State of Illinois
Office of the State Fire Marshal

Checklist for Documenting UST Compatibility

SUBMIT THIS FORM WITH SUPPORTING DOCUMENTATION ATTACHED.

ALL COMPONENTS MUST BE LISTED IN DETAIL, & COMPATIBILITY DOCUMENTATION MUST CLEARLY IDENTIFY THE COMPONENTS.

Facility where equipment is located:

Facility Number: _____
Facility Owner: Thorntons, Inc.
Facility Name: Thorntons #342
Street Address: _____
City: Huntley
County: _____

UST Information:

Tank ID Number: 4
Tank Material: Steel _____
FRP X
Single Wall _____ Double Wall X
Tank Volume: 6,000 Gallons
Tank Product: E-85

Complete the checklist below, listing compatibility determination, method used and description**. All answers must be "YES" and supported with a sufficient description or supporting documentation** in order for your UST system to demonstrate compatibility with the blended fuel/biofuel product.

UST SYSTEM COMPONENTS	DOCUMENTATION DEMONSTRATING COMPATIBILITY WITH SUBSTANCE LISTED ABOVE		METHOD A or B (MAY USE BOTH)	DESCRIPTION OF COMPONENT TYPE, MODEL NUMBER, & NATIONAL LABORATORY CERTIFICATION, LISTING OR MANUFACTURER APPROVAL (ATTACH TO CHECKLIST)
TANK	**NO**	**YES**	B	Fiberglass DW Xerxes Tank
PIPING	**NO**	**YES**	B	Fiberglass DW Red Thread NOV Smith
CONTAINMENT SUMPS	**NO**	**YES**	B	Fiberglass SW Bravo Dispenser Sumps B1000-HE Fiberglass SW Xerxes Tank Sumps
PUMPING EQUIPMENT	**NO**	**YES**	B	FE Petro Advanced Protection E-85 IST-M-R-VS4-VL2

UST SYSTEM COMPONENTS	DOCUMENTATION DEMONSTRATING COMPATIBILITY WITH SUBSTANCE LISTED ABOVE		METHOD A or B (MAY USE BOTH)	DESCRIPTION OF COMPONENT TYPE, MODEL NUMBER, & NATIONAL LABORATORY CERTIFICATION, LISTING OR MANUFACTURER APPROVAL (ATTACH TO CHECKLIST)
RELEASE DETECTION EQUIPMENT	**NO**	**YES**	B	Veeder Root TLS450Plus 846391-410 (Probe) 846400-004 (Float) 859080-001 (Leak detector) 794380-303 (Interstitial) 794380-323 (Sump sensor)
SPILL PREVENTION EQUIPMENT	**NO**	**YES**	B	Franklin Fueling Defender Spill Bucket 705-555-101-CI-GKT
OVERFILL PREVENTION EQUIPMENT	**NO**	**YES**	B	OPW 71SOM-412C
GASKETS & SEALS (installs after 10/13/18)	**NO**	**YES**	B	Wayne Dispensers Helix 5000
JOINT DOPES & ADHESIVES (installs after 10/13/18)	**NO**	**YES**	B	Gasolia E-Seal

Methods:

A. Certification or listing of UST system equipment or components by a nationally recognized, independent testing laboratory for use with the regulated substance stored.

B. Equipment or manufacturer approval. The manufacturer's approval must be in writing, indicate an affirmative statement of compatibility, specify the range of biofuel blends the component is compatible with, and be from the equipment or component manufacturer

Note: Owners and operators may find American Petroleum Institute's Recommended Practice 1626, *Storing and Handling Ethanol and Gasoline-Ethanol Blends at Distribution Terminals and Filling Stations*, useful in complying with the compatibility requirements.

In order to be in compliance with the 2015 federal UST regulation compatibility requirements for storing biofuels, you must keep documentation of compatibility of the UST system components listed on this page as long as you store the fuel.

For your records, you should update this checklist each time you repair or replace components of your UST system to ensure you have all the required compatibility documentation while storing biofuels.

Checklist Completed By: print name: Nick Bugajsky date completed: 2/26/2020

signature: _____ position/title: Project Manager

LIMITED WARRANTY
Underground Petroleum Storage Tanks

Xerxes Corporation (“Xerxes”) warrants to owner ("Owner") that our underground petroleum storage tanks, if installed, used, and maintained in the United States or Canada in accordance with Xerxes' published specifications, installation instructions and operating guidelines, applicable supplemental materials, all applicable laws and regulations, and limited to storage of the products listed below at ambient temperatures or fuel oils, used in oil burning equipment, at temperatures not to exceed 150°F (65° C):

1) Will not fail for a period of thirty (30) years from date of original delivery by Xerxes due to natural external corrosion.

