

Technical Bulletin 0304-BE/BSA

A central image of the Earth from space, with several blue, glowing orbital paths or rings around it. Overlaid on this scene are various valve components: a blue valve assembly with a pneumatic actuator on the left, a large blue valve body on the right, and a collection of black and white valve parts at the bottom left.

**World Class Performance
in Abrasive, Scaling and
Corrosive Slurries, Sludge,
Liquids, and Bulk Solids**

RF VALVE® aiRFlex®



RF Technologies' mission is to solve valve problems. We achieve this by providing valves that offer the lowest cost of ownership and operation, highest reliability and minimum maintenance.

Simple and rugged patented construction throughout sets RF valves apart in the most severe service and process control applications.



RF Manual Valves



RF Pneumatic Valves

On/Off and Control Valves

The RF Family of Elastomer Tubes

■ RF's patented non-stretch tube design features two expansion arches that flex rather than stretch when closing. This gives RF valves remarkable wear resistance and cycle life superiority over conventional pinch valves. In addition, the tube arches and positive opening tags ensure tube stability under low or fluctuating line pressures and vacuum conditions. Full port and reduced port tubes permit precise throttling control.

■ RF tubes are available in a wide range of wear-resistant elastomers. KEVLAR® reinforcing cords add unsurpassed performance under high loads. Our VITON® tubes withstand even the most chemically aggressive and corrosive process conditions.

Wear-Sensing Monitor

■ A patented SMART Valve™ Wear Monitoring Sensor is imbedded between the inner thick wear resistant elastomer and the outer reinforcing cords of each tube. If the inner lining wears sufficiently to disturb the sensor wire, it will trigger a signal that can be displayed at the valve or looped into a DCS. This provides for the first time a reliable tool to tell when a tube needs replacement, thus reducing downtime, outage costs and unexpected valve failures.



World Class Performance



RF Electric Valves



RF Control Valves



airFlex Pinch Valves

1" - 60" ID, full port, Standard ASME/ANSI B16.10, DIN 3205 F5/F15, and ISO 5752 face-to-face dimensions, working pressures 15 to 600 psi, temperatures -50° to 250° F, pH 1-13

Fugitive Emission Control

Fugitive Emission Control RF valves are built without valve stems, packings, and seals that can leak. Their seamless elastomer tube design, incorporating the wear sensor wire inside, offers two levels of protection. A third level of emission containment is provided by the sealed body feature.

Note: HON Rule Method 21 emission monitoring occurs inside a sealed valve body isolated from weather and harsh external operating environments, automating compliance process.

Technical Advantages

- Standard full port design provides unobstructed, bidirectional flow, low resistance, zero leakage shut-off and precise, repeatable linear flow control.
- The self-cleaning, flexing action of the elastomer tubes prevents build-up of scaling deposits and thus guarantees that the valve will not jam or seize, even in high solids.
- High pressure molded elastomer tube insert outperforms more expensive 316, stellite, or alloy ball, plug, globe, diaphragm and conventional pinch valves in abrasive, scaling or corrosive services.
- Interchangeable with most standard ASME or DIN face-to-face dimensions for ball, plug, butterfly, globe and diaphragm valves. Versatile retrofit valve for plant upgrade and modernization projects.
- Elastomer tube is the only wear part in contact with process stream. Tube replacement, when required, is accomplished without complicated tools, components, or specialized skills; maintenance costs are reduced up to 70 percent
- Seamless flange-to-flange tube construction and sealed body design eliminates valve stem, packings, or seals that can leak.



Control Valve Performance

Because of their unique design characteristics, RF Control Valves® are recommended when...

- ...abrasion and corrosion result in high maintenance,
- ...turbulent flow causes valves or pipes to wear,
- ...scaling causes valves to seize, and...
- ...fibers or other materials have a tendency to plug the valves.



