ROOF DRAIN SYSTEMS

Bend Master Flexible Roof Drain Joint
Roof Drain Float Check Valve
Roof Drain Swing Wafer Check Valve
Roof Drain Dual Flap Wafer Check Valve
Flexible Roof Drain Hose
Swivel Joint Articulated Roof Drain System
Flexible Joint Articulated Roof Drain System

ATS TANK

THE BEST SOLUTION SUITED TO YOUR EXTERNAL FLOATING ROOF DRAIN SYSTEMS

BEND MASTER FLEXIBLE ROOF DRAIN JOINT

ATS Drain Systems offer proven technology, free-maintenance, easy to install floating roof drains. All you need to do is to fill in and fax to us our standard ATS Tank Drain Data Sheet and we will provide installation drawings for you. The ATS Drain System is easy to install in any tank. Each drain line requires just a 500mm wide corridor to operate, between sump and shell nozzles. In tanks above 60m diameter, it is advisable for safety reasons, to fit more than one drain. This can easily be done with the ATS Drain System. As many as 5 lines have previously been fitted to one large crude oil storage tank.

ATS Drain advantages over swivel joint drains:

Conventional Swivel joint drains will eventually leak and require periodic maintenance. Tank cleaning costs are extremely expensive. ATS Drain joints will give a free maintenance life for more than 15 years. Only 4 ATS Drain joints/line are required. This makes a ATS Drain more cheaper, simpler, lighter and easier to install

ATS Drain advantages over hose drains:

All types of drain hoses have problems from time to time interfering with floating roof landing legs. This results in premature drain failure. Drain hoses can have problems with their own buoyancy, they must be very heavy to overcome their own displaced weight. ATS Drainswill always remain within the same narrow operating corridor, and will never interfere with landing legs because of the fixed geometry of the ATS Drain system.

Materials:

The Standard ATS Drain Joint hose is constructed from layers of polypropylene and polyester film and fabric. Hoses have 316 stainless steel inner and outer wires and are swaged to carbon steel tailpieces with ANSI 150# RF flanges. Flanges can also be in stainless steel or in carbon steel, epoxy painted. The ATS Drain Joint pivot assembly is stainless steel with main side plates either standard galvanised or stainless steel.

ATS Tank Products include:

Aluminium Internal Floating Roofs - Floating Roof Tank Seals - Floating Roof Tank Drain Systems - Floating Roof Tank Fire Foam Systems - Floating Suction Lines & Skimmers - Floating Suction Swing Joints 4" to 30"

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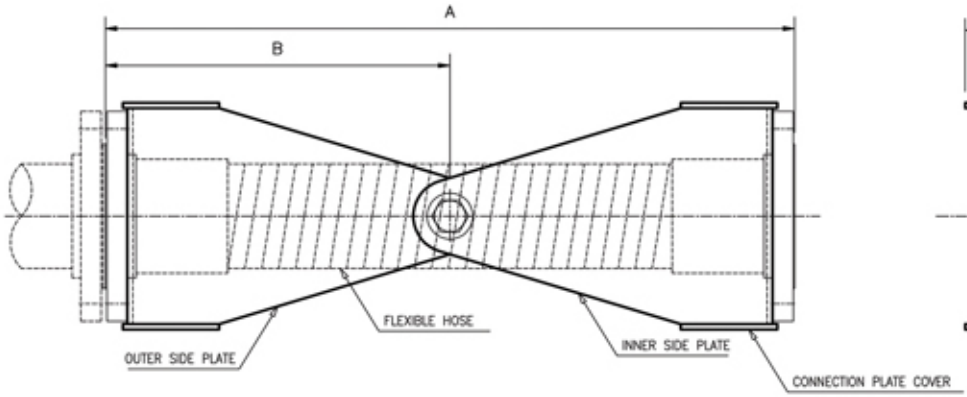
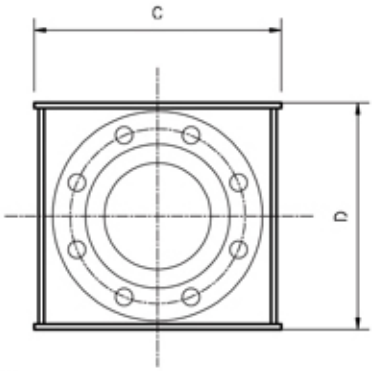
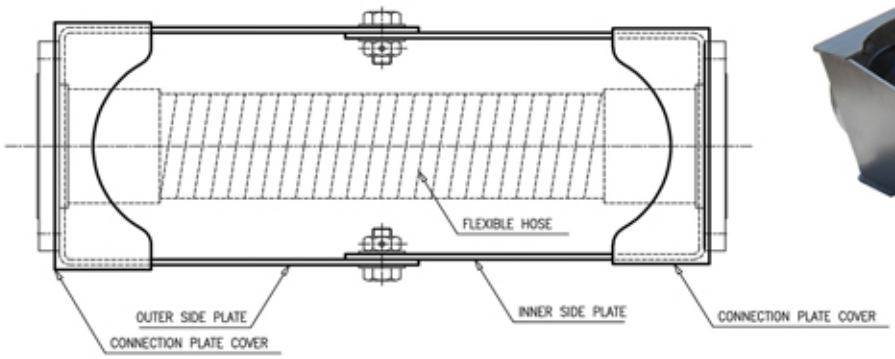
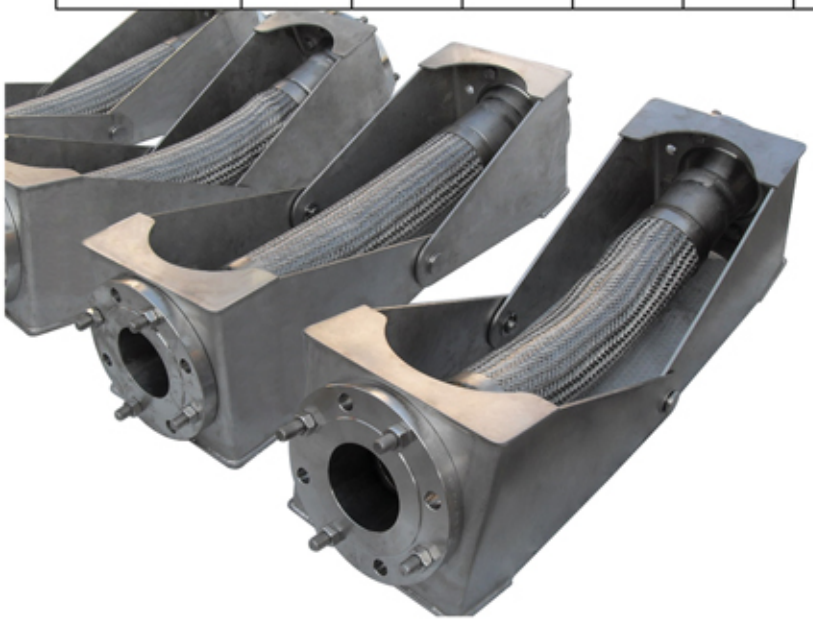






DIMENSIONAL AND DESIGN DATA									
PART NO	SIZE	A	B	C	D	SET OF 4 JOINT CRATED WT.KG	SET OF 4 JOINT VOL. M3	OPERATING TEMP °C	MAXIMUM PRESSURE
ABM300	3"	620	310	228	195	132	0,28	-40°C +100°C	10,6 Kg/cm^2
ABM400	4"	750	375	268	235	194	0,42	-40°C +100°C	10,6 Kg/cm^2
ABM600	6"	950	475	362	312	420	0,78	-40°C +100°C	10,6 Kg/cm^2
ABM800	8"	1300	650	426	385	680	1,47	-40°C +100°C	10,6 Kg/cm^2



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ROOF DRAIN FLOAT CHECK VALVE

The unique ATS 's Float Check Valve is operated in line with roof drain systems to prevent a possible product overflow from floating roof tank at the time of drain leakage situation. Whether drain line cause leakage, the valve closes inside of drain sump automatically and prevent oil flow from the tank.

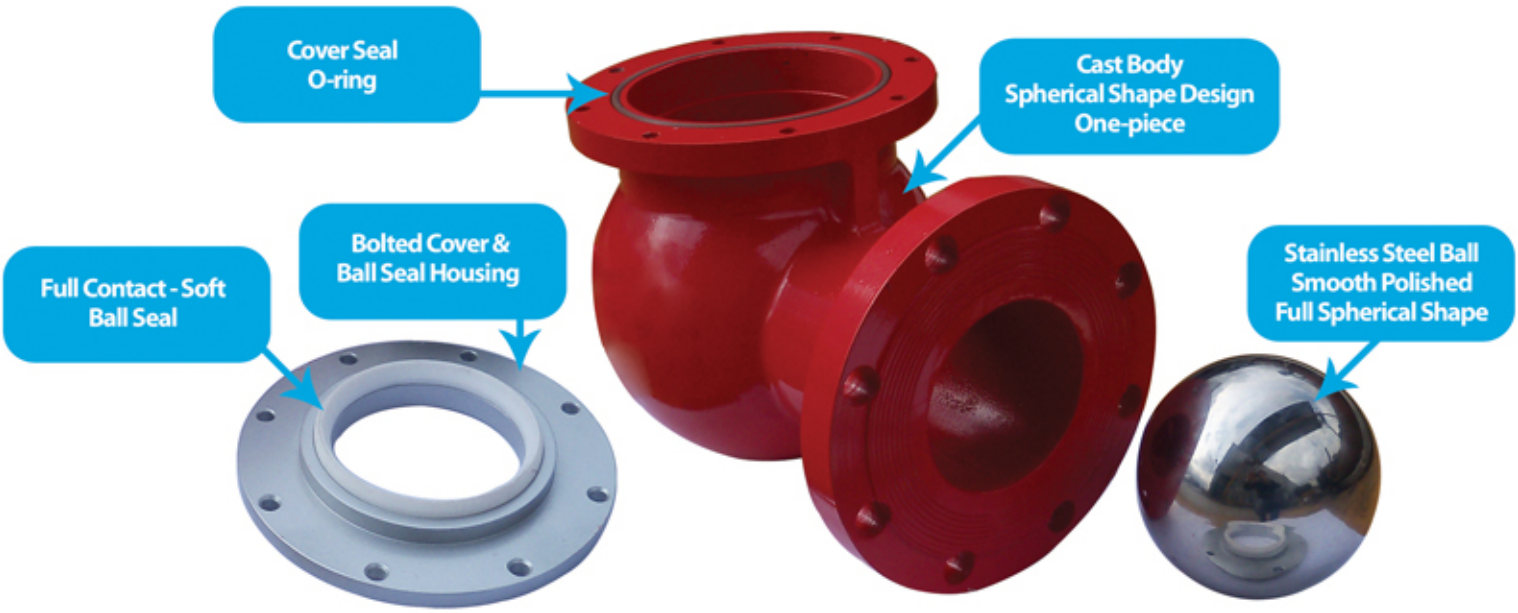
Advantages

* Seals at Low Differential Pressures.
* Stainless Steel Construction.
* No Mechanical Moving Parts to Corrode or Get Stuck.
* No Drop in Flow Rates.

Detail Description

1. ATS Float Check Valve is designed to operate inside of the drain sump in connection with complete drainage systems on the tank.
2. When the stainless ball floats inside of the valve, the drain systems will be closed. So, it prevents product overflow of the drain system to keep oil spillage on the floating tank.