2) Will not fail for a period of thirty (30) years from date of original delivery by Xerxes due to internal corrosion, provided the tank is used solely, with or without tank water bottoms, to store the following products:

   a. gasoline, jet fuel, aviation fuels, motor oils, motor vehicle waste oils, kerosene, diesel fuel, or fuel oils

      - gasoline with up to 20%, by volume, of methyl tertiary butyl ether (MTBE), ethyl tertiary butyl ether (ETBE), di-isopropyl ether (DIPE), tertiary butyl alcohol (TBA), tertiary amyl methyl ether (TAME), or tertiary amyl ethyl ether (TAEE)

   b. gasoline and ethanol blended motor fuels (per applicable ASTM fuel standards)

      - E10 (90% gasoline and 10% ethanol)
      - E15 (85% gasoline and 15% ethanol)
      - E85 (85% ethanol and 15% gasoline)
      - other ethanol blends up to and including 100% ethanol

   c. gasoline and methanol blended motor fuels (per applicable ASTM fuel standards)

      - M85 (85% methanol and 15% gasoline)
      - other methanol blends up to and including 100% methanol
      - Oxinol-50 waiver (90.5% gasoline and 9.5% Oxinol-50 comprised of a 4.75% methanol and 4.75% gasoline-grade tertiary butyl alcohol (GTBA) mixture)
      - Dupont EPA waiver (gasoline with 5% methanol and a minimum of 2.5% cosolvent – the blend may contain a maximum concentration of up to 3.7%, by weight, oxygen in the final fuel)

   d. biodiesel fuel blends up to 100% biodiesel (per applicable ASTM fuel standards)

3) Will not fail for a period of thirty (30) years from date of original delivery by Xerxes due to structural failure (defined as spontaneous breaking or collapse caused by material defects in materials or workmanship).

4) Will meet Xerxes' published specifications and will be free of material defects in materials and workmanship for a period of one (1) year following the date of original delivery by Xerxes.

Xerxes warrants to Owner that all Xerxes-manufactured tank accessories, if installed, used and maintained in Canada or the United States in accordance with Xerxes' published specifications, installation instructions and operating guidelines, applicable supplemental materials, and all applicable laws and regulations, will be free of material defects in materials and workmanship for a period of one (1) year following the date of original delivery by Xerxes.

If any tank or accessory is to be removed from an installation, moved and reinstalled at Owner’s new location and is intended for active service at the new location, the tank and accessories must be recertified by Xerxes to continue the balance of the limited warranty as originally extended.

The foregoing limited warranty does not extend to tanks or accessories (“individually and collectively Goods”) damaged due to acts of God, war, terrorism, or failure of Goods caused, in whole or in part, by misuse, unlawful use, improper installation, storage, servicing or maintenance, or operation in excess of their rated capacity or contrary to their recommended use, whether intentional or otherwise, or any other cause or damage of any kind not the fault of Xerxes. Xerxes only warrants repairs or alterations performed by Xerxes or its authorized contractors performing work authorized in advance, in writing, by Xerxes. Xerxes does not warrant any product, components or parts manufactured by others. All consumable components including but not limited to o-rings and gaskets are excluded from this limited warranty.

Owner's sole and exclusive remedy for breach of warranty is limited at Xerxes' option to: (a) repair of the defective tank or accessory, (b) delivery of a replacement tank or accessory to the point of original delivery, or (c) refund of the original purchase price. No warranty claim will be considered without removing the tank and any accessory from the ground if Xerxes deems it necessary to evaluate a warranty claim. In the event of a breach of warranty claim, a claimant must give Xerxes the opportunity to observe and inspect the installation prior to the removal of any backfill below the tank top, and the removal of the tank and any accessory from the ground, or the claim will be forever barred. All claims must be made in writing within one (1) year after tank or accessory failure or be forever barred. ALL RIGHTS, OBLIGATIONS AND CLAIMS UNDER THIS LIMITED WARRANTY SHALL BE EXCLUSIVELY MADE AND DETERMINED IN THE COURTS OF, AND GOVERNED BY THE LAWS OF, THE STATE OF MINNESOTA, U.S.A., EXCLUDING ITS CONFLICT OF LAW PRINCIPLES.

