

Valves Technical  
**Tee-Style "Zero Dead-leg" Diaphragm Valves**



Tee x Spigot

**Features — PVC, Low Extractable PVC & CPVC**

Spears® Tee-Style "Zero Dead-Leg" Diaphragm Valve design integrates valve and Tee-fitting for direct branch take-off and eliminates the need for tees and reducing fittings normally required for service drops and other tie-ins to the loop. The Tee-Style valve provides a stronger, more compact connection enabling throttling, sampling, draining or diverting of critical process fluids. The "Zero Dead-leg" design is excellent for DI water and other critical applications. Close proximity of valve to mainline minimizes any areas of fluid stagnation by eliminating "dead leg" that can harbor bacterial growth and other contamination. Produced to order with Spigot, Socket & Threaded, or Special Reinforced (SR) Threaded end connection valve sizes 1/2" through 2", and specified Tee Socket connection sizes for virtually any mainline connection size.

**Sample Engineering Specification**

All lateral branch valve connections shall be made using Tee-style Diaphragm Valves. All valves shall be constructed from PVC, ASTM D 1784 Cell Classification 12454; CPVC Type IV, ASTM D 1784 Cell Classification 23447; or Low Extractable PVC, ASTM D 1784 Cell Classification 12343. Diaphragms shall be EPDM, FKM or elastomer backed, bonded PTFE. All valves with elastomer diaphragms shall be pressure rated to 235 psi and all valves with PTFE diaphragms to 150 psi, for water at 73°F, as manufactured by Spears® Manufacturing Company.

**T-Style Valve Advantages**

- Chemical & Corrosion Resistant PVC, CPVC or Low Extractable PVC materials
- Minimizes Fluid Stagnation
- Improves Branch Valve Connection Strength
- Simplifies Installation
- Suitable for Vacuum Service (except with PTFE Diaphragms)

**Diaphragm Valve Features**

- Multi-featured Industrial Grade
- Built-in Position Indicator
- EPDM, FKM, or Elastomer Backed PTFE Diaphragm
- 235 psi Pressure Rating @ 73°F (150 psi for PTFE Diaphragms)
- High Impact Polypropylene Handle
- Fully Serviceable, Replaceable Components

**Quick-View Selection Chart**

The following Base Part Numbers must be completed according to desired configuration size. Contact Spears® for the appropriate Tee size x Valve size code designations to replace the "xxx" in each.

Diaphragm Material	PVC Base Part Number			Pressure Rating @ 73°F (23°C)
	Spigot	Socket & Threaded	SR Threaded	
EPDM	2727ZD-xxx	2729ZD-xxx	2721ZD-xxxSR	1/2" — 2" 235 psi
FKM	2737ZD-xxx	2739ZD-xxx	2731ZD-xxxSR	
PTFE, EPDM Backing	2797TZD-xxx	2729TZD-xxx	2721TZD-xxxSR	1/2" — 2" 150 psi
PTFE/FKM Backing	2797VTZD-xxx	2739VTZD-xxx	2731VTZD-xxxSR	

