Compact Fittings Catalog





	Compact Fittings Catalog Table of Contents	
Product Introduction Compact Penetration Fittings	Work in Progress Completed Document	Page 2
Product Bulletin		
Never Repair Again		Page 3
Price List		
Compact Penetration Fitting Series		Page 4
FGT Penetration Series		Page 5
Tools & Crossovers		Page 6
Sanding Hole Saws		Page 7
Data Sheets		
APT		Page 8 & 9
OPW		Page 10 & 1
NOV Fiberglass Pipe		Page 12 & 1
Tool Kit		Page 14
Crossover fittings		Page 15
Sanding Hole Saws		Page 16 & 1
Installation Instructions		
APT, Brugg, Omegaflex, OPW Flex F	Pipe and Semi Flex Pipe	Page 18 & 1
NOV Rigid Fiberglass Pipe		Page 20
Guideline Specifications		
Compact Penetration Fittings		Page 21
Third Party Approvals		
Roundtable		Page 22
N.D. Eryou		Page 23-25
Reference Data		
Compact Fitting Matrix		Page 26
Testing Data		Page 27-29
Contact US		Page 30
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Diversified Products Manufacturing

"Better By Design"



Revolutionary Compact Penetration Fitting "NO RUBBER" In The Sump



Features

No Exposed Rubber In The Sump

- Water Tight Corrugated Ducting Seals
- Penetration Extends Less Than 1-1/2" Into Sump
- . Tested In Excess of 60 PSIG

Benefits

Never Repair a Penetration Fitting Again

- Available For All Pipe Sizes up to 3.3" OD
- Pipe Is Fully Retractable & Replaceable
- . Easy and Quick Installation

Applications

- . Corrugated Ducting
- Direct Burial
- Single Wall Sumps
- . Double Wall Sumps









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FGC Series Penetrations



Fiberglass Penetrations for Flex & NOV Pipe "No Rubber in the Sump" for DPM Single & Double Wall Sumps Direct Burial



Part #	Description	List Price
PF-FGC-1.18-DB	Compact Fiberglass Penetration for OPW-C075A	
PF-FGC-1.27-DB	Compact Fiberglass Penetration for APT-XP-100-D	
PF-FGC-1.47-DB	Compact Fiberglass Penetration for APT-XP-100-SC	
PF-FGC-1.50-DB	Compact Fiberglass Penetration for OPW-C10A	
PF-FGC-1.70-DB	Compact Fiberglass Penetration for APT-XP-150-D	
PF-FGC-1.90-DB	Compact Fiberglass Penetration for APT-XP-150-SC	
PF-FGC-2.00-DB	Compact Fiberglass Penetration for OPW-C15A	\$146.96
PF-FGC-2.15-DB	Compact Fiberglass Penetration for APT-XP-175-D	\$140.90
PF-FGC-2.38-DB	Compact Fiberglass Penetration for NOV 2" Single Wall Pipe	
PF-FGC-2.45-DB	Compact Fiberglass Penetration for OPW-C20A & APT XP-200-D	
PF-FGC-2.65-DB	Compact Fiberglass Penetration for APT-XP-200-SC	

Note for OmegaFlex DoubleTrac Products refer to our OmegaFlex Catalog

Fiberglass Penetrations for Flex & NOV Pipe "No Rubber in the Sump" for DPM Single & Double Wall Sumps used with Corrugated Duct

	Part #	Description	List Price
		Description	LIST PITCE
	PF-FGC-1.18-CD	Compact Fiberglass Penetration for OPW-C075A	
	PF-FGC-1.27-CD	Compact Fiberglass Penetration for APT-XP-100-D	
	PF-FGC-1.47-CD	Compact Fiberglass Penetration for APT-XP-100-SC	
	PF-FGC-1.50-CD	Compact Fiberglass Penetration for OPW-C10A	
	PF-FGC-1.70-CD	Compact Fiberglass Penetration for APT-XP-150-D	
	PF-FGC-1.90-CD	Compact Fiberglass Penetration for APT-XP-150-SC	
	PF-FGC-2.00-CD	Compact Fiberglass Penetration for OPW-C15A	\$208.98
	PF-FGC-2.15-CD	Compact Fiberglass Penetration for APT-XP-175-D	
	PF-FGC-2.45-CD	Compact Fiberglass Penetration for OPW-C20A & APT XP-200-D	
	PF-FGC-2.65-CD	Compact Fiberglass Penetration for APT-XP-200-SC	
	Note for Omega	Flex DoubleTrac Products refer to our OmegaFlex Catalog	

Diversified Fiberglass Seals, Bonder & Cleaner for Fiberglass Penetrations

	Part #	Description	List Price
Pres .	CH-DFB-50ml	50ml Cart Set Epoxy Fiberglass Bonder for Fiberglass Penetrations includes one CH-DSM-V Static Mixer. Use with CH-DAG-III and CH-DSM-V	\$104.12
	CH-DSM-V	Static Mixer for use with CH-DBF-50ml This is a fast curing Product. Additional Static Mixers may be required.	\$15.76
	CH-DAG III	Plastic Applicator Gun for use with 50ml Cartridge Sets	\$142.49
Fiberglass Epoxy	CH-DAG III M	Metal Applicator Gun	\$192.50
DBC I		for use with 50ml Cartridge Sets	
	CH-DBC II	Diversified Bulkhead Cleaner for use prior to bonding	\$20.36
	ES-IS-5.0x4.5	Interstice Seal for required for Double Wall sumps	\$45.00
-		\$50 Hazmat fee on air shipments gs if installing -DB series in the field. ery 4 fittings when water tight seals on Corrugated Duct Systems are required	J.
	5522	Diversified Products Manufacturing	
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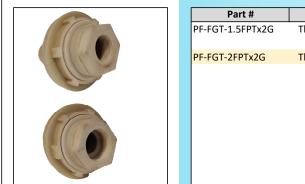
FGT Series Penetrations



Fiberglass Penetrations for NOV Pipe "No Rubber in the Sump" for DPM Single & Double Wall Sumps

Tapored for 2" or 3" FRP	Part #	Description	List Price
	PF-FGT-2NOVx2G	Threaded for 2" Single Wall Pipe also see compact fittings	\$162.28
2" or 3" Sanitary	PF-FGT-3NOVx3G	Threaded for 3" Single Wall Pipe also see compact fittings	\$168.00
	PF-FGT-2LCXx2G	Threaded for 2" LCX Double Wall Pipe with test	\$162.28
	PF-FGT-3LCXx3G	Threaded for 3" LCX Double Wall Pipe with test	\$212.14
2" or 3" FPT	PF-FGT-3x2G	and drain ports Threaded for 3" over 2" Double Wall Pipe over Pipe with test and drain Ports	\$180.00
	PF-FGT-4x3G	Threaded for 4" over 3" Double Wall Pipe over Pipe with test and drain ports	\$212.44

Fiberglass fittings for Above Ground UDC's with Hex head and no test or drain ports