Full Port



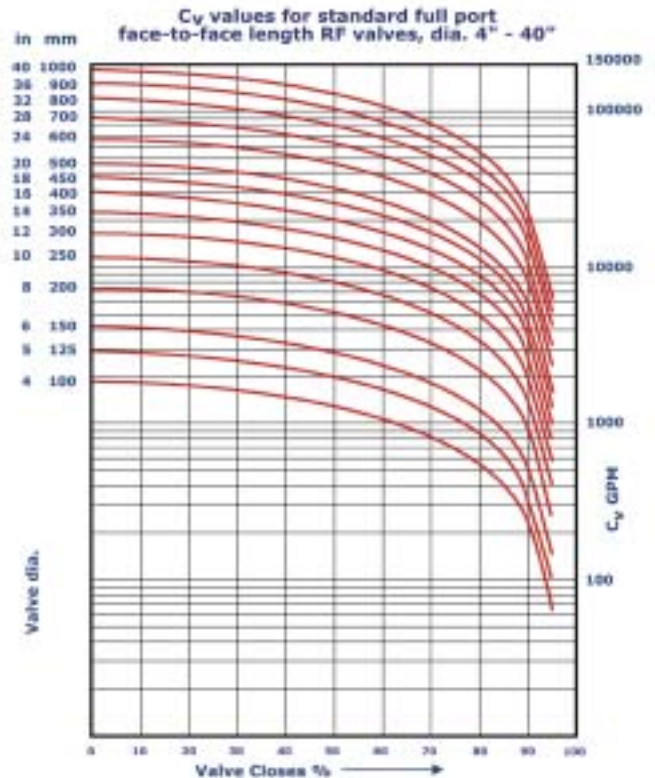
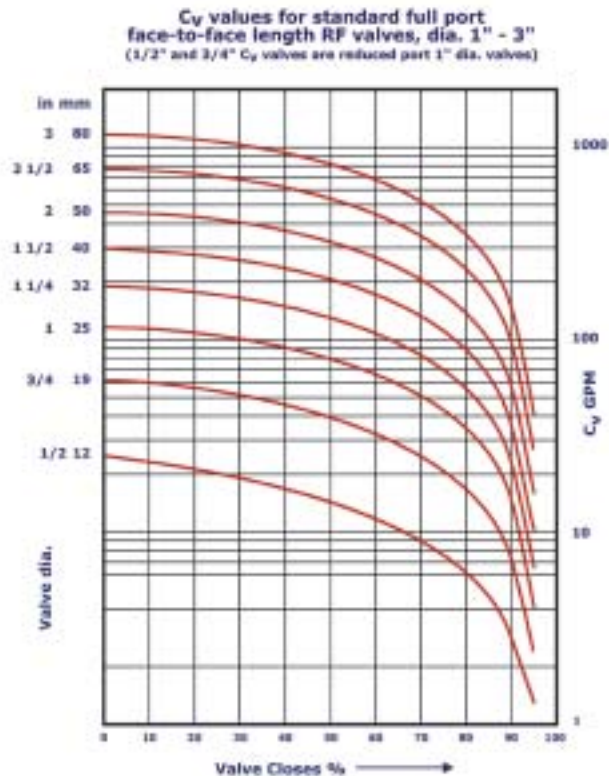
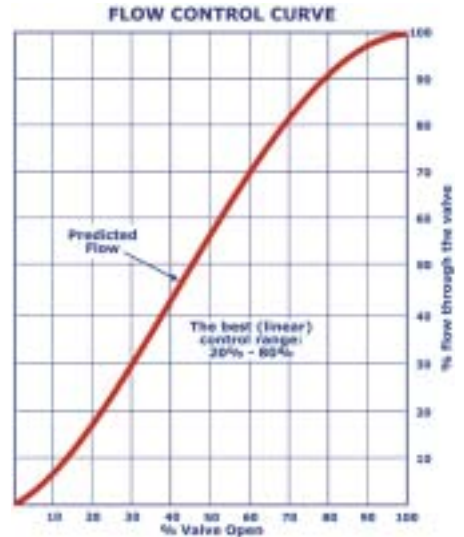
Reduced Port