Model No	Size (mm/inch)	Weight	Material (house+ball)	Remarks
AFCV80	DN80 / 3"	30 kg	Cast Iron / Stainless Steel	Viton Seal
AFCV100	DN100 / 4"	35 kg	Cast Iron / Stainless Steel	Viton Seal
AFCV150	DN150 / 6"	45 kg	Cast Iron / Stainless Steel	Viton Seal
AFCV200	DN200 / 8"	65 kg	Cast Iron / Stainless Steel	Viton Seal
AFCV250	DN250 / 10"	80 kg	Cast Iron / Stainless Steel	Viton Seal
AFCV300	DN300 / 12"	95 kg	Cast Iron / Stainless Steel	Viton Seal



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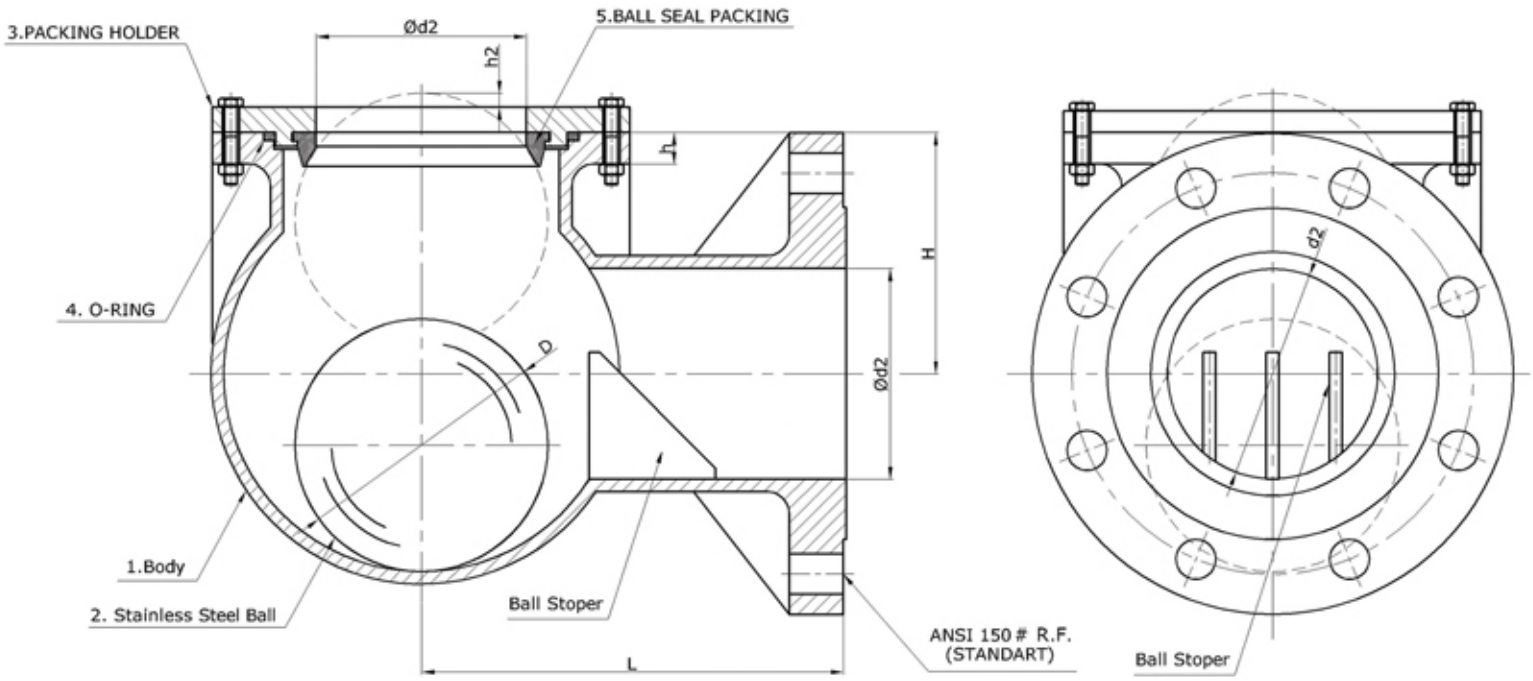
Dimensions



Model No	Size	D1	D2	Packing Holder			L	H	D	h	H2
				O.D.	B.C.D.	STUD BOLT					
AFCV80	DN80 / 3”	80	80	170	150	4-M10	180	115	90	22	
AFCV100	DN100 / 4”	100	100	190	170	4-M10	200	115	120	22	
AFCV150	DN150 / 6”	150	150	265	240	8-M12	250	160	150	26	6.3
AFCV200	DN200 / 8”	200	200	315	290	8-M12	300	250	200	26	24.2
AFCV250	DN250 / 10”	250	250	380	355	8-M12	350	310	300	26	33.1
AFCV300	DN300 / 12”	300	300	420	420	8-M12	400	360	350	26	50.9

Dimensions is milimeter

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ROOF DRAIN SWING CHECK VALVE

Main Features

Complete closing is ensured in Roof Drain Swing Check Valve by using powered spring technology. This situation provides assembling privilege for each respect. The maximum flow is ensured by minimizing pressure losses. The distance between the flanges is short. The standart of the flange is international
ANSI 150#, DIN PN10 and PN16. Its light and portable features provide assembling easiness.

Advantages - Simple design / Easy installation / Light in Weight

Typical Applications - External Floating Roof Drain System
Emergency Drain System and Other Tank Piping Systems

Installation - Installation is in all position

Operating Conditions		
Operating Pressure Mpa		1
Operating Temperature EPDM (°C)		90
Max. °C Presuusre PMO (bar)		16
Temperature Related To Pressure	NBR	80°
	EPDM	100°

WEIGHTS											
Connections	Flanged										
Sizes mm	32	40	50	65	80	100	125	150	200	250	300
	1-1/4"	1-1/2"	2"	2- 1/2"	3"	4"	5"	6"	8"	10"	12"
Weights kgs	0.82	1.11	1.34	2.2	3.7	3.92	5.23	7.39	13.16	24.59	37.6

Dimensions

DN		ØA	ØB	ØC	C
MM	INS	MM	MM	MM	MM
32	1-1/4"	85	72	18	14
40	1-1/2"	94	80	22	14
50	2"	109	89	32	14
65	2-1/2"	129	111	40	14
80	3"	144	119	54	14
100	4"	164	147	70	18
125	5"	195	171	92	18
150	6"	220	200	112	20
200	8"	275	256	154	22
250	10"	330	302	192	26
300	12"	380	352	227	32

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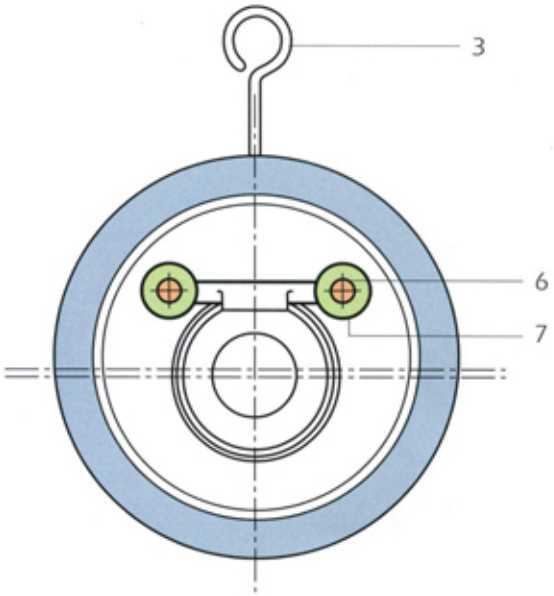
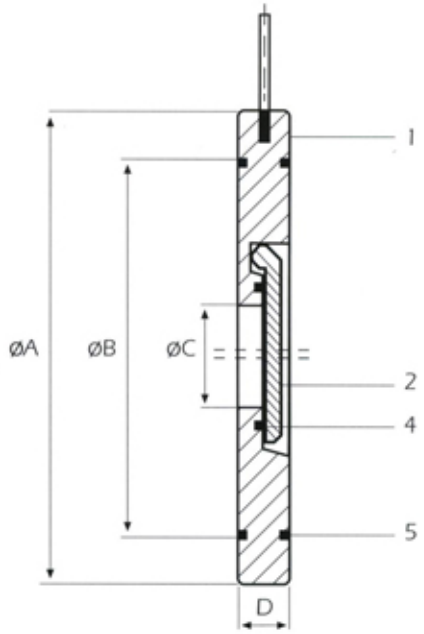


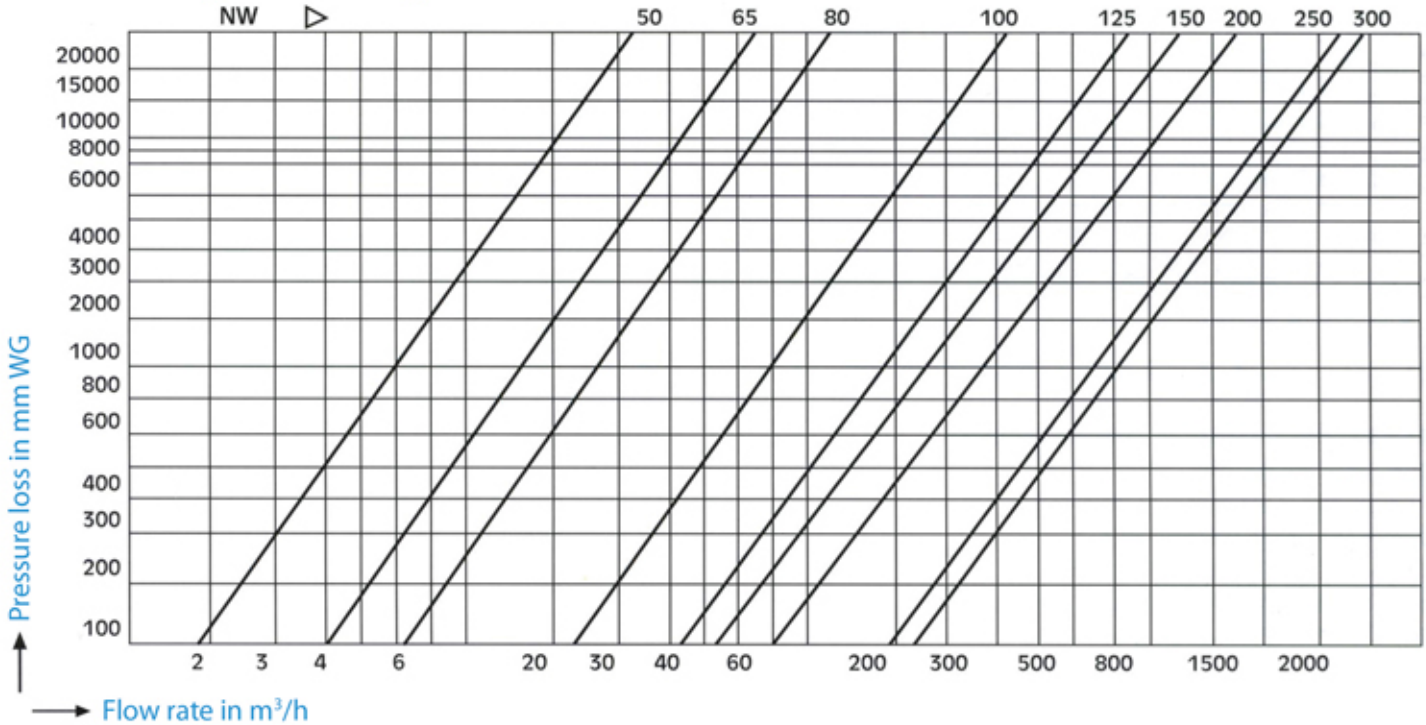


Materials

No	Material	ASCV 30	ASCV 35	ASCV 40
1	Body	AISI 316	Carbon Steel with Chromiumplated	Brass
2	Disc	AISI 316	Carbon Steel with Chromiumplated	AISI 316
3	Eye Bold	AISI 316	Carbon Steel with Chromiumplated	AISI 316
4	O-Ring	EPDM	EPDM	Viton
5	O-Ring	EPDM	EPDM	Viton
6	Retainer Screw	Carbon Steel with Chromiumplated	Carbon Steel with Chromiumplated	AISI 304
7	Disc Bearing	Carbon Steel with Chromiumplated	Carbon Steel with Chromiumplated	AISI 304

Applicable Fluids: Water, %100 Aromatics Hydrocarbons, Warm Water, Sea Water

Loss of Head Diagram for Swing



The diagram values for water at 20°C and result from measurings at valves installed in horizontal pipes.

