FLOWSERVE

TECHNICAL BULLETIN

NAF Setball Ball Sector Valves

Experience In Motion

Primary Characteristics

The NAF Setball from Flowserve is a highly versatile and cost-effective solution designed to deliver unmatched performance in a range of general service and erosive applications such as fibers and slurries.

The Setball is a V-port ball sector valve that combines a compact design with excellent equal percentage flow characteristics and high flow capacity. It is designed primarily for modulating control applications, however it can also be used effectively for shut-off service.

The NAF Setball is engineered to increase process yield and plant uptime through durable functionality and higher reliability. Its features include:

- A ball sector with a **V-port** resulting in **excellent control characteristic** in combination with high **flow capacity and high rangeability**
- A **one-piece, leak-proof** valve body, **flanged** or **wafer** design, provides a cost-effective design for minimizing leak paths
- Enhanced product integrity through a **V-ring stem seal packing** and an optional **spring loading**, that provides safe operation within a wide temperature coverage
- Dual **low friction bearings** facilitate **smooth operation** and allows the use of a **small actuator**
- A stem with a **splined transmission** to the ball sector provides **optimum control performance**
- **Direct actuator mounting** capabilities of the NAF Turnex actuator provides a high performance, vibration resistant, compact valve package
- **Spring loaded metal seats** with a rigid welded overlay of Alloy 6 provide a higher leakage resistance over extended periods or alternatively, **metal supported, reinforced PTFE** seats for optimum tightness
- Special **low flow trims** for the smallest size
- Unique **Z-trim™** option that **minimizes the risk of cavitation and aerodynamic noise**, resulting in **better working environment and lower maintenance costs**
- Reduced downtime through an **easy-to-service arrangement** which allows for simplified replacement of the seat and seat seal without the need for removing the ball sector and stem

CE-marked according to Pressure Equipment Directive (PED 2014/68/EU) module H, category III.

Technical Specifications for standard design

Material	Stainless steel, carbon steel or higher alloys
Size range	DN 25-700, 1”- 28”
Pressure ratings	PN 10-40, ANSI Class 150-300
Face to face length	IEC 60534-3-2
Valve design	ANSI B16.34 or EN 12 516
Installation method	Wafer or Flange type
Temperature range	-30 - 250°C, see graph on page 8 and 9
Test procedure	Acc. to IEC 60534-4 Hydrostatic test: 1.5 x maximum working pressure Metal seat leakage test: 1.0 x maximum allowed differential pressure tested with water with inhibitor[1] Soft Seat leakage test: 3.5 bar(g) tested with gas
Tightness class[2]	Metal seats: IEC 60534-4 Class IV-S1, tested with water[1] Soft seats: IEC 60534-4 Class VI, tested with gas

[1] Gas test upon request, acc to IEC 60534-4 Class IV

[2] Tested in preferred flow direction

Applications

The NAF Setball can be used in an extensive range of control applications ranging from general services to applications with particles, fibers, slurries etc. Due to its excellent rangeability and high flow capability in combination with its overall compact size, it is a viable economical alternative to linear control valves.

NAF Setball is recommended for a variety of applications in the following industries:

- **Pulp and Paper**
- **Chemical**
- **Oil and Gas**
- **Metals and Mining**
- **District Heating**
- **General Industries**

Figure 1: *NAF Setball, flanged version*

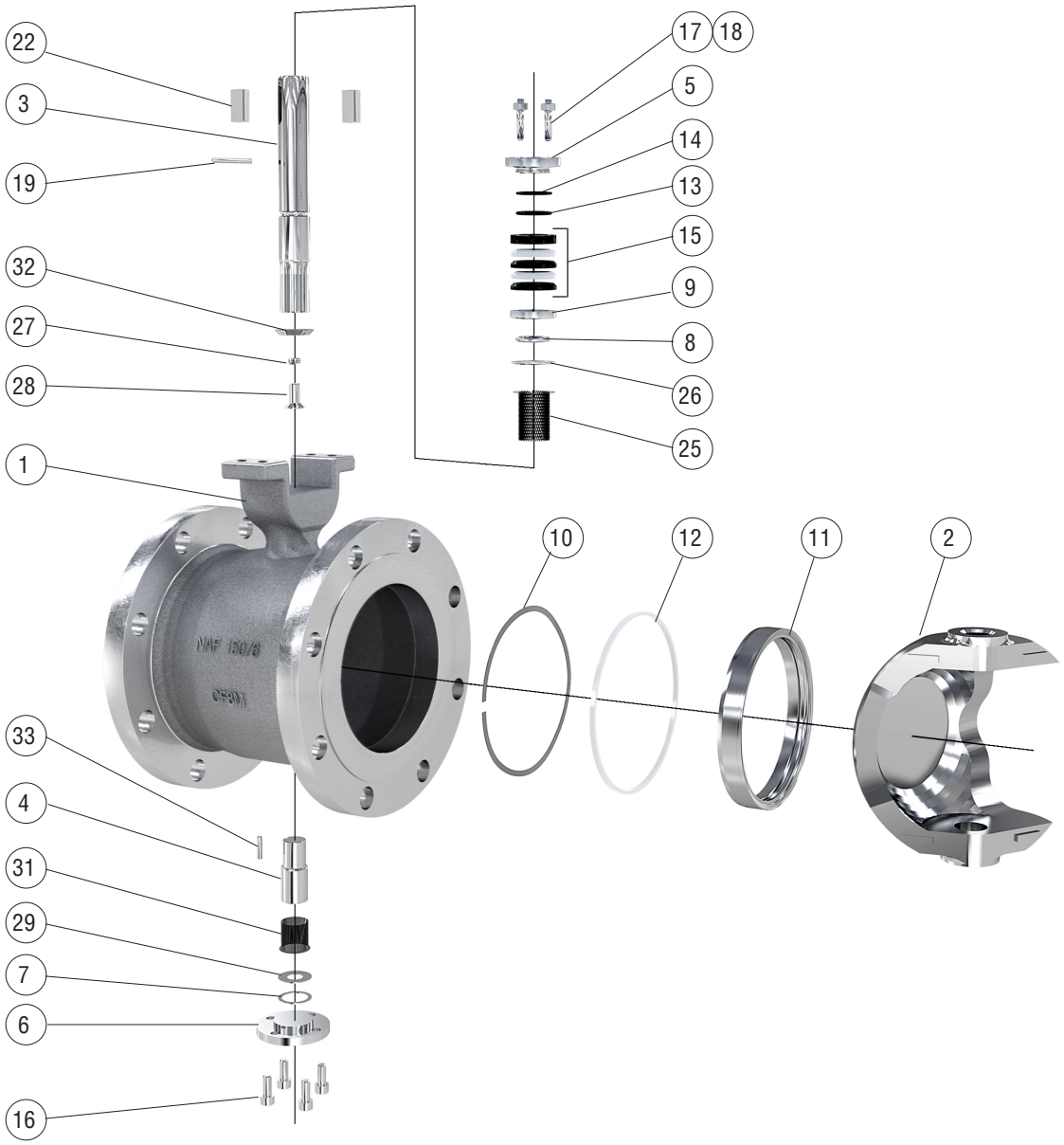
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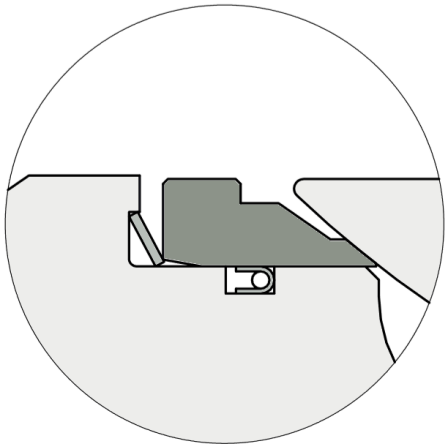
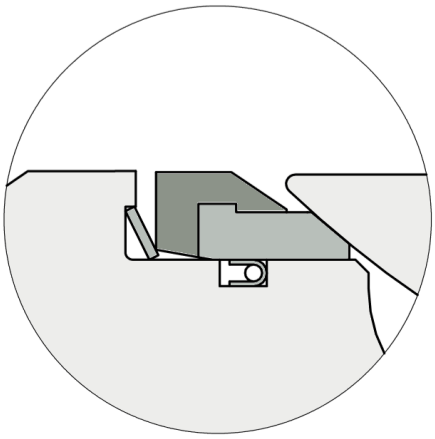
Table 1: Material (metal seated, standard version)