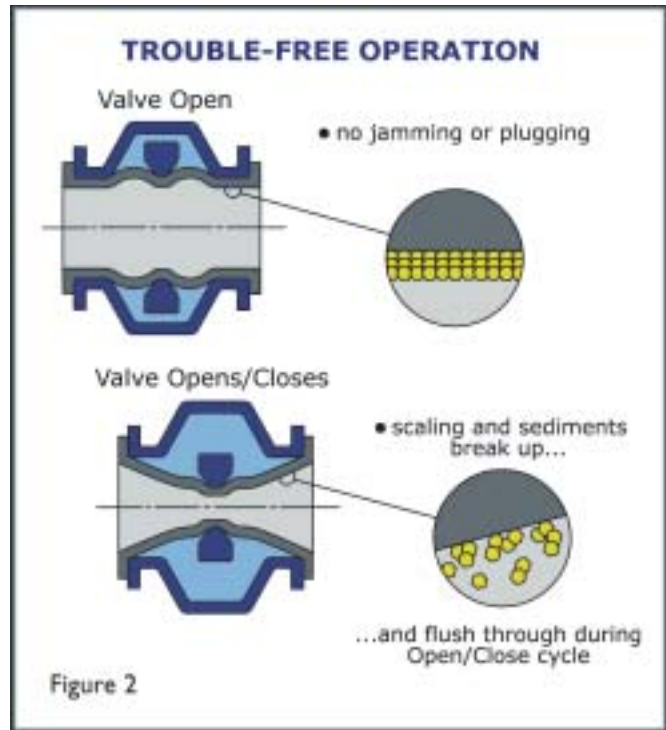
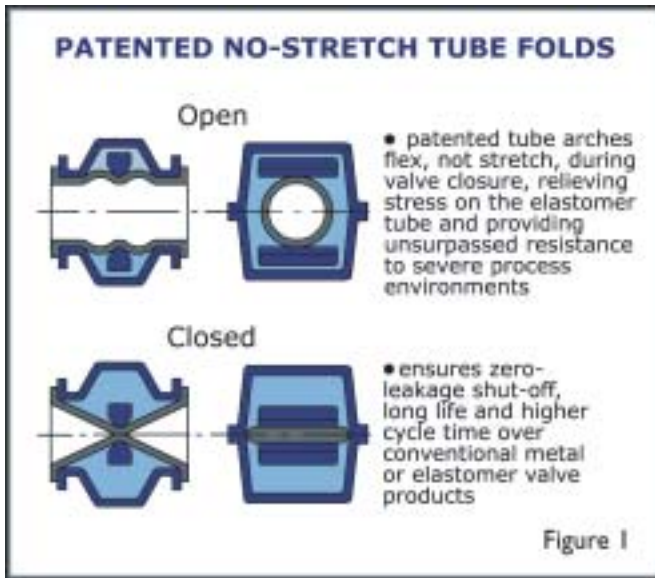
The inherently high Cv values of RF Control Valves ensure superior cost-vs.-capacity ratios. Control performance is also enhanced, as each valve is uniquely characterized to flow requirements with either full- or reduced-port designs, thus reducing the turbulence and cavitation found in other valve designs.

The self-cleaning, flexing elastomer action loosens deposits (Fig. 2, opp. page) and eliminates most problems associated with stiction, overshoot, and conventional control valve irregularities.

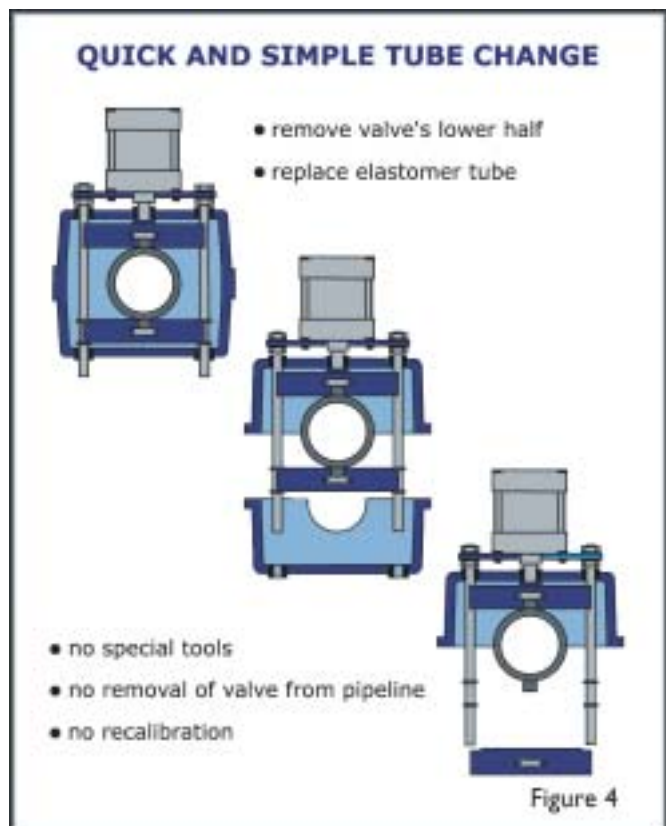
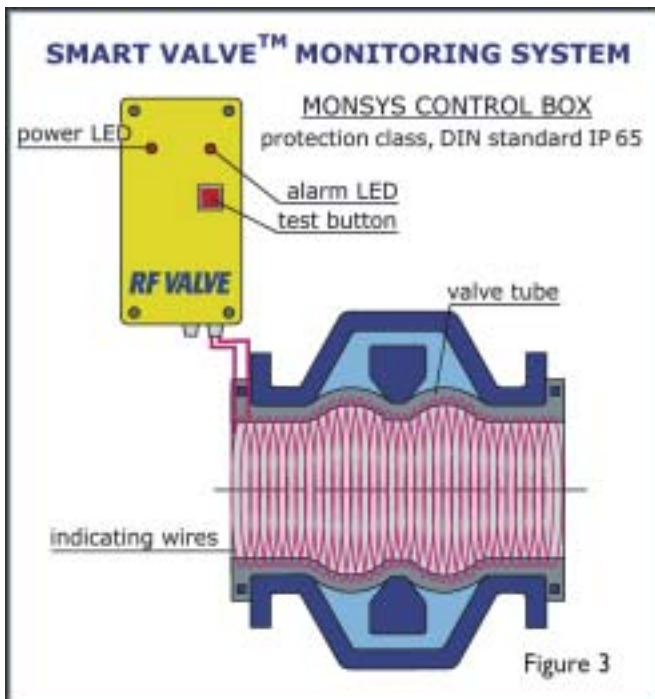
When zero-leakage shut-off is a must, RF Control Valves® outperform most others, even against abrasive and scaling-prone slurries and liquids.