ROOF DRAIN DUAL FLAP WAFER CHECK VALVE

Main Features

Dual Flap Wafer Check Valve is designed to operate with the minimum flow restriction. The twin spring loaded half disc operates with the Roof Drain System water flow and reseal back against the rubber disc seating providing a positive shut off against any back flow. The resillent seating prevents a slamming action.

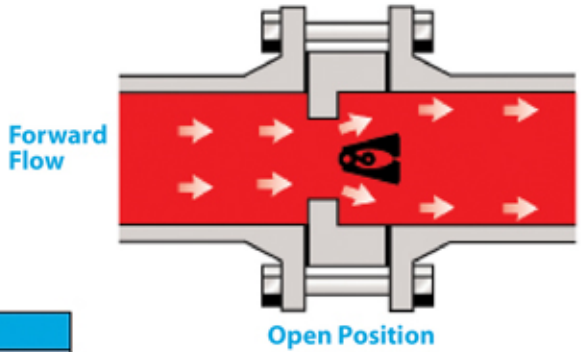
Check Valves offer greater flexibility and low cost in most of Drain System and moreover, its lightness, it is more convenient to install and has smaller face to face dimension than conventional swing check valve.

These valves can be supplied to match the international standards of flange (DIN, ANSI, JIS & BS).

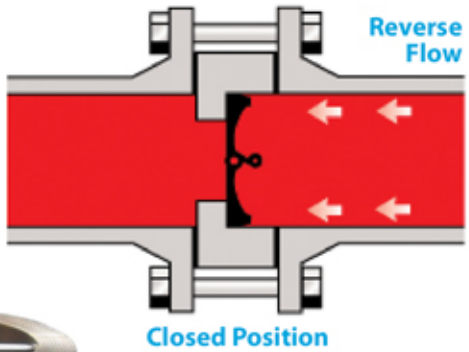
Check Valves when compared with other traditional isolating valve such as swing check valve, it offers the following advantages:

- Low purchase cost
- Compact design
- Non-slam principle of operation
- Light weight
- Easy installation
- Good flow characteristic and less pressure drop
- Suitable for horizontal and vertical flow up

MAXIMUM NON-SHOCK SERVICE PRESSURE	50 - 300 mm
SEAT OPENING PRESSURE (MBAR)	12
SEAT TEST PRESSURE (BAR)	13.7
SHELL TEST PRESSURE (BAR)	20



DIMENSIONAL OF GASKET										
VALVE SIDE	mm	50	65	80	100	125	150	200	250	300
	INS	2"	2-1/2"	3"	4"	5"	6"	8"	10"	12"
O.D.	Refer to valve external diameter ØA									
I.D.	mm	60	73	90	115	142	169	219	273	324



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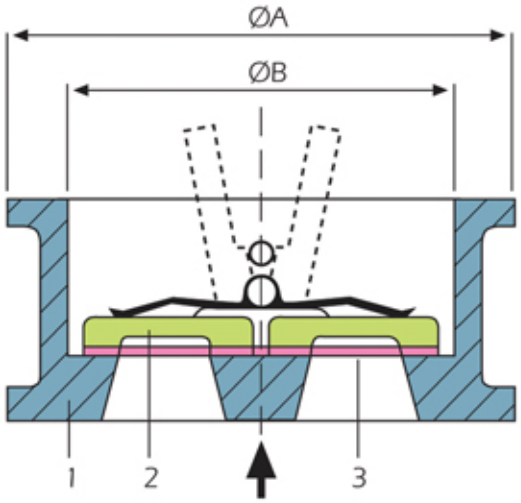
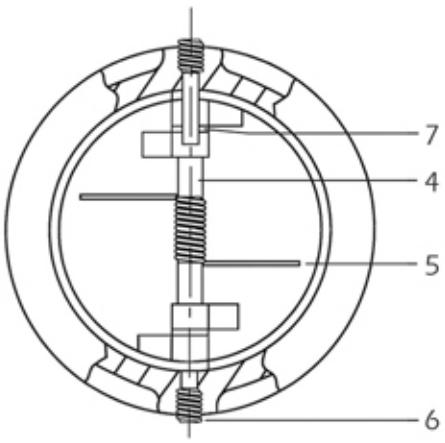
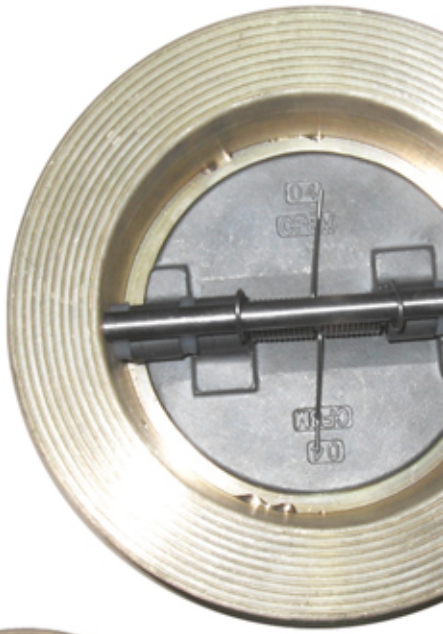


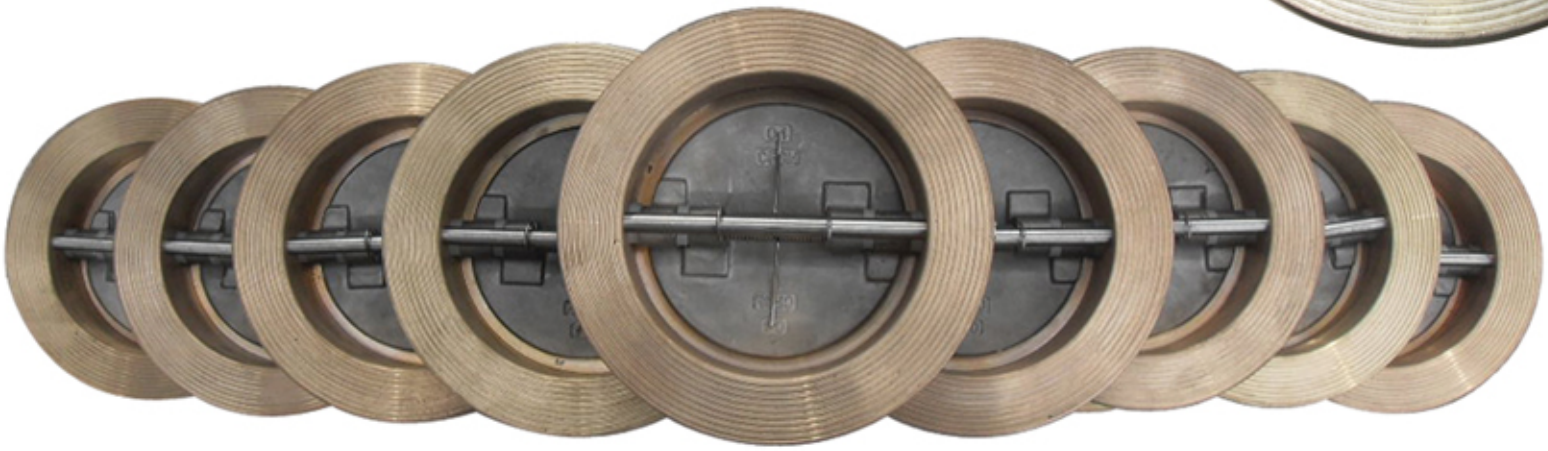


No	MATERIAL	CV 20	CV 25	CV 30
1	Body	Cast iron GG 25	AISI 316	Brass
2	Disc	AISI 316	AISI 316	AISI 316
3	Resilient seat	EPDM	EPDM	Viton
4	Hinge pin	AISI 316	AISI 316	AISI 316
5	Spring	AISI 304	AISI 304	AISI 304
6	Retainer screw	Stainless Steel	Stainless Steel	Stainless Steel
7	Disc bearing	Teflon	Teflon	Teflon

Other materials except above are available on request.

NOMINAL PIPE SIZE		EXTERNAL DIAMETER ØA DIN STANDARD	INTERNAL DIAMETER	FACE TO FACE	MAXIMUM WORKING PRESSURE	MAXIMUM WORKING TEMP.
mm	INS	mm	mm	mm	BAR (10°C)	°C
50	2"	109	60	54	16	110
65	2-1/2"	129	73	54	16	110
80	3"	144	90	57	16	110
100	4"	164	115	64	16	110
125	5"	194	142	70	16	110
150	6"	220	169	76	16	110
200	8"	275	219	95	16	110
250	10"	330	273	108	16	110
300	12"	380	324	144	16	110





FLEXIBLE HOSE DRAIN JOINT

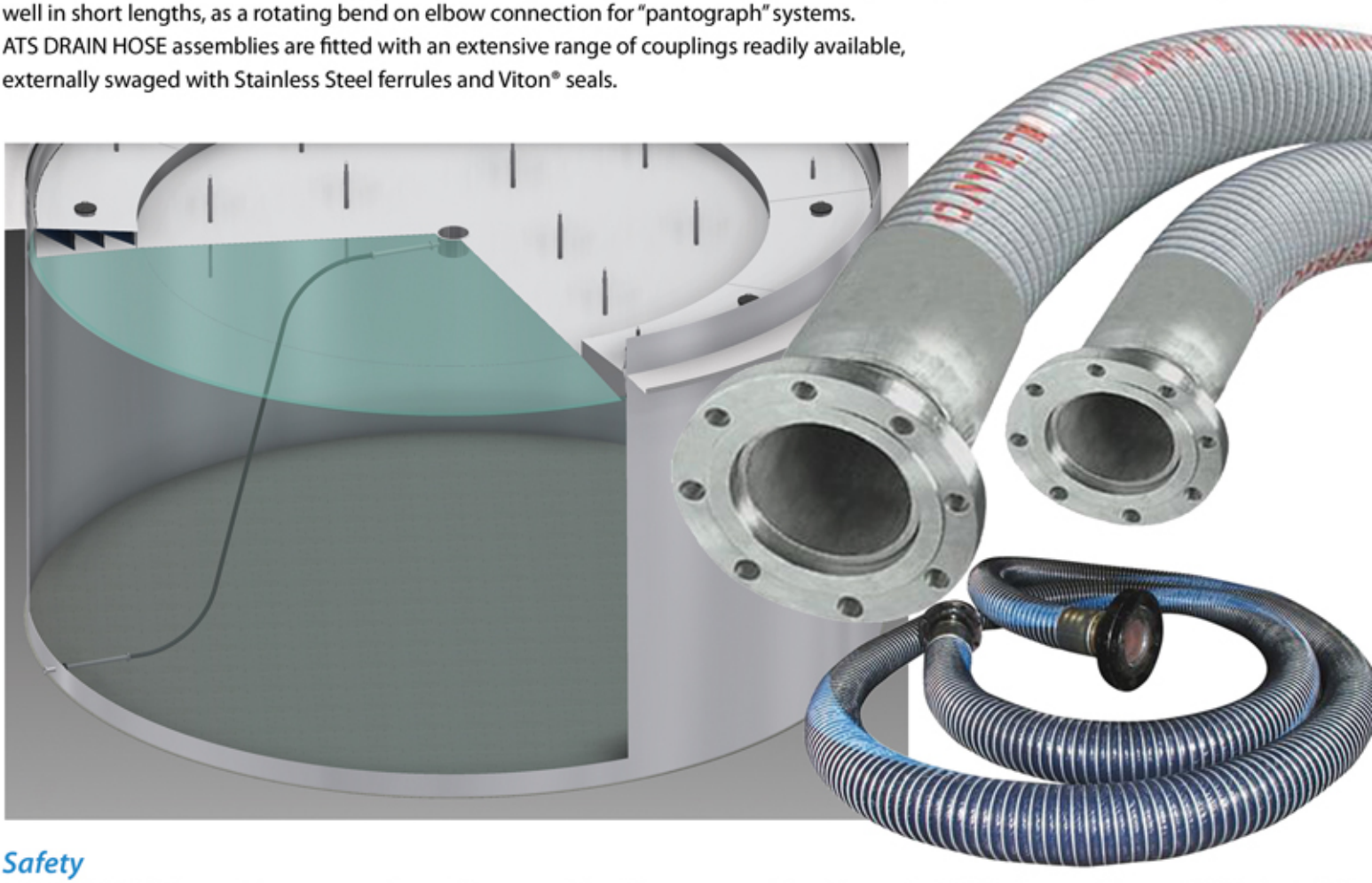
Characteristics and Applications

ATS DRAIN HOSE is manufactured according to the requirement specified by the European Standards EN 13765:2003 Type 3 (BS 5842:1980), and in accordance with the recommendations of NAHAD Guidelines (NAHAD 600/2005).