Item	Qty.	Part	Stainless Steel	Carbon Steel
1	1	Body	CF8M (~EN1.4408)	WCB
2	1	Ball sector	CF8M (~EN1.4408) +Hard Chrome Plated	
3	1	Stem, upper	EN1.4460 (type AISI 329)	
4	1	Stem, lower	EN1.4460 (type AISI 329)	
5	1	Gland	CF8M (~EN1.4408)	
6	1	Bottom cover	AISI 316/EN1.4436	
7	1	Gasket	Graphite	
8	2	Locking segment	AISI 316/EN1.4401	
9	1	Bearing seat	EN1.4460 (type AISI 329)	
10	1	Wave spring	AISI 316/EN1.4436	
11	1	Seat ring	Alloy 6 + Stainless steel	
12	1	Seat seal	PTFE + Stainless steel	
13	1	O-ring	FPM	
14	1	Backing ring	PTFE	
15	1	Stem packing	R-PTFE/PTFE	
16	4	Screw	A4	
17	2	Screw	A4	
18	2	Nut	A4	
19	1	Pin	EN1.4460 (type AISI 329)	
22	2	Key	A4	
25	1	Bushing, upper	PTFE + Stainless steel	
26	1	Washer	AISI 316/EN1.4436	
27	1	Thread insert	A4	
28	1	Screw	A4	
29	1	Bearing washer	PTFE + Stainless steel	
31	1	Bushing, lower	PTFE + Stainless steel	
32	1	Washer	AISI 316/EN1.4436	
33	1	Pin	EN1.4460 (type AISI 329)	

Seat Rings



Metal seat standard



Soft seat standard

Ball Sectors

- **Standard.** The standard ball sector has a V-port resulting in an excellent control characteristicin comination with high flow capability and high rangeability. When used for pulp applications, it also prevents dewatering of the pulp when controlling small flows.
- **Low flow trims** are available for the smallest size, DN25/1". These can be used to extend the application coverage into really low-flow, like dosing of additives.
- **Z-trim™.** The ball sector with the Z-trim is a unique solution where the pressure drop is divided into several steps, resulting in a minimized risk for cavitation and aerodynamic noise.

Figure 5: *NAF Setball, flanged version with Z-trim*

Other versions

- **Degreased.** NAF Setball has an option D which needs to be specified for service in which the valve must be cleaned and degreased. In this version all components are degreased before assembly and a special grease is used in assembly. The valve is tested with gas, acc to IEC 60534-4 Class IV for metal seat and Class VI for soft seat.

  Option: D

- **ATEX approved.** When inteded for use in an explosive atmosphere, please specify option XA. With this option, the valve is certified according to ATEX 94/9/EC II 2 G/D c.

  Option: XA

- **Internally sealed stems.** Internal O-rings for sealing the stems from the medium.

  Option: I

- **Fugitive Emissions approved.** The Setball has been tested and fulfills fugitive emission requirements acc to ISO15848-1. The approval is valid for sizes DN25/1"-DN300/12" with a maximum operating pressure of 25 bar and with the spring-loaded V-ring stem packing. The valid classification is ISO-FE BH-CC1-SSA0-t200°C PN25.

  Use seal version B (pos 8 in the product code)

- **Setball for MC-Pulp.** This is a special version of NAF Setball specifically developed for use with medium consistency (MC) pulp 8-19%. This Setball version has an enlarged outlet with one size bigger flange on the outlet to get an excellent flow characteristic for the MC-pulp of the valve.

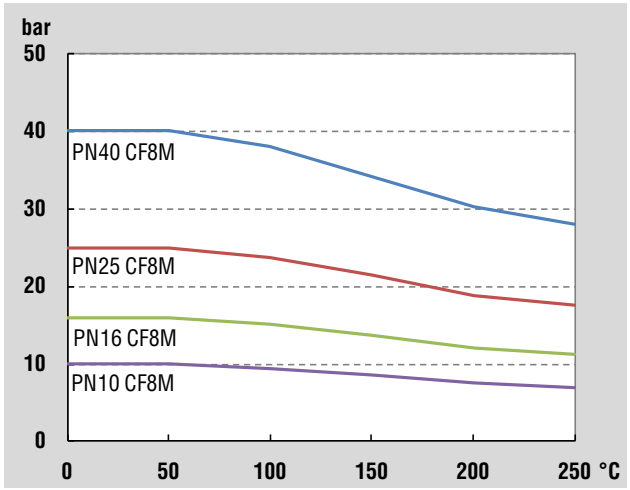
  Please see: Technical Bulletin Fk 41.54