List Price
\$155.60
\$155.60

Diversified Fiberglass Seals, Bonder & Cleaner for Fiberglass Penetrations

_	Part #	Description	List Price
Rey	CH-DFB-50ml	50ml Cart Set Epoxy Fiberglass Bonder for Fiberglass Penetrations includes one CH-DSM-V Static Mixer. Use with CH-DAG-III and CH-DSM-V	\$104.12
	CH-DSM-V	Static Mixer for use with CH-DBF-50ml	\$15.76
	CH-DAG III	This is a fast curing Product. Additional Static Mixers may be required. Plastic Applicator Gun for use with 50ml Cartridge Sets	\$142.49
	CH-DAG III M	Metal Applicator Gun	\$192.50
Fiberglass Epoxy		for use with 50ml Cartridge Sets	
	CH-DBC II	Diversified Bulkhead Cleaner for use prior to bonding	\$20.36
	ES-IS-5.0x4.5	Interstice Seal for required for Double Wall sumps	\$45.00
CH-DBC-II Cleaner			
		850 Hazmat fee on air shipments No Shipping Restrictions	
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Tools & Crossovers



Tool for Small Nut	Part #	Description	List Price
	PF-FGC-S-Tool	Spanner Tool for Small Nut - 1.18" OD through 1.55" OD Pipe	\$122.50
Tool for Medium Nut	PF-FGC-M-Tool	Spanner Tool for Medium Nut - 1.70" OD through 3.93" OD Pipe	\$122.50
Tool for Large Nut	PF-FGC-L-Tool	Spanner Tool for Latge Nut - 4.0" OD through 6.0" OD Pipe	\$122.50



Part #	Description	List Price
PF-FGS-Tool Kit	Spanner tools for 3 sizes of nuts with torque Wrench	\$560.00

Diversified crossover & Test Assemblies

	Part #	Description	List Price
PF-Xover-xft-SS	PF-Xover-2ft-SS	Crossover Assembly to connect Interstices 2 ft long	\$23.33
1 1	PF-Xover-3ft-SS	Crossover Assembly to connect Interstices 3 ft long	\$27.49
PF-Xover-Test-SS	PF-Xover-6ft-SS	Crossover Assembly to connect Interstices 6 ft long for use with 50ml Cartridge Sets	\$31.63
	PF-Xover-Test-SS	Crossover Assembly to connect Interstices 3 ft long for use with 50ml Cartridge Sets	\$28.18
PF-Xover-SM-Test-SS	PF-Xover-SM-Test-	S Crossover Assembly to connect Interstices Surface Mounted	\$45.00
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Sanding Hole Saws- Carbide Tipped



Sanding Hole Saws - Carbide Tipped for Fiberglass

	Part #	Description	List Price
	PF-SHS-1.75x2.8	Sanding Hole Saw for 3/4 & 1" Bonded Electrical Conduits SW Sumps	\$232.28
	PF-SHS-2x2.8	Sanding Hole Saw for 3/4 & 1" Bonded Electrical Conduits DW Sumps	\$256.61
	PF-SHS-2x3	Sanding Hole Saw for B2 Series Penetrations SW Sumps	\$261.13
	PF-SHS-3.5x5.2	Sanding Hole Saw for B3.5 Series Penetrations SW Sumps	\$407.56
	PF-SHS-5x6.7	Sanding Hole Saw for B5 Series Penetrations SW Sumps	\$565.85
	PF-SHS-6x7.6	Sanding Hole Saw for B6 Series Penetrations SW Sumps	\$587.08
89 8	PF-SHS-2.25x4.5	Sanding Hole Saw for 4 Stud Penetrations SW Sumps	\$291.71
	PF-SHS-4x6.7	Sanding Hole Saw for 8 Stud Penetrations SW Sumps	\$466.05
	PF-SHS-5.5x8	Sanding Hole Saw for 10 Stud Penetrations SW Sumps	\$509.88
	PF-SHS-4.5x6.38	Sanding Hole Saw for FGT & FGC Series Fiberglass Penetrations SW Sumps	\$467.33
	PF-SHS-5x6.85	Sanding Hole Saw for Omegaflex Series Penetrations SW Sumps	\$566.57
	PF-SHS-5x6.38	Sanding Hole Saw for FGT & FGC Series Fiberglass Penetrations DW Sumps	\$566.57
	PF-FGC-5.5x6.85	Compact Fiberglass Penetration for Omegaflex Penetrations DW Sumps	\$495.37
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Compact Fiberglass Penetrations for APT Flex Pipe

Technical Data Sheet

Since the introduction of EPA regulations for Underground Storage Tanks in 1988, there has been a need for Penetration Fittings that will last as long as the tanks. For flex pipe, the fitting must allow the pipe to be replaceable without breaking ground and there must be no "rubber" products inside the sump. DPM has the answer with the introduction of its "Compact" series of penetrations for Flex Pipe, Semi Rigid, and Rigid Fiberglass Pipe. The Compact Penetration Fitting assures the site owner that this cost will never be experienced again. Millions of repair dollars can be avoided in future budgets where these fittings are installed.

All components are either UL Listed or third party approved for their respective applications.

The Compact Fitting has a body, nut, compression nut, and seal. For those installing pipe in a Corrugated Duct, there is a terminating reducer that provides a water tight seal between the ducting and the penetration fitting.

Compact Penetrations are pressure tested in excess of 60 psi without leakage. Refer to DPM's test Data Summary.

Compact Penetrations may be used with flex pipes terminating with male swivel, sanitary, or barbed connections.

		Α	Α
Size	Pipe	Direct Burial	Corrugated Duct
1"	XP-100-SC	PF-FGC-1.47-DB	PF-FGC-1.47-CD
1 1/2"	XP-150-SC	PF-FGC-1.90-DB	PF-FGC-1.90-CD
1 3/4"	XP-175-SC	PF-FGC-2.15-DB	PF-FGC-2.15-CD
2"	XP-200-SC	PF-FGC-2.65-DB	PF-FGC-2.65-CD

Consult the Fitting Matrix Chart for Single Wall Product Numbers

Third Party Approvals

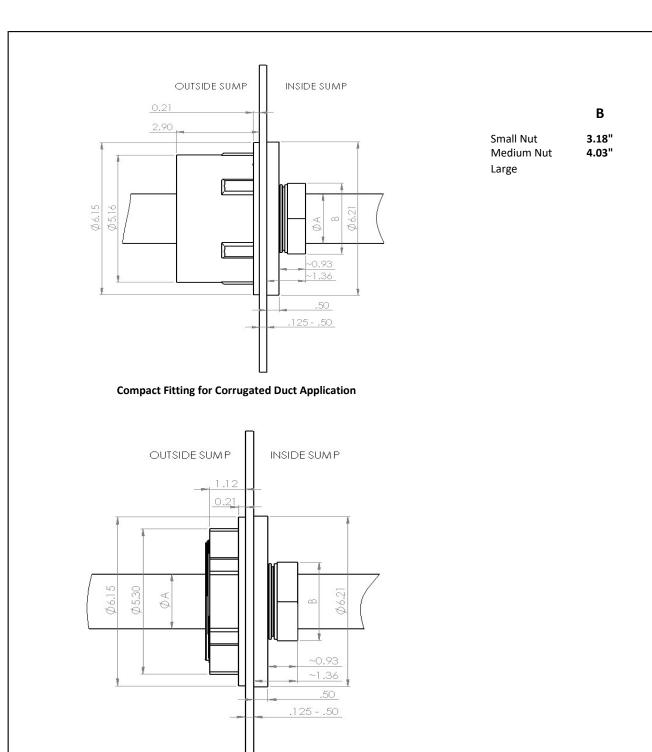




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Direct Burial Application



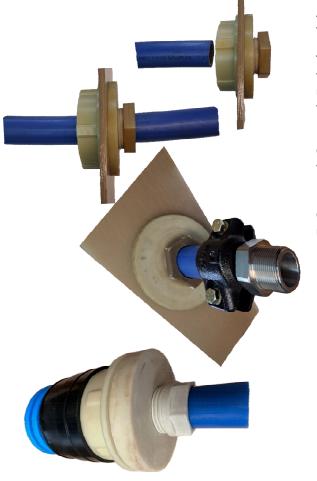
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Compact Fiberglass Penetrations for OPW Flexworks Pipe