Extremely flexible, easy to handle and bend, ATS DRAIN HOSE hose is used for immersion inside of the storage tanks, for water drainage from the floating roofs. ATS DRAIN HOSE hoses are specifically designed to resist immersion in high aromatic or corrosive liquids with a temperature range from -40 to +100°C and, thanks to its construction, prevent any possible collapse due to the external pressure. The hose is specifically engineered to have a negative buoyancy, this is to prevent the hose floating in the tank liquid. Upon request it is possible to apply a longitudinal coloured stripe on each hose, to ensure correct alignment. Clamps and chains for roof attachment are supplied on request. All hoses are 100% aromatic resistant, electrically continuous, antistatic and can be used for suction or discharge.

ATS DRAIN HOSE are used in full length, as complete system for water drainage, or in many cases, thanks to the great flexibility, it is used as well in short lengths, as a rotating bend on elbow connection for "pantograph" systems.

ATS DRAIN HOSE assemblies are fitted with an extensive range of couplings readily available, externally swaged with Stainless Steel ferrules and Viton® seals.



Safety

ATS DRAIN HOSE assemblies are tested at 1 ½ times rated working pressures for safety and reliability, in accordance with BS 5842:1980 clause 6.4 (EN ISO 1402). The securing ferrule, at one end of the hose, is permanently marked by embossing, with manufacturer's name, nominal bore, serial number and the test date . Full test certification can be supplied on request.

Burst pressure is indicated, at ambient temperature when tested in accordance with BS 5173 section 102.10:1990. (EN ISO 1402)

Electrical continuity is achieved by the two wires bonded to the end fittings, this helps dissipate accumulated charge and to avoid static flash. The electric resistance of hose assemblies is less than 10 ohms,as required by BS 5842:1980 clause 6.2(EN ISO 8031). A special conductive swaging seal is used to guarantee the hose as it is electrically continuous through both the inner and outer helices.

All hoses are available in an assortment of colours and it is possible, on request, and with a minimum purchase order, to add a "customer labelling" or "product labelling" to the outside wall.

Burst pressure is indicated at ambient temperature. Maximum temperature rating can only be maintained while working within limits of working pressure .Each hose assembly is permanently marked on the ferrule at one end according to EN13765:2003 clause 10.1 – 10.2

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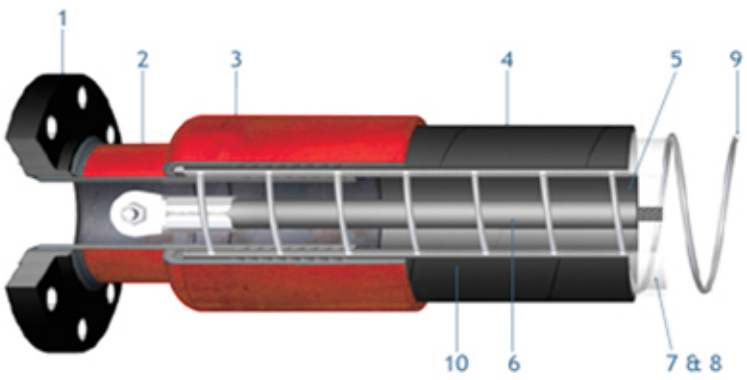
HOSE MATERIAL FOR %100 AROMATICS	
COLOUR	White
WIRES	304 Stainless steel internal wire (X) or Galvanised (Z)
	304 Stainless steel external wire (X) or Galvanised (Z)
	Also available with antistatic PP coated 304 Stainless Steel wires (XP)
CONSTRUCTION	ATS DRAIN HOSE is a multi-layer thermoplastic hose manufactured from Polypropylene, Polyethylene and Polyester films and Polypropylene fabrics, with an outer cover specifically engineered to withstand at the full immersion in aggressive fluids. ATS DRAIN HOSE includes in the construction an High Density PLT tubular extruded film to avoid any possible leak both, from inside to outside, as well as from the outside to the inside of the hose. All the different layers are wrapped together and tensioned between internal and external wire spirals.



HOSE CONSTRUCTION PARTS	
1	ANSI 150# Flanges
2	Hose Nipple
3	Hose Ferrule
4	Hose Outer Cover
5	Hose Inner Cover
6	Lead Ballast (with steel inner core)
7	Inner Reinforcing Ply
8	Outer Reinforcing Ply
9	High Tensile (heli-coil) Reinforcing Wire
10	White Reinforcing Stripe

PRODUCT DATA	
Electrical Continuity	Hoses are normally supplied electrically continuous by connecting the end flanges together via the embedded wire helix. Discontinuous hoses can be supplied if required.
Burst / Test Pressure	In service the hose is often under a slight negative pressure but the hose has a design burst pressure of 20 bar (300lbs/sq inch) and every hose is tested before despatch to 5 bar (75lbs/sq inch).
Aromatic Resistance	This product is suitable for service in products having an aromatic content of up to 100% which includes crude oil, gasoline and all of the normal bulk petrochemical products.

FITTINGS	
End Flanges	The hoses are normally supplied complete with attached ASA 150 RF Carbon Steel flanges with one flange modified to enable the attachment to the lead ballast cable.
Ballast Cable	To stop the hose floating inside the of product and therefore ensuring that the rainwater flows smoothly away through the hose, a lead covered high tensile steel cable is fixed inside the bore of the hose.
Clevis Clamp / Chain	To ensure that the top flanges are not strained when the hose is in service, a clevis clamp/chain is supplied and fixed to the hose at a convenient point about 1 metre from the top flange to support the hose.

HOSE MATERIALS For %70 Aromatics	
Inner Lining	High Quality Nitrile Rubber
Reinforcement	Synthetic textile materials together with a high tensile wire in a helical form are embedded in synthetic rubber.
Cover	High quality nitrile rubber applied in a number of layers to give maximum protection. A white rubber stripe is placed along the length of the hose to avoid twisting during installation.

Size		Max. W.P.	Min. Burst	Bend Radius	Weight	Max.
mm	Inch	Bar	Bar	mm	Kg / mt	mt
40	1 1/2"	20	75	85	1,2	25
50	2"	20	75	125	2,0	25
63	2 1/2"	20	75	150	2,8	30
76	3"	20	75	175	3,5	30
100	4"	20	75	250	4,3	30
150	6"	20	75	500	15,3	20
200	8"	20	75	700	22,5	20

SWIVEL JOINTS - FULL BORE 3-PIECE DESIGN

Applications

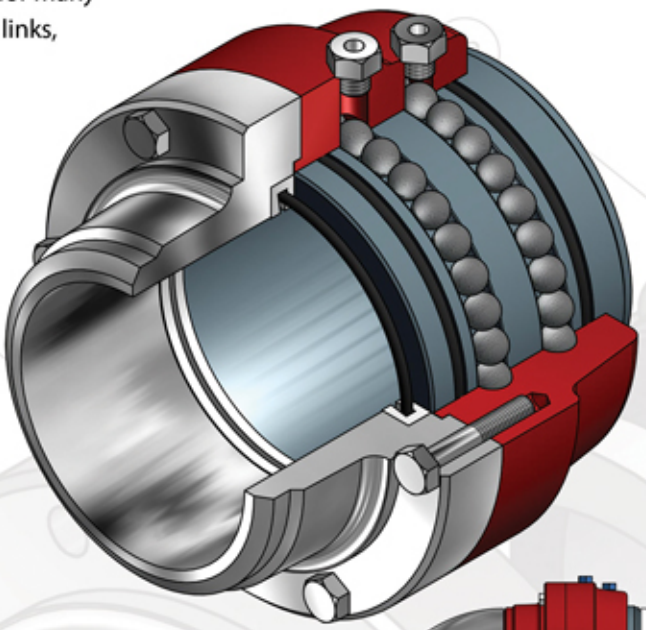
The unrivalled success of ATS Loading Systems is largely due to another first in liquid handling, the ATS Swivel Joint, which ensures fluid transfer continuity between two mobile sections. The durability of this swivel joint has been field proven and regularly enhanced since its inception in the early 2004's. The new Series 5000 ATS Swivel Joint is the right solution for the widest possible range of products.

The ATS Swivel Joint acts as the "heart" of loading/unloading arms and jumper assemblies. It provides reliability and sealability while transferring the product even under extreme temperature and pressure conditions.

The swivel joints, which permit a wide range of horizontal and vertical movements, are very easy to handle, move and position. The range can meet almost all chemical, gas or oil product transfer requirements, even in the most difficult service conditions (low or high pressure, very low or high temperatures), while taking into account specific conditions of use (underwater applications, aggressive products, etc.).

Swivel joints ensure dynamic watertightness and can be used for many industrial applications, such as pneumatic or hydraulic mobile links, pneumatic or hydraulic machines with rotating elements, etc.

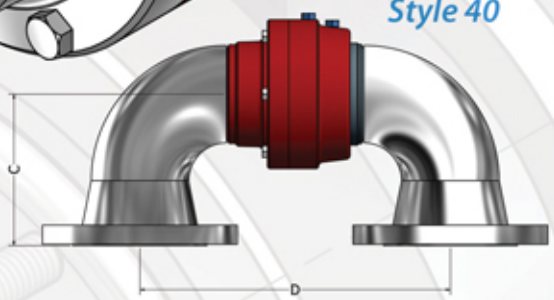
The number one priority of ATS is to offer the best solution for your fluid transfer requirements, from the easiest to the most demanding. The ATS Series 5000 Swivel Joint is the latest result of our constant investment and commitment in R&D, benefiting from more than 8 years of experience, as well as the latest technological innovations.



