Fire-Tested Status of Fisher™ Rotary Valves

This bulletin will help you find the correct High Performance Butterfly Valve (HPBV) product when you require a Fire-Tested Butterfly Valve Construction. The following table provides current constructions that have met the requirements of API 607, Fire-Test for Soft Seated Quarter-Turn Valves. Should this bulletin conflict with information in the product bulletin, the information in this shall take priority. For proof of Fire-Tested status, please contact your Emerson sales office.

Table 1. Fire-Tested Construction Availability(3)

Valve Type, Pressure Class	8560(2) CL 150/300	8532(2) CL 150/300	A31D(2) CL 150/300	8590(1) CL 600	Control-Disk™ Valve
Size Range (NPS)	3 -12	14 -48	3 - 12	3 – 24	See 8532 for CL 150/300 NPS 14-24 and 8590 for CL 600
Phoenix III Seal Material	NPS 3 -NPS 6 S31600/virgin or filled PTFE NPS 8 - NPS 12 S20910/virgin or filled PTFE	S31600/virgin or filled PTFE	S31600/virgin or filled PTFE	S20910 / ETFE	
Body Style	Lugged	Double Flanged and Lugged	Double Flanged	Lugged	

1. 8590 and Class 600 Control-Disk tested to API 607 6th Edition.
2. Tested to API 607 4th Edition.
3. See table 2 for fire-tested construction availability by valve type.

For Fire-Tested HPBV's you must use Phoenix III seals in the reverse (pressure at back side of disk). The materials of construction must be:
Body: Any Table 1 ASME B16.34 material
Packing: Graphite - standard, ENVIRO-SEAL™, or ISO-Seal
Bearings: Metal

Seat Leakage

Max allowable leakage rates when using fire-tested Phoenix III seal differ before, during, and after exposure to high temperatures or a fire. The concept behind a fire-tested seal is the valve can utilize a resilient seat during normal operating conditions but when exposed to elevated temperatures, or a fire, the resilient materials will deform or melt and a metal backup seal will provide shutoff. See figures 1 and 2 for images depicting the seal before and after a fire or high temperature exposure. The factory acceptance test is ANSI FCI 70-2 Class VI.

To pass API 607 valve configurations must meet the following leakage and operational requirements as specified by API 607. Reference Table 1 in API 607 standard, 5th edition (June 2005) for test procedures and conditions(1):

1. Allowable seat leak rate during fire (low pressure test) = 100 mL/min per inch of NPS
2. Allowable seat leak rate during fire (high pressure test) = 400 mL/min per inch of NPS
3. Allowable seat leak rate after cool down (low pressure test) = 25 mL/min per inch of NPS
4. Allowable external leakage during fire (low pressure test) = 25 mL/min per inch of NPS
5. Allowable external leakage during fire (high pressure test) = 100 mL/min per inch of NPS

6. Operational test after fire: The valve shall be capable of being unseated against test pressure and moved to full open position one time

7. Allowable external leakage after operational test (high pressure) = 25 mL/min per inch of NPS

1. External Leakage Following Operational Test, Table 1 -Maximum Leak Rates, source: API 607 5th Edition, June 2005.

Figure 1. Phoenix III Seal with Resilient Components

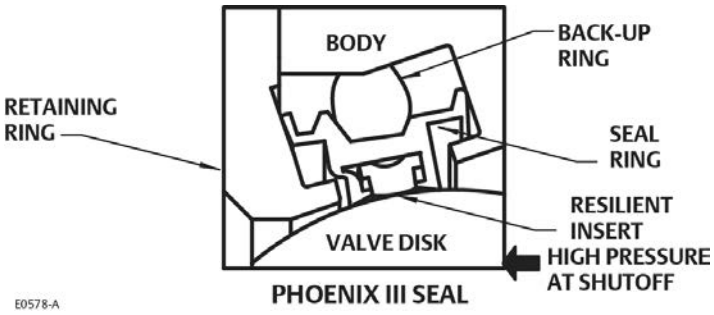
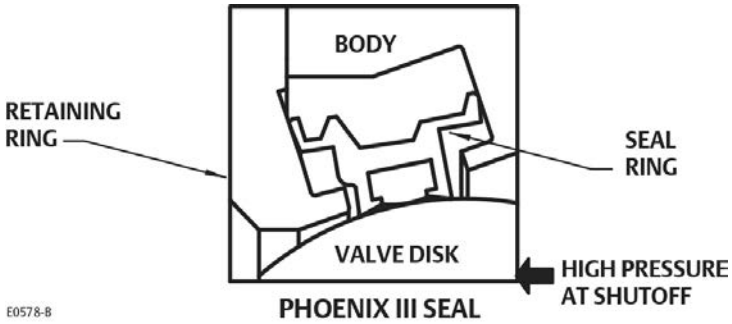


Figure 2. Phoenix III Seal without Resilient Components



Phoenix III Seal NACE Compatibility

The Phoenix III seal design has been used in applications requiring fire-safe performance since its release more than 30 years ago. While it does not technically conform to NACE MR0103 specifications, the non-conformance is caused by the method used to capture the resilient insert in the valve body by bending over the area circled in figure 3. The bending motion cold works the 316 SST, which is not allowed by current NACE standards.

Emerson has no record of the seal design failing due to stress corrosion cracking of the 316 stainless steel version. An Inconel 625 material option is available that would allow for NACE compliance, however that material was not qualified during Emerson's third party API 607 testing. Contact your Emerson sales office to discuss whether either of these solutions would be suitable for your selection and use in your process.

Figure 3. Phoenix III Seal with Resilient Components

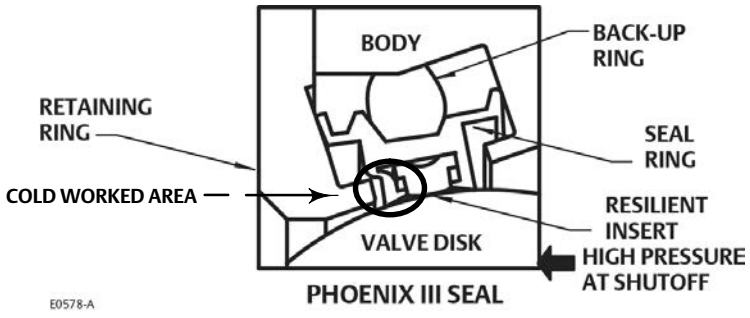


Table 2. Fire-Tested Construction Availability by Valve Type

PRESSURE CLASS	BODY STYLE	NPS											
		3	4	6	8	10	12	14	16	18	20	24	30-48
CL 150/300	Lugged	8560						8532/Control-Disk Valve					A11
	Double Flange	A31D											N/A
CL 600	Lugged	8590/Control-Disk Valve											
	Double Flange	8590 Special Construction											

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