Technical Data Sheet

Since the introduction of EPA regulations for Underground Storage Tanks in 1988, there has been a need for Penetration Fittings that will last as long as the tanks. For flex pipe, the fitting must allow the pipe to be replaceable without breaking ground and there must be no "rubber" products inside the sump. DPM has the answer with the introduction of its "Compact" series of penetrations for Flex Pipe, Semi Rigid, and Rigid Fiberglass Pipe. The Compact Penetration Fitting assures the site owner that this cost will never be experienced again. Millions of repair dollars can be avoided in future budgets where these fittings are installed.



All components are either UL Listed or third party approved for their respective applications.

The Compact Fitting has a body, nut, compression nut, and seal. For those installing pipe in a Corrugated Duct, there is a terminating reducer that provides a water tight seal between the ducting and the penetration fitting.

Compact Penetrations are pressure tested in excess of 60 psi without leakage. Refer to DPM's test Data Summary.

Compact Penetrations may be used with flex pipes terminating with male swivel, sanitary, or barbed connections.

		Α	Α
Size	Pipe	Direct Bury	Corrugated Duct
3/4"	C-075A	PF-FGC-1.18-DB	PF-FGC-1.18-CD
1"	C-10A	PF-FGC-1.50-DB	PF-FGC-1.50-CD
1 1/2"	C-15A	PF-FGC-2.00-DB	PF-FGC-2.00-CD
2"	C-20A	PF-FGC-2.45-DB	PF-FGC-2.50-CD

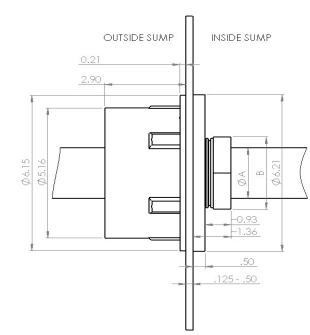
Third Party Approvals



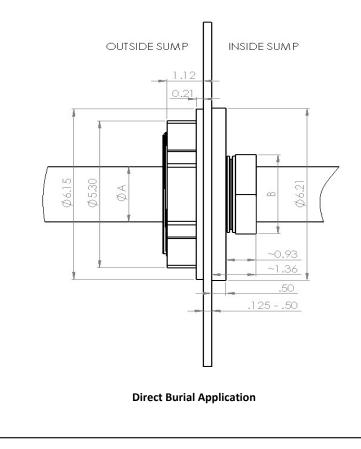
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DPM



Compact Fitting for Corrugated Duct Application



Small Nut3.18"Medium Nut4.03"Large Nut

В



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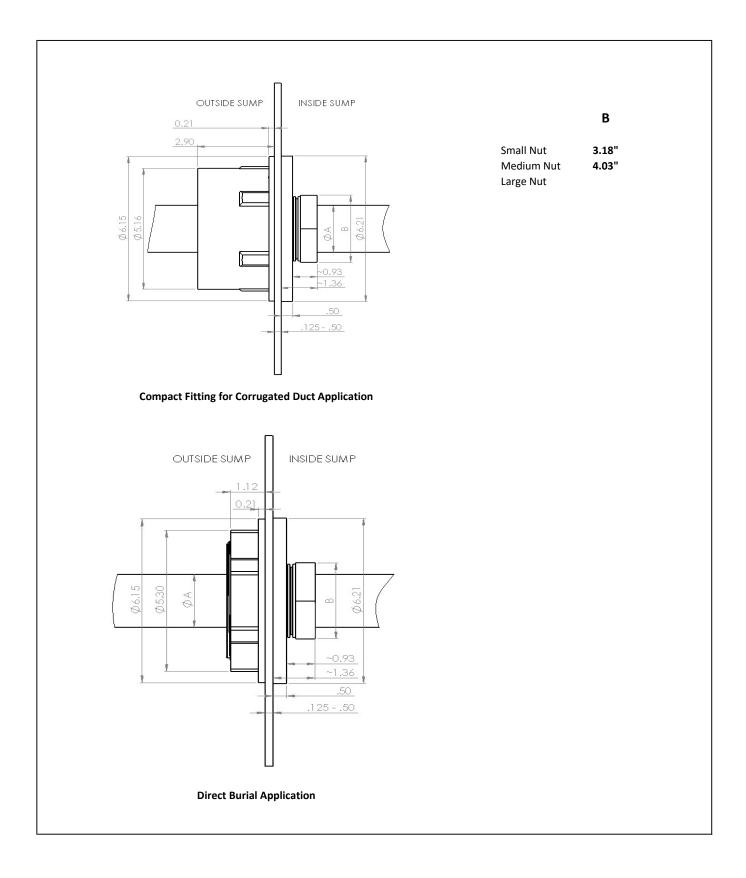


Compact Fiberglass Penetrations for NOV 2" Pipe

Technical Data Sheet

Since the introduction of EPA regulations for Underground Storage Tanks in 1988, there has been a need for Penetration Fittings that will last as long as the tanks. For flex pipe, the fitting must allow the pipe to be replaceable without breaking ground and there must be no "rubber" products inside the sump. DPM has the answer with the introduction of its "Compact" series of penetrations for Flex Pipe, Semi Rigid, and Rigid Fiberglass Pipe. The Compact Penetration Fitting assures the site owner that this cost will never be experienced again. Millions of repair dollars can be avoided in future budgets where these fittings are installed.







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Compact Penetration Fitting Tool Kit

Technical Data Sheet

Compact penetration fittings require the compression nut to be sealed by applying sufficient torque to compress a proprietary seal. The seal allows the pipe to be sealed to the body of the fitting while avoiding crushing the secondary of the double wall system. The system warranty will be voided should the torque not meet design standards.





The tool kit PF-FGC-Tool Kit comes complete with the custom spanner wrenches designed for the compact fittings.

The tool kit also comes with a torque wrench that will match the compact fitting's compression nuts.

Follow installation instructions. When the installation is complete, the compression nut should have 25 PSI torque applied to the nut.

Spanner Wrenches may be purchased sepearately or in a kit with both wrenches and the torque wrench.

