no bloc DAFRAM S.p.A.

VALVOLE A SFERA - BALL VALVES

LICENSE
6D-0265
6A-1175
6DSS-0029

Member of CISQ Federation
CERTIFIED MANAGEMENT SYSTEM
ISO 9001 - ISO 14001
ISO 45001

DAFRAM fire-safe ball valves
The right choice for high performance and critical applications

COMPANY PROFILE

DAFRAM S.p.A., founded in 1956, was the first company to manufacture floating ball valves in Italy. The long experience gathered during more than 50 years of activity ensures that DAFRAM are one of the most famous and competitive companies in the world.
DAFRAM's factory is located in Urbisaglia (Macerata), the centre of Italy on an industrial complex covering 32.000 square meters, 12.000 of which are covered workshops. The factory consists of commercial, technical and engineering offices and of two extremely modern workshops the latest of which, 4200 square meters, 10 meters high, completed in February 2008, allows the production, assembly, testing, sandblasting and painting of ball valves up to extremely large sizes and weights.
The Dafram design and production staff includes highly qualified engineers with a long experience in all technical standards and meeting customer's special requirements. Modern design methods are employed to analyse specific stresses and deformation limits of valve bodies and main valve components.
The manufacturing process is continually improved and changed using the most advanced manufacturing technologies such as: multi-function machining centers and several computer controlled lathes.
Special testing centers are used for testing of all products and are specifically used for high pressure and large size TRUNNION MOUNTED valves. Both vertical and horizontal testing machines as well as equipment used to determine valve operating torques, testing valves at low and high temperatures, allow DAFRAM's prototypes to be checked and verified on site and 100% of production to be tested, checked and certified before leaving DAFRAM's plant.

PRODUCTS and SERVICE

The range consists exclusively of TOP QUALITY BALL VALVES for high performance and critical applications in FLOATING, TRUNNION MOUNTED and special configurations, size 1/4" to 36", 150lbs to 2500lbs, PN10 to PN450, FULL and REDUCED bore, in Carbon Steel, Stainless Steel, Nickel and exotic alloys, for the following services:
Chemical, Petrochemical, Refining Pharmaceutical, Food industry, Power and co-generation plants, Desalting units, Pulp and Paper industry, Ship building (Chemical, LPG, LNG - DNV, ABS approved), ON-shore & OFF-shore OIL and GAS production, ON-shore OIL and GAS pipelines, OIL and GAS storage, Transportation and Gathering Systems, Gas re-injection plants, Gas treatment plants, LPG and LNG production storage and transportation.
Special products covering the entire pressure range are available for use in special services, such as:

- BALL VALVES with PTFE STEM PACKING for AGGRESSIVE CHEMICAL SERVICE without O-RINGS in TA-LUFT and Fire Safe BS 6755 part 2 executions
- METAL SEATED ball valves for both ABRASIVE and HIGH TEMPERATURE
- CRYOGENIC ball valves with special STEM EXTENSION
- FULLY JACKETED ball valves with oversize flanges
- TOP ENTRY ball valves
- FULLY WELDED ball valves
- LOW EMISSIONS ball valves, TA-LUFT certified and HELIUM tested both to VACUUM and to SNIFFER methods

DAFRAM S.p.A. is a specialised manufacturer of High Performance ball valves for Chemical, Petrochemical, Oil & Gas, Power Generation, OFF and ON-SHORE services with extensive experience in the most advanced sealing technologies

WORKSHOP

WORKSHOP

Because of continuous product development and modernisation, DAFRAM's workshop is constantly being renewed. It utilises the most advanced manufacturing technologies in valve component machining, drilling and testing.

Eleven modern, computer controlled lathes and seven machining centres ensure complete control over the entire manufacturing process.

Both vertical and horizontal testing machines, as well as two special machines which automatically detect the valves operating torques, allow DAFRAM's production to be 100% tested, controlled and certified before leaving our plant.

Standard testing for every valve is performed according to BS 6755 part 1 (floating ball valves), API 6D (TRUNNION mounted ball valves) and API 598. Other testing specifications or procedures may be followed upon customer request.

The castings used by DAFRAM are produced in sand and with a sophisticated REPLICAST moulding method by an innovative local foundry located on site. The "Moulding System" method used by the foundry, based on a special ceramic process, allows DAFRAM to supply high quality cast valves with excellent surface finish.

