

Gaskets

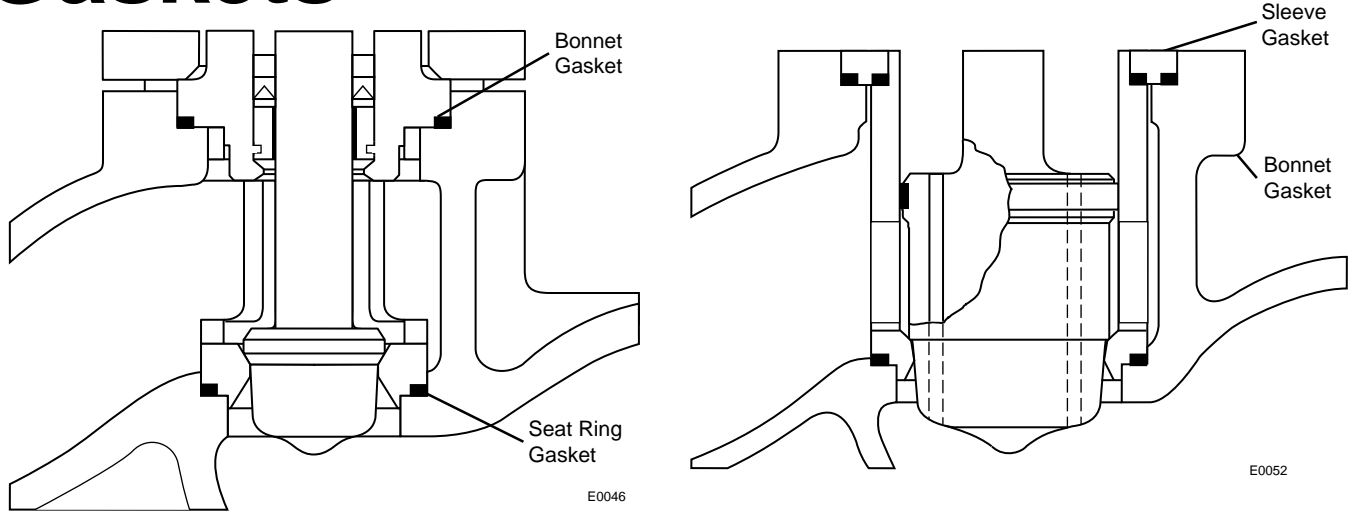


Figure 7-1: Bonnet, Seat Ring and Sleeve Gaskets, Unbalanced and Balanced Designs

Gaskets are used in control valves to prevent leakage around the seat ring, bonnet or pressure-balanced sleeve. Refer to Figure 7-1.

Valtek® globe valves are designed with the bonnet and seat ring gaskets fully retained. Since the bonnet bottoms metal-to-metal in the body, bonnet gasket compression is determined by the machined depth of the gasket step on the bonnet. This compression is equivalent to the gasket manufacturer's requirement. When the bonnet is fully installed, force is transmitted

through the seat retainer to secure the seat ring in position. The body, seat retainer and seat ring are all machined to close tolerances to provide the proper seat ring gasket compression. Unlike the bonnet, the seat ring does not bottom in the body. Thus allowing the small clearance remaining to compensate for manufacturing tolerances and thermal expansion.

Table 7-1 provides general information for selecting the proper gasket material with respect to temperature and pressure ratings.

Table 7-1: Gasket Specifications

	Type	Gasket Material	Maximum Gasket Temperature (degrees F)	Minimum Gasket Temperature (degrees F)	Maximum Pressure (psi)
Standard Gaskets	Flat	Teflon (TFE)	350	-200	Figure 7-2
	Spiral	AFG*	1500	-20	6250
	Spiral	304 SS/Asbestos	750	-20	6250
	Spiral	316 SS/Asbestos	1000	-20	6250
Alternate Gaskets	Spiral	316 SS/Teflon	350	-200	Figure 7-2
	Flat	Kel-F	350	-423	Figure 7-2
	Flat	Teflon (FEP)	400	-320	Figure 7-2
	Spiral	316 SS/Grafoil	1000	-423	6250
	Hollow O-ring	Inconel X -750	1500	-20	15,000

*Asbestos-free gasket

Teflon Gaskets

Flat Teflon gaskets are an economical first choice and should be used whenever possible within the pressure/temperature limits, which are listed in Figure 7-2:

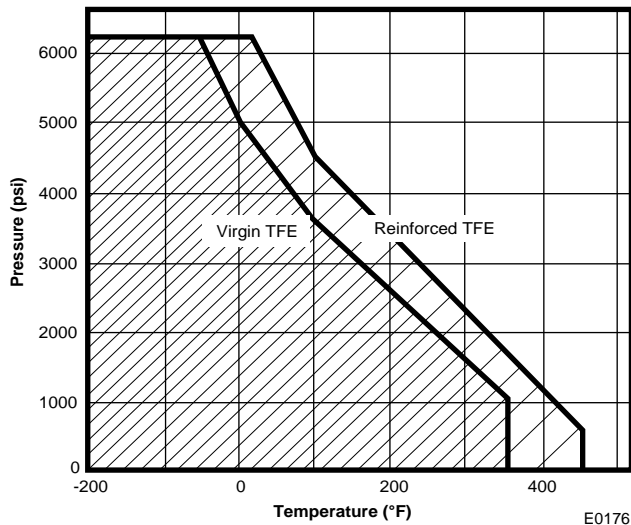


Figure 7-2: Teflon Gasket Allowable Pressure Versus Temperature

Kel-F Gaskets

Flat Kel-F gaskets are used primarily for cryogenic services. Whenever the customer specifies Kel-F or the temperature falls below the limits of Teflon (-200 to 350 degrees Fahrenheit), Kel-F is generally used. The temperature range for Kel-F is -423 to 350 degrees Fahrenheit. The pressure should be limited as shown in Figure 7-2.

Spiral Wound Gaskets

Spiral wound gaskets consist of alternate layers of metal and nonmetallic materials wound together. Because spiral wound gaskets are crushed during assembly, they can **never** be reused. With the exception of some CavControl, ChannelStream and Tiger-Tooth designs, spiral wound gaskets should not be used in valves with soft seat designs. The force needed to compress a spiral seat gasket is partially transmitted through the soft seat insert, which is more compressible than a spiral gasket. Hence, the soft seat is likely to extrude before the spiral gasket is fully compressed and may damage the seat ring or cause the seat to leak. Valtek's most commonly used spiral wound gaskets are discussed below:

AFG is a non-asbestos filler material for standard, spiral-wound gaskets and may be directly substituted for asbestos material in most applications. It has been tested in steam service up to 1000 degrees Fahrenheit and in air at 1500 degrees Fahrenheit. Its sealability is virtually equal to that of graphite gaskets.

The temperature range for 304 stainless steel/asbestos gaskets is -20 to 750 degrees Fahrenheit with the maximum pressure rating of ANSI class 2500. They are used in valves through 8-inch, in carbon steel and chrome moly.

316 stainless steel/asbestos gaskets have a temperature range from -20 to 1000 degrees Fahrenheit with a maximum ANSI class rating of 2500. They are usually used in stainless steel valves, and in carbon and chrome moly valves sizes 10-inch and above.

316 stainless steel/Grafoil gaskets have a temperature range from -423 to 1000 degrees Fahrenheit for a full pressure rating (ANSI class 2500). They are commonly used for high pressure, high temperature, severe service applications up to 1000 degrees – especially severe service valves.

Inconel/Grafoil gaskets have a temperature range from -20 to 1500 degrees Fahrenheit at a full pressure rating. They are commonly used for high temperature applications (above 1000 degrees Fahrenheit), or where Inconel is preferred over 316 stainless steel for that particular fluid.

Valtek also offers other types of custom spiral wound gaskets. A listing of the metallic and non-metallic windings are included in Table 7-II, along with the appropriate color code:

**Table 7-II:
Spiral Wound Gasket Temperature Range
and Standard Color Codes**

Metallic Windings	Temperature Range or Limit (Degrees F)	Color Code*
304 stainless	1000	yellow
316L stainless	1400 - 1500	green
347 stainless	1400 - 1500	blue
321 stainless	1400 - 1500	turquoise
Monel	1500	orange
Nickel	1400	red
Titanium	2000	purple
Alloy 20	1400 - 1500	black
Inconel	2000	gold
Carbon steel	500	silver
Hastelloy B	2000	brown
Hastelloy C-276	2000	beige
Incoloy	2000	white
Phosphor bronze	500	copper
Non-Metallic Fillers	Temperature Range or Limit (Degrees F)	Color Code*
AFG**	1500	Contact Factory
PTFE	500	white stripe
Ceramic	2300	light green stripe
Graphite (oxidizing atmosphere)	900	gray stripe
Graphite (neutral or reducing atmosphere)	6000	gray stripe
Canadian asbestos	1000 - 1200	no stripe
Blue African asbestos	1200 - 1300	light blue stripe

* Industry standard for metal and filler material as adopted by the Metallic Gasket Division of the Fluid Sealing Association.

** Asbestos-free gasket

Metal O-Rings

Inconel X-750 gaskets have a temperature range from -20 degrees to 1500 degrees Fahrenheit at full pressure rating. This gasket material is used where the customer specifies metal O-rings, very high temperatures, or where Grafoil cannot be used (oxidizing service above 800 degrees Fahrenheit). Other special materials are available for high temperature or corrosive environments.



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