Third Party Approvals



DPA





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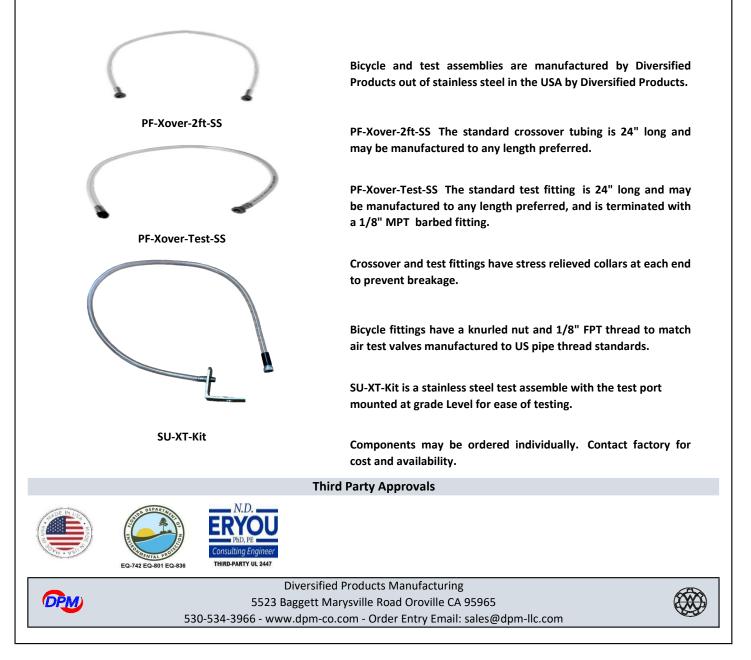
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Crossover and Test Fitting Assemblies

Technical Data Sheet

Crossover fittings are used in sumps to connect the interstice of the double wall system from the entering pipe to the leaving pipe. Crossover test fittings are used at the end of the run to provide easy access to the systems interstice to perform an air test of the system





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Sanding Hole Saws

Technical Data Sheet

Proper Hole saw selection for penetration fittings is key to having a tight sump. After the hole is cut, the sump should be sanded to remove all gel coat and to smooth rough fiberglass surfaces on the surfaces to be bonded.. This can now be accomplished in one step with Diversified's Sanding Hole Saws. Sanding hole saws are manufactured to match the penetration fitting's diameter and provided a smooth relief for the diameter of the bonding surface. An additional slight relief is designed for excess epoxy to easily compress to the outside of the fitting.

Sanding hole saws are available for all penetrations made up to 6 1/2" Diameter.

Sanding hole saws are industrial grade carbide tipped

The hole saw is backed with an aluminum disc with an abrasive surface.

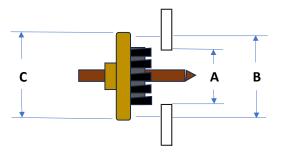
Abrasive surfaces are replacebale in the field by bonding on commercial sand paper of the grit desired.

Reduces labor by doing two operations at the same time.

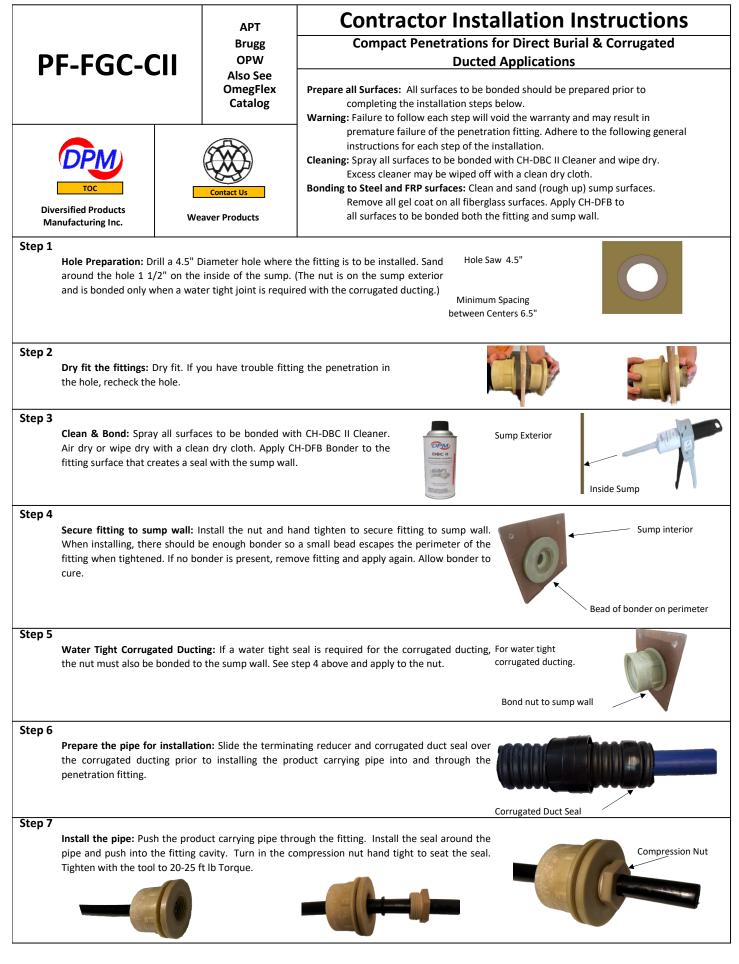
Assures a smooth, even bonding surface for penetration fittings.



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Α	В	С			
Hole	Bonding	SHS	Product		
Saw	Diameter	Diameter	Number	Application	Sump
1 3/4	2.61"	2.68"	PF-SHS-1.75x2.8	Bonded Electrical Conduit 3/4"	Single Wall
1 3/4	2.61"	2.68"	PF-SHS-1.75x2.8	Bonded Electrical Conduit 1"	Single Wall
2	2.97	3	PF-SHS-2x3	B2 Threaded Traditional Design	Single Wall
3.5	5.04	5.2	PF-SHS-3.5x5.2	B3.5 Threaded Tratitional Design	Single Wall
5	6.54	6.7	PF-SHS-5x6.7-	B5 Threaded Tratitional Design	Single Wall
6	7.43	7.6	PF-SHS-6x7.6	B6 Threaded Tratitional Design	Single Wall
2 1/4	4.34	4.5	PF-SHS-2.25x4.5	4 Stud Traditional Design	Single Wall
4"	6.34	6.5	PF-SHS-4x6.7	8 Stud Traditional Design	Single Wall
5 1/2	7.96	8	PF-SHS-5.5x8	10 Stud Traditional Design	Single Wall
4 1/2	6.25	6.38	PF-SHS-4.5x6.38	FGC & FGT Fiberglass Fittings	Single Wall
5	6.55	6.85	PF-SHS-5x6.85	Omegaflex Fiberglass Compact Fittings	Single Wall
2	2.61"	2.68"	PF-SHS-2x2.8	2" Interstice seal for Bonded Electrical Conduit 3/4"	Double Wall
2	2.61"	2.68"	PF-SHS-2x2.8	2" Interstice seal for Bonded Electrical Conduit 1"	Double Wall
					Double Wall
					Double Wall
					Double Wall
					Double Wall
					Double Wall
				Contact Factory for Applications	Double Wall
					Double Wall
					Double Wall
					Double Wall
					Double Wall
5	6.25	6.38	PF-SHS-5x6.38	Interstice Seal for FGC & FGT Fiberglass Fittings	Double Wall
5 1/2	6.55	6.85	PF-SHS-5.5x6.85	Interstice Seal for Omegaflex Fiberglass Compact Ftg	Double Wall