Figure 6: *NAF Setball for MC-pulp*

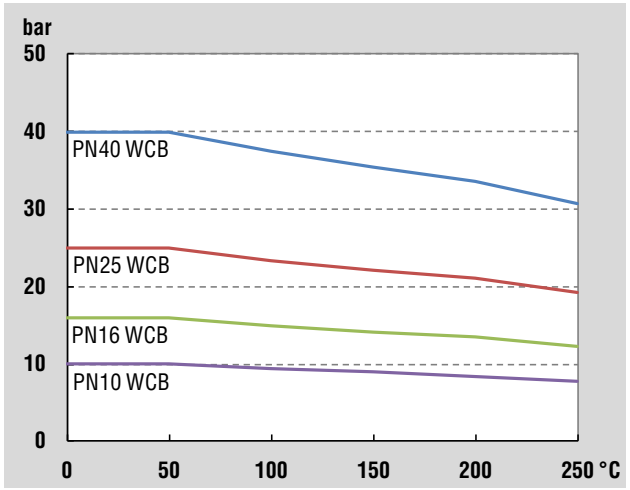
Working Pressure and Temperature

Max. working pressure PN rated valves

Stainless steel body (CF8M/1.4408)

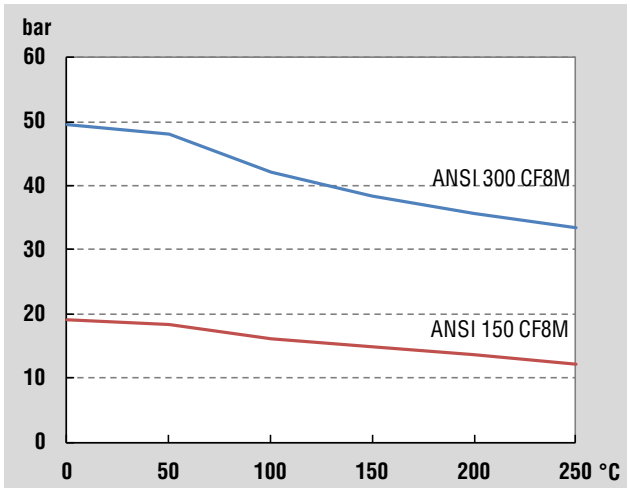


Carbon steel body (WCB/1.0619)

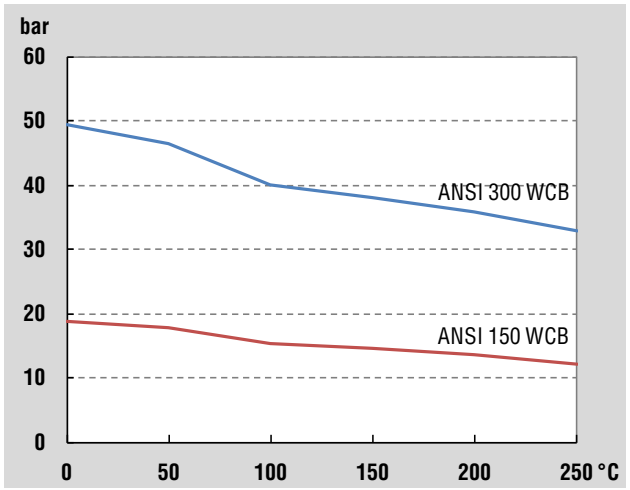


Max. working pressure ANSI rated valves

Stainless steel body (CF8M/1.4408)

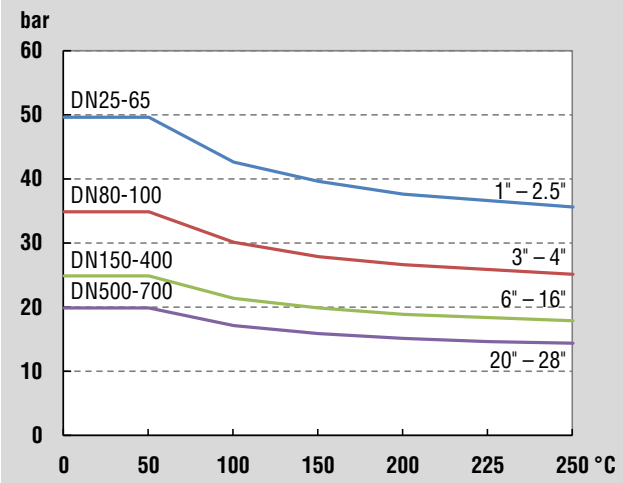


Carbon steel body (WCB/1.0619)

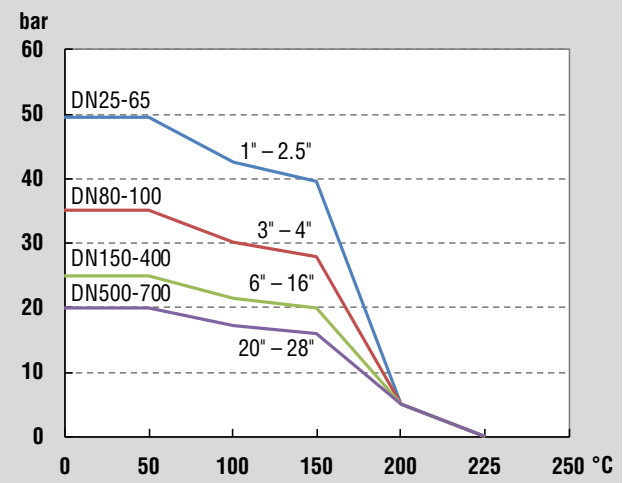


Differential Pressure and Temperature

Max. dp Alloy 6 seat, closed valve

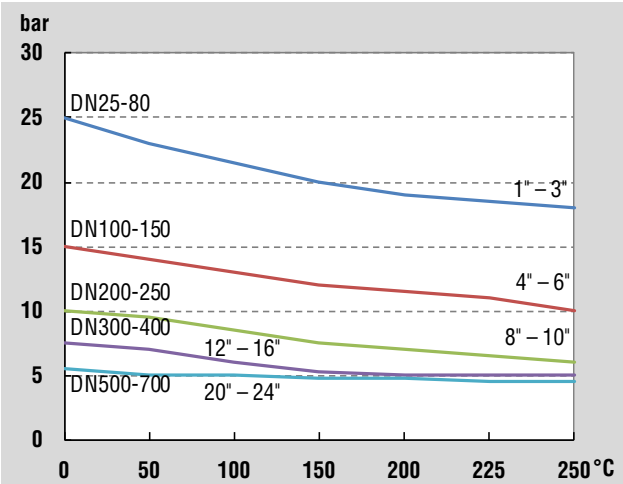


Max. dp R-PTFE seat, closed valve



Please note that the maximum allowed differential pressure can be further reduced if the maximum allowed working pressure, based on the body material and pressure class of the valve, is lower than the maximum allowed differental pressure.