A special quality laboratory has been developed to perform all the main tests required by the valve industry, such as: a quantometer to define the chemical composition of 24 elements, dedicated machines to verify the Carbon content in Low Carbon alloys and the Oxygen and Nitrogen content in Super Nickel alloys. All most important Non Destructive Tests like X-RAYS, Ferrite Content Examination, Magnetic Particles Inspections, DPE & PMI, Corrosion Tests are available upon request.

QUALITY

SYSTEM

DAFRAM design and production processes are covered by the following certificates:

- API 6D, license N. 0265
- API 6DSS, license N. 0029
- API 6A, license N. 1175
- PED 2014/68/EU by Bureau Veritas,
- TRD 100 / HP 0 by TÜV
- TA-Luft by TÜV
- DIRECTIVE 2014/34/UE (ATEX)
- SIL3 for functional safety

DAFRAM management system is covered by the following certificates:

- ISO 9001
- ISO 14001
- ISO 45001

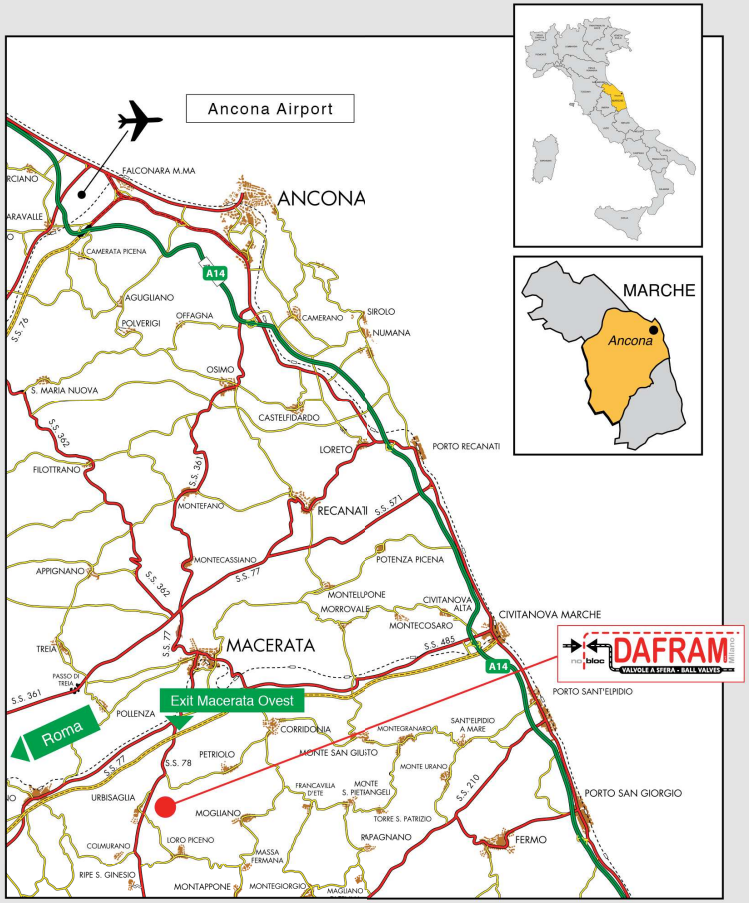
DAFRAM valves are tested according to:

- API 6D, API 6DSS, API 593, API 6A
- BS 6755 part I
- EN 12266-1
- IEC 60534

and Fire Safe tested and certified according to:

- API 607 5th Edition, API 6FA
- BS 6755 Part 2
- ISO 10497

DAFRAM



DAFRAM
VALVOLE A SFERA - BALL VALVES

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FLOATING BALL VALVES

ANSI EXECUTION

TYPE	CLASS	BORE	CONSTR.
150MC	150lbs	Reduced	1pc Insert Body
150RC	150lbs	Reduced	2pcs Split Body
150TC	150lbs	Full	2pcs Split Body
150TM	150lbs	Full	2pcs Split Body
300MC	300lbs	Reduced	1pc Insert body
300RC	300lbs	Reduced	2pcs Split Body
300TM	300lbs	Full	2pcs Split Body
600R	600lbs	Reduced	2pcs Split Body
600T	600lbs	Full	2pcs Split Body
900R	900lbs	Reduced	2pcs Split Body
900T	900lbs	Full	2pcs Split Body
1500R	1500lbs	Reduced	2pcs Split Body
1500T	1500lbs	Full	2pcs Split Body
2500R	2500lbs	Reduced	2pcs Split Body
2500T	2500lbs	Full	2pcs Split Body