Step 8		
	Tighten the compression nut: Once the pipe is connected to connector or other terminating device), test the product of produced no leaks at 5 psi test pressure. Torque the com- torque on the compression nut at 20 psi is applied the resul excess of 60 PSIG. This is best accomplished by using the tested at any time after tightening all Compact Penetri installation on Direct Burial Systems	arrying lines. A hand tight nut has pression nut to 20-25 ft lbs. When ting test has yielded a pass rating in PF-FGC Tool Kit. The sump may be
Step 9	Connect Corrugated Duct: Push corrugated duct into the Push until it snaps in place. Warning - the corrugated duct installed. Be sure you are ready to perform this step.	
Step 10	Move Corrugated Duct Seal: Place the corrugated duct so the penetration fitting.	al in the groove nearest
		Corrugated Duct Seal
Step 11	Install the Boot: Slide the boot in place. Push the front e until it stops on the shoulder of the penetration fitting.	dge of the boot forward
Step 12	Tighten Band Clamps: Tighten clamps but do not exceed 60 should be complete.	inch lbs. The installation
Step 13	Completed installations inside the sump.	
	Tools Required Sand paper for sump wall and pipe 4.5" hole saw CH-DAG III applicator gun for CH-DFB bonder	Products Needed PF-FGC - see product selection matrix to complete the product number CH-DFB 50ml Epoxy Bonder - will do three fittings CH-DBC II Aerosol Cleaner - will do 10 fittings PF-FGC-S-Tool or PF-FGC-L-Tool Spanner Wrenches

			Contractor Installation Instructions				
	F-FGC-CII	2" NOV	Compact Penetrations for NOV Fiberglass Pipe				
PF-FGC-CII		 Prepare all Surfaces: All surfaces to be bonded should be prepared prior to completing the installation steps below. Warning: Failure to follow each step will void the warranty and may result in premature failure of the penetration fitting. Adhere to the following general instructions for each step of the installation. Cleaning: Spray all surfaces to be bonded with CH-DBC II Cleaner and wipe dry. Excess cleaner may be wiped off with a clean dry cloth. Bonding to Steel and FRP surfaces: Clean and sand (rough up) sump surfaces. Remove all gel coat on all fiberglass surfaces. Apply CH-DFB to all surfaces to be bonded both the fitting and sump wall. 					
Step 1 Hole Prepara	tion: Drill a 4.5" ble 1 1/2" on th		the fitting is to be insta (The nut is on the sum		n Spacing		
Step 2 Dry fit the fit the hole, rech	•	you have trouble fitti	ng the penetration in				
Air dry or wi	Clean & Bond: Spray all surfaces to be bonded with CH-DBC II Cleaner. Air dry or wipe dry with a clean dry cloth. Apply CH-DFB Bonder to the fitting surface that creates a seal with the sump wall.						
When installin fitting when t	Secure fitting to sump wall: Install the nut and hand tighten to secure fitting to sump wall. When installing, there should be enough bonder so a small bead escapes the perimeter of the fitting when tightened. If bonder is not present all the way around the fitting, remove fitting and apply again. Allow bonder to cure approximately 2 hrs.						
pipe and pusl	5 Install the pipe: Push the product carrying pipe through the fitting. Install the seal around the pipe and push into the fitting cavity. Turn in the compression nut hand tight to seat the seal. Tighten with the tool to 20-25 ft lb Torque.						
connector or produced no torque on the excess of 60 F sump may b	other termination leaks at 5 psi te compression nu SIG. This is best e tested at any	ng device), test the p est pressure. Torque it at 20 psi is applied t accomplished by usir	nected to its mating sys roduct carrying lines. A the compression nut to the resulting test has yie ng the PF-FGC-Tool and ing all Compact Penet	A hand tight nut has 20-25 ft lbs. When elded a pass rating in Torque Wrench. The			
Step 7 Completed sump.	installations i	nside the		7			
	lole Saw 4 1/2"	for CH-DFB bonder		Products Needed PF-FGC -2.38 (for CH-DFB 50ml Epo CH-DBC II Aeroso PF-FGC-M-Tool	xy Bonder - will	-	
June 2023						Page 20	



Guideline Specifications - Compact Penetration Fittings

Compact Penetration Fittings:

Provide Fiberglass Penetration Fittings as indicated on the drawings or specified otherwise.

Materials: The Compact Penetrations Fittings shall be manufactured from Virgin glass filled materials suitable for injection molding. Compression molded components are not acceptable.

Penetration Body:

The body shall have a flange at least 6 inches outside diameter with a minimum thickness of ½". The flange shall have grooves for receiving a bonding agent and shall assist in the distribution of the bonding agent. The body shall fit in a 4.5" hole and shall be threaded to accept a nut for either direct burial or for attaching corrugated ducting as a chase pipe. The body shall receive a threaded "compression" nut that compresses a seal from inside the sump. The body shall be made such that pipe may pass through the body using only hand applied force. The body shall have a seal that rests in a pocket molded or machined inside the body. The design of the pocket and mating seal are proprietary.

Compression Nut:

The compression nut shall be threaded to match the threads in the body of the penetration fitting. The nose of the nut shall be designed to engage a compression seal encapsulated by the body. The design of the compression nut, body, and seal shall pass a pressure test when hand tightened to 5 PSIG. The nut, body, and seal shall not leak when tested to pressures in excess of 60 PSIG, when installed on the intended pipe.

Seal:

The seal shall be injection molded for consistency. The material shall be a fuel resistant material capable of serving for 30 years without replacement. The seal design shall have a replaceable split seal that tests in excess of 60 PSI without leakage. The seal shall match the design of the body.

Direct Burial Applications:

An external nut shall be used to hold the body in place while a bonding agent cures the body to the sump wall. For Direct Burial applications, the nut is not required but is recommended to remain in place to protect the penetration fitting from damage.

Corrugated Duct Applications:

Where the fuel carrying pipe is installed in a chase (corrugated duct) a unique nut shall be provided that allows the corrugated duct to snap into the nut. The nut shall be designed to retain the corrugated ducting once installed. Provide a unique nut to match the corrugated duct being used on the project.

Watertight Corrugated Duct Applications:

Where watertight applications are required, provide a corrugated duct seal and terminating reducer to band clamp to the external nut of the penetration fitting and the outside of the corrugated ducting.

Bonding:

The flange of the body shall be bonded to the inside surface of the sump using a suitable epoxy bonding material designed for fiberglass applications. The body of the penetration fitting shall be held in place by an external nut. When the corrugated duct nut is used it shall be bonded to the external surface of the sump using the same bonding materials.

