OPW®

FUELING CONTAINMENT SYSTEMS

Dispenser Containment Manual

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FlexWORKS
BY OPW FUELING CONTAINMENT SYSTEMS

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1.0 INTRODUCTION

The FlexWorks System requires the use of dispenser sumps or dispenser pans as a means of secondary containment for the plumbing and piping connections located beneath the dispenser. These sumps also provide surface access to piping connections and provide a clean and dry environment for future service and maintenance. Dispenser sumps and dispenser pans are installed just beneath the above ground fuel dispensing units. Dispenser sumps are non-corrosive, chemically compatible and structurally suitable for underground burial applications.

1.1 General Information

This product manual contains useful information about all models of dispenser sumps and pans. It is recommended that this manual be read prior to specifying and installing under dispenser containers. The installation practices shall comply with the installation instructions contained within this product manual in order for the product warranty to be valid.

1.2 Independent Testing

All OPW-FCS dispenser sumps and dispenser pans are listed with Underwriters Laboratories, Inc. (UL®). The dispenser sump / pan frames were tested to *UL's* "Standard Testing Procedure for Underground Dispenser Sumps and Tank Sumps " and are UL Listed. These tests verified the frame's ability to withstand a lateral impact from all sides and permit proper activation of a shear valve in the event of a knockover. The integrity of the sump itself was conducted in accordance with *UL's* "Standard Testing Procedure for Underground Dispenser Sumps and Tank Sumps" and is UL Listed This test program tested the sump's fluid compatibility as well as its ambient and low temperature physical properties.

1.3 Liquid Tightness

Dispenser sumps are open at the top and are sheltered from the weather by the dispenser housing. Most dispenser sumps and dispenser pans provide a 1" vertical lip above the surface of the island to prevent any surface run-off from entering the container. All pipe and conduit entries are required to be sealed with flexible entry boots.

1.4 Chemical Compatibility

All dispenser sumps and dispenser pans are made of either fiberglass or polyethylene plastic material; both of which are chemically inert and have a long history of underground burial applications. Polyethylene and fiberglass have been used in storage containers designed for containment of a long list of chemical solvents, hydrocarbon and alcohol based fuels. All seals are made of a specially formulated compound which has been independently tested to insure its compatibility with a wide

assortment of chemicals. These tests include measuring the material's retention of physical properties and determining the capability of the compound to withstand exposure.

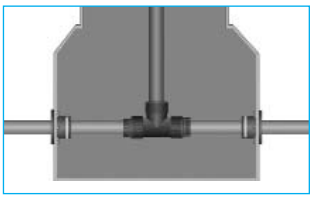
1.5 Corrosion Resistance

All metal framework components are either powder coated, galvanized or zinc plated for excellent long term corrosion protection. The entry seal fasteners are made of stainless steel. All of these metallic components are accessible from inside the sump. The sump body is non-metallic and will never corrode.

2.0 SPECIFYING DISPENSER CONTAINMENT

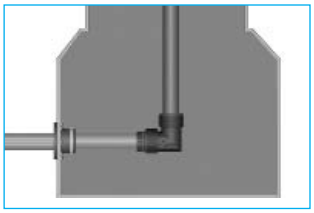
OPW-FCS offers a wide variety of under dispenser containers to accommodate the most common types and sizes of product dispensers. The selection of the appropriate type of under dispenser container depends on the following:

2.1 Junction Applications



Dispenser containers used in junction applications occur only in pressure piping systems with series pipe routing (from one dispenser to the next). This application uses the tee fitting to interconnect one flexible pipe section to the next, as well as branching off vertically to the fuel dispenser.

2.2: Terminating Applications



Dispenser containers used in terminating applications are typically at the end of pressure piping systems with series routed piping. They are located under all dispensers of suction piping systems with direct routed piping. They are also located under all dispensers of pressure piping systems with branch routed piping. This application uses the elbow fitting attached to a riser pipe assembly to attach one flexible pipe section to the fuel dispenser.

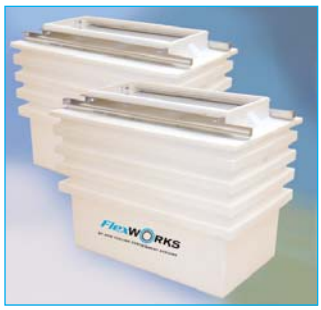
2.3 Dispenser Containment Models

Five types of dispenser containers are available for use with the FlexWorks piping system. They include:

2.3.1 One Piece Sumps

These higher profile dispenser sumps have a total height of 30 inches permitting the *FlexWorks* pipe to exit out of the dispenser sump at a very low elevation which is ideal for pressure piping systems requiring slope back indirectly to the tank. They are also recommended for use with pressure piping systems run in series which require piping fall back to the tank. These dispenser sumps are height adjustable to accommodate piping fall requirements between all containment sumps. These are available in poly for most dispenser models, and in fiberglass for a few dispensers. See the FlexWorks Dispenser Directory in the FlexWorks Product Catalog for availability.