DIN EXECUTION

TYPE	CLASS	BORE	CONSTR.
16R	PN16	Reduced	1pc Insert Body
16TE	PN16	Full	2pcs Split Body
16TL	PN16	Full	2pcs Split Body
16VK	PN16	Full	2pcs Split Body
16VL	PN16	Full	2pcs Split Body
40R	PN40	Reduced	1pc Insert Body
40ME	PN40	Full	1pc Insert Body
40TE	PN40	Full	2pcs Split Body
40TL	PN40	Full	2pcs Split Body
40VK	PN40	Full	2pcs Split Body
40VL	PN40	Full	2pcs Split Body

Other pressure classes from PN64 to PN400 available upon request

SPECIAL EXECUTION

TYPE	CLASS	BORE	CONSTR.	NOTES
THREE WAYS				
S3VP	150lbs	Full	SPLIT BODY	120° CONN
S3VE	PN16	Full	SPLIT BODY	120° CONN
S3VT	300lbs	Full	SPLIT BODY	120° CONN
S3VLP	150lbs	Full	SPLIT BODY	90° CONN.
S3VLE	PN16	Full	SPLIT BODY	90° CONN.
S3VLT	300lbs	Full	SPLIT BODY	90° CONN.
WAFER TYPE - SHORT PATTERN				
16STA	PN16	Full	1pc Insert Body	NOT FIRE SAFE
40STA	PN40	Full	1pc Insert Body	NOT FIRE SAFE
150STA	150lbs	Full	1pc Insert Body	NOT FIRE SAFE
300STA	300lbs	Full	1pc Insert Body	NOT FIRE SAFE
16WT	PN16	Full	1pc Insert Body	FIRE SAFE
40WT	PN40	Full	1pc Insert Body	FIRE SAFE

VALVES with NIPPLED AND THREADED ENDS

DAFRAM's NIPPLED AND THREADED ENDS ball valves figures are defined by the following "fields"

FIGURE		
1st "field"	D	standard
2nd "field"	class	800, 1500, 3000
3rd "field"	bore	F = Full / R = reduced
4th "field"	ends	BW, SW, PE, NPT, BSP, GAS
5th "field"	optional	3P in case of three piece body
6th "field"	optional	CRYO = Cryogenic /// HT = High Temperature

i.e. Ball valve - cl. 800 - Full Bore - one end BW/one end NPT female = **D800-F-BW/NPT** (if 3 pcs body = **D800-F-BW/NPT-3P**)

All FLOATING BALL VALVES are manufactured according to BS5351 (API-6D and B16.34 available upon request), and supplied complete of UNI/EN 10204 3.1B certificates showing the materials mechanical and chemical properties plus the pressure tests and any other special tests performed. Tests are carried out as standard to BS 6755 part 1 or according to other international rules upon specific request by the user. All valves are equipped with antistatic device, anti blow-out stem, flanged ends ANSI B16.5 or DIN with different finish: RF, RFS, RTJ or with special finish BW, PE, SW, HUB. Most of the valves are with standard ISO 5211 TOP FLANGE to ensure easy mounting of any actuation system. Fire Safe Certified executions to BS 6755 part 2 and API 607 4th Edition are available for all valves' types; TA-LUFT low emission certificates are available for most common types and executions. Special accessories may be installed on the whole range, such as: Gearboxes, Actuators, Chain Wheels, Locking Devices, Stem extensions for insulation, cryogenic and high temperature service, limit switches, pup pieces, heating jackets.

FACE to FACE / END TO END - [mm]