DPM
TOC



Third Party Approval - ROUNDTABLE

ROUNDTABLE ENGINEERING SOLUTIONS October 30, 2020 Mr. Josh Dow **Diversified Products Manufacturing Inc** 5523 Baggett Marysville Rd Oroville, CA 95965 NDE Reference No: NDE20201020 RE: Third-Party Certification under UL 2447- Outline of Investigation for Fittings Accessories for Fuels Products Evaluated: Split Repair Fittings & Test Reducers for Containment Sumps for Fuels PF-Penetration Fittings Series, Sump Entry Fittings and Test Reducers SR- Split Repair Sump Entry Fittings and Test Reducer Series FG/PG Spilt Repair Series CH- Series, All Chemicals used in the installation process SU- Sumps and Accessories Dear Mr. Dow, In reference to the above listed products, our testing partner on this project (N.D. Eryou, PhD, PE) has performed our UL 2447 Third-Party inspection and testing. All products listed were determined to comply with the "Outline of Investigation for Fittings and Accessories for Fuels". It is our opinion that both the design and materials used in the above products are based on sound engineering principles and the materials are compatible with all motor fuels and additives currently being used including fuels containing >10% ethanol or 20% biodiesel. Therefore, the Spill Containment Liner should have the same chemical resistance to the UL 2447 test fuels as the DPM "Products Evaluated" listed above. Disclaimer: Underwriters Laboratories (UL) is an independent testing laboratory and use of, in any way, of the UL Listing or Registered Trade Mark UL is prohibited unless specifically authorized by Underwriters Laboratories. aman and DOLIC Very truly yours, Brian E Lewis, P ONA Roundtable Engineering Solutions, Inc 660 Southpointe CT, Unit 300G Colorado Springs, CO 80906





Third Party Approval - N.D. ERYOU



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NOTICE OF COMPLETION OFTHIRD-PARTY UL 2447 EVALUATION

February 3, 2021

Mr. Josh Dow Diversified Products Manufacturing Inc 5523 Baggett Marysville Rd Oroville, CA 95965

RE: NDE Reference No: NDE20201020 Third-Party Certification under UL 2447- Outline of Investigation for Fittings Accessories for Fuels

Products Evaluated: Split Repair Fittings & Test Reducers for Containment Sumps for Fuels PF-Penetration Fittings Series, Sump Entry Fittings and Test Reducers SR- Split Repair Sump Entry Fittings and Test Reducer Series FG/PG Spilt Repair Series CH- Series, All Chemicals used in the installation process. SU - Sumps and Accessories

Dear Mr. Dow

In reference to the above listed products, we have performed our UL 2447 Third-Party inspection and testing. All products listed were determined to comply with the "Outline of Investigation for Fittings and Accessories for Fuels".

It is our opinion that both the design and materials used in the above products are based on sound engineering principles and the materials are compatible with all motor fuels and additives currently being used including fuels containing >10% ethanol or 20% biodiesel. Therefore, the Spill Containment Liner should have the same chemical resistance to the UL 2447 test fuels as the DPM "Products Evaluated" listed above.

Further to your recent request with regard to your Canadian distributors utilization of the above test results, we have compared the <u>testing requirements</u> of UL (US) 2447 with CAN/ULC-S664:2017 and found them to be virtually identical.

There were only two differences that we found between the two Codes.

1. ULC S664 Section 5.8.5 "Extreme Low Temperature Impact Test – requires testing at 40^{0} F and our tests were conducted at a minimum temperature of -30^{0} F.

2. ULC S664 Section Appendix B 1.1 Defines 21 specific grades of fuel while UL US defines four grades of fuel, which covers the wide range of fuels commonly used by gasoline and diesel-powered vehicles.

Furthermore, we have reviewed the UL (US) website which contains the following relevant statement confirming the sharing of UL specifications between UL - US and UL - Canada:

"UL STANDARDS: ACCREDITED IN THE US AND CANADA

In the US, UL is accredited by the American National Standards Institute (ANSI) as an audited designator. In 2013, UL was accredited by the Standards Council of Canada (SCC) as a nationally recognized Standards Development Organization (SDO) able to develop National Standards of Canada (NSCs).

UL's Standards Technical Panels (STPs) serve as the consensus body for both American National Standards (ANS) and National Standards of Canada (NSC). Essential information About UL's standards development programs, how to Access Standards, and how to participate in the UL programs used to Develop Standards is available on this site."

It should not be inferred that our test of DPM products addresses the issue of long-term quality control issues as both UL (US) and UL Canada do with their annual subscription programs.

Disclaimer: Underwriters Laboratories (UL – US & UL - Canada) are independent testing laboratories and use of, in any way, of the UL Listing or Registered Trademark UL is prohibited unless specifically authorized by Underwriters Laboratories (US or Canada).

Very truly yours,

N.D. Eryou, Ph.D., P.E. Eryou Engineering dennis@eryouengineering.com

N.D. Eryou, PhD, PE **Consulting Engineer**

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NOTICE OF COMPLETION OFTHIRD-PARTY UL 2447 EVALUATION

October 22, 2020

Mr. Josh Dow **Diversified Products Manufacturing Inc** 5523 Baggett Marysville Rd Oroville, CA 95965

RE: NDE Reference No: NDE20201020 Third-Party Certification under UL 2447- Outline of Investigation for Fittings Accessories for Fuels

Products Evaluated: Split Repair Fittings & Test Reducers for Containment Sumps for Fuels PF-Penetration Fittings Series, Sump Entry Fittings and Test Reducers SR- Split Repair Sump Entry Fittings and Test Reducer Series FG/PG Spilt Repair Series CH- Series, All Chemicals used in the installation process SU- Sumps and Accessories

Dear Mr. Dow

In reference to the above listed products, we have performed our UL 2447 Third-Party inspection and testing. All products listed were determined to comply with the "Outline of Investigation for Fittings and Accessories for Fuels".

It is our opinion that both the design and materials used in the above products are based on sound engineering principles and the materials are compatible with all motor fuels and additives currently being used including fuels containing >10% ethanol or 20% biodiesel. Therefore, the Spill Containment Liner should have the same chemical resistance to the UL 2447 test fuels as the DPM "Products Evaluated" listed above.

Disclaimer: Underwriters Laboratories (UL) is an independent testing laboratory and use of, in any way, of the UL Listing or Registered Trade Mark UL is prohibited unless specifically authorized by Underwriters Laboratories.

Very truly yours.

N.D. Eryou, Ph.D., P.E.