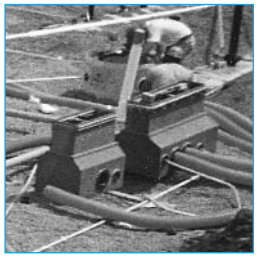
2.3.2 Two Piece Polyethylene and Fiberglass Sumps



These higher profile dispenser sumps have total height of 37 inches permitting the *FlexWorks* pipe to exit out of the dispenser sump at a very low elevation which is ideal for pressure piping systems requiring slope back indirectly to the tank. They are also recommended for use with pressure piping systems run in series which require piping fall back to the tank. These dispenser sumps are height adjustable to accommodate piping fall requirements between all containment sumps. Because of its two piece design, connection of all fittings is easier than in standard one piece dispenser sumps.

3.0 DISPENSER MOUNTING FRAMES

All dispenser containment models share the same type of metal frame assembly. The frame assembly is specifically sized to accommodate one or more types of makes and models of product dispensers. All metal side struts, which secure the adjustable stabilizer bars, are directly anchored into the concrete using side



anchors. The side struts also allow for convenient mounting of any type of leak detection probes. Specifically located anchor bolts are used to secure the dispenser frame to the concrete island.

4.0 GENERAL INSTALLATION INSTRUCTIONS

The different types of dispenser containment pans and sumps have similar installation procedures but also have some specific differences. The following instructions under this section concern only those general installation procedures which are consistent with all dispenser pans and sumps.

4.1 Dispenser Containment Mounting

The dispenser container frame has side anchors as well as a wide metal flange containing anchor bolts for secure anchoring to a concrete island. The proper anchoring of dispenser frames is very important to secure stabilizer bars, which are fitted with shear valves. There are three typical types of mounting applications and they are described as follows:

4.2 Metal Island Form Mounting

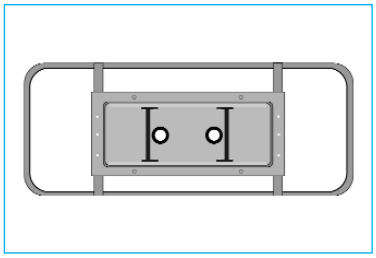
For new or extensive retrofit applications, pre-engineered metal island forms are used. These metal island forms may or may not have adjustable or fixed support bars for mounting of the dispenser sump or pan frame assembly.

4.3 Installing Anchors

Install the provided anchor bolts in the designated holes of the mounting frame to accommodate the model of dispenser to be installed.

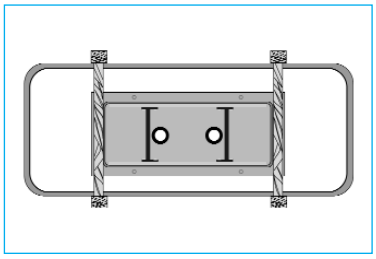
Fitted With Support Bars:

Metal island forms typically have adjustable metal supports which support and fasten the dispenser sump or pan's metal frame assembly.



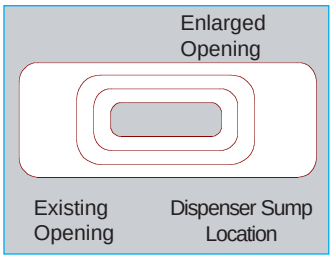
No Support Bars

For metal island forms with no supports, two pieces of lumber should be used to span across the island form to support and fasten a dispenser sump or pan's metal frame assembly.



Retrofit Mounting

For retrofit applications, it is possible to enlarge the opening in the concrete to accept the insertion of the dispenser pan unit. Expandable anchor bolts must be installed to secure the dispenser pan frame and the dispenser.

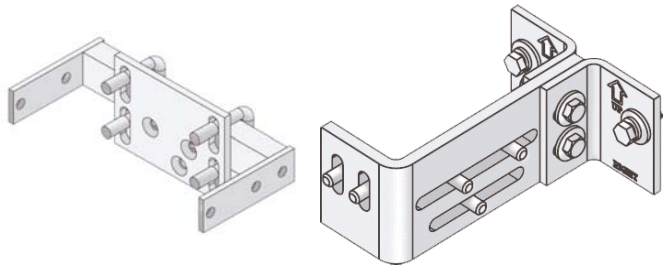


4.4 Installing Stabilizer Bars

Two strut spring nuts must be inserted into each of the two side struts of the containment sump.

