

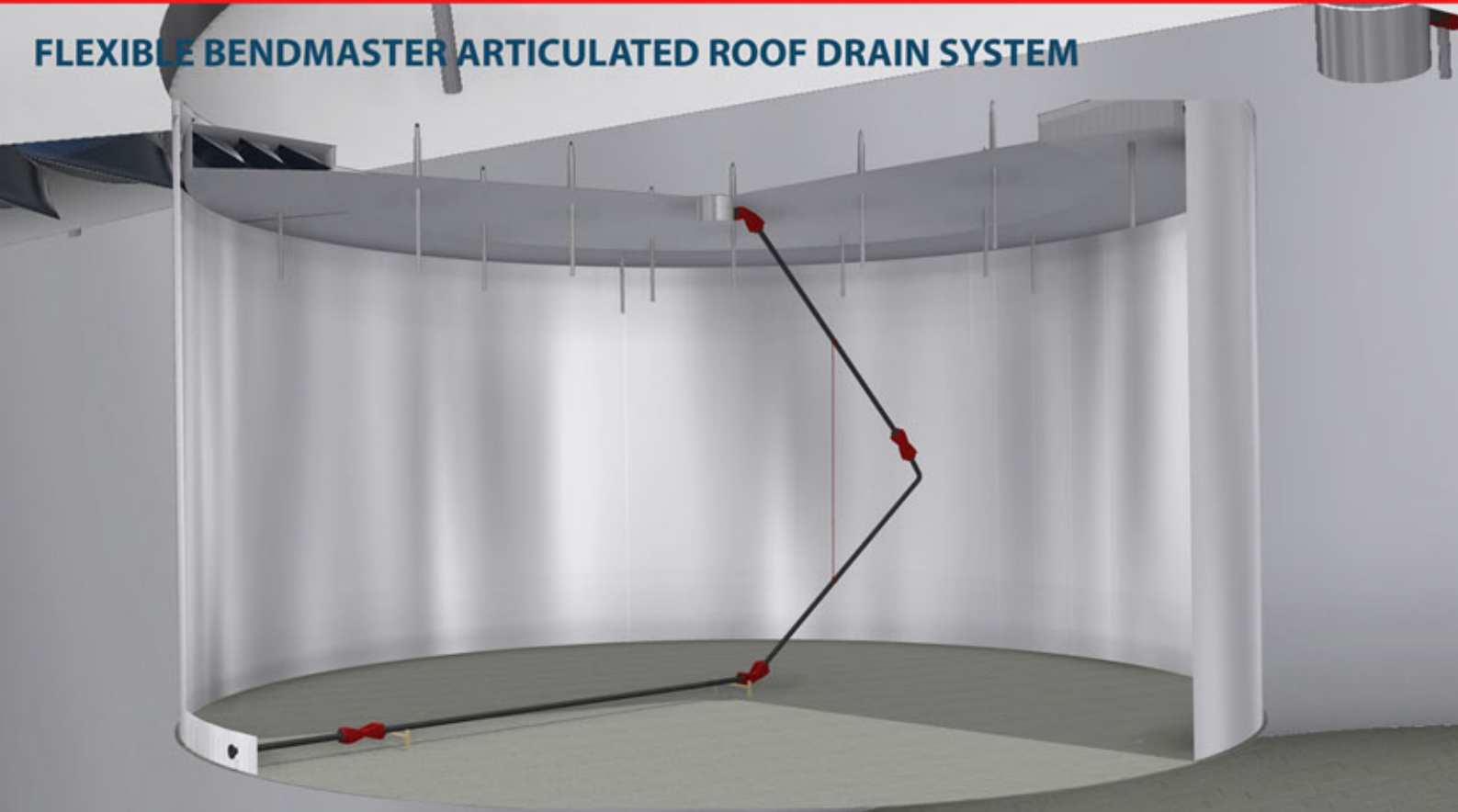
## ROOF DRAIN SYSTEMS

# FLEXIBLE BENDMASTER ARTICULATED



# THE SOLUTION BEST SUITED TO YOUR EXTERNAL FLOATING ROOF DRAIN SYSTEMS

## 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.

ATECO 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 ATECO TANK TECHNOLOGIES AND ENGINEERING can install the Roof Drain Systems using our own installation crew at a time convenient 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 maintenance free.
- 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 retained in 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 occur with 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 Fire Fighting Foam Delivery Systems

## *Construction and Material Specification*

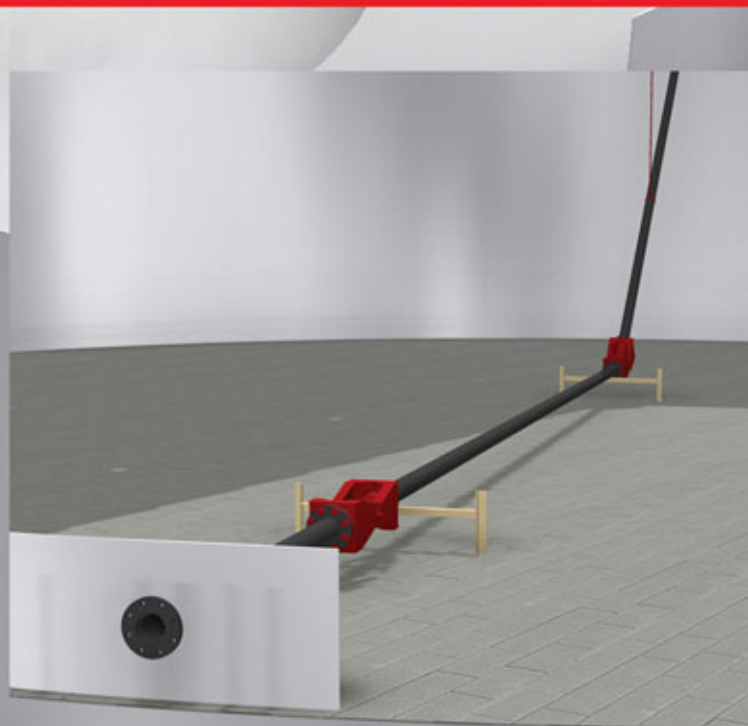
The ATECO BENDMASTER flexible joint is designed with inner and outer stainless steel wire helixes to maintain hose rigidity when subjected to internal or external pressures. Multiple inner layers of polar and non-polar elastomeric materials in the flexible joint prevent product permeation through the 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.