THE FOREGOING WARRANTY CONSTITUTES XERXES' EXCLUSIVE OBLIGATION AND XERXES MAKES NO OTHER WARRANTY OR REPRESENTATION, EXPRESS OR IMPLIED, WITH RESPECT TO THE GOODS, OR ANY SERVICE, ADVICE, OR CONSULTATION, IF ANY, FURNISHED TO OWNER BY XERXES OR ITS REPRESENTATIVES, WHETHER AS TO MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE, OR OTHERWISE. THE SELLER (XERXES) UNDERTAKES NO RESPONSIBILITY FOR THE QUALITY OF THE GOODS, EXCEPT AS OTHERWISE PROVIDED IN THIS CONTRACT. THE SELLER (XERXES) ASSUMES NO RESPONSIBILITY THAT THE GOODS WILL BE FIT FOR ANY PARTICULAR PURPOSE FOR WHICH YOU (OWNER) MAY BE BUYING THESE GOODS, EXCEPT AS OTHERWISE PROVIDED IN THE CONTRACT. THE REMEDIES SET FORTH IN THE ABOVE WARRANTY ARE THE ONLY REMEDIES AVAILABLE TO ANY PERSON OR ENTITY FOR BREACH OF WARRANTY OR FOR BREACH OF ANY OTHER COVENANT, DUTY, OR OBLIGATION ON THE PART OF XERXES. XERXES SHALL HAVE NO LIABILITY OR OBLIGATION TO ANY PERSON OR ENTITY FOR BREACH OF ANY OTHER COVENANT, DUTY, OR OBLIGATION UNDER THIS WARRANTY EXCEPT AS EXPRESSLY SET FORTH HEREIN. IT IS EXPRESSLY AGREED THAT THIS WARRANTY DOES NOT FAIL OF ITS ESSENTIAL PURPOSE. XERXES SHALL HAVE NO LIABILITY FOR COSTS OF INSTALLATION OR REMOVAL OF GOODS, ENVIRONMENTAL CONTAMINATION, FIRES, EXPLOSIONS, OR ANY OTHER CONSEQUENCES ALLEGEDLY ATTRIBUTABLE TO A BREACH OF WARRANTY, OR INCIDENTAL, CONSEQUENTIAL, PUNITIVE OR OTHER DAMAGES OF ANY DESCRIPTION, WHETHER ANY SUCH CLAIM OR DAMAGES BE BASED UPON WARRANTY, CONTRACT, NEGLIGENCE, STRICT LIABILITY OR OTHER TORT, OR OTHERWISE. IN NO EVENT SHALL XERXES' TOTAL LIABILITY HEREUNDER EXCEED THE ORIGINAL PURCHASE PRICE OF THE GOODS WHICH GAVE RISE TO SUCH LIABILITY.

Consumer Notice: This warranty gives you (Owner) specific legal rights. You (Owner) may also have other rights which vary from state to state.

XERXES®
a ZCL company

Effective: June 1, 2015
United States

ZCL | XERXES®

making a lasting difference®

Containment Sumps

Over 200,000 fiberglass storage tanks manufactured and shipped in North America

ZCL | Xerxes is the largest manufacturer of fiberglass underground storage tanks in the world. As customer needs and industry regulations change, ZCL | Xerxes continues to be the market leader in product innovation.

Containment Sumps

Think in decades, not years

Today, more and more customers, US states and Canadian provinces recognize the need for a structurally strong, sturdy containment sump that withstands the forces inherent in underground installations. This is why most installers and owners have moved away from the use of polyethylene containment sumps.

Innovation never stops, and neither do we. Our recently redesigned containment sumps are manufactured for the dual purpose of enclosing fittings and equipment – such as piping and pumps – and containing spills or piping leaks should they occur.

ZCL | Xerxes containment sumps and collars provide easy access to fittings in a variety of applications.

Consider Double-Wall Sumps

New federal regulations that require periodic leak testing of containment sumps provide an exemption for hydrostatically monitored double-wall sumps in most applications.

Installing our double-wall sump can be a cost-effective way to avoid both the expense and ongoing service involved in meeting this testing requirement. In California, and potentially other states and provinces, regulations require all new sumps to be double-walled.

Why Choose **Our Fiberglass Sump?**

For decades, ZCL | Xerxes has established itself throughout North America as a leading manufacturer of long-life, corrosion-resistant fiberglass vessels and accessories that offer superior protection for the environment. The internal environment of containment sumps is very corrosive. The use of ethanol, ultra-low sulfur diesel (ULSD) and biodiesel fuels, and the corrosion damage caused by these fuels and resulting vapors is increasing. Our fiberglass containment sumps offer customers a corrosion-resistant, long-term option for the storage of liquids in underground installations.

