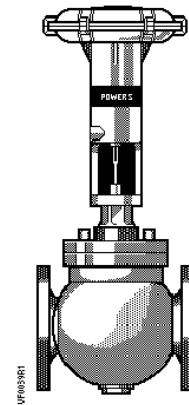


Flowrite™

Packing for 591/592 Flowrite Valves



Description

This bulletin provides a description of and recommended installation procedures for the 591/592 packing used in the Flowrite Valves. The following three types of packing are described:



1. Spring-loaded V-ring.
2. Split ring.
3. Solid ring product.

Valve stem sizes of the various types and sizes of Flowrite Valves are shown in Table 1. The type of packing recommended for the various applications is shown in Table 2.

Table 1. Valve Stem Sizes.

Type of Valve	Line Size (Inches)	Stem Diameter at Packing Inches (mm)
VF 591 CD	1/2 thru 2	1/4 (6.4)
VF 591 CD	2 1/2 thru 4	3/8 (9.5)
VF 591 WM	1/2 thru 2	1/4 (6.4)
VF 591 WM	2-1/2 thru 6	3/8 (9.5)
VF 591 DS	1 thru 4	1/4 (6.4)
	5 thru 8	3/8 (9.5)
VF 591 SD	3/4 thru 1	1/4 (6.4)
	1-1/4 thru 2	3/8 (9.5)
VF 591 ST	1/2 thru 1	1/4 (6.4)
	1-1/4 thru 4	3/8 (9.5)
VF 591 V-PORT	1/2 thru 2	1/4 (6.4)

Installation Conventions

WARNING		Personal injury/loss of life may occur if you do not perform procedure specified.
CAUTION		Equipment damage, or loss of data may occur if you do not perform a procedure as specified.

Packing Applications

The packing on a Flowrite Valve provides a "seal" around the valve stem to prevent loss of the controlled medium (that is, steam, water, ethylene glycol solutions, etc.) while allowing the valve stem to pass through the packing for functional opening and closing of the valve.

Table 2. Valve Packing Application.

Type of Packing	Temperature Range	Maximum Pressure	
		Saturated Steam	Water
EP V-Ring Packing (Spring Loaded)	25 to 300°F (-4 to 149°C)	50 psig (345 kPa)	Valve Body Rating
Teflon V-Ring Packing (Spring Loaded)	25 to 350°F (-4 to 177°C)	*125 psig (862 kPa)	Valve Body Rating
Split Teflon® Ring Packing	40 to 366°F (4 to 198°C)	*150 psig (1034 kPa)	Valve Body Rating
Solid Teflon Ring Packing	40 to 366°F (4 to 198°C)	*150 psig (1034 kPa)	Valve Body Rating

*or Valve Body Rating if it is lower.

V-Ring Packing for Flowrite Valves

Table 3 provides a listing of the spring-loaded V-ring packing kits, valve stem diameters, and the packing materials.

Table 3. V-Ring Packing Kits.

Packing Kit Number	Valve Stem Diameter at Packing	Packing Material
591-501	1/4-inch (6.4 mm)	EP V-ring
591-502	3/8-Inch (9.5 mm)	
592-007	1/4-inch (6.4 mm)	Teflon (2) and EP (1) V-Ring
592-008	3/8-inch (9.5 mm)	

Selecting the Appropriate V-Ring Packing Kit

Choose the proper V-ring packing kit from Table 3. When a kit has two packing gland assemblies or two gland spacers, See Tables 4 and 5 and Figures 1 and 2. Select the packing gland assembly (item 1, Figure 5), gland spacer (item 2, Figure 5), and washer (item 3, Figure 5) for the valve size and type being serviced.

VF591SD and VF591ST valves, 1/2-inch (13 mm) through 2-inch (51 mm) sizes, use the stem bearing (item 7, Figure 5) included in each kit.

VF591ST valves 1-1/2-inch (38 mm) and two-inch (51 mm) sizes normally closed, use the O-ring (item 11, Figure 4) included in kits 591-502 and 592-008.

The eight-inch actuators use the set screw (item 8, Figure 5) and the copper slug (item 9, Figure 5) included in each kit.

**V-Ring Packing for
 Flowrite Valves,
 continued**

	Description	Dimensions Inches (mm)			Part Number
		X	Y	Z	
	Packing gland assembly, type A	7/8 (22)	1 (25)	1/4 (6.4)	590-763
	Packing gland assembly, type B	15/16 (24)	15/16 (24)	3/8 (9.5)	591-783
Packing gland assembly, type C	1-1/8 (29)	1-1/4 (32)	3/8 (9.5)	590-767	

Figure 1. Packing Gland Assembly.