IMPORTANT: Spring nut must be locked in place prior to installing stabilizer bar.

Fasten the stabilizer bars with the provided bolts loosely to permit movement from side to side movement of the bar for positioning purposes. Firmly tighten down the bolts after the shear valve has been plumbed to the dispenser.



IMPORTANT: Stabilizer bars must be tightened down securely to the side strut after the dispenser has been mounted.

4.5 Specifying Shear Valves

Shear valves need to be securely mounted to the stabilizer bar to insure that they will activate in the event of impact.

4.5.1 Standard Boss Mount Shear Valves

Shear valves having boss mounts can be used providing the valve mounting plate is attached. Attach the plate using the three flat-head socket screws provided with a 1/4" allen wrench. It is necessary to order shear valve mounting plates with these types of shear valves.

IMPORTANT: Shear Valves must be tightened down securely on to stabilizer bar after dispenser has been mounted.

5.0 SPECIFIC INSTALLATION INSTRUCTIONS

The following installation instructions refer more specifically to the different containment applications available with each type of dispenser containment pan or sump. OPW-FCS recommends hydrostatic testing all sumps after installation to check for proper sealing of joints and connections.

5.1 Pipe Entries

The installation of all flexible entry boots must be completed prior to the installation of the riser pipe assembly. Determine the correct pipe entry location in the bottom of the pan so that there is direct alignment with the dispenser inlet fitting.

5.1.1 Riser Pipe Assemblies

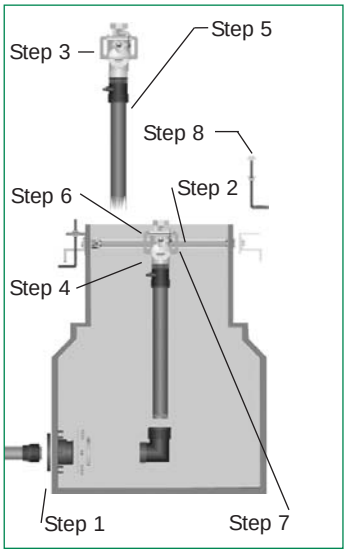
Refer to the FlexWorks piping manual for a detailed description of available riser pipe design options and assembly procedures for this deep dispenser pan application using coax fittings & couplings with riser jackets.

5.2 One Piece Dispenser Sump Assemblies

Both deep and shallow dispenser sumps may be used for FlexWorks piping systems using coax and swivel couplings & fittings. Follow these installation instructions for this application:

5.2.1 Sump Height Adjustment

The easiest means of adjusting the pipe entry height is to install the flexible entry boot at a higher entry level in the sidewall of the sump.



Step 1: Install anchor bolts at required hole locations.

Step 2: Locate and install Flexible Entry Boots in sump side panel.

Step 3: Install Stabilizer Bars to the side struts.

Step 4: Install Shear Valve Mounting Plate to the Shear Valve (if required).

Step 5: Attach the riser pipe to Shear Valve.

Step 6: Install Shear Valve to Stabilizer bar.

Step 7: Install Conduit Entry Boots into side of sump.

5.3 One and Two Piece Poly and Fiberglass Sumps

Fiberglass dispenser sumps are available in one piece, or 2 piece widemouth design for easy connections of pipe couplings and fittings.

5.3.1 Assembly of the Fiberglass Dispenser Sump

Step 1: Locate flexible entry boot centers and install boots in the side wall of the base. Refer to the flexible entry boot installation manual for proper installation of the boot.

Step 2: Insert sections of piping through flexible entry boots and attach to fittings inside the dispenser sump base.

Step 3: Install stabilizer bars to dispenser sump riser frame. Attach shear valves to stabilizer bars. Install anchor bolts to the dispenser sump frame.

6.0 DISPENSER MOUNTING

After all riser pipe assemblies have been loosely installed into either a dispenser sump or a dispenser pan, mounting of the product dispenser may be completed. The stabilizer bars and valve plate assembly are designed to provide multi-directional side-to-side positioning of the shear valve as well as providing up to 1" of up and down movement. This will greatly assist in the connection of the shear valve to the product dispenser.