Max. dp in control service



Operating Torque and Flow Capacities

Table 2: Operating torque, Nm

DN	Size	Differential pressure in bar																	
		3		10		15		20		25		30		35		40		50	
		R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6
25	1"	5	7	8	12	12	17	15	21	18	25	20	29	23	33	26	37	32	45
40	1.5"	6	8	11	15	15	21	19	27	22	32	27	38	31	44	35	50	43	62
50	2"	7	10	13	19	18	26	22	31	27	38	31	44	35	50	39	56	48	69
65	2.5"	13	19	25	35	32	45	42	60	49	70	57	81	65	93	73	104	89	127
80	3"	15	22	32	45	42	60	56	80	67	95	78	112	90	128				
100	4"	21	30	42	60	60	85	77	110	95	135	112	160	130	185				
150	6"	53	75	109	155	147	210	189	270	228	325								
200	8"	98	140	214	305	294	420	375	535	455	650								
250	10"	175	250	378	540	525	750	665	950	812	1160								
300	12"	301	430	620	885	847	1210	1075	1535	1309	1870								
350	14"	440	629	928	1325	1345	1921	1623	2318	1971	2815								
400	16"	624	892	1281	1830	1845	2635	2220	3171	2689	3841								
500	20"	784	1120	1512	2160	2093	2990	2653	3790										
600	24"	1582	2260	3010	4300	4130	5900	5250	7500										
700	28"	2268	3240	4480	6400	6160	8800	7770	11100										

The minimum design differential pressure for selecting the actuator is 3 bar.

The specified torques in the table above are for clean media. For steam and with Alloy 6 seat rings increase the required torque by a factor of 1.2. If the media is a slurry or contains solids etc, consult your NAF representative.

Table 3: Flow capacities and characteristics

DN	Size	Flow capacities of K_v and C_v at the opening angle of																		Z-trim option at 90° opening angle	
		15°		20°		30°		40°		50°		60°		70°		80°		90°			
		K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v	K_v	C_v
25/05	1T05	0.04	0.05	0.09	0.10	0.24	0.28	0.40	0.46	0.56	0.65	0.75	0.87	0.94	1.09	1.19	1.38	1.52	1.76		
25/10	1T10	0.04	0.05	0.10	0.12	0.30	0.35	0.70	0.81	1.20	1.39	1.80	2.09	2.60	3.0	3.5	4.1	5.1	5.9		
25/15	1T15	0.50	0.58	0.70	0.81	1.20	1.39	2.00	2.3	3.3	3.8	4.4	5.1	5.6	6.5	8.3	9.6	11	13		
25/20	1T20	0.20	0.23	0.30	0.35	0.90	1.04	2.3	2.7	4.1	4.8	7.1	8.2	10	12	15	17	22	26		
40	1.5"	1.0	1.2	2.1	2.4	5.1	5.9	9.5	11	15	17	23	27	33	38	53	61	65	75	32	37
50	2"	1.6	1.9	3.2	3.7	8.2	9.5	15	17	25	29	38	44	53	61	85	99	103	119	49	57
65	2.5"	2.4	2.9	4.0	4.6	8.0	9.3	17	20	27	31	44	51	65	75	98	114	145	168	72	84
80	3"	4.0	4.6	8.0	9.3	18	21	32	37	52	60	78	90	110	128	150	174	245	284	181	210
100	4"	9.0	10	15	17	31	36	53	61	83	96	124	144	180	209	254	295	415	481	372	432
150	6"	25	29	40	46	78	90	135	157	212	246	310	360	445	516	615	713	970	1125	769	892
200	8"	30	35	50	58	110	128	200	232	310	360	470	545	670	777	920	1067	1250	1450	1219	1414
250	10"	33	38	80	93	200	232	337	391	575	667	830	963	1150	1334	1560	1810	2480	2877	2206	2559
300	12"	87	101	173	201	390	452	655	760	995	1154	1410	1636	1930	2239	2580	2993	3960	4594	3216	3731
350	14"	126	146	250	290	565	655	945	1096	1430	1659	2035	2361	2780	3225	3710	4304	5705	6618	2782	3227
400	16"	171	198	340	394	765	887	1285	1491	1950	2262	2770	3213	3785	4391	5050	5858	7765	9007	3715	4309
500	20"	205	238	435	505	990	1148	1710	1984	2600	3016	3690	4280	5045	5852	6730	7807	10350	12006	6036	7002
600	24"	271	315	561	650	1274	1478	2087	2421	3238	3756	4683	5432	6704	7776	9417	10924	14556	16885		
700	28"	389	452	804	933	1828	2120	2993	3472	4634	5375	6868	7967	9448	10960	12764	14806	19966	23161		