	Description	Dimensions Inches (mm)			Part Number
		T	U	V	
	Gland spacer, type D	3/32 (2.4)	1 (25)	3/4 (19)	591-922A
	Gland spacer, type E	1/8 (3.2)	1 (25)	3/4 (19)	591-922
	Gland spacer, type F	3/32 (2.4)	1 (25)	7/8 (22)	591-926
	Washer, type G	3/32 (2.4)	5/8 (16)	9/32 (7.1)	591-919
Washer, type H	3/32 (2.4)	3/4 (19)	13/32 (10)	591-923	

Figure 2. Gland Spacer or Washer.

Table 4. Packing Kit-Multiple Part Selection (See Note).

Valve Size In Inches	Valve Type	Packing Gland	Gland Spacer	Washer
1/2- 2	VF591CD	A	D	G
1/2 - 2	VF591WM	A	D	G
1/2 - 2	VF591 V--PORT	A	D	G
3/4 - 1	VF591SD	A	E	G
3/4 - 1	VF591ST	A	E	G
1 - 4	VF591DS	A	D	G
1-1/4 - 2	VF591SD	B	F	H
1-1/4 - 2	VF591ST	B	F	H
2-1/2 - 6	VF591CD	C	F	H
2-1/2 - 6	VF591WM	C	F	H
5-8	VF591 DS	C	F	H

NOTE: Letter designations are defined in Figures 1 and 2.

**V-Ring Packing for
Flowrite Valves,
continued**

**Repacking
Procedure**



WARNING:

Isolate the valve so medium (water, steam, etc.) will not leak out of the valve body when it is disassembled.

See Figure 5 for the location of the parts used in this procedure unless otherwise indicated.

1. Remove and cap air line to valve actuator.
 2. Remove actuator and disassemble valve body.
 3. Check the stem. It must have a polished surface that is free from roughness or pitting. Replace the stem if necessary.
 4. Remove the old packing and clean packing chamber. Be sure it is free of dirt and grease.
 5. On valves with a removable stem bearing (item 7), examine it and replace if damaged. If replaced use epoxy type adhesive (not provided) to hold the new bearing in place.
 6. Slide the stem assembly into the bonnet.
 7. The packing parts must be installed in the exact order shown in Figure 5. Place split ring (item 6), washer (item 3), and spring (item 5) over the stem and gently push each piece into the packing chamber.
 8. Remove the tie wrap holding the V-ring packing set (item 4) together and lightly lubricate each V-ring with the silicone lubricant provided in the packing kit.
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CAUTION:

Cover the threads on the stem with a thread protector or thick coat of silicone grease so the V-rings will not be damaged. Even a small cut can prevent the rings from sealing against the stem.

9. Starting with the small hard ring, slide the rings over the stem in the order shown in Figure 3. Carefully push each ring into the packing chamber.
10. Place gland spacer (item 2) on top of bonnet.
11. Thread the packing gland assembly (item 1) into the bonnet. Finger tighten the gland assembly against the spacer. **Do not pack bonnet packing chamber with grease.**
12. On valves with an O-ring seal located on the bottom guide (item 11, Figure 4), remove the old seal and replace it with a new one.
13. Reassemble the valve body and attach the actuator to it (item 8).
14. Connect the air line to the actuator.

The repacking procedure is now complete.

V-Ring Packing for Flowrite Valves, continued

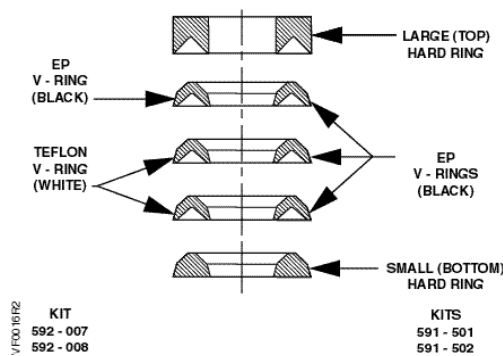


Figure 3. V-ring, Packing Set.

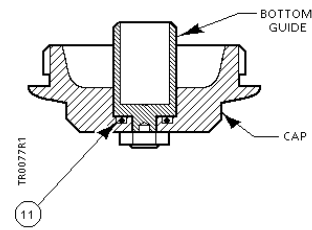


Figure 4. Valve Cap.

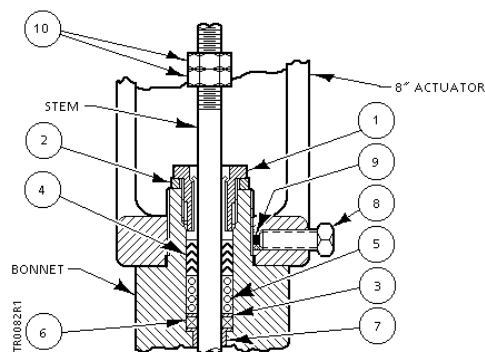


Figure 5. V-ring Packing Assembly.