A Variety of Sump Options

Whether a customer is installing a new underground system or is retrofitting an existing installation, containment sumps are used on nearly all double-wall tanks today. We supply containment collars and sumps as a package to provide secondary containment around tank fittings, piping, pumps and manways. Customers have the option of either dry interstitial monitoring or hydrostatic monitoring. Most double-wall containment sump installations are equipped with hydrostatic monitoring for the same reasons that customers choose it as a monitoring method for double-wall tanks – continuous monitoring of both walls 24/7. Our containment sumps come in a variety of models, sizes and cover/top options.

MODELS & MONITORING OPTIONS

- Round and flat-sided
- Double-wall sump with hydrostatic monitoring
- Double-wall sump with dry monitoring
- Single-wall sump

COVER/TOP OPTIONS

- 32-inch watertight cover
- 38-inch watertight cover
- 32-inch friction-fit cover
- Open top option

SIZE OPTIONS

- 42-inch diameter
- 48-inch diameter
- 36-inch to 72-inch height
- Available in shallow and deep burial heights

THE ZCL | XERXES ADVANTAGE

ZCL | Xerxes double-wall underground storage tanks offer customers several significant design and performance differences that make them a superior choice to both steel tanks and other fiberglass tanks.

- Corrosion-Resistant Inside and Out
- 100% Premium Resin and Glass
- Flexible Design and Installation Options
- Maintenance-Free
- TRUCHEK® Continuous Leak Detection
- 30-Year Limited Warranty

FUEL COMPATIBILITY

Our UL-listed (1316) and ULC-listed (S615) double-wall fiberglass tanks are listed as compatible with 0-100 percent ethanol storage and warranted for the full range of ethanol-blended gasoline. Since the UL listing for steel tanks does not require ethanol compatibility testing, this is another distinct advantage of fiberglass over steel.

PARABEAM®

To create a double-wall sump that is structurally strong, ZCL | Xerxes uses Parabeam®, our patented 3D glass-reinforcement material, to bond the sump walls. This is the same design concept that has made our double-wall tanks the most widely used underground tanks in North America. By using our unique woven-glass to create the interstitial space, our sumps are built to avoid weaknesses such as structural collapse and false monitoring alarms due to flexing walls.

CORROSION RESISTANCE

ZCL | Xerxes tanks and sumps are made of fiberglass, which means they are inherently resistant to corrosion. Because they are corrosion-resistant inside and out, you'll have the peace of mind of choosing products that help preserve and protect the environment. You'll also enjoy a lower cost of ownership than with steel tanks, which corrode over time and require maintenance.