Dimensions and Weight

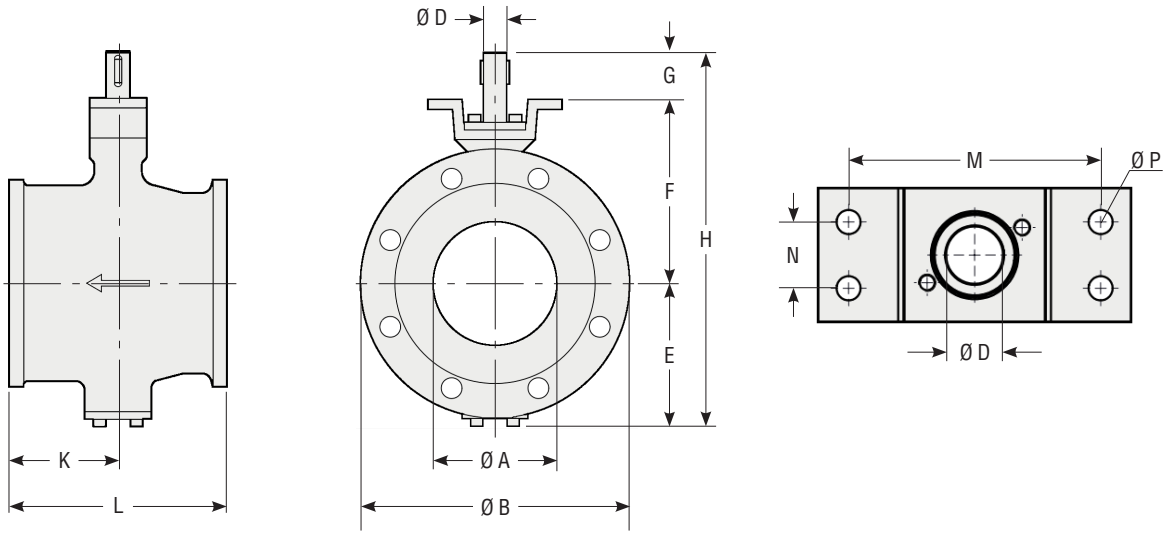


Table 4: Valve Dimensions and Weight

DN	Size	Dimensions, mm												Weight kg	
		A	B	D	E	F	G	H	K	L	M	N	P	Wafer	Flanged[1]
25	1"	20	65	20	60	120	43	225	51	102	115	30	11	4	7.2
40	1.5"	32	86	20	75	125	43	245	57	114	115	30	11	5.5	9.8
50	2"	40	105	20	90	131	43	265	62	124	115	30	11	6.5	13.0
65	2.5"	50	122	20	101	139	43	283	68	135	115	30	11	9	15.5
80	3"	70	132	20	110	145	43	300	83	165	115	30	11	11.5	18
100	4"	85	162	20	120	167	43	332	97	194	115	30	11	15.5	25
150	6"	130	218	25	155	195	50	400	115	229	115	30	11	26	41
200	8"	170	273	30	185	236	59	480	130	243	160	40	14	42	64
250	10"	208		35	230	295	65	590	155	297	160	40	14	-	100
300	12"	258		40	260	320	80	660	183	338	214	60	18	-	145
350	14"	282		50	290	360	93	742	200	400	214	60	18	-	174
400	16"	316		50	308	383	93	784	224	400	214	60	18	-	211
500	20"	400		50	371	460	93	942	288	508	214	60	18	-	348
600	24"	498		80	509	584	149	1242	350	610	277	115	33	-	840
700	28"	581		80	569	685	149	1403	407	710	277	115	33	-	1100

[1] Applies to the weight of a PN10 valve

Actuators

NAF Setball is available with hand levers, worm gears, pneumatic actuators or with electrical actuators and accessories.

The maximum differential pressure for selected actuator and valve is based on torque values in table 2 and is valid for clean media, e.g. water. For steam and other media, please see notes under table 2.

The NAF Turnex pneumatic actuator can be directly mounted to the NAF Setball without any couplings or brackets. Together with the direct mounting capabilities of all NAF positioners and several of the Flowserve positioners (PMV P5/EP5, PMV D3/D20/D30 and Logix 520 MD+/Logix 3800), this provides high performance, vibration resistance and a compact valve package suitable for precision control.

Please see data sheet for further information on the NAF Turnex actuator capabilities and all other available accessories.

If other pneumatic or electrical actuators are required, consult your Flowserve NAF representative.

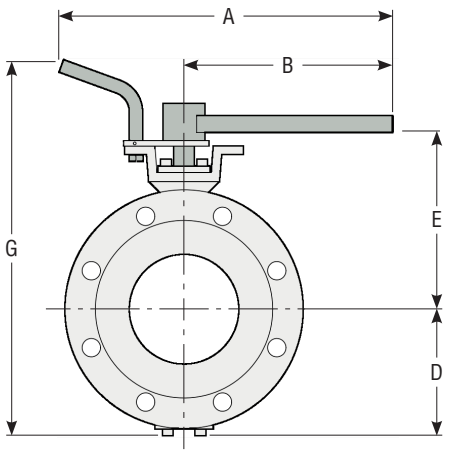


Table 5a: NAF Setball valves with hand levers

DN	Size	Max. dp bar Seat of		NAF No.	Dimensions, mm					Weight kg	
		R-PTFE	Alloy 6		A	B	D	E	G	Wafer	Flanged
Hand lever as per Fk 70.51											
25	1"	50	50	791020-2	500	350	60	158	300	6	9.2
40	1.5"	50	50	791020-2	500	350	75	163	320	7.5	11.8
50	2"	50	45	791020-2	500	350	90	168	340	8.5	15
65	2.5"	35	35	791020-2	500	350	101	176	348	11	17.5
80	3"	35	30	791020-2	500	350	110	183	375	13	20
100	4"	25	25	791020-2	500	350	120	205	497	18	27
150	6"	12	8	791020-3	500	350	155	233	470	28	43
200	8"	7	5	791020-4	615	450	185	273	550	45	67

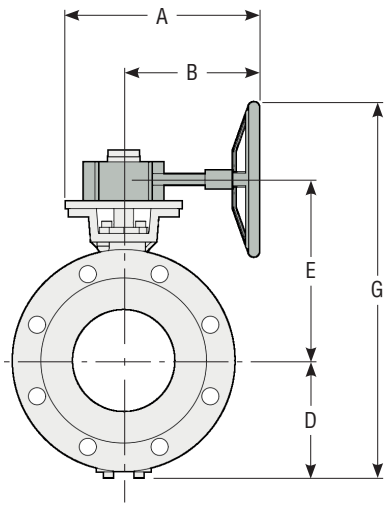
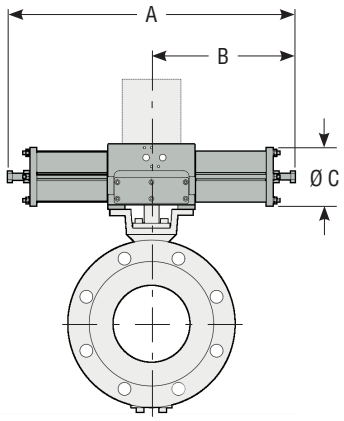
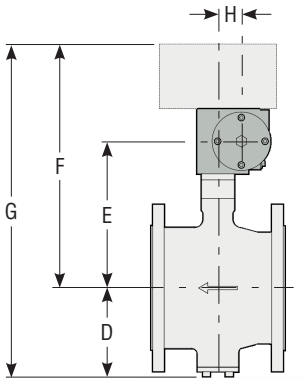