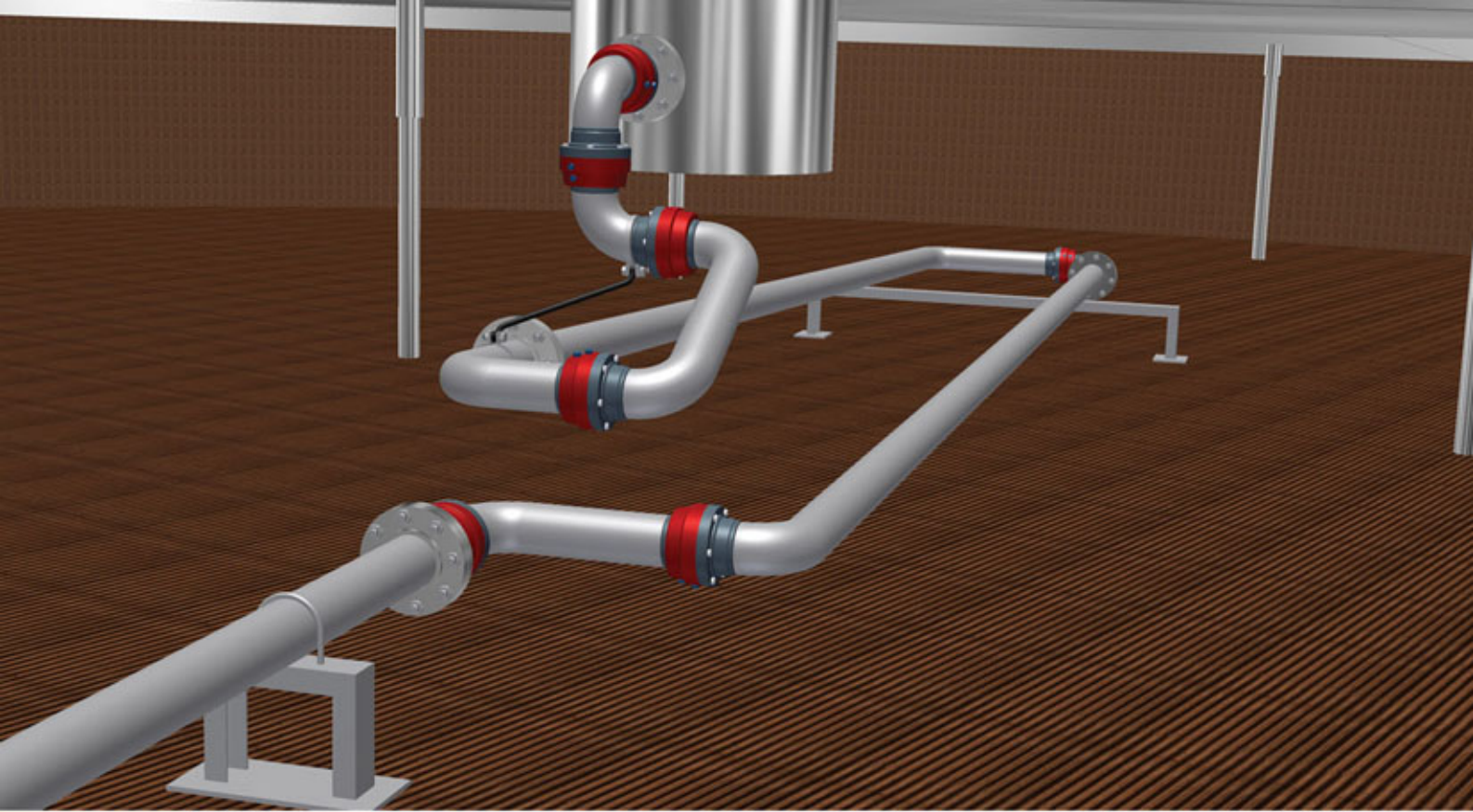
These side plates are available carbon steel (galvanized or prime coated) and stainless steel materials.

BENDMASTER flexible joints are attached to Schedule 40 carbon steel piping to provide a rigid, maintenance-free 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







Geodesic  
Dome Roof

Internal  
Floating Roof

Floating  
Roof Seal

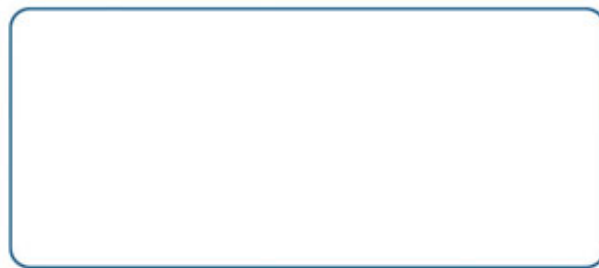
Floating  
Suction System

Roof  
Drain System

Emission  
Control Systems

Special  
Products

Engineering



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