inches	1/2"	3/4"	1"	1.1/4"	1.1/2"	2"	2.1/2"	3"	4"	5"	6"	8"	10"	12"
mm	15	20	25	32	40	50	65	80	100	125	150	200	250	300
ANSI BALL VALVES														
150MC	108	117	127	140	165	178	191	203	229	254	267	292	330	356
150RC					165	178	191	203	229	254	267	292	330	610
150TC						178	191	203	229					
150TM	108	117	127	140	165	203	222	241	305	356	394	457	533	610
300MC	140	152	165		190	216	241	283	305	381	403	419	457	502
300RC						216	241	283	305	381	403	419	457	502
300TM	140	152,5	165		190	216	241	283	305		403	502	568	648
600R					241	292	330	356	432		559	660		
600T	165	190	216		241	292	330	356	432		559			
900R-RF					305	368								
900R-RJ					305	371								
900T-RF	216	229	254	280	305	368								
900T-RJ	216	229	254	280	305	371								
1500R-RF					305	368								
1500R-RJ					305	371								
1500T-RF	216	229	254	280	305	368								
1500T-RJ	216	229	254	280	305	371								
2500R-RF					384	451								
2500R-RJ					384	454								
2500T-RF					384	451								
2500T-RJ	264	273	308		384									
150STA	35	39	45	50	60	72	95	116	140		210			
300STA	35	39	45	50	60	72	95	116	140		210			
DIN BALL VALVES														
16R	115	120	125	130	140	150	170	180	190	325	350	400	450	
16TE	115	120	125		140	150	170	180	190	325	350	400	450	
16TL	130	150	160	180	200	230	290	310	350	400	480	600	730	
16VK	115	120	125	130	140	150	170	180	190					
16VL	130	150	160	180	200	230	290	310	350					
40R	115	120	125	130	140	150	170	180	190	325	350	400	450	
40ME	115	120	125	130										
40TE	115	120	125		140	150	170	180	190	325	350	400	450	
40TL	130	150	160	180	200	230	290	310	350	400	480	600	730	
40VK	115	120	125	130	140	150	170	180	190					
40VL	130	150	160	180	200	230	290	310	350					
16STA	35	39	45	50	60	72	95	116	140					
40STA	35	39	45	50	60	72	95	116	140					
16WT							100	125	155	200	234	310		
40WT	41	42	50	52	67	80								
3-WAY BALL VALVES														
S3VP-E (*)	90	90	90	95	111	120	140	150	165	180	215	248	310	
S3VT (*)	90	100	102		125	135	170	178,5	194,5		236	315		
S3VLP-E (**)	122-100	122-100	122-100		169-155	160-160	175-175	195-195	215-215	245-245	285-285	335-335	405-405	
S3VLT (**)	122-100	132-100	132-106		180-150	180-170	220-200	230-230	265-265		315-315	405-370		
NIPPLED AND THREADED ENDS BALL VALVES														
D800F (***)	75	85	95	110	120	135								
D800R (***)	65	75	85	105	120	130								

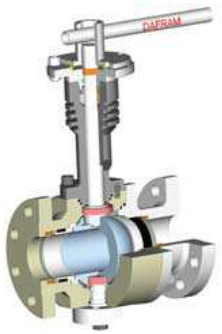
GEAR operator is suggested for these diameters

(*) THE VALUE GIVEN IS: DISTANCE BETWEEN CENTER VALVE AND BODY CONNECTOR FLANGE

(**) THE VALUES GIVEN ARE: DISTANCE BETWEEN THE ALIGNED FLANGES / ALIGNED FLANGED AXIS AND LATERAL BODY FLANGE

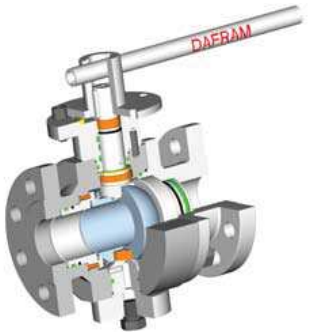
(***) THE FACE TO FACE OF NPT VALVES IS INDICATIVE ONLY. IN CASE OF NIPPLED ENDS THESE VALVES ARE SUPPLIED WITH NIPPLES 100mm LONG

Other product constructions both with ANSI flanges and DIN face to face and with DIN flanges and ANSI face to face dimension are available upon specific request in FULL and REDUCED bore, insert body and split body design under the following figures: 16MC, 40MC, 16ML, 40ML, 16RE, 40RE, 16RL, 16TM, 40TM, 16TC, 40TC



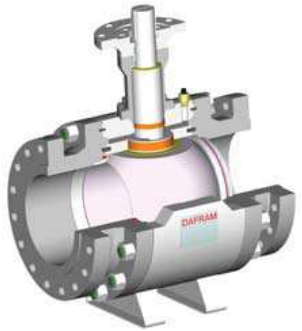
METAL SEATED BALL VALVES for HIGH TEMPERATURE SERVICE

DAFRAM's ball valve range (cl. 150lbs to 2500lbs / PN10 to PN400 - from 1/4" to 36") is available in METAL to METAL seated design for HIGH TEMPERATURE SERVICE up to +400°C, equipped with specially designed stem extensions in FLOATING BALL and TRUNNION MOUNTED execution.
Basic standards are : API, ANSI, DIN
Depending on the service required, different surface treatments are available on ball and seat rings, such as : Tungsten Carbide Coating (WC) and Chromium Carbide Coating (CrC).
Different materials are available to suit the most common applications.
DAFRAM has conducted laboratory tests at high temperature on different prototypes.
DAFRAM laboratories are equipped to test the valves with gas at the temperature pressure of the actual service conditions. Cycling tests as well as leakage tests to the environment or through the seats may be performed, upon request, with gas at high pressure and high temperature conditions.