Table 5b: NAF Setball valves with worm gears

DN	Size	Max. dp bar Seat of		NAF No.	Dimensions, mm					Weight kg	
		R-PTFE	Alloy 6		A	B	D	E	G	Wafer	Flanged
Worm gear actuator as per Fk 70.76[1]											
25	1"	50	50	791051-11020	249	174	60	154	314	8	11.2
40	1.5"	50	50	791051-11020	249	174	75	159	334	9.5	13.8
50	2"	50	50	791051-11020	249	174	90	165	355	10.5	17
65	2.5"	35	35	791051-11020	249	174	101	173	374	13	19.5
80	3"	35	35	791051-11020	249	174	110	179	389	15.5	22
100	4"	25	25	791051-11020	249	174	120	201	421	19.5	29
150	6"	25	25	791051-11025	249	174	155	229	484	30	45
200	8"	25	25	791051-22030	328	243	185	279	614	51	73
250	10"	25	16	791051-22035	328	243	230	338	718	-	109
250	10"	25	25	791051-32035	416	291	230	345	775	-	117
300	12"	25	25	791051-33040	416	291	260	370	830	-	162
350	14"	25	16	791051-33050	416	291	290	425	915	-	191
350	14"	25	25	791051-43050	507	337	290	415	955	-	206
400	16"	16	11	791051-33050	416	291	308	433	941	-	227
400	16"	25	25	791051-43050	507	337	308	438	996	-	243
500	20"	20	20	791051-43050	507	337	371	515	1136	-	380
600	24"	14	9	791051-45080	507	337	509	639	1398	-	872
600	24"	20	17	791051-55080	591	421	509	639	1348	-	878
600	24"	20	20	791051-65080	697	487	509	656	1465	-	907
700	28"	15	10	791051-55080	591	421	569	740	1509	-	1138
700	28"	20	20	791051-65080	697	487	569	757	1626	-	1167

[1] Available with locking device-please contact Flowserve NAF representative





NAF 791290/791390

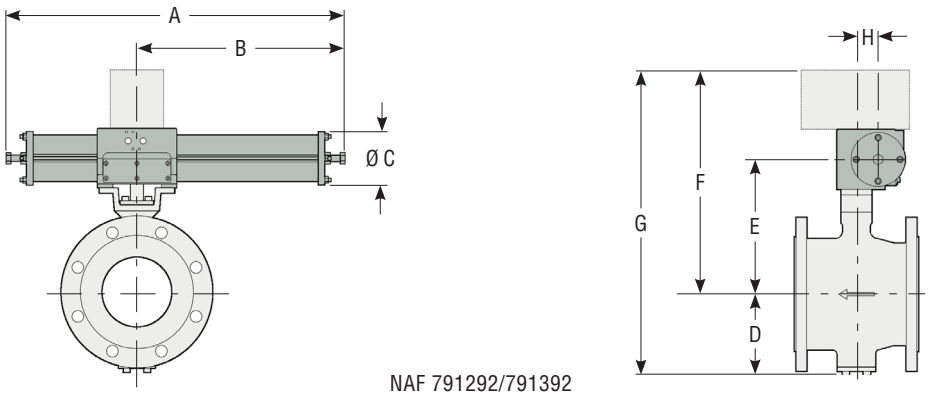
Table 6: NAF Setball valves with NAF Turnex pneumatic actuators (double acting)

DN	Size	Max. dP bar at supply of						NAF No.	Dimensions, mm								Weight kg	
		4 bar		5 bar		6 bar												
		R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6		A	B	C	D	E	F	G[2]	H	Wafer	Flanged[1]
25	1"	50	50	50	50	50	50	791390-0220	370	185	80	60	171	222	392	31	8	11.2
40	1.5"	50	50	50	50	50	50	791390-0220	370	185	80	75	176	227	412	31	10	14.3
50	2"	50	50	50	50	50	50	791390-0220	370	185	80	90	182	233	433	31	11	17.5
65	2.5"	44	30	50	38	50	48	791390-0220	370	185	80	101	190	241	452	31	13	19.5
80	3"	30	20	35	25	35	33	791390-0220	370	185	80	110	196	247	467	31	16	22.5
80	3"	35	35	35	35	35	35	791390-1220	490	245	100	110	201	257	477	40	18	24.5
100	4"	20	14	25	18	25	22	791390-0220	370	185	80	120	218	269	499	31	20	29.5
100	4"	35	30	35	35	35	35	791290-1220	490	245	100	120	223	279	509	40	22	31.5
150	6"	5	-	8	4	11	7	791390-0225	370	185	80	155	246	297	562	31	30	45
150	6"	16	11	21	14	25	17	791290-1225	490	245	100	155	251	307	572	40	32	47
150	6"	25	25	25	25	25	25	791290-2225	700	350	145	155	270	343	608	63	43	58
200	8"	17	11	22	14	25	18	791290-2130	700	350	145	185	311	384	679	63	59	81
200	8"	25	24	25	25	25	25	791290-2230	700	350	145	185	311	384	679	63	59	81
250	10"	8	5	11	7	14	9	791290-2135	700	350	145	230	370	443	783	63	-	117
250	10"	19	13	24	16	25	20	791290-2235	700	350	145	230	370	443	783	63	-	117
250	10"	25	22	25	25	25	25	791290-3135	820	410	200	230	401	493	833	75	-	129
300	12"	10	7	14	9	17	11	791290-2240	700	350	145	260	395	468	838	63	-	162
300	12"	25	25	25	25	25	25	791290-3240	820	410	200	260	420	512	882	75	-	174
350	14"	25	16	25	21	25	25	791290-3250	820	410	200	290	460	552	952	75	-	203
350	14"	25	25	25	25	25	25	781390-4250	1110	555	260	290	488	591	991	100	-	240
400	16"	16	11	22	15	25	19	791290-3250	820	410	200	308	483	575	993	75	-	240
400	16"	25	25	25	25	25	25	781390-4250	1110	555	260	308	511	614	1032	100	-	277
500	20"	14	8	19	11	20	13	791290-3250	820	410	200	371	560	652	1133	75	-	377
500	20"	20	20	20	20	20	20	781390-4250	1110	555	260	371	588	691	1172	100	-	414
600	24"	14	9	18	11	20	15	781390-4280	1110	555	260	509	712	815	1434	100	-	906
600	24"	20	18	20	20	Max air supply 5 bar		781390-4580	1250	695	395	509	712	815	1434	100	-	950
700	28"	8	4	11	7	14	9	781390-4280	1110	555	260	569	813	916	1595	100	-	1166
700	28"	17	11	20	15	Max air supply 5 bar		781390-4580	1250	695	395	569	813	916	1595	100	-	1210

[1] Applies to weight of a PN10 valve, including actuator and positioner

[2] Including all direct mounted Flowserve positioners

The above stated dP apply for clean media type water 20 °C. For other media, please contact Flowserve NAF. See also page 10.