Compact Fitting Matrix



	Compact Fittings for Rigid FRP, Flexible & Semi Flexible Pipes								
	Product	Seal	Nominal	Pipe	Pipe	Single Wall	Pipe		
	Number	Reference	Pipe Size	Manufacturer	Identifier	Double Wall	Туре		
Small Nut	PF-FGC-1.18	PF-FGS-1.18	3/4"	OPW	C-075A	Double Wall	Flex Pipe		
	PF-FGC-1.22	PF-FGS-1.22	3/4"	Brugg	CHT 21/31	Double Wall	Semi Flex Pipe		
	PF-FGC-1.27	PF-FGS-1.27	1"	APT	XP-100-D	Single Wall	Flex Pipe		
nal	PF-FGC-1.47	PF-FGS-1.47	1"	APT	XP-100-SC	Double Wall	Flex Pipe		
SI	PF-FGC-1.50	PF-FGS-1.50	1"	OPW	C-10A	Double Wall	Flex Pipe		
	PF-FGC-1.50	PF-FGS-1.50	1"	Brugg	CHT 30/38	Double Wall	Semi flex Pipe		
	PF-FGC-1.70	PF-FGS-1.70	1 1/2"	APT	XP-150-D	Single Wall	Flex Pipe		
	PF-FGC-1.90	PF-FGS-1.90	1 1/2"	APT	XP-150-SC	Double Wall	Flex Pipe		
	PF-FGC-1.90	PF-FGS-1.90	1"	Brugg	HL 30/48		Semi Flex Pipe		
	PF-FGC-2.00	PF-FGS-2.00	1 1/2"	OPW	C-15A	Double Wall	Flex Pipe		
	PF-FGC-2.15	PF-FGS-2.15	1 3/4"	APT	XP-175-SC	Double Wall	Flex Pipe		
	PF-FGC-2.45	PF-FGS-2.45	2"	APT	XP-200-D	Single Wall	Flex Pipe		
	PF-FGC-2.45	PF-FGS-2.45	2"	OPW	C-20A	Double Wall	Flex Pipe		
Nut	PF-FGC-2.45	PF-FGS-2.45	2"	OPW	520	Single Wall	Flex Pipe		
ge	PF-FGC-2.50	PF-FGS-2.50	1 1/2"	Brugg	SEC 40		Semi Flex Pipe		
Large	PF-FGC-2.65	PF-FGS-2.65	2"	APT	XP-200-SC	Double Wall	Flex Pipe		
	PF-FGC-2.65	PF-FGS-2.65	1 1/2"	Brugg	CHT 48/60	Double Wall	Semi flex pipe		
	PF-FGC-2.80	PF-FGS-2.80	2"	Brugg	CHT 60/71	Double Wall	Semi flex Pipe		
	PF-FGC-2.80	PF-FGS-2.80	1 1/2"	Brugg	HL 48/71		Semi Flex Pipe		
	PF-FGC-3.00	PF-FGS-3.00	2"	Brugg	SEC 50		Semi Flex Pipe		
	PF-FGC-3.30	PF-FGS-3.30	2"	Brugg	HL 60/83		Semi Flex Pipe		
	PF-FGC2.38	PF-FGS-2.38	2"	NOV		Single Wall	Riogid FRP		

For Direct Burial Applications add -DB to the product Number For Corrugated Ducted Applications add -CD to the product number.

PF-FGC- Testing Da	Omogaflay	Design and Testing Data Compact Penetrations for Direct Burial & Corrugated Ducted Applications Background and test data were compiled to determine the capability of the product designed. Processes and procedures used in testing are outlined herein. Consult the installation instructions
Toc Diversified Products Manufacturing Inc.	Contact Us Weaver Products	for details on how to install these fittings. Bonding and cleaning agents used in the process are identified in the installation instructions. These products are available from your local PEI distributor. For comments or questions contact the factory at 530- 534-3966 or sales@DPM.com
seal to the pipes and sumps. Add time. To date industry has not be membranes have failed within a effective penetration fitting that	ditionally the penetration fitting een able to meet these require few years, spawning a whole in performs all of the above requ	988. The industry has struggled to create a seal for flexible pipe that would contain fluids, g needed to allow the flexible and semi rigid pipes to be removed and replaced at a later ments without using a rubber type of membrane inside the sump. Traditionally these ndustry fixing leaking penetration fittings. Diversified Products now introduces a very cost uirements and more at a reasonable cost, often less than other products. DPM offers "no os, that tests over 60 times other fittings.

Penetration Fitting to Sump Attachment:

For direct burial pipe the Diversified "Compact" penetration fitting has a threaded fiberglass body with a flange that is bonded to the inside of the sump. There is a nut on the outside of the sump that holds the body in place while the bonder is curing (approximately 1 hour).

For Corrugated Duct applications the nut is designed with a unique snap in feature. Snap the chase pipe into the nut and the chase installation is complete.

For Corrugated Duct applications where a water tight seal between the chase pipe and penetration is desired, a terminating reducer is provided that seals the nut to the corrugated ducting.

Penetration Fitting to Pipe Attachment:

The body of the penetration fitting has a proprietary seal configuration that allows a compression nut to be tightened from the inside of the sump that compresses a seal around the outside of a single or double wall pipe. The seal is removable from inside the sump. A split seal may be used to replace the original at any time.

Testing:

The testing for the seal to the pipe was performed inside a pressure pot. Testing started with the compression nut hand tightened. The seals started to leak at approximately 5 PSIG. Of course the scientific method did not allow us to document whose hand was used in tightening the nut. The compression nut was tightened under various torque settings. At 20 ft lbs on a torque wrench, the seals were repeatedly tested to 60 PSIG without leaks around the pipe for both original seals and the split seals.

Extremes:

The nut was tightened until it bottomed out at 70-80 ft lbs torque. The seal continued to hold. The test fitting was disassembled and inspected. There was no damage to the threads on either the nut or body. The seal showed compression marks but was not damaged. It was reinstalled and retested with the same results.

Testing protocols started by applying hand force to the nut with a leak generating after 5 PSIG air pressure was applied to the assembly. The compression nut was then tightened with the spanner tool and torque wrench to 20 ft lbs torque. Air was then introduced to the test chamber and tested to 10, 20, 30, 40, 50, and finally to 60 PSIG. There were no leaks between the fitting and pipe at any point in the process. The system could have been tested to higher pressures but for no real reason.

Some of the sample pipes received by Diversified were significantly out of round. It is estimated that the variance from round was up to 20%. These samples tested to the same limits that round pipe achieved at 60 PSIG with no leaks.

Double wall flex pipe and semi rigid pipe have rather small interstices. While under a 60 PSIG test the double wall pipe was terminated on one end with a test reducer. Air was introduced through the test reducer and flowed easily through the tested pipe to atmosphere.

Operating Considerations:

A column of water 2.31 ft high will yield 1 PSIG pressure at the bottom. Penetration fittings are generally installed at less than (2.31 ft or 27+ inches) from the surface. Therfore, most fittings would experience less than 1 PSIG when the sump is filled to grade level with water. The fitting Diversified has designed would not leak if submerged under 138+ feet of water.

Test Subjects:

Currently, Diversified has identified 24 different flex and semi rigid pipes. The outside diameter of these pipes run from 1.18 through 3.30 inches. A representative group of four sizes were selected for initial testing. Pipes with outside diameters of 1.55 inches, 2.00 inches, 2.30 inches, and 2.93 inches were tested using three sets of Compact fittings. All tests were terminated at 60 PSIG with all samples passing (No leaks around the pipe).

