WAFER-SPHERE® HIGH-PERFORMANCE BUTTERFLY VALVE SEAT MATERIALS

WAFER-SPHERE valves are available with several optional seat materials to provide a high degree of media, temperature, and pressure application versatility. This bulletin provides an overview of these valve seat materials. For valve selection, use the valve body pressure specifications and seat pressure/ temperature specifications from the valve bulletins.

WAFER-SPHERE valves are factory tested for tight shutoff. Long term shutoff performance, however, is affected by the nature of the media being handled, and by other factors including:

- Pressure
- Temperature
- Degree of pressure fluctuation
- Degree of thermal fluctuation
- Velocity of media
- Speed of valve operation
- Cycling frequency

These factors interrelate in actual service. Maximum performance can be gained by reducing the severity of these factors or by applying a different seat material.

PTFE (T)*

The basic *WAFER-SPHERE* valve seat material is PTFE (T), which provides both the temperature capability of -50˚F to +400˚F (-46˚C to +204˚C) and chemical compatibility to fill the widest possible range of service applications.

XTREME™ (X)

An engineered filled flourocarbon polymer that is rated to 500˚F (260˚C) at significantly higher pressures than filled PTFE (M) material while maintaining the same or greater chemical compatability properties as filled PTFE (Refer to Bulletin T101-3 for your specific chemical compatability). *XTREME* exhibits the same abrasion resistant characteristics as filled PTFE (M) seats. *XTREME* has excellent memory for thermal and pressure cycling and is ideal for steam, hot gases, thermal fluids and a variety of process chemicals. *XTREME* is available for all ANSI 150, 300 and 600 *WAFER-SPHERE* valves.

Filled PTFE (M)

Filled PTFE (M) seats retain virtually all of the chemical compatibility properties of PTFE and extend the temperature capability of *WAFER-SPHERE* valves to +500˚F (+260˚C). Additionally, "M" seats provide enhanced wear resistance and are rated to 1×10^4 rads maximum radiation dosage.

UHMW Polyethylene (U)

UHMW seats are designed for radiation and abrasive services. In applications where the radiation level exceeds the PTFE limit, UHMW can be a good alternative. UHMW seats are suitable for radiation levels to 2×10^7 rads. They also fill requirements in applications where the use of PTFE is prohibited, and are especially well-suited for handling highly abrasive media. These seats are rated from -100˚F to +200˚F (-73˚C to +94˚C).

ETFE (S)

Tefzel® seats are designed for services requiring high resistance to gamma radiation, being rated to 1×10^8 rads maximum dosage. They are temperature-rated from -50˚F to +360˚F (-46˚C to +182˚C).

Fire-Tite® (AE)

FIRE-TITE seats are designed for services requiring fire-tested performance and for severe services. While standard *WAFER-SPHERE* valves have a one-piece seat in the various materials described above, valves in *FIRE-TITE* design have a PTFE (T) seat with a stainless steel (AE), Monel® (AH), or alloy 20 (AF) seat carrier.

The PTFE seat provides long-lasting, tight shutoff during normal service. In the event of a fire with resulting partial or complete destruction of the PTFE seat, the metal seat carrier moves into position against the disc to give effective shutoff. These seats are suitable for service from -50˚F to +400˚F (-46˚C to +204˚C).

* Denotes seat model code.

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Cryogenic Composite Seats (AS, AP, AJ)

Composite cryogenic seats are similar to the two-piece *FIRE-TITE* seat. They consist of a PTFE or CTFE (Kel-F®) seat with a 316 stainless steel or *MONEL* seat carrier. This combination offers chemical compatibility with most cryogenic liquids and gasses. The PTFE (AS, AP) seats are suitable for service from -320˚F to +400˚F (-196˚C to 204˚C), and the CTFE (AJ) seat is rated from -320˚F to 250˚F (-196˚C to +121˚C). The PTFE seats are rated to 1 x 10^4 rads maximum, and the CTFE seat is rated to 1 x 10^6 rads maximum. The CTFE seat is recommended for severe cryogenic services involving thermal cycling such as truck filling.

Cryogenic CTFE (K)

WAFER-SPHERE valves for cryogenic services are furnished with a CTFE (K) *KEL-F* seat, which is also well-suited for cryogenic liquids and gases. CTFE seats are rated from -320˚F to +250˚F (-196˚C to +121˚C). This material is rated to 1 x 10^6 rads maximum.

Seat Availability

The following table shows the availability of the various seat materials. Consult the appropriate bulletin for the pressure/temperature ratings of the seat materials.

Standard Seat Materials

Valve Series	Type	Sizes		Seat Materials								Reference Bulletin
				T	M	U	S	X	*FIRE-TITE*	Cryogenic		
		Inches	mm							Composite	K	
815	ANSI Class 150	3 – 60	80 – 1500	•	•	•	•	•	•			W106-1
830	ANSI Class 300	3 – 36	80 – 900	•	•	•	•	•	•			
835	ANSI Class 150	30 – 60	750 – 1500	•	•	•		•	•	•		W105-1
860	ANSI Class 600	3 – 24	80 – 600		•			•	•			W104-1
K815	ANSI Class 150 Cryogenic	3 – 12	80 – 300							•		W130-1
K815	ANSI Class 150 Cryogenic	14 – 48	350 – 1200								•	
K830	ANSI Class 300 Cryogenic	3 – 12	80 – 300							•		
K830	ANSI Class 300 Cryogenic	14 – 24	350 – 600								•	
K860	ANSI Class 600 Cryogenic	3 – 24	80 – 600							•		

Tefzel is a registered trademark of E.I. duPont de Nemours & Co.
Monel is a registered trademark of Inco.
KEL-F is a registered trademark of 3M

Installation Instructions, Maintenance and Operation

IMO's (Installation, Maintenance, and Operating instructions) or AMI's (Assembly, Mounting, and Installation instructions) are shipped with the products. Additional copies of these instructions are available. Call your local Metso Automation Distributor, or visit our web site.

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