METAL SEATED BALL VALVES for ABRASIVE SERVICE

The DAFRAM ball valve range (cl. 150lbs to 2500lbs / PN10 to PN400 - from 1/4" to 36") is available in METAL to METAL seated design for ABRASIVE SERVICE in FLOATING BALL and TRUNNION MOUNTED execution.
Basic standards are : API, ANSI, DIN
Depending on service conditions required different surface treatments are available on ball and seat rings, such as : Tungsten Carbide Coating (WC) and Chromium Carbide Coating (CrC) while a special hardening process (DAFRADUR) has been specially developed for abrasive conditions.
Different materials are available to suit the most applications.



CRYOGENIC BALL VALVES

The DAFRAM ball valve range (cl. 150lbs to 2500lbs / PN10 to PN400 - from 1/4" to 36") is available in special design for CRYOGENIC use for service temperatures from -140°C up to 150°C, in FLOATING BALL and TRUNNION MOUNTED, Double Block and Bleed, with SELF RELIEVING facility for normal uses and for dangerous expanding fluids (LPG).
Basic standards are : API, ANSI, DIN
Depending on the service conditions and on the lowest working temperature DAFRAM's CRYOGENIC ball valves are assembled with special stem extensions (vapour space to SHELL 77/200) and in Fire Safe design.
Different materials are available to suit most common applications, such as:
ASTM A350 gr. LF2,
ASTM A352 gr. LCC,
ASTM A182 gr. F316(L),
ASTM A351 gr. CF8M/CF3M
Special alloys are available upon specific request.

ACTUATED BALL VALVES

The DAFRAM ball valves are supplied with standard manual operators :

- Levers / Hand Wheel Worm Gear Operators

All valves are designed with standard TOP FLANGE ISO 5211 for easy mounting of any of the most advanced remote actuating systems, such as :

- ELECTRIC MOTOR OPERATORS for MOV service,
- PNEUMATIC and HYDRAULIC Actuators for regular ON-OFF service or for continuous cycling
- PNEUMATIC and HYDRAULIC Actuators for EMERGENCY SHUT DOWN (ESD) services

Specific manuals have been developed for the sizing of any actuation systems and special equipments are used for the detection of the valves torque upon delivery.

Assembling and functional pressure tests are carried out in DAFRAM's own testing workshop with the most advanced actuation and control facilities.

Ball valves for undergound service - gas distribution

Special valves for UNDERGROUND SERVICE are manufactured by DAFRAM for GAS DISTRIBUTION services.

Depending on the specific case, DAFRAM's valves are designed acc. To API6D, BS5351, ASME B16.34 and UNI-CIG 9734 – D.M.54/11/84, and available with bolted, seal welded or fully welded bodies, Full and Reduced Bore, from 1" up to 36", body ratings 150lbs to 2500lbs / PN10 to PN400

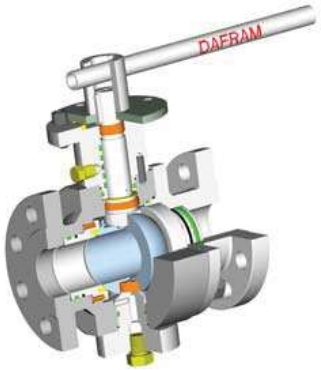
All valves may be supplied for installation in pit or buried, Floating and Trunnion Mounted with BW ends according to ASME B16.25, anti blow out stem, antistatic device, equipped with stem extensions to the main international standards and rules. Special executions with welded on pipe nipples (pup pieces), special purging bleed connections and stem extensions of specific length are available upon request.

Trunnion Mounted Ball Valves are Double Block and Bleed to API-6D and with Self Relieving or Double Piston effect seats.

External surface protection for underground applications is generally given by Epoxidic Resin Coating with thickness 100µm to 1500µm. Other painting cycles may be performed upon request.

TOP ENTRY BALL VALVES

On request DAFRAM can manufacture valves, Floating and Trunnion mounted, cl. 150lbs to 2500lbs / PN10 to PN400, Carbon Steel, Stainless Steel and Nickel alloys are available in TOP ENTRY design for easy maintenance on the internal components without removing the valve from the line.