NAF 791292/791392

Table 7: NAF Setball valves with NAF Turnex pneumatic actuators (spring to close)

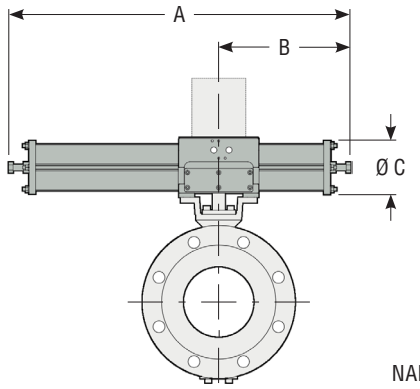
DN	Size	Max. dP bar at supply of						NAF No.	Dimensions, mm								Weight kg	
		4 bar [3]		5 bar		6 bar												
		R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6		A	B	C	D	E	F	G[2]	H	Wafer	Flanged[1]
25	1"	50	46	50	50	50	50	791392-0220	455	270	80	60	171	222	392	31	9	12
40	1.5"	50	34	50	39	50	39	791392-0220	455	270	80	60	176	227	412	31	11	15
40	1.5"	50	50	50	50	50	50	791292-1220	635	390	100	60	181	237	422	40	15	19
50	2"	42	28	48	33	48	33	791392-0220	455	270	80	90	182	233	433	31	12	19
50	2"	50	44	50	50	50	50	791292-1220	635	390	100	90	185	243	443	40	16	23
65	2.5"	18	12	32	20	32	20	791392-0220	455	270	80	101	190	241	452	31	14	21
65	2.5"	38	25	50	35	50	35	791292-1220	635	390	100	101	195	251	462	40	18	25
80	3"	13	8	16	10	16	10	791392-0220	455	270	80	110	196	247	467	31	17	24
80	3"	22	15	30	20	30	20	791292-1220	635	390	100	110	201	257	477	40	21	28
80	3"	35	35	35	35	35	35	791292-2220	890	540	145	110	220	293	513	63	35	42
100	4"	10	5	13	6	13	6	791392-0220	455	270	80	120	218	269	499	31	21	31
100	4"	12	9	19	13	19	13	791292-1220	635	390	100	120	223	279	494	40	25	35
100	4"	35	35	35	35	35	35	791292-2220	890	540	145	120	242	315	530	63	39	49
150	6"	3	-	6	3	6	3	791292-1225	635	390	100	155	251	307	572	40	35	50
150	6"	25	25	25	25	25	25	791292-2225	890	540	145	155	270	343	608	63	49	64
200	8"	15	10	20	14	20	14	791292-2230	890	540	145	185	311	384	679	63	65	87
200	8"	25	25	25	25	25	25	791292-3230	1050	640	200	185	336	428	723	75	85	107
250	10"	7	4	9	6	9	6	791292-2235	890	540	145	230	370	443	783	63	-	123
250	10"	25	21	25	25	25	25	791292-3235	1050	640	200	230	401	493	833	75	-	143
300	12"	16	11	22	16	22	16	791292-3240	1050	640	200	260	420	512	882	75	-	188
300	12"	25	25	25	25	25	25	791392-4240	1520	965	260	260	448	551	921	100	-	245
350	14"	8	6	13	9	13	9	791292-3250	1050	640	200	290	460	552	952	75	-	217
350	14"	28	18	25	24	25	24	791392-4250	1520	965	260	290	488	591	991	100	-	274
400	16"	6	3	9	5	9	5	791292-3250	1050	640	200	308	483	575	993	75	-	254
400	16"	19	12	25	16	25	16	791392-4250	1520	965	260	308	511	614	1032	100	-	311
400	16"	25	16	25	16	Max air supply 5 bar		791392-4550	1665	965	395	308	511	614	1032	100	-	356
500	20"	3	-	7	4	7	4	791292-3250	1050	640	200	371	560	652	1132	75	-	391
500	20"	15	9	20	13	20	13	791392-4250	1520	965	260	371	588	691	1172	100	-	448
500	20"	20	20	20	20	20	20	791392-5250	2210	1370	395	371	642	761	1242	150	-	833
600	24"	3	-	8	5	8	5	791392-4280	1520	965	260	509	712	815	1434	100	-	942
600	24"	8	5	8	5	Max air supply 5 bar		791392-4580	1665	965	395	509	712	815	1434	100	-	987
600	24"	20	20	20	20	20	20	791392-5280	2210	1370	395	509	766	885	1504	150	-	1327
700	28"	18	12	20	19	20	19	791392-5280	2210	1370	395	569	867	986	1665	150	-	1587

[1] Applies to weight of a PN10 valve, including actuator and positioner

[2] Including all direct mounted Flowserve positioners

The above stated dP apply for clean media type water 20 °C. For other media, please contact Flowserve NAF. See also page 10.

[3] Actuators with alternative spring rates for low supply pressure are available from sizing tool Performance Next!



NAF 791294/791394

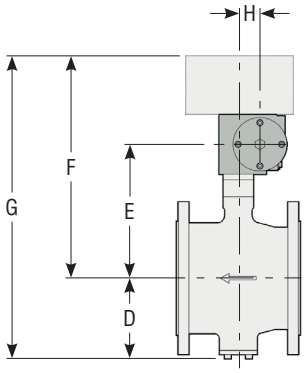


Table 8: NAF Setball valves with NAF Turnex pneumatic actuators (spring to open)