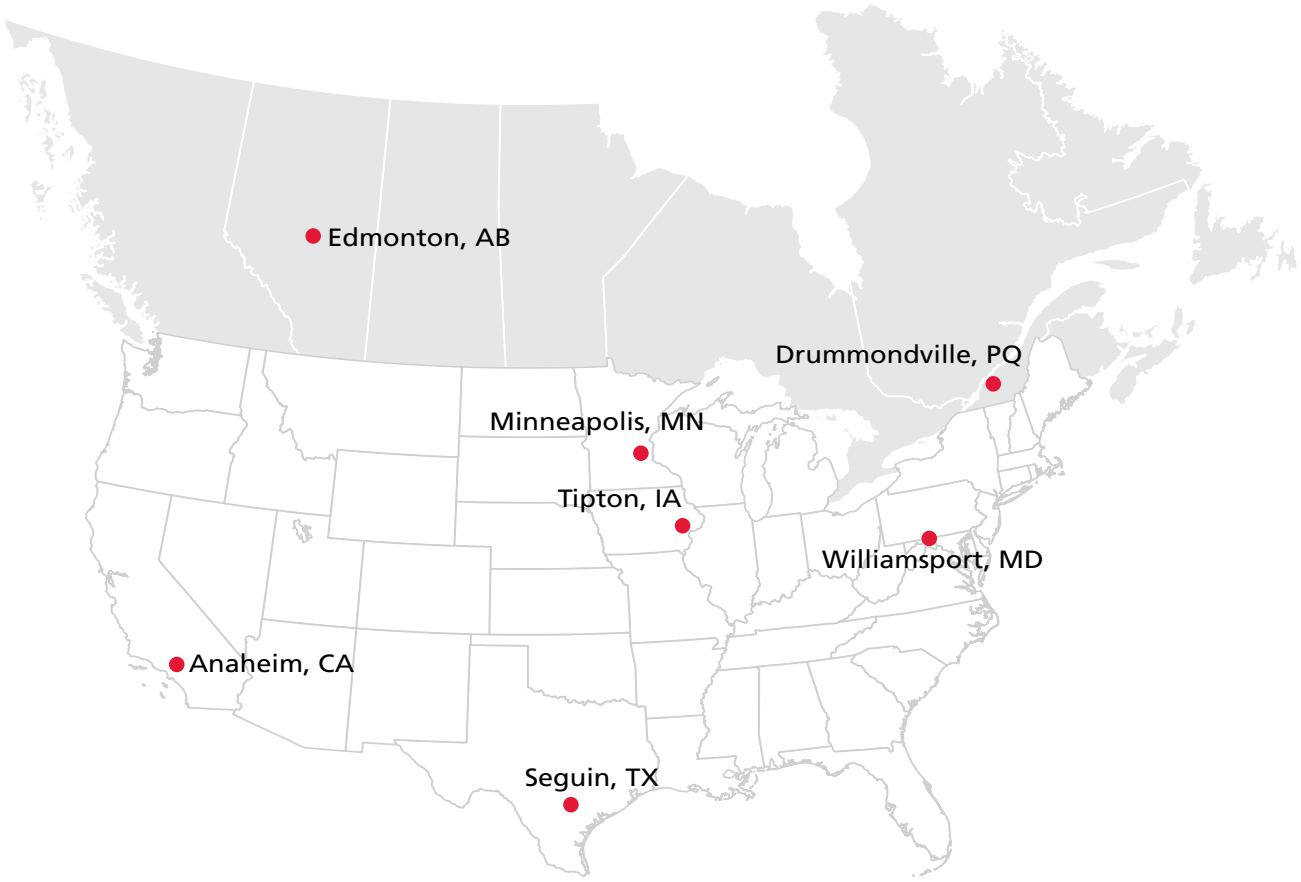
EXTENSIVE THIRD-PARTY QUALITY TESTING

As further evidence of their durability, ZCL | Xerxes double-wall sumps have passed extensive third-party testing to verify that they withstand interstitial pressure levels that other sumps cannot. Therefore, customers can be assured that our containment sumps are superior to other options in the marketplace.

Multiple Facilities

Customers Can Rely on Timely Manufacturing and Delivery of Tanks and Accessories.

With six manufacturing facilities – four in the United States and two in Canada – no matter where customers need fiberglass tanks and accessories shipped, a ZCL | Xerxes manufacturing facility is not far away. No other tank producer offers this kind of manufacturing capability in North America. All our facilities are either UL-listed or ULC-listed.



Contact Us

We're ready to design a sump solution for you. Visit our website, or contact technical support for more information (see contact information below).

On the Web:
www.zcl.com

Technical Support:
800.661.8265
952.887.1890
eng.support@zcl.com

Corporate Head Office

ZCL Composites Inc.
1420 Parsons Road SW
Edmonton, AB T6X 1M5

US Office

Xerxes Corporation
7901 Xerxes Avenue S
Minneapolis, MN 55431

Manufacturing Facilities:

Canada
Edmonton, AB
Drummondville, PQ

USA
Anaheim, CA
Seguin, TX
Tipton, IA
Williamsport, MD

ZCL | XERXES®
making a lasting difference®

SPECIFICATIONS CONTINUED

Approvals/Certifications

- ULC Listed (grade level CI-GKT versions only).
- CARB approved (grade level only).
- Exceeds H20 and HS20 load standards (maximum axle load requiring support for the 32,000 or 16,000 pounds for each set of dual tire wheels).

ORDERING INFORMATION

Ordering Guide
Complete spill container part numbers have a specific order and are created using the following guidelines:

705 XXX Y A B C

XXX = Containment Options
- 545 = Grade level single wall
- 555 = Grade level double wall
- 556 = Below grade double wall

Y = Interstitial Monitoring Options
- 0 = No sensor
- 1 = Visual monitor (float gauge)
- 2 = Electronic sensor monitor

A = Base Thread Options
- 0 = NPSM
- 1 = NPT
- 2 = BSPT

B = Drain Options
- 1 = With drain
- 2 = Without drain

C = Lid/Cover
- BLK = Black fiberglass 18" manway cover (below grade only)
- CI-GKT = Black epoxy-coated cast iron gasketed lid (grade level only)
- CI-GRN = Green epoxy-coated cast iron gasketed lid (grade level only)
- CI-ORG = Orange epoxy-coated cast iron gasketed lid (grade level only)
- CI-RED = Red epoxy-coated cast iron gasketed lid (grade level only)
- CI-WHT = White epoxy-coated cast iron gasketed lid (grade level only)
- CI-YEL = Yellow epoxy-coated cast iron gasketed lid (grade level only)

Example: **705555111CI-GKT** = Defender Series® grade level double wall spill container with visual monitor, with NPT base thread, with drain and with black cast iron gasketed lid.