BALL VALVES FOR FUGITIVE EMISSIONS

DAFRAM's ball valve range may be supplied with special stem extensions to reduce the fugitive emission to the environment and equipped with stem leakage detection plugs.
Most of the standard valves are TA-LUFT certified while special executions may be tested and certified with Helium tests according to the following methods:

- Quantitative : VACUUM - ASME V Art. 10 App. V par. 1062.2 (Hood Technique) for leakage of 1x10-6 mBar x L / sec. (this test is able to quantify the leak entity)
- Qualitative : SNIFFER METHOD - ASME V Art. 10 Par. 1000 "Detector Probe Technique" - for leakage of 1 x 10-6 mBar x L / sec. (this test is able to verify if the sniffer detects a leak within its sensitivity range)

Both tests are carried out at the DAFRAM quality laboratory by our Level 2, ASNT TC-1A: 2001 Qualified Inspectors

SELECTION OF MAIN MATERIALS

Part name	Standard Carbon Steel	Standard Low Temperature Carbon Steel	Standard Stainless Steel	Standard 22Cr Duplex and 25Cr Super Duplex Alloys	6Mo
Abbreviation	CS	LTCS	SS	DUP & S./DUP	SMO
BODY and CONNECTOR	ASTM A216 gr. WCB	ASTM A352 gr. LCC	ASTM A351 gr. CF8M	ASTM A890 gr. 4A	ASTM A351 CK3MCuN
	ASTM A105 - A105N	ASTM A350 gr. LF2	ASTM A351 gr. CF3M	ASTM A890 gr. 5A	ASTM A182 gr. F44
			ASTM A182 gr. F316	ASTM A182 gr. F51	
			ASTM A182 gr. F316L	ASTM A182 gr. F53 or F55	
BALL	ASTM A351 gr. CF8M / CF3M	ASTM A351 gr. CF8M / CF3M	ASTM A351 gr. CF8M / CF3M	ASTM A890 gr. 4A	ASTM A351 CK3MCuN
	ASTM A216 gr. WCB + ENP		ASTM A890 gr. 5A	ASTM A890 gr. 5A	ASTM A182 gr. F44
	ASTM A352 gr. LCC + ENP	ASTM A352 gr. LCC + ENP	ASTM A182 gr. F316 / 316L	ASTM A182 gr. F51	
	ASTM A182 gr. F316 / 316L	ASTM A182 gr. F316 / 316L	ASTM A182 gr. F51	ASTM A182 gr. F53 or F55	
	ASTM A105 - A105N + ENP				
	ASTM A350 gr. LF2 + ENP	ASTM A350 gr. LF2 + ENP			
STEM	ASTM A182 gr. F316 / 316L	ASTM A182 gr. F316 / 316L	ASTM A182 gr. F316 / 316L	ASTM A182 gr. F51	ASTM A182 gr. F44
	ASTM A182 gr. F51	ASTM A182 gr. F51	ASTM A182 gr. F51	ASTM A182 gr. F53 or F55	
	ASTM A105 - A105N + ENP	ASTM A350 gr. LF2 + ENP			
	ASTM A350 gr. LF2 + ENP	ASTM A546 gr.630 (17-4-Ph)			
	ASTM A546 gr.630 (17-4-Ph)	AISI 4140 + ENP			
	AISI 4140 + ENP				
SEAT / INSERT	PTFE, PTFE+15%GF, PTFE+25%GF, PTFE+50%SS, PTFE+20%Carbon+5%Grafite, NYLON, PEEK, KEL-F, VITON				
SPRINGS (Trunn.)	INCONEL X-750 - INCONEL 625				
FIRE SAFE SEALS	EXPANDED GRAPHITE				
BOLTS	ASTM A193 B7/ A194-2H	ASTM A320 L7/ A194 Gr.7	ASTM A193 B8/ A194-8	ASTM A193 B8/ A194-8	ASTM A193 B8/ A194-8
	ASTM A193 B7M/ A194-2HM	ASTM A320 L7M/ A194 Gr.7M	ASTM A193 B8M/ A194-8M	ASTM A320 L7/ A194 Gr.7 HDG	ASTM A320 L7/ A194 Gr.7 HDG
	ASTM A320 L7/ A194 Gr.7 HDG				

CAST ALLOY **FORGED or BAR STOCK**

Other materials normally used : ASTM A182 gr. F6a cl. 2, ASTM A743 gr. CA15, Nickel Alloy 625 ASTM B564 UNS N06625, Nickel Alloy 625 ASTM A494 gr. CW-6MC, Titanium B348 gr. 2/5/7/11

ENP = Electroless Nickel Plating 30mic or 75mic

Other alloys available upon specific request.

