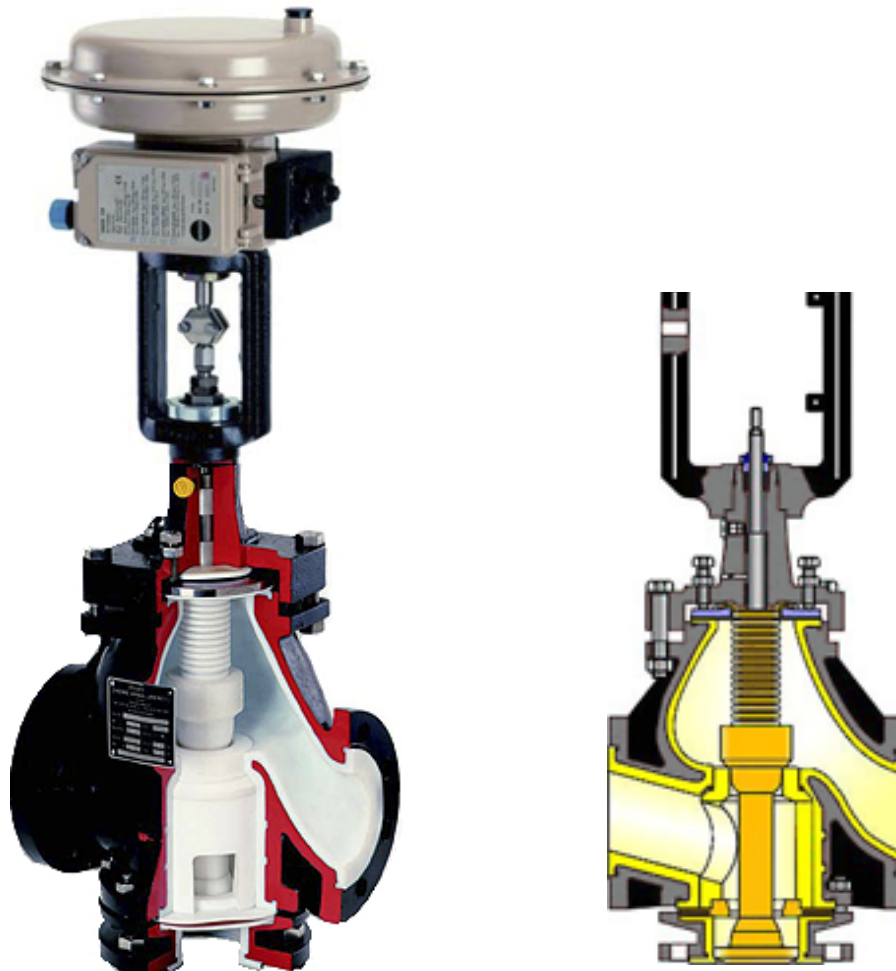


Figure 6.12.1.-5: PFA-lined Globe Control Valve Type 1b



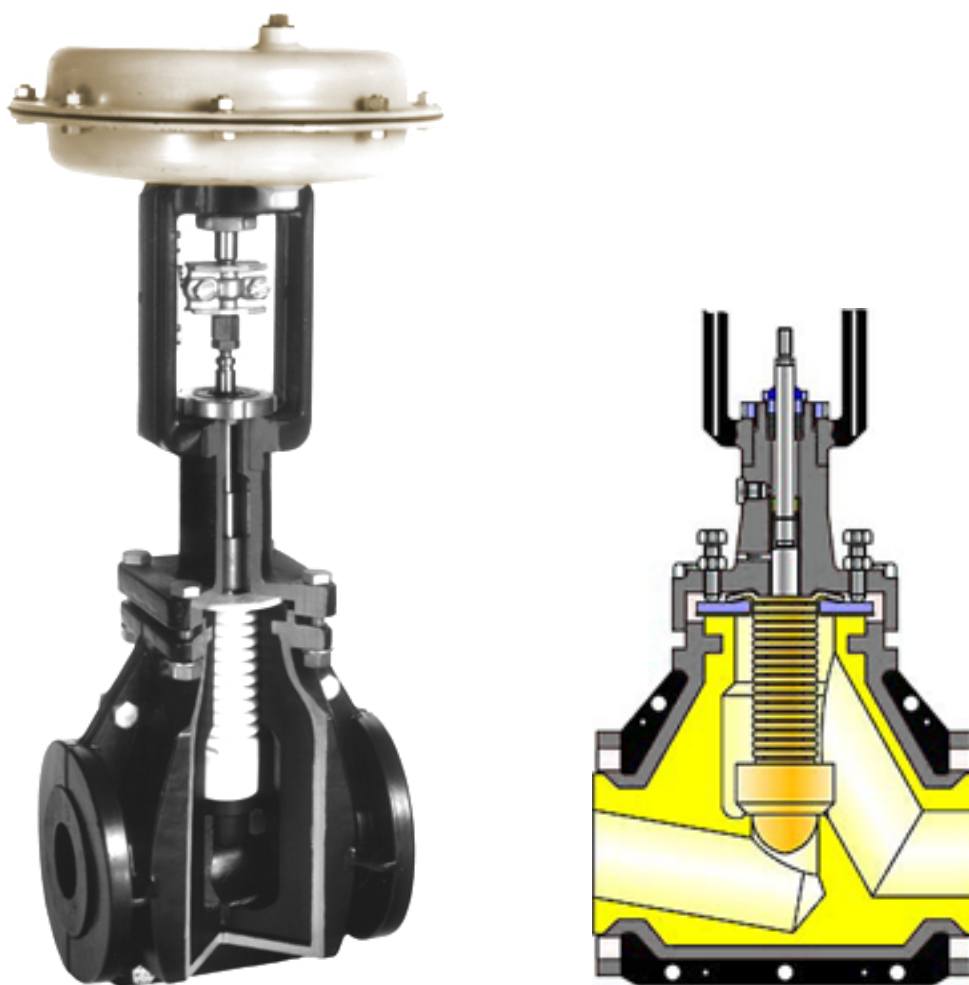
Type	PFA-lined Aseptic Control Valve Type 1c			
Application	This PFA control valve is used in both the pharmaceutical and chemical industry as well as in the "food and drug" industry. It is also suitable for superheated steam sterilization as well as highly aggressive and efflorescent media			
Valve data	Temperature: -10 to 150 °C (14 to 302 °F)			
	Nominal size	Nominal pressure	C _v value	Lining
	DN 25 to 50 NPS 1 to 2	PN 10/16 ANSI Class 150	0.006 to 29	PFA 3 to 5 mm thick
	Plug material: PTFE-TFM* ▪ Diaphragm: EPDM / PTFE optionally aluminium oxide or other special materials * when seat diameter 2 mm, only tantalum or other metals			
Technical data and accessories	The modular design of the control valves allows them to be equipped with various accessories: Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation. For all further data and industry codes see the associated technical data sheet TB 01c_EN for details.			

Figure 6.12.1.-6: PFA-lined Aseptic Control Valve Type 1c



Type	PTFE-lined Three-Way Valve Type 1d			
Application	PTFE-lined control valve for severely aggressive or corrosive media, especially for chemical processes.			
Valve data	Temperature: –10 to 150 °C (14 to 302 °F)			
	Nominal size	Nominal pressure	C _v value	Lining
	DN 25 to 150 NPS 1 to 6	PN 10/16 ANSI Class 150	4.7 to 304	PTFE 5 to 8 mm thick
	Trim material: PTFE or precious metal			
Technical data and accessories	The modular design of the control valves allows them to be equipped with various accessories: Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation.			
	For all further data and industry codes see the associated technical data sheet TB 01d_EN for details.			

Figure 6.12.1.-7: PTFE-lined Three-Way Valve Type 1d



Type	PTFE-lined Control Valve Type 1z			
Application	PTFE-lined control valve for severely aggressive or corrosive media, especially for chemical processes.			
Valve data	Temperature: –10 to 150 °C (14 to 302 °F)			
	Nominal size	Nominal pressure	C _v value	Lining
	DN 20 to 100	PN 10/16	0.01 to 146	PTFE 5 to 8 mm thick
	Trim material: PTFE optionally aluminium oxide, Tantalum or other metals			
Technical data and accessories	The modular design of the control valves allows them to be equipped with various accessories: Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation.			
	For all further data and industry codes see the associated technical data sheet TB 01z_EN for details.			