Example: **705556211BLK** = Defender Series® below grade double wall spill container with electronic sensor monitor, with NPT base thread, with drain and with black fiberglass manway cover (manyway included).

Defender Series® Spill Containers Common Configurations

Model	Description
705545001CI-GKT	Defender Series® grade level, single wall, NPSM thread, with drain, with black epoxy-coated cast iron gasketed lid
705545002CI-GKT	Defender Series® grade level, single wall, NPSM thread, without drain, with black epoxy-coated cast iron gasketed lid
705545011CI-GKT	Defender Series® grade level, single wall, NPT thread, with drain, with black epoxy-coated cast iron gasketed lid
705545012CI-GKT	Defender Series® grade level, single wall, NPT thread, without drain, with black epoxy-coated cast iron gasketed lid
705545021CI-GKT	Defender Series® grade level, single wall, BSPT thread, with drain, with black epoxy-coated cast iron gasketed lid
705545022CI-GKT	Defender Series® grade level, single wall, BSPT thread, without drain, with black epoxy-coated cast iron gasketed lid
705555101CI-GKT	Defender Series® grade level, double wall, NPSM thread, with drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555102CI-GKT	Defender Series® grade level, double wall, NPSM thread, without drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555111CI-GKT	Defender Series® grade level, double wall, NPT thread, with drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555112CI-GKT	Defender Series® grade level, double wall, NPT thread, without drain, with visual monitor, with black epoxy-coated cast iron gasketed lid
705555211CI-GKT	Defender Series® grade level, double wall, NPT thread, with drain, with electronic sensor monitor, with black epoxy-coated cast iron gasketed lid
705555212CI-GKT	Defender Series® grade level, NPT thread, without drain, with electronic sensor monitor, with black epoxy-coated cast iron gasketed lid
705556111BLK	Defender Series® below grade, double wall, NPT thread, with drain, with visual monitor, with black fiberglass manway cover (18" manway included)
705556112BLK	Defender Series® below grade, double wall, NPT thread, no drain, with visual monitor, with black fiberglass manway cover (18" manway included)
705556211BLK	Defender Series® below grade, double wall, NPT thread, with drain, with electronic sensor monitor, with black fiberglass manway cover (18" manway included)
705556212BLK	Defender Series® below grade, double wall, NPT thread, no drain, with electronic sensor monitor, with black fiberglass manway cover (18" manway included)
705559901*	Defender Series® grade level cutaway display, double wall, with drain, with visual monitor

*For display and demonstration purposes only. Six to eight week lead time.

Defender Series® Spill Container Installation Tools

Model	Description
T-7001	T-handle wrench
T-7106	Double-ended installation tool
T-7107	Double wall vacuum test kit (for double wall models only)

Franklin Fueling Systems

May 4, 2018

Subject: Franklin Fueling Overfill Prevention Valve (OPV) and Spill Prevention Equipment Fuel Compatibility

To Whom It May Concern,

This letter affirms that the materials used by Franklin Fueling Systems in the construction of the Overfill Prevention Valve (OPV) and Spill Prevention Equipment listed herein, as of the date of this letter, is compatible with the following fuels as defined by ASTM:

Group 1

- Gasoline (E0 to E10)
- Diesel (B0 to B5)
- Heating Fuels (Kerosene, Fuel Oil)

Group 2

- Mid-level Ethanol Fuel Blends (E11 to E50)
- Ethanol Fuel Blends (E51 to E83*)

*Commercially know as E85

Group 3

- Biodiesel Blends (B5 to B20) and Biodiesel (B100)

Group 4

- Aviation Fuels (AvGas, Jet Fuel)

Overfill Prevention Valves

Model Numbers		Groups
708591901, 708591902, 708592901, 708592902, 708593901, 708593902	Defender Series™ OPVs with standard drop tubes	1
708591921, 708591922, 708592921, 708592922, 708593923, 708593924, 708594901, 708594902	Defender Series™ OPVs, AGB	1, 2, 3, 4
708226901	Defender Series™ Remote fill splice kit	1, 2, 3, 4

3760 Marsh Road • Madison, Wisconsin 53718 USA • 608 838 8786

Franklin Fueling Systems

Spill Containment

Model Numbers		Groups
702xxxxx, 705xxxxx, 715xxxxx	EBW Series Direct Bury Spill Containers	1
705545xxx, 705555xxx, 705556xxx	Defender Series™ Direct Bury Spill Containers	1, 2, 3, 4
DMP36xxxxxx, DMP42xxxxxx	Defender Series™ Multiports	1, 2, 3, 4
SWF-100-SS, SWV-101-SS	Stainless Steel Swivel Adapters	1, 2, 3**, 4
77720102	4" Top Seal Fill Cap	1, 2, 3
30430103, 30430104	4" Vapor Recovery Cap	1, 2, 3

**B100 not determined on this equipment

Please let me know if there are any other questions of concerns regarding Franklin Fueling Overfill Prevention Valve (OPV) and Spill Prevention Equipment Fuel Compatibility.