TRUNNION MOUNTED BALL VALVES

DAFRAM's TRUNNION MOUNTED ball valves figures are defined by the following table:

First area: BORE	Second area: CLASS	Third area: ENDS TYPE	Fourth area: CONSTRUCTION
F = Full bore R = Reduced bore	1 = class 150lbs 3 = class 300lbs 6 = class 600lbs 9 = class 900lbs 15 = class 1500lbs 25 = class 2550lbs 16 = PN16 2 = PN25 40 = PN40 64 = PN64 10 = PN100 45 = PN450	J = ANSI B16.5 - RJT F = ANSI B16.5 - RF H = HUB ENDS W = BUTT WELDING	S = 2 PIECES BODY SIDE ENTRY, UP TO 4"FB AND 6"X4" RB (*) P = 3 PIECES BODY SIDE ENTRY, FROM 6"FB AND 8"X6" RB AND ABOVE (*) TWO PIECES CONSTRUCTION (CODE"S") IS ALSO AVAILABLE FOR BIGGER SIZES IN CAST EXECUTION

i.e a Full Bore ball valve, TRUNNION MOUNTED, Class 300lbs, B16.5 300RF ends, DN600 is : F3FP
In case of TOP ENTRY FULLY WELDED ball valves the name is preceded by the letter T (i.e. TF3FP)
In case of FULLY WELDED TRUNNION MOUNTED ball valves the name is preceded by the letter W (i.e. WF3FP)

DAFRAM TRUNNION mounted ball valves are built as standard in accordance with the design requirements of API 6D and, upon request, B16.34; both in two and three piece bolted construction.
Independent floating spring loaded seat rings are always in contact with the ball to provide an effective tight seal at low differential pressures.
At higher differential pressures, the upstream seat ring becomes pressure energised against the ball to ensure the seal, whilst the downstream seat remains spring loaded. The single sealing feature, standard on DAFRAM TRUNNION mounted ball valves, is ideal for block and bleed service to API 6D. The valve body cavity can be vented to atmosphere through a bleed valve and completely drained by removing the drain plug with the ball in closed position, even when the line is pressurised. This feature also allows easy replacement of upper stem seal and the checking of the sealing of the seats, while the valve is installed in the pipeline. The whole range may be supplied with two basic seating design criteria:

- SELF RELIEVING SEATS (standard) providing the self relieving of the body cavity overpressure
- DOUBLE PISTON EFFECT (upon request) providing a double barrier against the fluid. In this case when the upstream seat fails, the downstream seat ensures the seat tightness (the valve body is equipped with an automatic safety valve to release the body overpressures in case of expanding fluids)

All valves meet the antistatic requirements of BS 5351. Positive anti blow-out stem design retained by the valve body on complete product range prevents the stem removal when valve is installed. The body and top flange joints incorporate double sealing components (secondary seal is made of expanded graphite) to ensure safe body sealing even in the event of a fire. All valves are tested to resist fire exposure, both outside and on-line, with very low losses, in compliance with BS 6755 part. 2 and API 607 IV Ed. Valves size 6" and above may be equipped with seat injection fittings to perform the emergency sealing by the injection of sealant through an orifice and special grooves of the seat ring into seating area. Valves up to 4" can be equipped with a body cavity port through which the sealant spreads on the ball surface and then reaches the seat area when the ball rotates to close. In all DAFRAM TRUNNION mounted ball valves the ball turns on two dry bushes to reduce the operating torque. These bushes are maintenance free, even under the most severe service conditions.

FACE to FACE / END TO END - [mm]

2 PCS	inches	2" 2"x1/2"	3" 3"x2"	4" 4"x3"	6"x4"
	mm	DN50 FB & RB	DN80 FB & RB	DN100 FB & RB	DN150 RB
150lbs	FIGURES				
J= RJT	F1JS, R1JS	191	216	241	406
F= RF	F1FS, R1FS	178	203	229	394
W= BW	F1WS, R1WS	216	283	305	457
300lbs	FIGURES				
J= RJT	F3JS, R3JS	232	298	321	419
F= RF	F3FS, R3FS	216	283	305	403
W= BW	F3WS, R3WS	216	283	305	457
600lbs	FIGURES				
J= RJT	F6JS, R6JS	295	359	435	562
F= RF	F6FS, R6FS	292	356	432	559
W= BW	F6WS, R6WS	292	356	432	559
900lbs	FIGURES				
J= RJT	F9JS, R9JS	371	384	460	613
F= RF	F9FS, R9FS	368	381	457	610
W= BW	F9WS, R9WS	368	381	457	610
1500lbs	FIGURES				
J= RJT	F15JS, R15JS	371	473	549	711
F= RF	F15FS, R15FS	368	470	546	705
W= BW	F15WS, R15WS	368	470	546	705
2500lbs	FIGURES				
J= RJT	F25JS, R25JS	454	584	683	927
F= RF	F25FS, R25FS	451	578	673	914
W= BW	F25WS, R25WS	451	578	673	914