RF® and airFlex® Valves are offered with a wide variety of positioners with 3-15 psi or 4-20 mA control signals for modulating control.





- Replaceable elastomer tube will not jam or seize; eliminates "throw away" valves (Figure 2).
- Smart Valve™ monitoring system reduces maintenance costs and unscheduled outages (Figure 3).
- Elastomer tube, when worn, is quickly replaced in line without special tools (Figure 4).

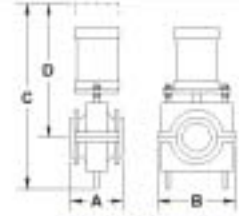




RF VALVE

ASME/ANSI Standard Valves

Dimensions = inches
Weight = lbs
Pressure = psig



PNEUMATIC

Specifications

RF Valve specifications are given at right; aiRFlex specifications are shown below.

aiRFlex

Patented tube folds prevent tube from stretching when air is introduced between valve body and tube to close the valve. The folds and reinforcing cords insure full opening when actuating air is exhausted.



1" to 14" ID, full port, on/off and control services, standard ASME/ANSI B16.10 face-to-face dimensions, temperatures up to 210 degrees F, pH 1-13, working pressure 30 psi below available plant air with minimum 60 psi plant air needed to close the valve.

Valve ID ins.	A F-F ins.	B Wid. ins.	C Ht. ins.	Weight lbs.	
				Cast Iron	Cast Alum.
1	5	5	4.2	6	3.5
1.5	6.5	5.9	5	11	5
2	7	8.1	6.5	17	7
3	8	10.1	7.9	27	14
4	9	11.6	9	37	17
5	10	12.3	10	52	24
6	10.5	15.2	11.2	66	43
8	18	18.3	13.4	152	77
10	21	24.3	16		155
12	24	28.2	19		205
14	27	27.9	26.6		284

Sizes larger than 14" ID are available upon request.

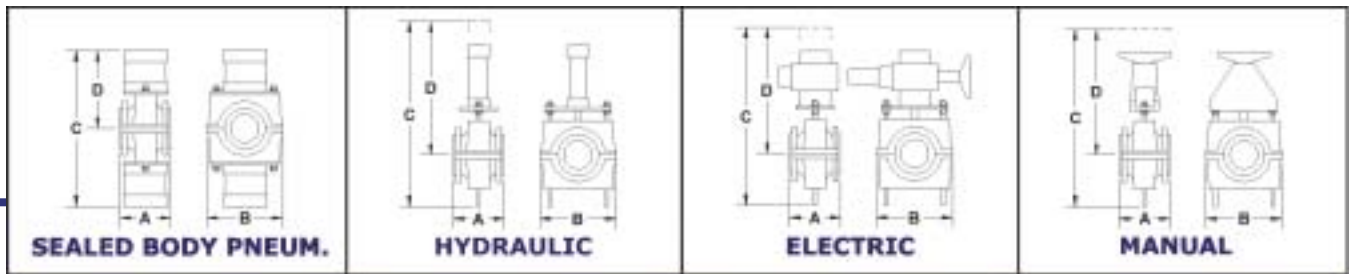
General Accessories

RF Technologies' complete line of valve accessories ensures optimum field performance:

- On/off limit switches
- Fail Close systems
- Air operated hydraulic power packs
- Manual overrides
- Positive opening tags
- Hand wheel lockout
- SMART Valve™ Monsys Alarm Box
- Positioners: 3-15 psi and 4-20 mA
- Solenoid and air valves

Actuator, Line Pressure			P15	P90	P150
DN	Weight		20	20	20
1	A = 5 B = 7 1/8 C D	C	16 1/8 12 3/8	16 1/8 12 3/8	16 1/2 12 3/4
	Weight		22	22	24
1 1/4	A = 5 1/2 B = 7 5/8 C D	C	17 13	17 13	17 3/8 13 1/4
	Weight		26	26	31
1 1/2	A = 6 1/2 B = 8 1/8 C D	C	17 12 5/8	18 3/8 13 7/8	18 3/8 13 7/8
	Weight		44	44	46
2	A = 7 B = 9 1/2 C D	C	19 3/4 14 1/4	19 3/4 14 1/4	20 1/8 15 1/2
	Weight		55	57	62
2 1/2	A = 7 1/2 B = 9 1/2 C D	C	17 3/4 15 3/8	21 5/8 15 3/4	21 5/8 15 3/4
	Weight		60	66	73
3	A = 8 B = 11 1/8 C D	C	23 1/4 16 7/8	23 5/8 16 7/8	26 1/4 18 1/2
	Weight		84	93	99
4	A = 9 B = 12 1/2 C D	C	27 3/8 19 1/4	28 3/4 20 1/2	28 3/4 20 1/2
	Weight		121	132	150
5	A = 10 B = 13 1/2 C D	C	30 1/2 21 1/4	31 3/4 22 5/8	31 7/8 22 3/4
	Weight		168	185	203
6	A = 10 1/2 B = 15 3/4 C D	C	35 1/2 23 5/8	35 5/8 26 1/2	41 3/8 31 1/8
	Weight		318	351	428
8 short	A = 11 1/2 B = 20 3/8 C D	C	43 3/8 29 3/4	47 5/8 34 1/4	58 1/8 44 5/8
	Weight		348	381	458
8 long	A = 18 B = 20 3/8 C D	C	43 3/8 29 3/4	47 5/8 34 1/4	58 1/8 45 5/8
	Weight		373	494	637
10	A = 21 B = 22 C D	C	49 1/4 33 7/8	65 3/4 50 7/8	74 1/2 59 1/8
	Weight		787	820	
12	A = 24 B = 28 3/8 C D	C	56 3/4 38 5/8	83 1/2 65 3/4	
	Weight		1169		
14	A = 27 B = 33 1/8 C D	C	63 3/4 43 3/8		
	Weight		1257		
16	A = 30 B = 42 1/2 C D	C	70 7/8 48		
	Weight		1433		
18	A = 34 B = 46 1/2 C D	C	78 52 1/2		
	Weight		1532		
20	A = 36 B = 50 3/8 C D	C	85 1/2 57 1/8		
	Weight		2062		
24	A = 42 B = 53 1/8 C D	C	130 3/4 97 5/8		

The weights and dimensions in this table are only approximate and may change with different actuators or accessories. Please contact RF Technologies, Inc. if more detailed information is needed.