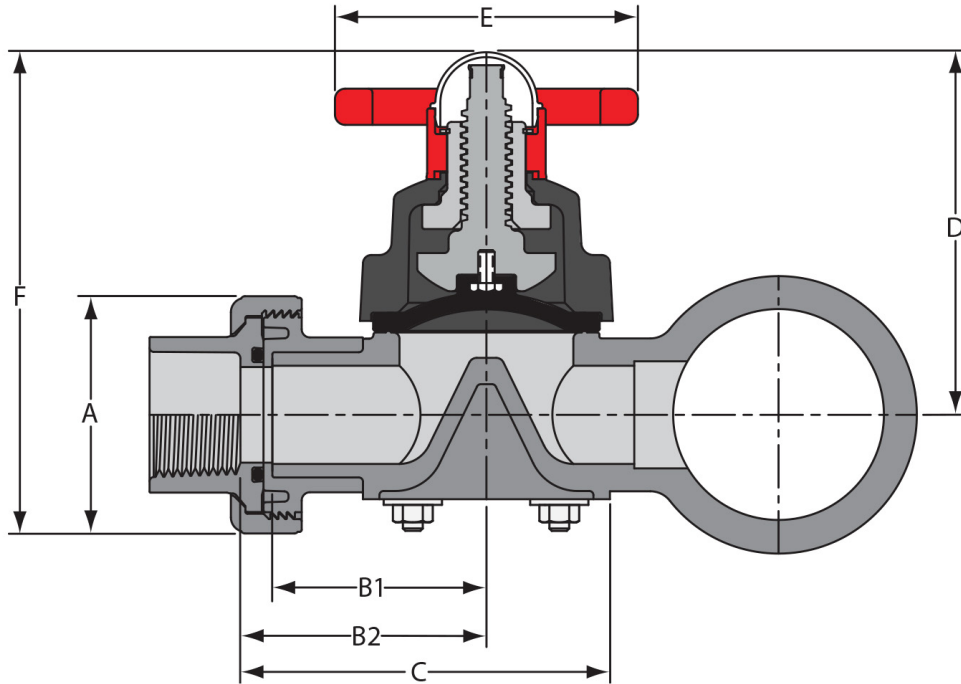
Diaphragm Material	CPVC Base Part Number			Pressure Rating @ 73°F (23°C)
	Spigot	Socket & Threaded	SR Threaded	
EPDM	2727ZD-xxxC	2729ZD-xxxC	2721ZD-xxxCSR	1/2" — 2" 235 psi
FKM	2737ZD-xxxC	2739ZD-xxxC	2731ZD-xxxCSR	
PTFE, EPDM Backing	2797TZD-xxxC	2729TZD-xxxC	2721TZD-xxxCSR	1/2" — 2" 150 psi
PTFE/FKM Backing	2797VTZD-xxxC	2739VTZD-xxxC	2731VTZD-xxxCSR	

Diaphragm Material	Low Extractable PVC Base Part Number			Pressure Rating @ 73°F (23°C)
	Spigot	Socket & Threaded	SR Threaded	
EPDM	2727ZD-xxxBL	2729ZD-xxxBL	2721ZD-xxxSRBL	1/2" — 2" 235 psi
FKM	2737ZD-xxxBL	2739ZD-xxxBL	2731ZD-xxxSRBL	
PTFE, EPDM Backing	2797TZD-xxxBL	2729TZD-xxxBL	2721TZD-xxxSRBL	1/2" — 2" 150 psi
PTFE/FKM Backing	2797VTZD-xxxBL	2739VTZD-xxxBL	2731VTZD-xxxSRBL	

**Note:** Low Extractable PVC Valves are typically used with elastomer backed PTFE Diaphragms to maintain purity in most applications.



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**Dimensions**

Nominal Size	Dimension Reference ( $\pm 1/16$ )						
	A	Spigot B1	Socket Threaded B2	C	D	E	F
1/2	1-15/16	2-3/16	2-1/2	3-13/16	3-5/16	2-7/8	4-5/16
3/4	2-3/8	2-3/8	2-3/4	4-1/8	3-3/4	3-1/4	4-9/16
1	2-5/8	2-11/16	3-1/16	4-5/8	4-7/16	3-5/16	5-3/4
1-1/4	3-3/16	3-1/8	3-1/2	5-3/8	5-5/8	4-5/8	7-1/4
1-1/2	3-9/16	3-1/4	3-3/4	5-5/8	5-5/8	4-5/8	7-7/16
2	4-5/16	4-7/8	4-3/8	6-3/4	7	5-7/8	9-3/16

**Temperature Pressure Rating**

Nominal Valve Size	73°F to 100°F	110°F	120°F	130°F	140°F
1/2" - 2"	150	135	110	75	50

Valves have elevated temperature pressure ratings different than pipe, as shown in chart above. Maximum PVC system service temperature is 140°F.

**C<sub>v</sub> Values**

Valve Size	PERCENT OPEN			
	100%	75%	50%	25%
1/2	5.1	4.8	4.2	2.4
3/4	8.0	7.5	6.5	6.5
1	11.5	10.8	9.4	9.4
1-1/4	22.0	20.6	18.0	18.0
1-1/2	28.2	26.4	23.0	23.0
2	52.9	49.6	43.2	43.2

**Note:** C<sub>v</sub> values are for basic Diaphragm Valve only, excluding Tee end connection.