Table 5. Packing Kit Parts List (See Figures 4, 5 and Notes).

Item	Description	591-501	592-007	591-502	592-008
1	Packing gland assembly	A	A	B	B
1	Packing gland assembly	•	•	C	C
2	Gland spacer	D	D	F	F
2	Gland spacer	E	E	•	•
3	Washer	G	G	H	H
4	V-ring packing set	X	X	X	X
5	Spring	X	X	X	X
6	Split ring Packing	X	X	X	X
7	Stem Bearing	X	X	X	X
8	Set screw	X	X	X	X
9	Copper slug	X	X	X	X
10	Stem nuts (3 or 4)	X	X	X	X
11	O-ring	•	•	X	X

NOTES:

1. An (X) indicates the part is in the kit.
2. Letter designations are defined in Figures 1 and 2.
3. See Table 4 for the packing gland assembly, gland spacer, and washer for each valve type and size.
4. Valve bonnets manufactured before March 1988 have 1/8 NPT hole and pipe plug.

Split Ring Packing for Flowrite Valves

The split ring packing is made of Teflon-impregnated fiber to provide low friction and a degree of self-lubrication. This type of packing can be utilized for hot and cold water, steam, and ethylene glycol solutions. Split ring packing kits and parts are shown in Tables 6 and 7.

Valve lubricators and lubricants are recommended to prolong packing life and improve sealing of the controlled medium. See Table 8 for lubricant.

Table 6. VF591CD, DS, WM, V-Port Flowrite Valves. See Figure 6.

Item	Description	1/4-inch (6.4 mm) Diameter Stem at Packing	3/8-inch (9.5 mm) Diameter Stem at Packing
1	Split ring packing kit (200 pieces)	590-088	590-089
2	Packing gland assembly	590-763	590-767
3	Packing spacer	590-766	590-770

Table 7. VF591SD and ST Flowrite Valves. See Figure 6.

Item	Description	1/4-inch (6.4 mm) Diameter Stem at Packing	3/8-inch (9.5 mm) Diameter Stem at Packing
1	Split ring packing kit (200 pieces)	590-088	590-089
2	Packing gland assembly	590-763	591-783
3	Packing spacer	591-798	591-799
4	Stem bearing	591-796	591-797

Table 8. Lubrication for Flowrite Valves w/ Split Ring Packing.

Description	Lubricant Part Number
Tube of Lubricant 5.3 oz, Dow Corning Number 111 silicone. Use below 300°F (149°C).	590-165A
Stem packing lubricator with Dow Corning Number 111 silicone. Use below 300°F (149°C)	590-184A
Tube of lubricant 1.1 oz, Dow Corning Number 111 silicone. Use below 300°F (149°C)	591-946

Split Ring Packing for Flowrite Valves, continued

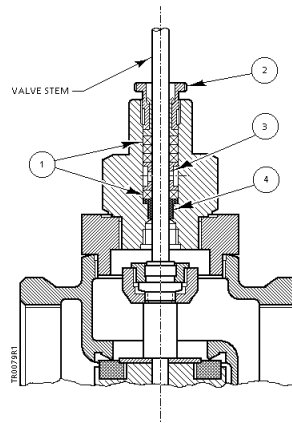


Figure 6. Split Ring Packing Assembly.

Partial Repacking

The top three packing rings can be replaced without disassembling the valve to minimize servicing time for critical system operation. However, replacement of all four packing rings is recommended to obtain optimum packing performance and life.



CAUTION:

Do not use a wrench on the packing gland nut or valve stem. Do not scratch polished surface of stem with pick.

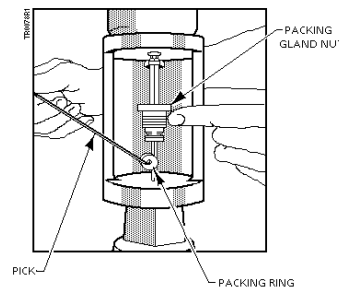


Figure 7. Split Ring Packing Removal.

1. Loosen packing gland nut.
2. Remove the three packing rings from above the lubricator spacer with a pointed rod or pick (Figure 7).
3. Coat new packing rings with recommended lubricant.
4. Slip rings around stem, staggering cuts, push down as far as possible and tighten packing gland nut sufficiently to compress the packing rings toward the bottom of the packing gland.
5. Loosen packing gland nut and readjust to "finger tight" only.
6. Pack bonnet with recommended lubricant.

NOTE: Single seat 2-way screwed valves should be repacked in the closed position.

The partial repacking procedure is now complete.

Split Ring Packing for Flowrite Valves, continued

Complete Repacking

Disassembly

See Figure 6 for the location of the parts used in this procedure.