Regards,

N. M. Keppy

Nicole Keppy
Franklin Fueling Systems
Product Manager, Service Station Hardware

GASOILA® E-Seal

GASOILA® CHEMICALS

TECHNICAL DATA 2013

Description
A dark green, opaque, viscous, non-hardening, textured paste with PTFE.

Type
Slow-drying, soft-setting, non-toxic, brushable, without grit. Cures by solvent evaporation providing a durable, long- lasting seal that can be easily disassembled.

Typical Uses
Especially designed for ethanol blended gasoline
Including E10, E20 & E85.

Substrates
Can be used on brass, copper, stainless steel, aluminum, black pipe, tin, galvanized pipe, ABS plastic, CPVC, nylon, PVC, polyethylene, polypropylene and more.

Chemical Resistance
Excellent resistance to ethanol blended gasoline, kerosene, petroleum solvents, diesel fuel, propane, butane, LPG, water, cutting oils.
NOT oxygen.

Set Time
None. For immediate service
Dries to the touch 48-72 hour

Packaging
Available in 1/4 pint, 1/2 pint and pint cans with brush-top lids.

For Chemical Emergency, Spill, Leak, Fire, Exposure or Accident Call:
CHEMTREC - Day or Night. 1-800-424-9300
KEEP OUT OF THE REACH OF CHILDREN

Product Data Sheet

Safety
Contains no lead, is non-toxic, not a skin sensitizer, and is non-corrosive.

Shelf Life: One year in original containers, when stored at room temperature at or below 80°F (27°C)

Wt./Gal.: 11.35 lbs

Color: Medium/Green

Clean Up: Hand cleaner or alcohol.

Temperature Range
-100°F to 600°F (-73°C to 316°C)
Allow to dry thoroughly before exposing to high temperatures. Remains usable in sub-zero weather.

Pressure Range
Up to 10,000 psi when sealing liquids and up to 3,000 psi with gases. Allow to dry, if possible, before subjecting to pressure.