DN	Size	Max. dP bar at supply of						NAF No.	Dimensions, mm								Weight kg	
		4 bar [3]		5 bar		6 bar												
		R-PTFE	Alloy 6	R-PTFE	Alloy 6	R-PTFE	Alloy 6		A	B	C	D	E	F	G[2]	H	Wafer	Flanged[1]
25	1"	30	20	50	50	50	50	791394-0220	455	270	80	60	171	222	392	31	9	12.2
25	1"	45	30	50	50	50	50	791294-1220	635	390	100	60	176	232	402	40	13	16.2
40	1.5"	20	14	50	46	50	50	791394-0220	455	270	80	75	176	227	412	31	11	15.3
40	1.5"	32	22	50	50	50	50	791294-1220	635	390	100	75	181	237	422	40	15	19.3
50	2"	18	11	50	39	50	43	791394-0220	455	270	80	90	182	233	433	31	12	18.5
50	2"	26	17	50	50	50	50	791294-1220	635	390	100	90	187	243	443	40	16	22.5
65	2.5"	7	4	28	17	31	20	791394-0220	455	270	80	101	190	241	452	31	14	100
65	2.5"	11	7	50	35	50	45	791294-1220	635	390	100	101	195	251	462	40	18	24.5
80	3"	-	-	18	12	20	14	791394-0220	455	270	80	110	196	247	467	31	17	23.5
80	3"	8	4	28	19	35	26	791294-1220	635	390	100	110	201	257	477	40	21	27.5
100	4"	6	3	19	13	25	17	791294-1220	635	390	100	120	223	279	494	40	25	34.5
100	4"	35	32	35	35	35	35	791294-2220	890	540	145	120	242	315	530	63	39	49
150	6"	-	-	5	3	8	5	791294-1225	635	390	100	155	251	307	572	40	35	50
150	6"	17	11	25	25	25	25	791294-2225	890	540	145	155	270	343	608	63	49	64
200	8"	7	4	20	13	25	18	791294-2230	890	540	145	185	311	384	679	63	65	87
200	8"	25	19	25	25	25	25	791294-3230	1050	640	200	185	336	428	723	75	85	107
250	10"	-	-	10	6	12	8	791294-2235	890	540	145	230	370	443	783	63	-	123
250	10"	14	9	25	25	25	25	791294-3235	1050	640	200	230	401	493	833	75	-	143
300	12"	7	4	20	14	25	20	791294-3240	1050	640	200	260	420	512	882	75	-	188
300	12"	17	11	25	25	25	25	791394-4240	1520	640	200	260	448	551	921	100	-	245
350	14"	-	-	12	8	19	12	791294-3250	1050	640	200	290	460	552	952	75	-	217
350	14"	10	6	25	21	25	25	791394-4250	1520	965	260	290	488	591	991	100	-	274
400	16"	-	-	9	5	12	7	791294-3250	1050	640	200	308	483	575	993	75	-	254
400	16"	6	3	22	14	25	21	791394-4250	1520	965	260	308	511	614	1032	100	-	311
400	16"	25	21	25	21	Max air supply 5 bar		791394-4550	1665	965	395	308	511	614	1032	100	-	356
500	20"	-	-	16	11	20	17	791394-4250	1520	965	260	371	588	691	1172	100	-	448
500	20"	20	17	20	17	Max air supply 5 bar		791394-4550	1665	965	395	371	588	691	1172	100	-	493
600	24"	11	7	11	7	Max air supply 5 bar		791394-4580	1665	965	395	509	712	815	1434	100	-	987
600	24"	8	4	20	17	20	20	791394-5280	2210	1370	395	509	766	885	1504	150	-	1327
700	28"	7	3	7	3	Max air supply 5 bar		791394-4580	1665	965	395	569	813	916	1595	100	-	1247
700	28"	-	-	16	11	20	20	791394-5280	2210	1370	395	569	867	986	1665	150	-	1587
700	28"	20	20	20	20	Max air supply 5 bar		791394-5580	2260	1370	550	569	867	986	1665	150	-	1687

[1] Applies to weight of a PN10 valve, including actuator and positioner

[2] Including all direct mounted Flowserve positioners

[3] Actuators with alternative spring rates for low supply pressure are available from our sizing tool Performance Next!

The above stated dP apply for clean media type water 20 °C. For other media, please contact Flowserve NAF. See also page 10.

Product Code for NAF Setball

Example:

	87	**8**	**0**	**E**	**B**	-	**0100**	–	**0**	**A**	**XA**
Code	1	2	3	4	5		6		7	8	9

1. Valve type

87 **NAF Setball**

Z-87 NAF Setball with Z-trim option

2. Material [1]

	Body	Ball Sector
6	WCB (~EN1.0619)	CF8M/316 (~EN1.4408)[4]
8	**CF8M/316 (~EN1.4408)**	**CF8M/316 (~EN1.4408)**[4]

3. Pressure rating

Wafer version

	PN ratings	ANSI ratings	
	DN 25-65	Size 1"-2"	PN 10-40/ANSI 150-300
0	DN 80-100	Size 2.5"-4"	PN 10-25/ANSI 150
	DN 150-200	Size 6"-8"	PN 10-16/ANSI 150

Flanged version

2	**PN 10**	(DN 200-700)[2]
3	**PN 16**	(DN 80-700)
4	**ANSI Class 150**	(Size 1"-28")
5	**PN 25**	(DN 200-700)[2]
6	**PN 40**	(DN25-700)
7	**ANSI Class 300**	(Size 1"-28")[3]

4. Stem bearing

E **R-PTFE + stainless steel**

5. Body type

B Wafer

F Flanged

[1] For material CF8, CF3M, CG3M, CG8M, Duplex EN 1.4470, CW-12MW, M35-01, CK3MCuN, titanium B367 Grade C2, etc, please contact Flowserve NAF

[2] Size DN 25-65 have the same flange dimension in PN 10, 16, 25 and 40. Choose PN 40 for these valves.
Sizes 80–150 have the same dimensions in PN 10 and PN 16. Choose PN 16 for these sizes.
Sizes 80–150 have the same dimensions in PN 25 and PN 40. Choose PN 40 for these sizes.

[3] Not available in size 2.5".

[4] Ball sector material in the Z-trim version is Duplex EN 1.4470.

6. Size

	PN ratings		ANSI ratings
	DN		Size
2505	25/5	**1T05**	1"/5
2510	25/10	**1T10**	1"/10
2515	25/15	**1T15**	1"/15
2520	25/20	**1T20**	1"/20
0040	40	**01.5**	1.5"
0050	50	**0002**	2"
0065	65	**02.5**	2.5"
0080	80	**0003**	3"
0100	100	**0004**	4"
0150	150	**0006**	6"
0200	200	**0008**	8"
0250	250	**0010**	10"
0300	300	**0012**	12"
0350	350	**0014**	14"
0400	400	**0016**	16"
0500	500	**0020**	20"
0600	600	**0024**	24"
0700	700	**0028**	28"

7. Seat and ball sector overlay

	Seat	Ball Sector Overlay
0	Alloy 6	Hard Chrome
1	R-PTFE, max 225°C	-

8. Seals

	Seat Seal	Stem Packing
A	**R-PTFE**	**Zebra-CL™ (R-PTFE/PTFE V-rings)**
B	R-PTFE	Safeguard (R-PTFE/PTFE V-rings, spring loaded)

9. Options

D Degreased version

I Internal O-rings for sealing the stem from the medium

XA ATEX certified

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VATB000192 (EN/A4) August 2020

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visit www.flowserve.com or call 1 800 225 6989