Features

- Double row, 4 point angular contact bearing raceways.
- Increased raceway separation for higher load capacity.
- 3-Part design allowing easy product seal replacement without removing ball bearings.
- S/S Spring energised P.T.F.E product seal.
- 5 Years guarantee
- Standard diameters from 2" through 12".
- All styles in a variety of designs and materials
- Various packing according to the application
- Exclusive field of replaceable stainless steel snap-in ball races

Style 40



BASE SWIVEL JOINT DIMENSIONS

SIZE		DIMENSIONS							WEIGHT
		D1	D2	D3	L1	L2	L3	S	
inch	mm	mm	mm	mm	mm	mm	mm	mm	kg
1"	25	33,4	50	90	80	90	66	2,77 / 3,38	2,5
1 1/4"	32	42,2	50	90	80	90	66	2,77 / 3,56	2,3
1 1/2"	40	48	65	110	80	90	66	2,77 / 3,68	3,5
2"	50	60,3	82	117	112	145	87	2,77 / 3,54	5,2
2 1/2"	65	76,2	110	150	112	150	87	3,05 / 5,94	6,6
3"	80	88,9	116	152	112	155	87	3,05 / 5,94	8,0
4"	100	114,3	139	175	112	160	87	3,05 / 6,02	10,0
6"	150	168,3	185	262	153	160	120	3,40 / 7,11	28,6
8"	200	219,1	235	316	153	160	120	3,76 / 8,18	37,0
10"	250	273	290	390	183	205	155	4,19 / 9,27	79,0
12"	300	323	340	445	183	205	155	4,57 / 9,53	95,0

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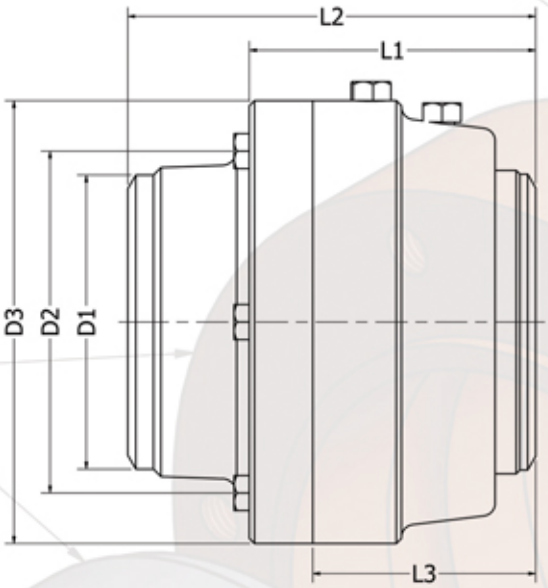
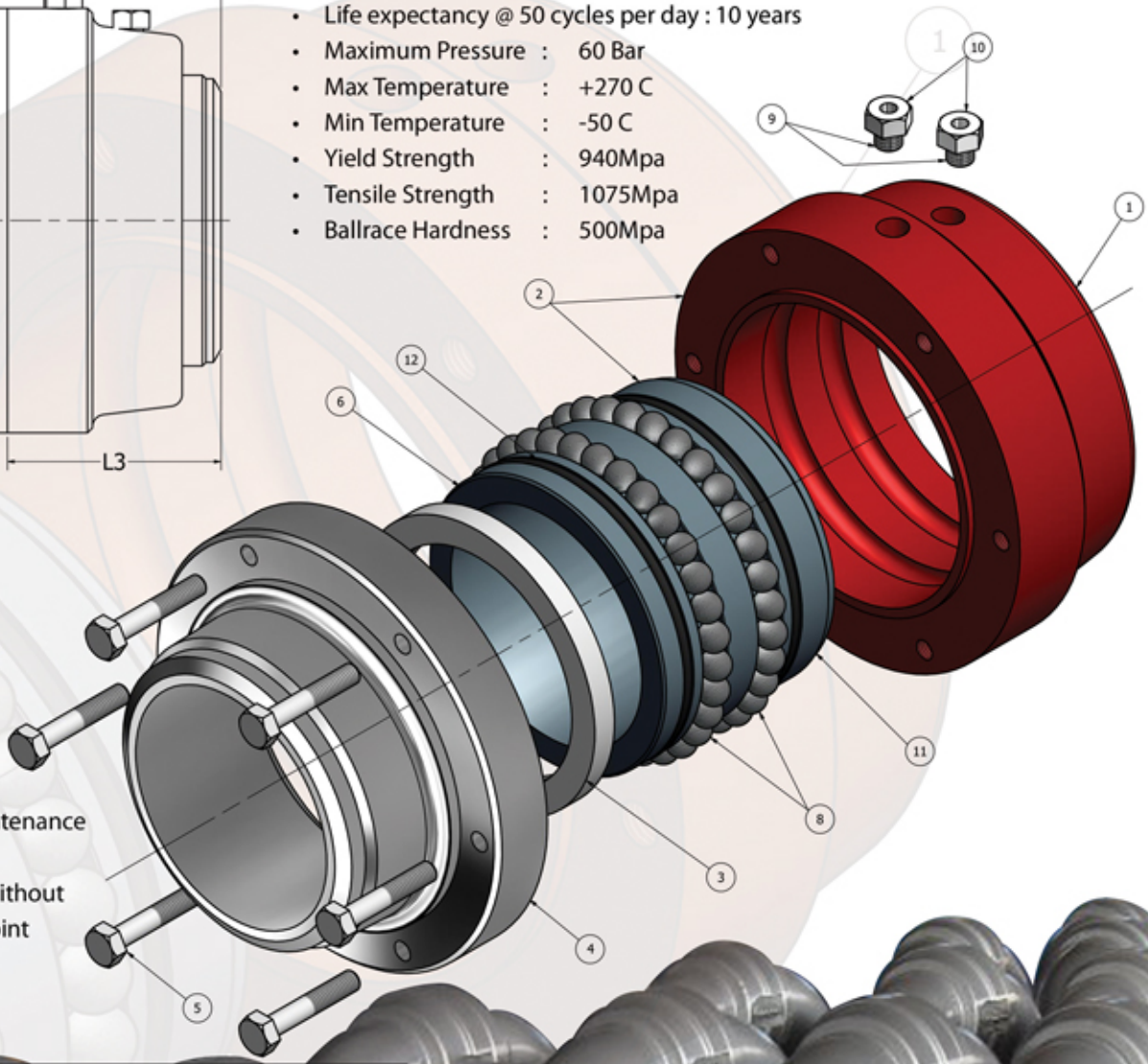


Technical Specifications

- Life cycle for 4" base swivel joint based on maximum bending moment of 4000Nm : 200,000
- Life expectancy @ 50 cycles per day : 10 years
- Maximum Pressure : 60 Bar
- Max Temperature : +270 C
- Min Temperature : -50 C
- Yield Strength : 940Mpa
- Tensile Strength : 1075Mpa
- Ballrace Hardness : 500Mpa



Benefits

- Bubble-tight sealability
- Reliable service life
- Easy and quick on-site maintenance
- Easy to replace
- Primary seal replacement without disassembly of the swivel joint

BASE SWIVEL JOINT PART LIST

ITEM	NAME	QUANTITY			MATERIAL
		4"	6"	8"	
		100	150	200	
1	Swivel Joint	1	1	1	CS/SS/AL/Hastelloy
2	Midpart	1	1	y 1	CS/SS/AL/Hastelloy
3	Product Seal, PTFE	1	1	1	PTFE
3	Product Seal, Viton	1	1	1	VITON
3	Product Seal, EPDM	1	1	1	EPDM
4	Swivel Flange	1	1	1	CS/SS/AL/Hastelloy
5	Bolts	10	12	20	Stainless Steel
6	Nipple*	1	1	1	Stainless Steel
7	Coupler*	1	1	1	CS/SS/AL/Hastelloy
8	Ball	78	76	98	Stainless Steel
9	Ballplug	2	2	2	Stainless Steel
10	Nuts	2	-	-	Stainless Steel
11	Dust Seal, PTFE	1	1	1	PTFE
11	Dust Seal, NBR	1	1	1	NBR
11	Dust Seal, FPM	1	1	1	FRM
12	Chamber Seal, PTFE	1	1	1	PTFE
12	Chamber Seal, FPM	1	1	1	FRM

CONFIGURATION DIMENSION TABLE

SIZE	C	D
inc	[mm]	[mm]
1"	84	146
1 1/4"	92	160
1 1/2"	103	172
2"	117	253
2 1/2"	137	284
3"	149	313
4"	181	370
6"	245	470
8"	308	572
10"	359	719
12"	422	821

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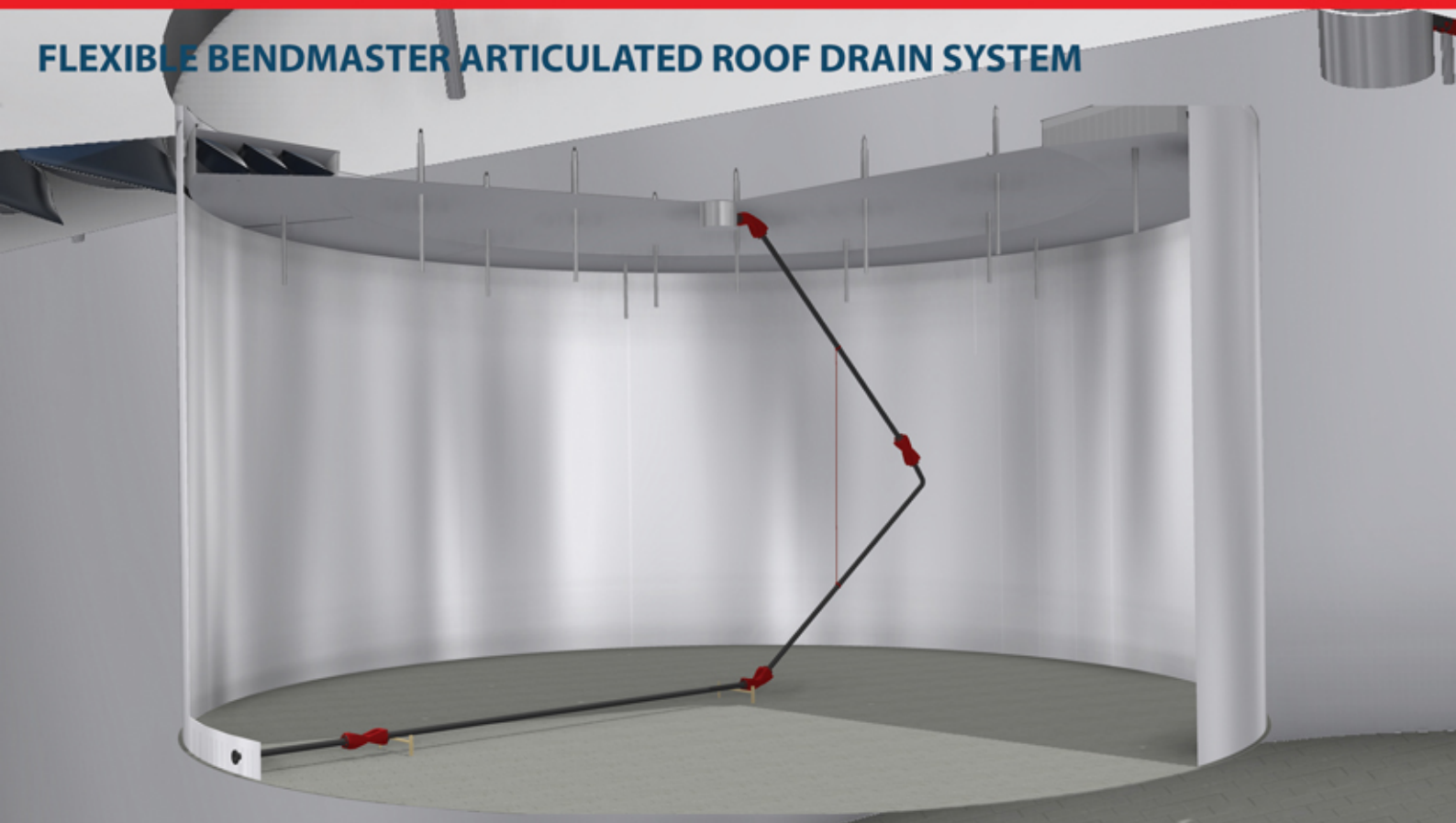
FLEXIBLE BENDMASTER ARTICULATED ROOF DRAIN SYSTEM



For External Floating Roof Tanks The Flexible Bend Articulated Rigid Pipe Roof Drain System is used to remove rain water from the roof of an External Floating Roof Tank.

The Roof Drain System is designed to remove rain water so as not to put unacceptable loadings on the roof. API 650 Appendix C states that the drain system shall not be smaller than 3 ins (75 mm) diameter for roofs with a diameter less than 120 ft or smaller than 4 ins (100 mm) diameter for roofs with a diameter greater than 120 ft.

ATS TANK TECHNOLOGIES AND ENGINEERING can provide this Roof Drain System completely prefabricated with an Installation Manual for final assembly and installation at site by the customer. Alternatively ATS TANK TECHNOLOGIES AND ENGINEERING can install the Roof Drain Systems using our own installation crew at a convenient time for the customer.

This Drain System comprises of rigid pipe, normally carbon steel and a number of flexible bend joints. The flexible bend joints incorporate flexible hose material fixed within a stainless steel or galvanised carrier frame and are specifically designed for submerged service and the operational requirements of the drain system. It is normal practice to have 4 No flexible bends where the tank diameter is greater than the height and 3 No where the tank diameter is less than the height.