P15	P90	P150	H15	H90	H150	E15	E90	E150	M15	M90	M150
26	26	29	26	26	26	55	55	55	20	20	20
19 1/4	19 1/4	19 7/8	16 7/8	16 7/8	16 7/8	20 7/8	20 7/8	20 7/8	15 1/8	15 1/8	15 1/8
9 5/8	9 5/8	7/8	13 1/8	13 1/8	13 1/8	16 7/8	16 7/8	16 7/8	10 7/8	10 7/8	10 7/8
26	26	31	29	29	29	51	51	51	22	22	22
20 1/8	20 1/8	20 3/4	17 3/4	17 3/4	17 3/4	21 5/8	21 5/8	21 5/8	16	16	16
10	10	10 3/8	13 5/8	13 5/8	13 5/8	17 3/8	17 3/8	17 3/8	11	11	11
31	31	35	31	31	31	55	55	55	26	26	26
21 1/8	21 3/4	21 3/4	18 1/2	18 1/2	18 1/2	22 1/2	22 1/2	22 1/2	16 7/8	16 7/8	16 7/8
10 1/2	10 7/8	10 7/8	13 3/4	13 3/4	13 3/4	17 7/8	17 7/8	17 7/8	12 3/4	12 3/4	12 3/4
55	55	60	35	35	35	71	71	71	44	44	44
22 7/8	22 7/8	23 1/2	20 1/8	20 1/8	20 1/2	23	23	23	17 7/8	17 7/8	17 7/8
11 1/2	11 1/2	11 3/4	13 3/8	13 3/8	13 3/4	16	16	16	12 3/4	12 3/4	12 3/4
68	73	82	55	55	55	86	86	88	55	55	55
24 1/4	24 3/4	24 3/4	22 5/8	23 1/4	23	25 1/4	25 1/4	25 1/4	19 1/8	19 1/8	19 1/8
12 1/8	12 3/8	12 3/8	15 3/8	15 3/4	15 3/4	17 1/2	17 1/2	17 1/2	13 5/8	13 5/8	13 5/8
73	79	95	66	66	66	95	95	95	66	66	66
26	26 3/8	29 1/8	24 3/4	25 1/4	26 3/4	26 3/4	26 3/4	26 3/4	20 1/4	20 1/4	20 1/4
13	13 1/8	14 1/2	16 7/8	17 3/8	18 7/8	18 1/2	18 1/2	18 1/2	14 1/8	14 1/8	14 1/8
88	99	110	79	79	88	95	95	95	84	84	84
30 3/8	33 1/8	33 1/8	28 3/8	29 7/8	26 3/8	23	23	23	26 3/4	26 3/4	26 3/4
15 1/8	16 1/2	16 1/2	18 7/8	20 1/2	20 1/2	19 1/4	19 1/4	19 1/4	18 7/8	18 7/8	18 7/8
128	128	161	143	143	154	115	119	123	132	132	132
32 5/8	35	35 7/8	31 1/8	33 1/8	33 1/8	31 3/8	31 3/8	31 3/8	29 3/8	29 3/8	29 3/8
16 3/8	17 1/2	17 7/8	20 5/8	22 5/8	22 7/8	20 1/2	20 1/2	20 1/2	25 7/8	25 7/8	25 7/8
176	194	221	168	179	190	150	150	159	190	190	190
38 5/8	39	47 5/8	35 1/2	37	41 3/8	34 1/4	34 1/4	34 1/4	35 1/2	35 1/2	35 1/2
19 1/4	19 1/2	23 7/8	23 5/8	25 1/4	29 1/2	22	22	22	25 1/4	25 1/4	25 1/4
295	362	456	318	318	362	333	351	423	318	318	318
45 1/4	54 3/4	75 3/8	43 3/4	50	50	40 1/2	40 1/2	42 1/8	43 3/8	43 3/8	43 3/8
22 5/8	27 3/8	37 3/4	29 1/8	35	35	25 5/8	25 5/8	27 1/8	31 1/2	31 1/2	31 1/2
325	392	486	348	348	392	353	381	453	348	348	348
45 1/4	54 3/4	75 3/8	43 3/8	50	50	40 1/2	40 1/2	42 1/8	43 3/8	43 3/8	43 3/8
22 5/8	27 3/8	37 3/4	29 1/8	35	35	25 5/8	25 5/8	27 1/8	31 1/2	31 1/2	31 1/2
434	567	745	362	384	406	399	476	509	465	476	476
50	83 1/2	100 3/8	53 1/2	58 1/4	58 1/4	47 1/4	48 7/8	49 1/4	50 3/8	50 3/8	50 3/8
25	41 3/4	50 1/4	36 1/4	41	41	29 1/8	30 7/8	30 7/8	35	35	35
432	948		666	688	721	613	679	767	591	591	657
56 3/8	111		62	67 3/8	67 3/4	54	55 7/8	57 1/8	57 1/8	57 1/8	57 1/8
28 1/8	55 1/2		41 3/4	46 1/2	46 7/8	32 5/8	34 5/8	35 1/2	39 3/4	39 3/4	39 3/4
917			787	820	942	922	1032	1473	789	789	878
62 3/4			70 1/8	75 5/8	76	60 1/4	62 1/4	63 3/8	63	63 3/4	63 3/4
31 3/8			47	52	52 3/8	36 1/4	37 7/8	39	44 1/2	45 1/4	45 1/4
1345			1169	1235	1422	1367	1521	2007	1125	1235	1389
69 1/8			78 3/8	83 7/8	84 5/8	68 1/8	69 1/4	70 1/8	77 1/8	78	78
34 1/2			52 3/4	57 1/2	57 7/8	41 3/8	42 1/2	42 1/2	51 3/8	52	52
1557			1283	1349	1570	1605	2112	2245	1252	1385	1715
75 3/8			91 3/4	92 1/2	92 7/8	74 7/8	76 3/8	78	83 7/8	84 5/8	84 5/8
37 3/4			63	63	63 5/8	44 7/8	46 1/8	47 5/8	57 1/2	58 1/4	58 1/4
1665			1466	1643	1907	1731	2194	2326	1488	1665	1996
81 3/4			100 3/8	100 3/4	101 1/2	81 1/2	82 3/4	84 5/8	91 3/4	92 1/2	92 1/2
40 7/8			68 1/2	68 1/2	69 1/4	48 1/2	49 5/8	51 1/8	62	63	63
2304			1797	1951	2084	1907	2547	3076	1797	2172	
155 1/2			117 3/4	118 1/8	118 7/8	94 1/2	97 1/2	100 3/8	68 7/8	69 1/4	
77 3/4			79 7/8	79 7/8	0 3/8	55 7/8	58 1/4	61 3/8	52	52 3/8	