Assembly & Retractability:

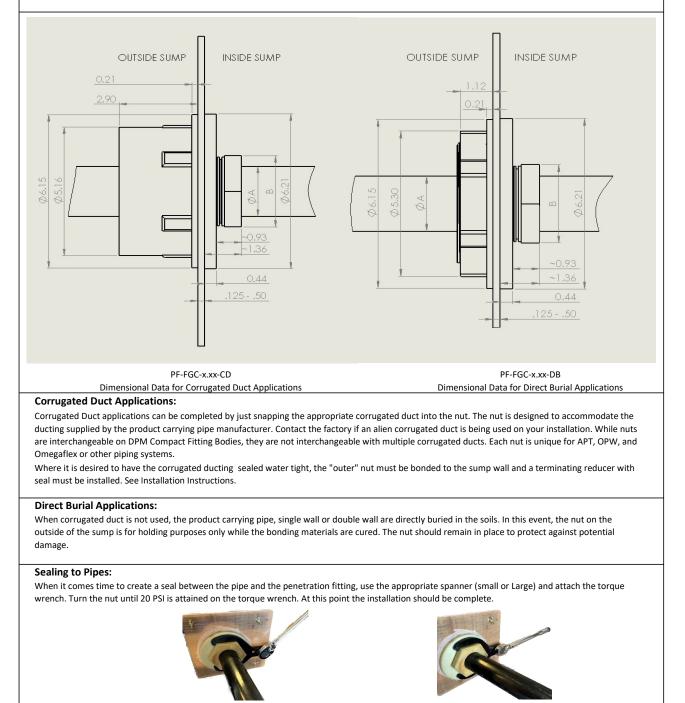
Once the body is bonded to the sump wall, the pipe may be inserted through the fitting into the sump. This only requires hand coordination and does not encounter any significant resistance. The surface of the penetration fitting extends approximately 1.25" into the sump leaving the most space available for assembling the end pieces on the pipe. Once the head of the pipe is secure, the pipe may be extended to the flex connector or other terminating location.

Once in place, the nut should be tightened to 25 ft lbs. Diversified offers a kit with two spanner wrenches (one for the smaller sizes and one for the larger sizes) and a torque wrench pre set to 25 PSI. Turn the nut until the 25 PSI setting has been reached. Finished!

Should the customer be using Corrugated Ducting for a chase pipe, a different nut, a boot and corrugated duct seal are provided. Once the primary pipe is in place and tested, the corrugated duct can be snapped into place in the tailpiece of the nut. The corrugated duct seal and boot then need to be

To extract the pipe for replacement, disconnect and remove the terminating head of the pipe. Using the spanner wrench loosen the compression nut or remove the nut completely. Pull out the existing pipe.

To install new pipe. Contact the factory for a new seal. If a smaller pipe is to be installed, contact the factory for a custom seal to match the fitting and new pipe to be installed.



Testing:

Testing was performed using two compact fittings with a representative segment of pipe running between the penetration fittings. The fittings were installed in both ends of the pressure pot. In one case, the compression nut is inside the pot and in the second instance the compression nut is outside of the pot. When the pressure is applied to the test pieces, both possible real world applications are tested simultaneously. In one case the test verifies that liquid cannot escape out of the sump. In the latter case the test verifies that liquid cannot enter the sump from outside the sump.











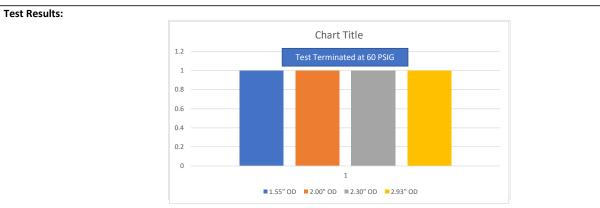
Test Assembly

Compression Nut Outside Sump

60 PSIG Test

Compression Nut Inside Sump

Interstice Test



The test results are rather boring and show that the product is performing at approximately 60 times required operational expectations.

Pipe Size Selection:

Refer to the following table and select the pipe being used. Select the product Number for Ordering. Be sure to add -CD or -DB for Corrugated Duct for Direct Burial applications

Compact Fittings for Flexible & Semi Flexible Pipe

	Product	Seal	Nominal	Pipe	Pipe	Single Wall	Pipe
	Number	Reference	Pipe Size	Manufacturer	Identifier	Double Wall	Туре
	PF-FGC-1.18	PF-FGS-1.18	3/4"	OPW	C-075A	Double Wall	Flex Pipe
	PF-FGC-1.22	PF-FGS-1.22	3/4"	Brugg	CHT 21/31	Double Wall	Semi Flex Pipe
let 1	PF-FGC-1.27	PF-FGS-1.27	1"	АРТ	XP-100-D	Single Wall	Flex Pipe
Small Nut	PF-FGC-1.47	PF-FGS-1.47	1"	APT	XP-100-SC	Double Wall	Flex Pipe
ž	PF-FGC-1.50	PF-FGS-1.50	1"	OPW	C-10A	Double Wall	Flex Pipe
•••	PF-FGC-1.50	PF-FGS-1.50	1"	Brugg	CHT 30/38	Double Wall	Semi flex Pipe
	PF-FGC-1.55	PF-FGS-1.55	1"	Omegaflex	UGF-FSP-16	Double Wall	Semi Flex Pipe
	PF-FGC-1.70	PF-FGS-1.70	1 1/2"	APT	XP-150-D	Single Wall	Flex Pipe
	PF-FGC-1.90	PF-FGS-1.90	1 1/2"	APT	XP-150-SC	Double Wall	Flex Pipe
	PF-FGC-1.90	PF-FGS-1.90	1"	Brugg	HL 30/48		Semi Flex Pipe
	PF-FGC-2.00	PF-FGS-2.00	1 1/2"	OPW	C-15A	Double Wall	Flex Pipe
	PF-FGC-2.15	PF-FGS-2.15	1 3/4"	APT	XP-175-SC	Double Wall	Flex Pipe
	PF-FGC-2.30	PF-FGS-2.30	1 1/2"	Omegaflex	UGF-FSP-24	Double Wall	Semi Flex Pipe
	PF-FGC-2.45	PF-FGS-2.45	2"	APT	XP-200-D	Single Wall	Flex Pipe
Large Nut	PF-FGC-2.45	PF-FGS-2.45	2"	OPW	C-20A	Double Wall	Flex Pipe
ge I	PF-FGC-2.45	PF-FGS-2.45	2"	OPW	520	Single Wall	Flex Pipe
arg	PF-FGC-2.50	PF-FGS-2.50	1 1/2"	Brugg	SEC 40		Semi Flex Pipe
_	PF-FGC-2.65	PF-FGS-2.65	2"	APT	XP-200-SC	Double Wall	Flex Pipe
	PF-FGC-2.65	PF-FGS-2.65	1 1/2"	Brugg	CHT 48/60	Double Wall	Semi flex pipe
	PF-FGC-2.80	PF-FGS-2.80	2"	Brugg	CHT 60/71	Double Wall	Semi flex Pipe
	PF-FGC-2.80	PF-FGS-2.80	1 1/2"	Brugg	HL 48/71		Semi Flex Pipe
	PF-FGC-2.93	PF-FGS-2.93	2"	Omegaflex	UGF-FSP-32	Double Wall	Flex Pipe
	PF-FGC-3.00	PF-FGS-3.00	2"	Brugg	SEC 50		Semi Flex Pipe
	PF-FGC-3.30	PF-FGS-3.30	2"	Brugg	HL 60/83		Semi Flex Pipe

For Corrugated Ducted applications add -CD to the product number For Direct Burial applications add -DB to the product number





Diversified Products Manufacturing Inc. Diversified Distribution Centers of California 5523 Baggett Marysville RD Oroville CA 95965

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