Advantages

- Unlike the swivel joint system, the flexible bends are free maintenance.
- Load stresses are transferred across the flexible bend not through it.
- The complete drain system is designed to ensure a continuous slope from roof to shell nozzle and so avoid any water being retainedin the pipe work.
- The pipework is fitted with support legs, complete with neoprene pads to protect the tank floor when the drain system is in the low position.
- The drain system is fitted in a fixed position in the tank. This ensures no interference with tank internals, a problem that can occurwith a flexible hose drain system.
- Rigid pipework ensures no kinking, collapsing, dragging or scraping action across the tank floor something that can be a problem with the flexible hose drain system.
- There are no piping runs on the underside of the floating roof.

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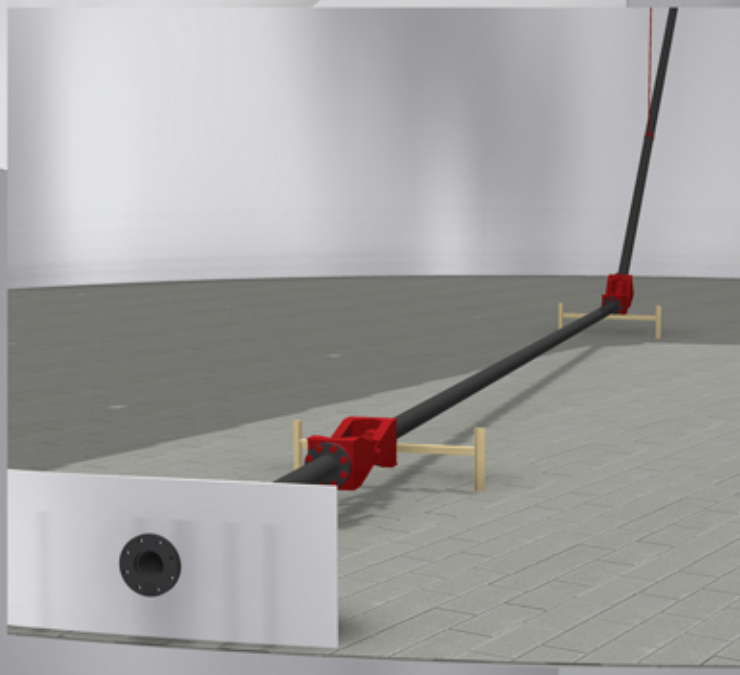

Advantages of the BENDMASTER compared to Swivel Joint Systems:

- Straight-line design - no offsets to cause unbalanced loading
- No O-rings, bearings or seals
- No moving parts to lubricate
- Designed for submerged service
- No flow restrictions
- Load Stresses transferred across joint, not through it
- Easy installation

Advantages of BENDMASTER Compared to Hose Drain Systems:

- Continuous slope design - no sediment traps
- Small operating area - no tank layout required, minimizing downtime
- Fixed position - no damage due to interference
- 100% aromatic resistant components
- Higher design pressure
- No kinking or collapsing
- No dragging or scraping action across tank bottom
- No ballasting needed

Other Advantages of the BENDMASTER Drain System:

- Ease of design and installation
- No measuring of roof legs and other internals required prior to design
- Immediate delivery of system components, reducing tank downtime
- Minimal field welding required for system installation
- No piping runs required on underside of floating roof
- BENDMASTER flexible joints can be used for internal floating suctions
- BENDMASTER Roof Drain Systems can be designed for dual use of Fire Fighting Foam Delivery Systems

Construction and Material Specification

The ATS BENDMASTER flexible joint is designed with inner and outer stainless steel wire helixes to maintain hose rigidity when subjected to internal or external pressures. Multiple inner layers of polar and non-polar elastomeric materials in the flexible joint prevent product permeation through the hose, even from such products as MTBE. The outer layers of this woven fabric protect the inner hose materials. Its high design pressure also makes the BENDMASTER suitable for use with fire fighting foam delivery systems.

The flexible joint pivot-pin design uses stainless steel bushings and spacers to eliminate binding and assure flexibility. No lubrication is required. The reinforced side plates transfer the load around the flexible hose, eliminating stress on the hose end connections and minimizing the possibility of hose end failure.

These side plates are available carbon steel (galvanized or prime coated) and stainless steel materials.

BENDMASTER flexible joints are attached to Schedule 40 carbon steel piping to provide a rigid, free-maintenance drain system. Piping diameters of 3" through 10" are readily available from stock.

- Flexible Bending Joint: each joint consists of a section of flexible hose designed with stainless steel helix wires to maintain rigidity and multi layer elastomeric materials provide impermeable protection against the stored products
- Flexible Bending Joint Carrier Frame: manufactured in either mild steel, galvanized steel or stainless steel material
- Bending Joint Pin: manufactured from high quality stainless steel materials designed to provide trouble free operation for the life of the drain system
- Pipework: manufactured from ASTM 106 GrB Sch 40 materials
- Elbows: manufactured from ASTM A 234 M-91C Sch40 materials
- Flanges: supplied ASTM A 182 ANSI 150lbs RF
- Suitable for 100% aromatics

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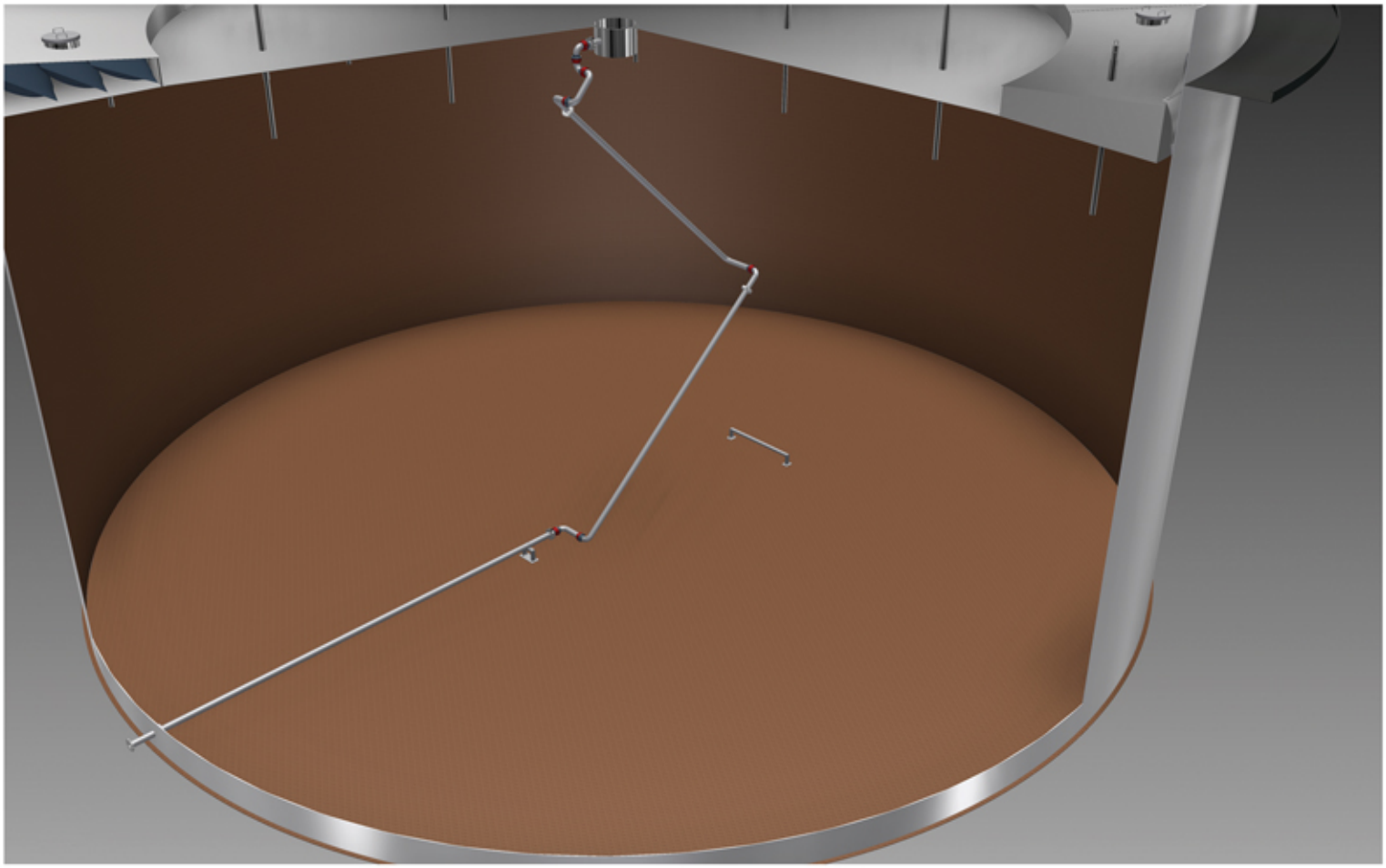
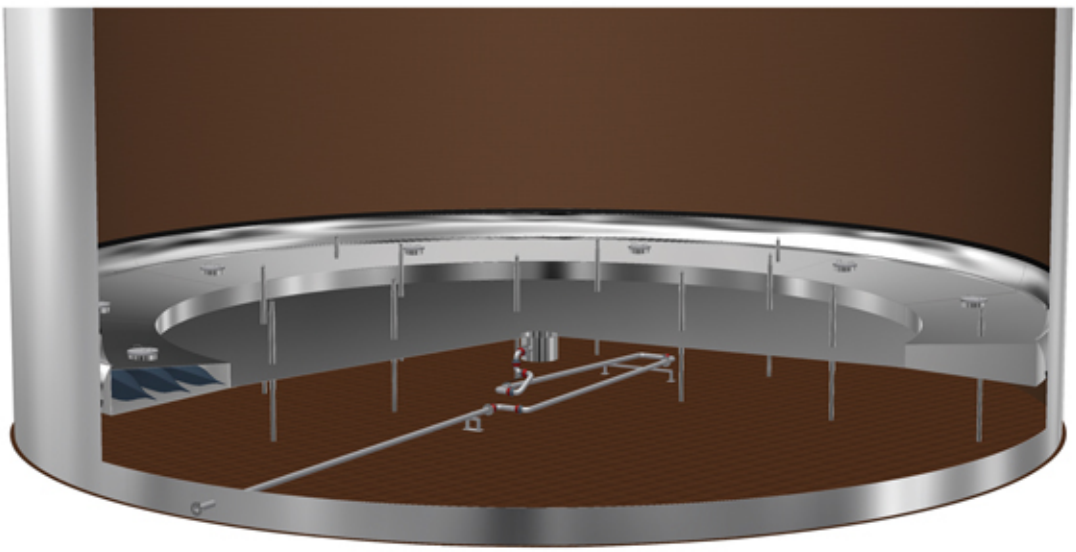
SWIVEL JOINT ARTICULATED DRAIN SYSTEM



Articulated Drain Systems are systems comprising steel pipes with swivel joints, designed to withstand the forces to which it may be subjected under all operating regimes. The system usually incorporates Heavy duty swivel joints but several alternatives are available to suit client preference.

The Articulated Drain system is available in 3", 4", 6" & 8" N.B. Diameter Systems. The system is supplied with full detailed drawings and installation instructions.