6.1 Tighten Down Fasteners

Once all the shear valves have been connected to the inlet fittings of the product dispenser, all stabilizer bars and valve plate fasteners must be securely tightened. Make sure all spring nuts are in absolute horizontal alignment prior to final tightening of the bolt fastener.

WARNING: Failure to properly secure stabilizer bar and valve plate fasteners could prevent the shear valve from activating in the event of a dispenser knock-over.

7.0 FLEXWORKS SYSTEM MAINTENANCE

The FlexWorks System is designed to provide reliable underground fuel transfer and short-term secondary containment of leaked petroleum product. FlexWorks sumps and secondary containment pipes are not intended for long term storage of petroleum products. Liquid that accumulates in the secondary containment system must be promptly removed and properly disposed of. Operational third party approved liquid sensors should be installed and maintained in each sump to reliably indicate to the operator that liquid is present in the secondary containment system. Once a leak is detected, the system must be shut down immediately and the source of the leak must be repaired. All liquid must be thoroughly flushed and cleaned out of the secondary containment system at once. Inspect all system components at least monthly for leaks or damage, and repair or replace any suspect component as necessary.

7.1 ROUTINE SUMP INSPECTIONS

Visual inspections of all containment sumps and components should be made on a routine basis to check for damage, water infiltration or for any signs of leaking product. An electronic or mechanical shut-off leak detection system is recommended for all containment sumps. When changing fuel filters at the dispenser, make sure any spilled product is cleaned out of the bottom of the dispenser sump. Sumps are to be kept free of debris and spilled fuel.

NOTE: Failure to remove fuel and liquids from containment sumps may compromise the performance and integrity of the sump and its associated fittings and seals over prolonged periods of time.

8.0 GUIDE SPECIFICATIONS

The following specifications are provided as general guidelines to specify under dispenser containment:

8.1 Short Form

The contractor shall provide liquid-tight dispenser containers located under each fuel dispenser as manufactured by OPW-FCS. Containers shall house and permit access to the plumbing components located under each product dispenser. Containers shall be installed in accordance with manufacturer's

current installation instructions.

8.2 Long Form

8.2.1 Design

The under dispenser container shall be of such a design as to permit access to all associated fittings and valves located directly below an above ground dispenser. The frame of the container shall be sized to fit the framework of the dispenser and permit anchoring of the dispenser directly into a concrete slab.

8.2.2 Product Compatibility

All components and accessories of the dispenser container shall be chemically compatible with the products to be distributed and with chemicals found naturally in the ground environment.

8.2.3 Corrosion Resistance

All dispenser container components which come in contact with the ground environment shall be made of non-metallic material or protected by materials which prevent corrosion.

8.2.4 Structural Integrity

All components shall be designed and constructed of materials strong enough for their intended use. The dispenser containers shall not collapse, crack or break due to ground movement, backfill stress or high ground water pressures.

8.2.5 Pipe & Conduit Entries

All dispenser containers shall be fitted with pipe and conduit entry seals which are semi-absorbent to ground movement and sufficiently flexible enough to permit angled entries up to 15 degrees without leaking under liquid head pressures of up to three feet.

8.2.6 Liquid Tightness

All *dispenser containers* shall prevent outside surface and ground water from coming into the container and prevent any product originating from within the sump from escaping into the underground environment. OPW-FCS recommends hydrostatic testing on all sumps after installation to check for proper sealing of joints and connections.

8.2.7 Hydrostatic Testing

OPW Fueling Containment Systems recommends the following procedure for hydrostatic testing of dispenser sumps, tank sumps and specialty application sumps.

1) Visually inspect all entry boots for band clamps, compression rings and donuts for possible leak points prior to connecting. Correct as needed.

2) Be sure all test tubes, connector tubes or any other open secondaries into the sump are sealed and liquid tight.

3) Fill all sumps to a minimum of 1" above the highest penetration fitting or sump joint. Mark the liquid level with a permanent marker.

4) Hydrostatic test should be held for 1 hour or per local regulations.

5) Be sure all water is disposed of properly after completing the test.

Note: Should the liquid level drop during testing, visually identify the leak source. Remove water and tighten band clamps to 30 in/lbs. Entry boot compression rings should be tightened in a clockwise manner until each stud reaches 60in/lbs. Repeat testing procedure.

If you have any questions, please feel free to call our Customer Service Department at 1-800-422-2525 for more details.

8.2.8 Height Adjustability

All deep type dispenser containers shall be field height adjustable to accommodate different tank and piping burial depths.

8.2.9 Anchoring & Stabilization

Dispenser containers shall provide a means of securing the above-ground dispenser unit, shear valve and piping.