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ELASTOMER QUALITIES SELECTION

Elastomer Type	Natural Rubber	Natural Pure Gum Rubber	Chloro-Butyl Rubber	Nitrile Rubber	Chloro-prene Rubber	Fluoro-Carbon Rubber	Chloro-Sulfonated Polyethylene	Ethylene Propylene
Designation	NR	PGR	IIR	NBR	N	FPM	CSM	EPDM
Tradename ⁽¹⁾				Buna-N	Neoprene	Viton®	Hypalon®	Nordel®
Properties								
Temperature of application:								
- Maximum °F	180	210	280	250	225	250*	260	250*
- Contin. Operating Temp.†	150-160	105-175	240-250	215-220	215-220	215-220	215-220	215-220
- Minimum °F	-65	-60	-60	-40	-40	-5	-40	-60
Elasticity	5	5	2	3.4	3.4	2	3.4	3.4
Resistance								
- Weather & Ozone	1.2	1.2	4	1.2	3.4	5	5	5
- Acids	2.3	2.4	4	3	3	3.4	4	3.4
- Alkaline	2.3	2.4	4	2.3	3	1.3	4	3.4
- Hydrocarbons, aliphatic	1	1	1	4	2.3	4	2.3	1
- Hydrocarbons, aromatic	1	1	1	3	1.2	4	1	1
- Water	5	5	3.4	5	3	4	3.4	5
- Wear	4.5	4.5	2.3	3.4	3.4	3	3	3
- Flame	1	1	1	1.2	3.4	4	3	1
- Electrical	4	3.4	4.5	1.2	3	3	3.4	4
Gas Impermeability	3	2.3	5	2.3	2.3	4	4	2.3

5 = Excellent, 4 = Very Good, 3 = Good, 2 = Fair, 1 = Not Recommended

*FPM HT and EPDM HT available for temperatures up to 250° F

Food Grade elastomers are available in NBR, N, and EPDM

White elastomers (TiO₂ filled) are available in N and EPDM

+Based on Nylon cords; Kevlar cords are specified for temperatures over 220° F

(1) Viton®, Nordel® and Hypalon® are registered trademarks of DuPont Dow Elastomers.



Be sure to visit our Website
<http://www.rfvalve.com>
 for latest industry updates.

We provide the world's most complete line of pinch valves in standard ASME/ANSI B16, DIN and ISO face-to-face dimensions from 1" to 60" ID!

With manufacturing facilities in the US and Finland — and with sales and support facilities in North and South America, Europe, Australia and the Pacific Rim — RF Technologies supplies the pulp and paper, mining, industrial minerals, chemical, power generation, and waste treatment industries around the globe. Wherever your business is located, RF Technologies is dedicated to providing you with the world's most complete line of pinch valves in standard ASME/ANSI B16, DIN and ISO face-to-face dimensions from 1" to 60" ID!



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