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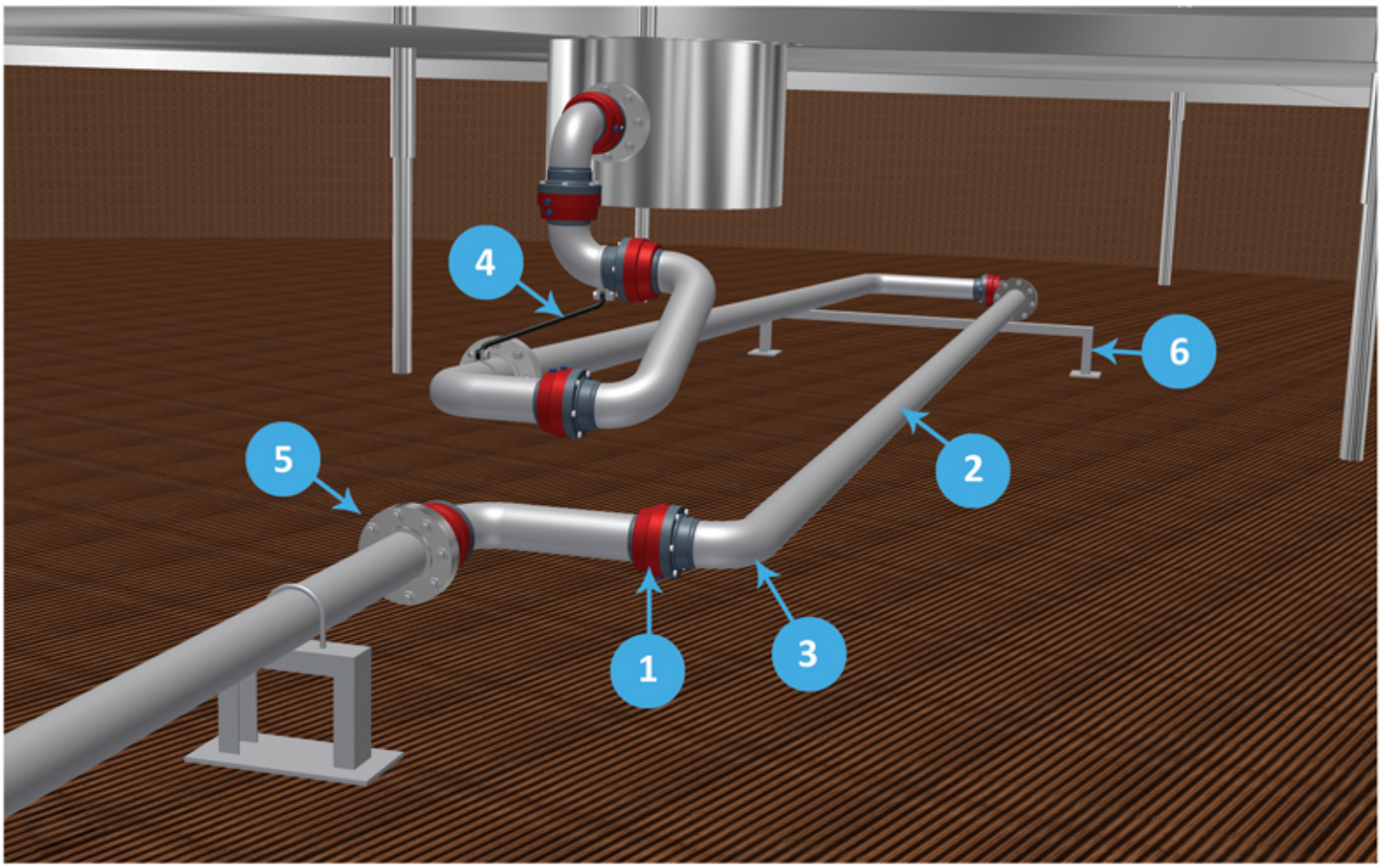
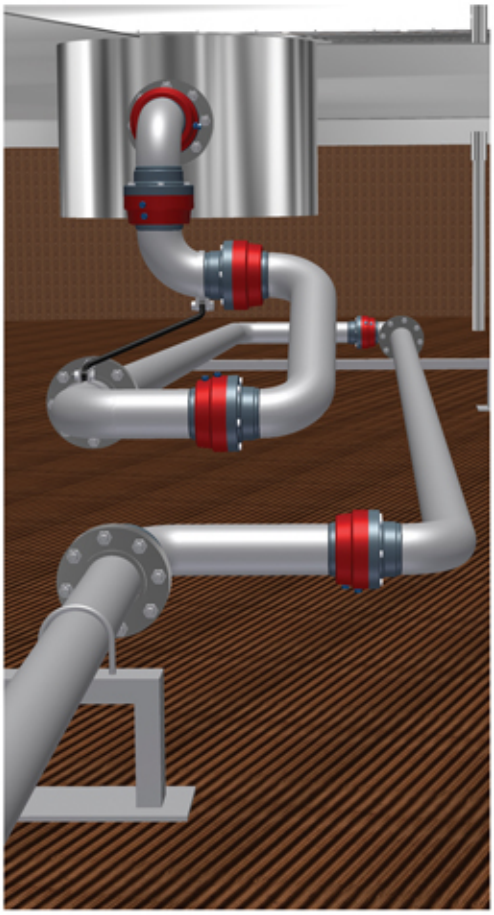




MATERIAL SPECIFICATION		
PART NO	DESCRIPTION	MATERIAL
1	Swivel Joints	Carbon Steel or Stainless Steel Body (see Swivel Joint Leaflet or sheets for other full details)
2	Pipework	ASTM A106 GrB - Sch40 Seamless Pipe, Carbon Steel
3	Elbows	ASTM A234 WCB - Sch40 Seamless Pipe, Carbon Steel
4	Link Chain	Stainless Steel, 10"
5	Flanges	ASTM A105 - 150# RF, WN, Carbon Steel
6	Base Leg Supports	Carbon Steel

System Type	Articulated Roof Drain System
Description	Steel Pipe System with Rotary Swivel Joints
Used On	External Floating Roof System
Service	Suitable for all products with correct material selection
API650 Compliant	Yes
Codres Compliant	Yes
Advantages	Robust construction capable of withstanding all imposed forces. No maintenance requirements. No problem of contacting with roof legs. Available 3"-4"-6"-8" inch systems.
Disadvantages	Higher initinal cost and longer installation time than drain hose.

THE BEST SOLUTION SUITED TO YOUR EXTERNAL FLOATING ROOF DRAIN SYSTEMS

ROOF DRAIN SPILL STOPPER - HYDROCARBON SENSING VALVE

Hydrocarbon Spills! These hydrocarbon spills have cost money and embarrassment to your company – until now! Spill Stopper is now available to detect the presence of hydrocarbons in the liquid flow and to automatically close, thus protecting the surrounding soil or the ground water from hydrocarbon contamination.

Primarily designed for floating roof storage tank drain systems, tank farm dike drain systems and wastewater treatment facilities, Spill Stopper remains open during normal operation, allowing rainwater and non-hydrocarbon liquids to flow and drain from the tank or dike area. However, should hydrocarbons enter the liquid flow, the internal sensing characteristics of the Spill Stopper cause it to close, containing the problem and protecting the environment.

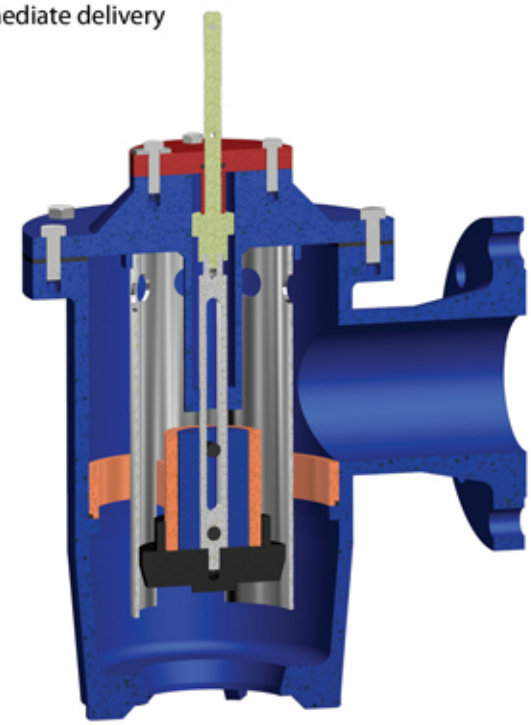
Spill Stopper has been designed for trouble-free performance. Since this valve is mechanically actuated, replacement of the Hydrocarbon Sensing Element upon repair of the source of the hydrocarbon leak source will reset the actuator. Winter freeze-ups are reduced because the drainage system can remain open due to Spill Stopper monitoring the liquid flow.

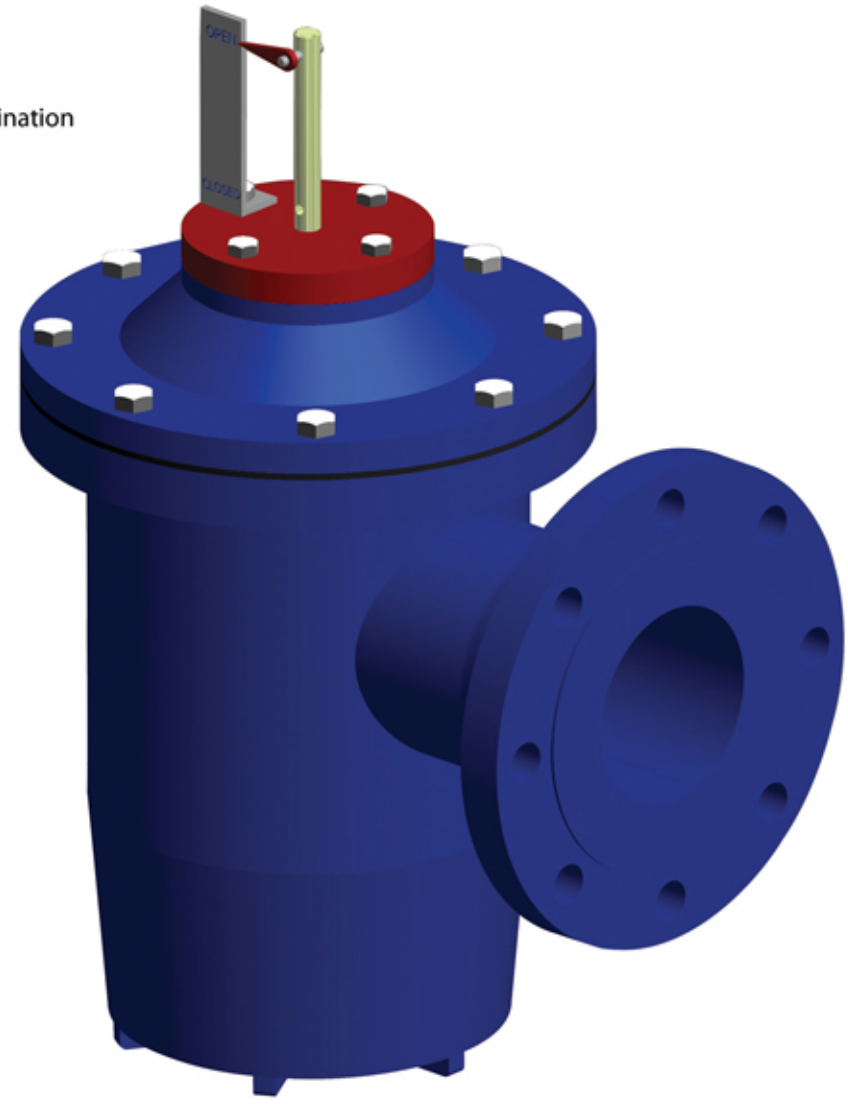
Spill Stopper Hydrocarbon Sensing Valves are available in 4" Diameter size, with 150# flanges. The rugged aluminum and stainless steel construction of this full flow valve offers lightweight plus long service life durability and strength. Spill Stopper makes good economic and environmental sense.

Spill Stopper has been designed and manufactured through the collaborative efforts of ATS Inc.