- Dispenser anchoring: Dispenser containers mounting frames shall be of such a design that the base frame of the product dispenser is mounted directly over the concrete slab and not cantilevered.
- Shear Valve Stabilization: Dispenser containers shall provide a metal framework including one or more fully adjustable stabilizer bars to securely attach a shear valve in such a manner that the valve will properly activate in the event of a dispenser knock-over.

8.2.10 UL Testing

Under dispenser containers shall be tested and listed by Underwriters Laboratories to meet the following listings:

NON-METALLIC UNDERGROUND PIPING FOR FLAMMABLE LIQUIDS

NON-METALLIC SECONDARY CONTAINMENT PIPING SYSTEMS FOR UNDERGROUND PIPING FOR FLAMMABLE LIQUIDS

MISCELLANEOUS DISPENSING DEVICE ACCESSORIES

FLAMMABLE AND COMBUSTIBLE LIQUID TANK ACCESSORIES

8.2.11 Leak Detection

Under dispenser containers shall be equipped with a leak detection sensor which shall be capable of activating a remote alarm and/or turn-off a submersible pump or product dispenser in the event a collection of 1/4” of product or 6” of water inside the dispenser container.

FlexWORKS
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LIMITED WARRANTY

NOTICE: FlexWorks by OPW, Inc., VAPORSAVER and all other OPW products must be used in compliance with all applicable federal, state, provincial and local laws, rules and regulations. Product selection must be based on physical specifications and limitations, compatibility with the environment and material to be handled. All illustrations and specifications in this literature are based on the latest production information available at the time of publication. Prices, materials and specifications are subject to change at any time, and models may be discontinued at any time, in either case, without notice or obligation.

OPW warrants solely to its customer that the following products sold by OPW will be free from defects in materials and workmanship under normal use and conditions for the periods indicated:

Product	Warranty Period
FlexWorks Primary Pipe	10 years from date of manufacture
All Products Certified to California 2001 Standards*	1 year from date of manufacture or from date of installation registration (Not to exceed 15 months from date of manufacture)
All other Products	1 year from date of manufacture
* Products certified to California 2001 Standards will have an OPW registration card endlosed/attached to the product.	

OPW's exclusive obligation under this limited warranty is, at its option, to repair, replace or issue credit (in an amount not to exceed the list price for any defective product) for future orders for any product that may prove defective within the applicable warranty period (repairs or replacements are subject to prorated warranty coverage fro remainder of the original warranty period). Complete and proper warranty claim documentation and proof of purchase required. All warranty claims must be made in writing and delivered during the applicable warranty period to OPW at P.O. Box 405003, Cincinnati, Ohio 45240, Attention: Customer Service Manager. No products may be returned to OPW without its prior written authority.

This limited warranty shall not apply to any FlexWorks or VAPORSAVER product unless it is installed by an OPW attested installer. This limited warranty also shall not apply to any FlexWorks, VAPORSAVER or other OPW product: unless all required site and warranty registration forms are completed and received by OPW within 60 days of installation; unless all piping connections are installed with a nationally-recognized or state-approved leak detection device in each tank and dispenser sump (which are not for storage and from which all discharge hydrocarbons must be removed, and the systems completely cleaned, with 24 hours); unless testable sumps utilize FlexWorks pipe and access fittings; unless a sump inspection log or an EPA recommended/required checklist is maintained and the results are furnished to OPW upon request; and unless OPW is notified with 24 hours of any known or suspected product failure and is provided with unrestricted access to the product and the site. This limited warranty also shall not apply to any product which has been altered in any way, which has been repaired by anyone other than a service representative authorized by OPW, or when failure or defect is due to: improper installation or maintenance (including, without limitation, failure to follow FlexWorks Quick Reference Manual Installation Guide and all product warning labels); abuse or misuse; violation of health or safety requirements; use of another manufacturer's, or otherwise unauthorized, substances or components; soil or other surface or subsurface conditions; or fire, flood, storm, lightning, earthquake, accident or any other conditions, events or circumstances beyond OPW's control.

THIS LIMITED WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES, EXPRESS OR IMPLIED, AND ALL OTHER WARRANTEIS INCLUDING, WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXCLUDED. OPW shall have no other liability whatsoever, whether based on breach of contract, negligence, gross negligence, strict liability or any other claim, including, without limitation, for special, incidental, consequential or exemplary damages or for the cost of labor, freight, excavation, clean-up, downtime, removal, reinstallation, loss of profit, or any other cost or charges. No person or entity is authorized to assume on behalf of OPW any liability beyond this limited warranty. This limited warranty is not assignable.

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