1. Disassemble the actuator from valve body assembly.
2. Remove the nuts from the valve stem.
3. Remove the packing gland nut from the bonnet, then disassemble the bonnet from the valve body. If the stem remains with the bonnet, on a normally open valve only, slide the stem out of the bonnet.
4. Examine the stem, replace if damaged.
5. Remove the top three packing rings, the packing spacer, and the lower packing ring with a pointed rod or a pick (Figure 7).
6. If a stem bearing is provided, examine it and replace if damaged.
7. Clean packing chamber so it is free of dirt and grease.

Reassembly

1. Slide the bonnet over the stem and screw the bonnet into the valve body.
2. If used, slide the stem bearing over the stem and into the bonnet, make sure it is properly nested in the pocket of the bottom of the bonnet. Use an epoxy type adhesive (not provided) to hold the bearing in place.
3. With the valve stem held in the closed position, carefully place a packing ring, the packing spacer and the remaining three packing rings over the stem in the order shown in Figure 6. Individually tamp each packing ring into the bonnet as far as possible. The splits in the packing rings must be staggered to provide a good seal.
4. Holding the stem in the closed position, tighten the packing gland nut sufficiently to fully compress the packing rings into the bonnet. Loosen the packing gland nut and readjust to "finger tight" only.
5. Pack bonnet with recommended lubricant. Use about 0.5 ounces of lubricant per valve.
6. Reassemble actuator to valve body.

The complete repacking procedure is now complete.

Solid Ring Packing for Flowrite Valves

Repacking Procedure

This packing uses solid Teflon packing rings and a lubricant. It is intended for high pressure steam but can be used in any application where packing leakage has been a problem. The lubricant prolongs packing life, improves the seal, and allows easier stem movement. The packing rings, lubricants, etc. are shown in Table 9. Since the packing rings are not split, the valve must be disassembled to install them.

See Figure 8 for the location of the parts used in this procedure.

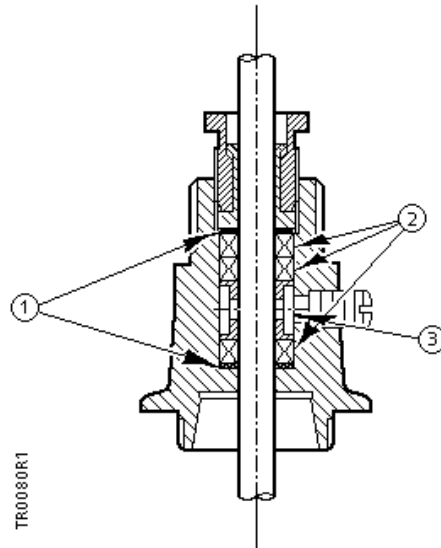


Figure 8. Solid Ring Packing Assembly. See Table 9.

Table 9. Solid Ring Packing Parts. See Figure 8.

Item	Description (See Note)	1/4-Inch (6.4 mm) Stem at Packing	1/4-Inch (6.4 mm) Stem at Packing
1	White Teflon packing ring (2 required)	590-771	590-773
2	Black Teflon packing ring (3 required)	590-772	590-774
3	Packing spacer	See Table 6, 7	See Table 6, 7
4	Packing gland assembly	See Table 6, 7	See Table 6, 7
5	Stem bearing	See Table 6, 7	See Table 6, 7
	Lubricant (Molycote G) 2.8 oz. Tube Use above 300°F (149°C)	590-164	590-164

Solid Ring Packing for Flowrite Valves, continued

Disassembly

1. Disassemble the actuator from the valve body assembly.
2. Remove the nuts from the valve stem.
3. Remove the packing gland nut from the bonnet, then disassemble the bonnet from the valve body. If the stem stays with the bonnet, on normally opened valves only, slide the stem out of the bonnet.
4. Examine the stem, replace if damaged.
5. Remove the old packing with a pointed rod or a pick. Clean the packing chamber so it is free of dirt and grease.

Reassembly

1. Slide the bonnet over the stem, and screw the bonnet into the valve body.
2. If used, slide the stem bearing over the stem and into the bonnet. Make sure it is properly nested in the pocket of the bonnet. Use an epoxy type adhesive (not provided) to hold the bearing in place.
3. With the valve stem held in the closed position, carefully place one white ring, one black ring, the packing spacer, two black rings, and one white ring over the stem in the order shown in Figure 8. Individually tamp each packing ring into the bonnet as far as possible.
4. Holding the stem in the closed position, tighten the packing gland nut sufficiently to fully compress the packing rings into the bonnet. Loosen the packing gland nut and readjust to "finger tight" only.
5. Pack bonnet with recommended lubricant. Use about 0.5 ounces of lubricant per valve.
6. Reassemble actuator to valve body.

The repacking procedure is now complete.