FACE to FACE / END TO END - [mm]

2/3 PCS	inches	6"	8" 8"x6"	10" 10"x8"	12" 12"x10"	14" 14"x10"	16" 16"x12"	18" 18"x16"	20" 20"x16"	24" 24"x20"	26" 26"x20"	28" 28"x24"	30" 30"x24"	32" 32"x28"	34" 34"x30"	36" 36"x30"
	mm	DN150 FB	DN200 FB & RB	DN250 FB & RB	DN300 FB & RB	DN350 FB & RB	DN400 FB & RB	DN450 FB & RB	DN500 FB & RB	DN600 FB & RB	DN650 FB & RB	DN700 FB & RB	DN750 FB & RB	DN800 FB & RB	DN850 FB & RB	DN900 FB & RB
150lbs	FIGURES															
J= RJT	F1JP, R1JP	406	470	546	622	698	775	876	927	1.080	---	---	---	---	---	---
F= RF	F1FP, R1FP	394	457	533	610	685	762	864	914	1.067	1.143	1.244	1.295	1.371	1.473	1.524
W= BW	F1WP, R1WP	457	521	559	635	762	838	914	991	1.143	1.245	1.346	1.397	1.524	1.626	1.727
300lbs	FIGURES															
J= RJT	F3JP, R3JP	419	518	584	664	778	854	930	1.010	1.165	1.270	1.372	1.422	1.553	1.654	1.756
F= RF	F3FP, R3FP	403	502	568	648	762	838	914	991	1.143	1.245	1.346	1.397	1.524	1.626	1.727
W= BW	F3WP, R3WP	457	521	559	635	762	838	914	991	1.143	1.245	1.346	1.397	1.524	1.626	1.727
600lbs	FIGURES															
J= RJT	F6JP, R6JP	562	664	791	841	892	994	1.095	1.200	1.407	1.461	1.562	1.664	1.794	1.946	2.099
F= RF	F6FP, R6FP	559	660	787	838	889	991	1.092	1.194	1.397	1.448	1.549	1.651	1.778	1.930	2.083
W= BW	F6WP, R6WP	559	660	787	838	889	991	1.092	1.194	1.397	1.448	1.549	1.651	1.778	1.930	2.083
900lbs	FIGURES															
J= RJT	F9JP, R9JP	613	740	841	968	1.038	1.140	1.232	1.334	1.568	---	---	---	---	---	---
F= RF	F9FP, R9FP	610	737	838	965	1.029	1.130	1.219	1.321	1.549	---	---	---	---	---	---
W= BW	F9WP, R9WP	610	737	838	965	1.029	1.130	1.219	1.321	1.549	---	---	---	---	---	---
1500lbs	FIGURES															
J= RJT	F15JP, R15JP	711	841	1.000	1.146	1.276	1.406	1.559	1.686	1.702	---	---	---	---	---	---
F= RF	F15FP, R15FP	705	832	991	1.130	1.257	1.384	1.537	1.664	1.698	---	---	---	---	---	---
W= BW	F15WP, R15WP	705	832	991	1.130	1.257	1.384	1.537	1.664	1.698	---	---	---	---	---	---
2500lbs	FIGURES															
J= RJT	F25JP, R25JP	927	1.038	1.292	1.444	1.597	---	---	---	---	---	---	---	---	---	---
F= RF	F25FP, R25FP	914	1.022	1.270	1.422	1.575	---	---	---	---	---	---	---	---	---	---
W= BW	F25WP, R25WP	914	1.022	1.270	1.422	1.575	---	---	---	---	---	---	---	---	---	---

DIFFERENT BORE REDUCTIONS ARE AVAILABLE UPON REQUEST (i.e.: 12"x8", 14"x12", 16"x14", 20"x18"
ALL VALVES WITH HUB ENDS ARE MANUFACTURED AS STANDARD WITH FACE TO FACE AS PER TYPE RTJ BUT SPECIAL DIMENSIONS ARE AVAILABLE UPON SPECIFIC REQUEST
DAFRAM SUGGESTS THE USE OF GEAR OPERATORS FOR ALL VALVES SIZE 6" AND LARGER