SPILL STOPPER OFFERS MANY ADVANTAGES

Can be used in many drainage system applications
Protection of surrounding soil and ground water from contamination
No external power required for operation
Visual and remote indicators signal valve closure
Reduced maintenance costs
Floating roof drain system valves can remain open
Reduces possibility of floating roof sinking
Easy to install
Immediate delivery





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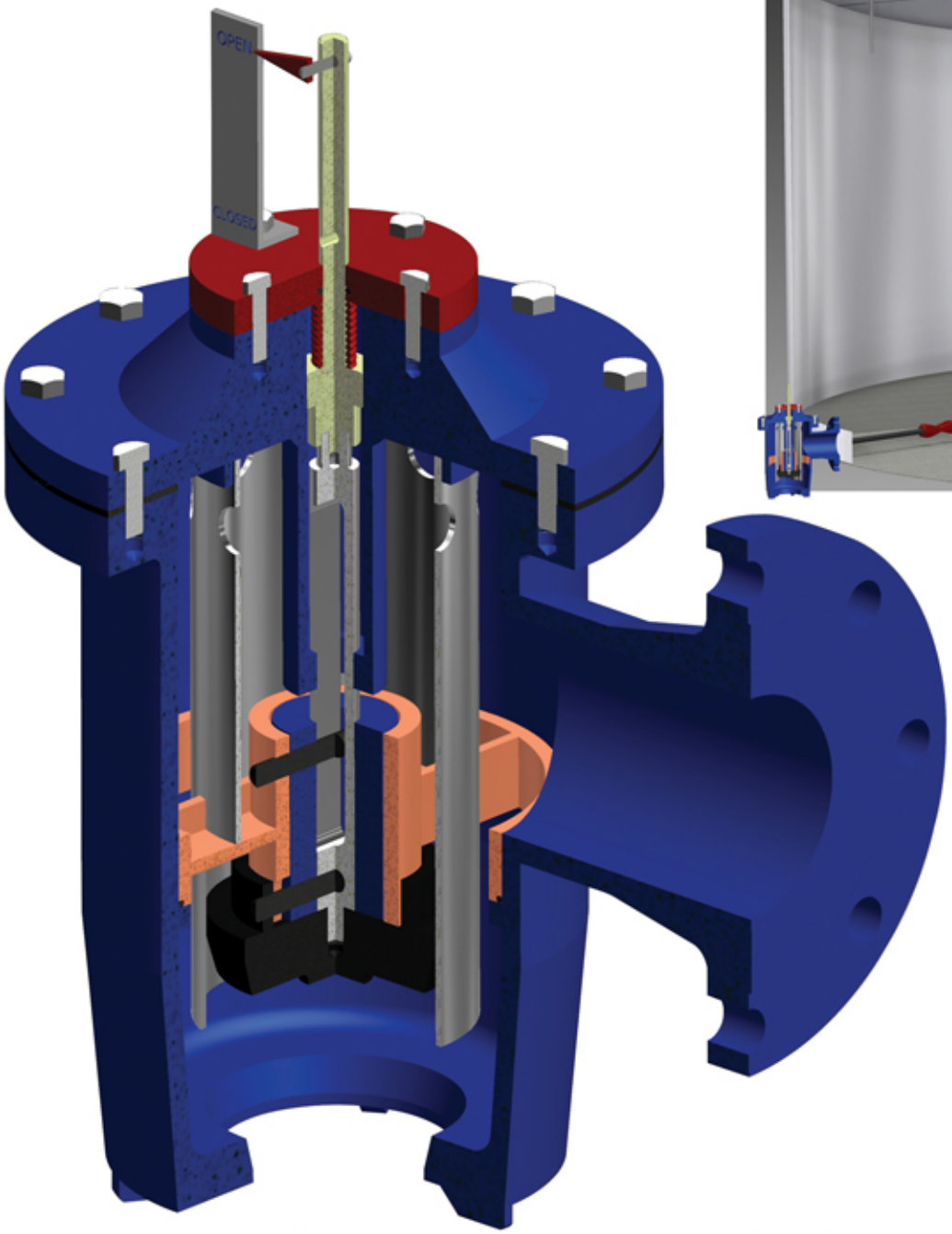

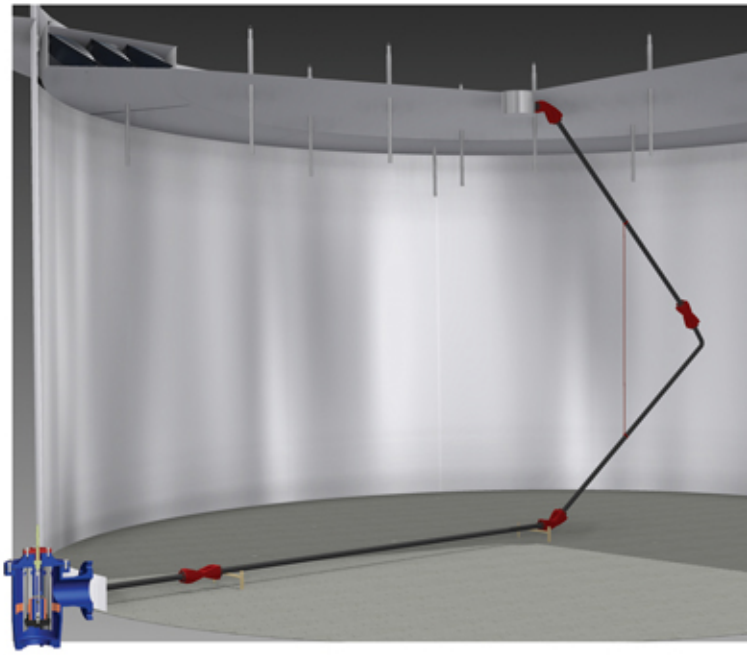

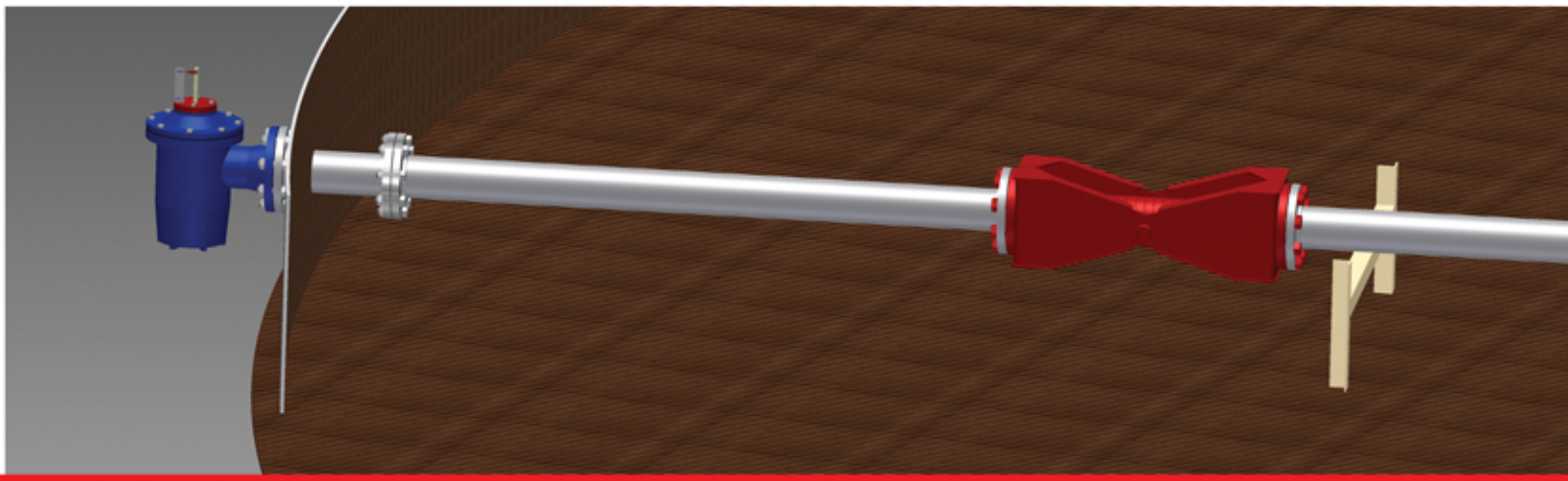

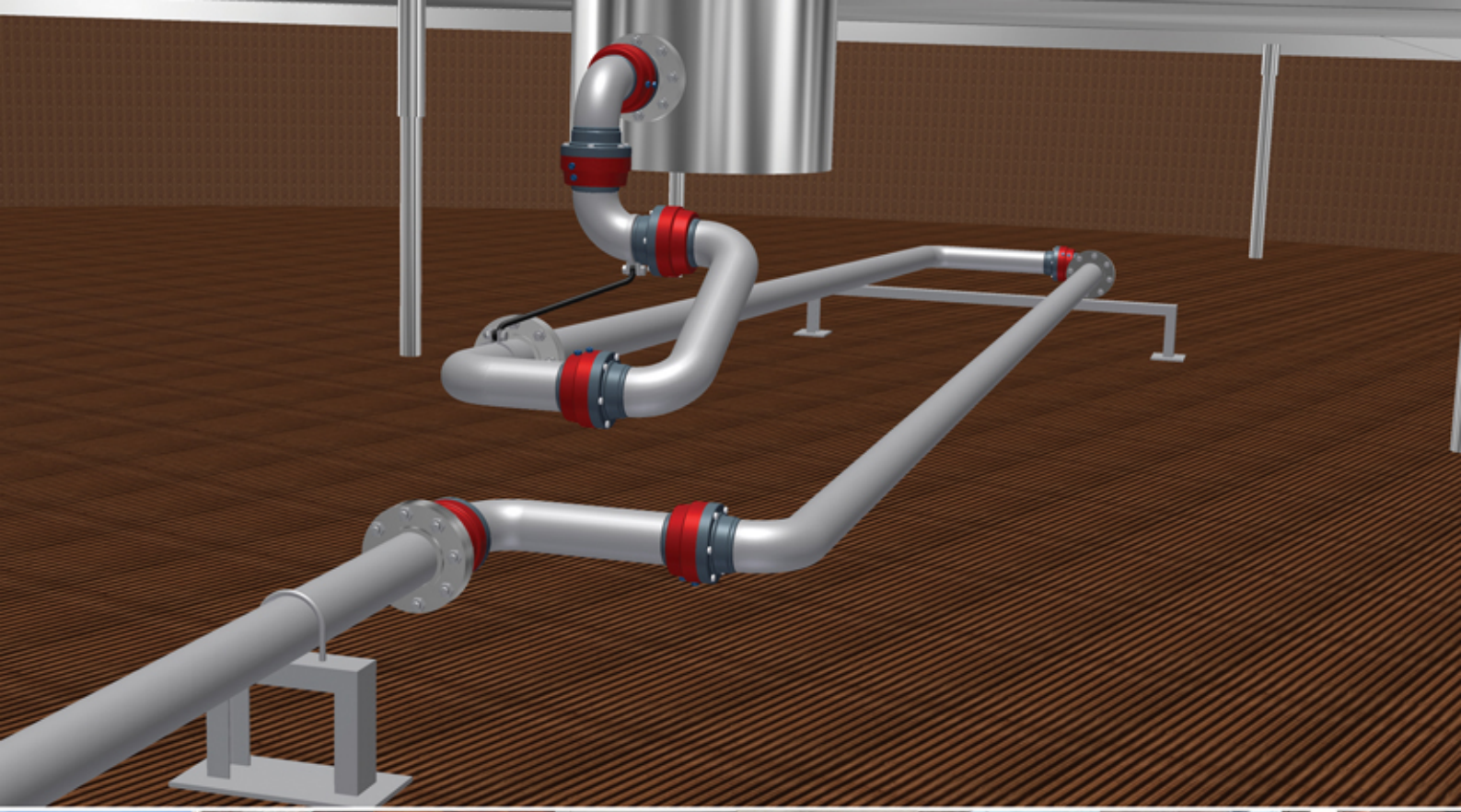


Geodesic Dome Roof


Internal Floating Roof


Floating Roof Seal


Floating Suction System


Roof Drain System


Emission Control Systems


Special Products


Engineering

ADVANCED TANK SYSTEMS ENGINEERING SERVICES COMPANY

483 Green Lanes, London N13 4BS - United Kingdom

Tel: +44 (0) 20 8242 6004 Fax: +44 (0) 20 8181 4842

info@atstank.com - www.atstank.com