Figure 6.12.1.-8: PTFE-lined Control Valve Type 1z

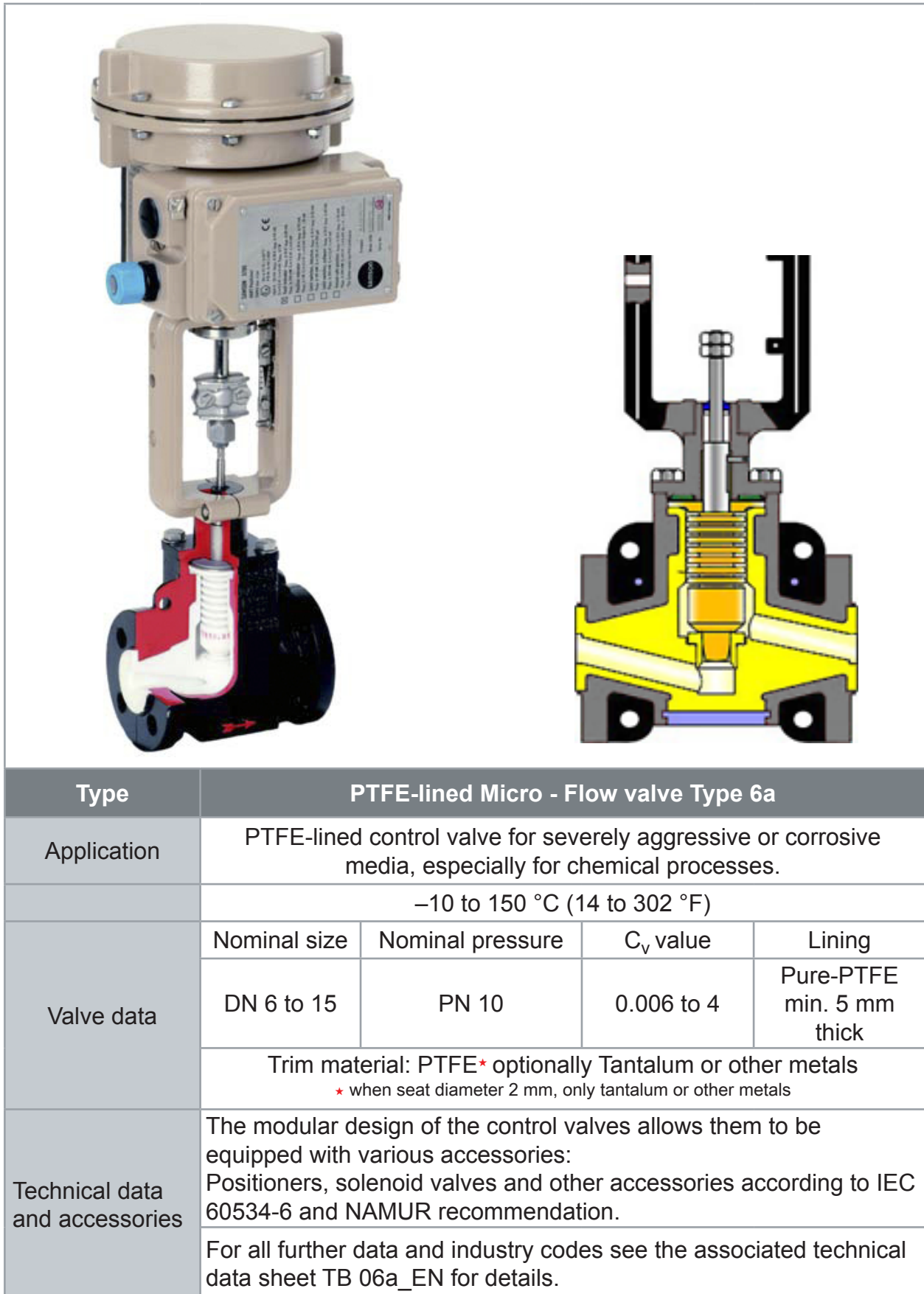
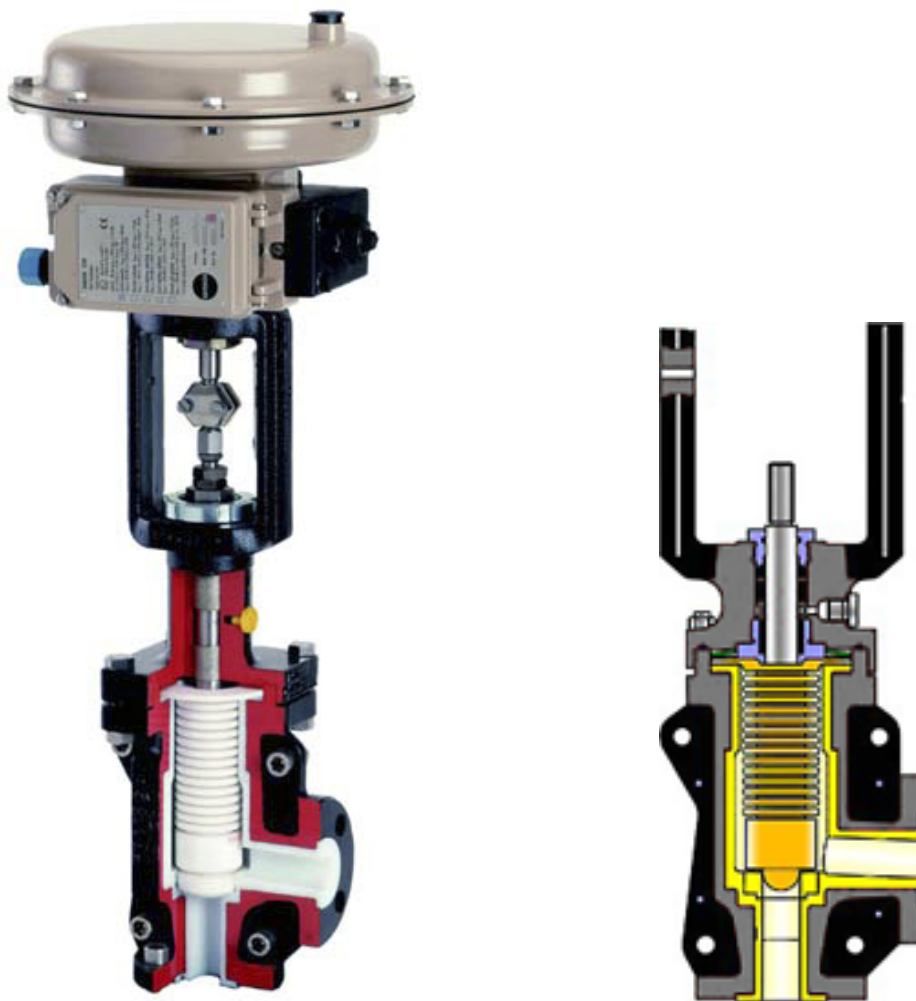


Figure 6.12.1.-9: PTFE-lined Micro - Flow valve Type 6a



Type	PTFE-lined Angle Valve Type 8a			
Application	PTFE-lined control valve for severely aggressive or corrosive media, especially for chemical processes.			
	-10 to 150 °C (14 to 302 °F)			
Valve data	Nominal size	Nominal pressure	C _v value	Lining
	DN 15 to 50 NPS ½ to 2	PN 10/16 ANSI Class 150	0.006 to 29	Pure-PTFE min. 5 mm thick
	Trim material: PTFE* optionally aluminium oxide, Tantalum or other metals * when seat diameter 2 mm, only tantalum or other metals			
Technical data and accessories	The modular design of the control valves allows them to be equipped with various accessories: Positioners, solenoid valves and other accessories according to IEC 60534-6 and NAMUR recommendation.			
	For all further data and industry codes see the associated technical data sheet TB 08a_EN for details.			

Figure 6.12.1.-10: PTFE-lined Angle Valve Type 8a