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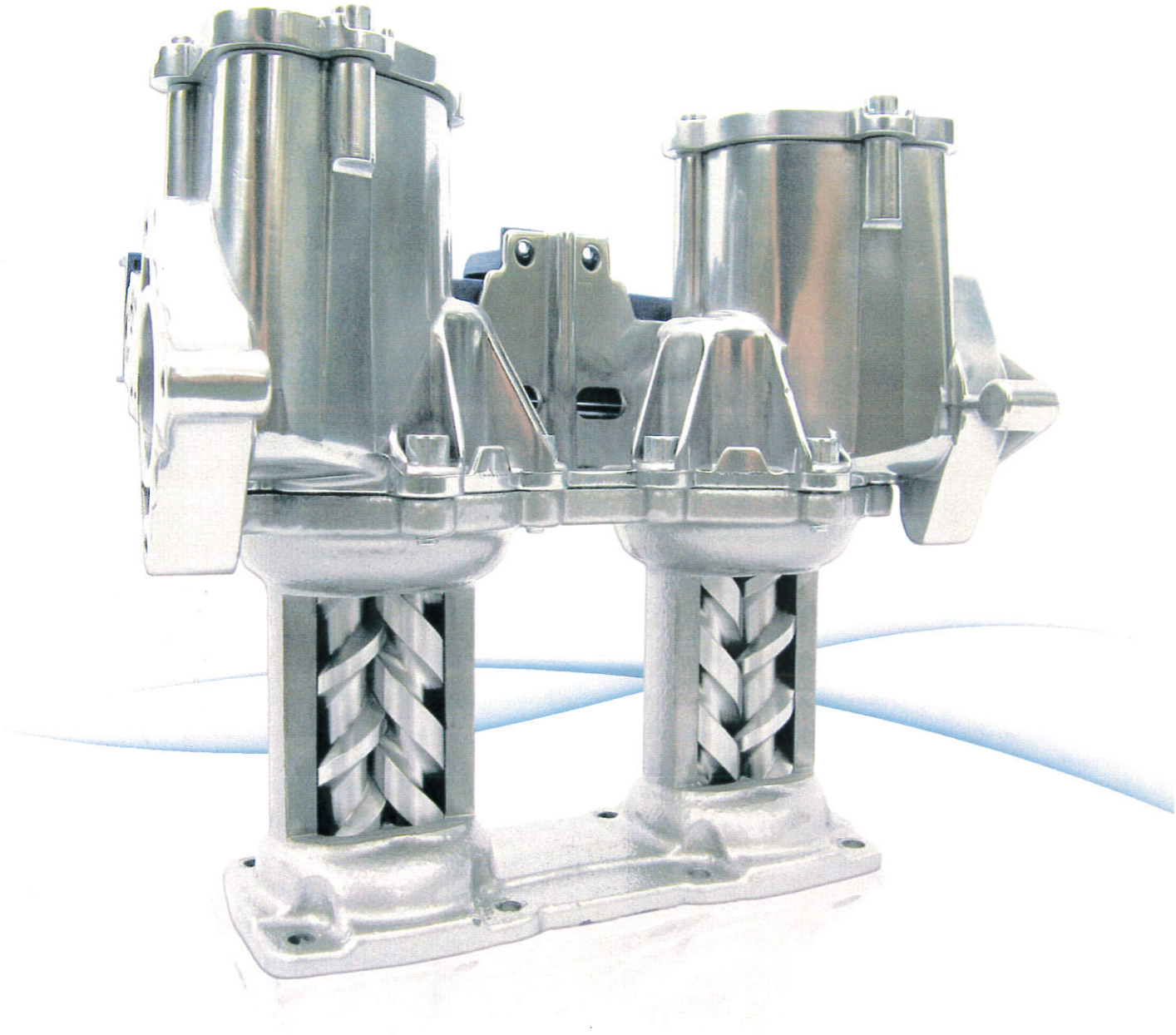
XFLO™ FUEL METER



Xflo™ Fuel Meter

Save fuel, save time, save money.

Without accurately-calibrated dispensers, you could be unintentionally giving away fuel every time customers fill their tanks. The new Wayne Xflo™ Meter can make this a thing of the past. With fewer moving parts and additional calibration points, the Xflo Meter sets the standard in metering accuracy. It's not only accurate, it's also 20-30% faster than traditional piston meters. And faster, more accurate transactions mean more profit to your bottom line.

Wayne
FUELING SYSTEMS

Xflo™ Fuel Meter

Save fuel, save time, save money.

So accurate, you may never have to calibrate it again

With the Xflo Meter, expect more accurate metering and less frequent calibration. In both lab and field tests, the Xflo Meter demonstrated no discernible drift after metering millions of litres of fuel — all were still perfectly calibrated. That means potential fuel savings of up to thousands of litres per year.

Peerless performance and uncompromised control

The Xflo Meter's phenomenal accuracy and throughput are the result of revolutionary engineering and precision manufacturing. Wear and tear are minimized thanks to the Xflo Meter's design, featuring fewer moving parts and sealing surfaces. This limits the possibility of meter drift. The Xflo Meter also has multiple calibration points, providing you with better accuracy across the entire flow range.

Extraordinarily adaptive

The Xflo Meter is both accurate and tough, making sure your investment lasts for years. Building on our tradition of dependable products, the Xflo Meter's efficient hydraulic design features tandem screw rotors made of hardened bearing steel in a compact housing. This rugged design is perfect for varied fuel environments. The Xflo Meter is built to handle millions of litres over its lifetime, in all flow conditions, fluid temperatures, densities and viscosities, and to be used with the same fuel types compatible with traditional piston meters.

- Increase profits by eliminating fuel loss: save potentially thousands of litres every year.
- Protect your investment: virtually eliminate recalibration costs.
- Expect field-proven performance: over 3,000 meters successfully installed using similar/comparable technology.
- Improve your throughput: Wayne's fastest meter ever.

Astonishing performance, outstanding security

At today's fuel prices, securing your investment is more important than ever. High-speed serial communication to the iGEM pump computer and a lack of exposed gear sets make the Xflo Meter highly resistant to tampering. Employing unique calibration tables and serial numbers that must be recognized by the iGEM enhances transaction security.

Customer-centric innovation since 1891

Wayne engineers designed the Xflo Meter module to mount in the same form factor as existing iMeters installed in our recent dispenser models. This makes it easy to replace meters in existing dispensers with iGEM electronics (Global Star™, Ovation®, Global Ovation®). The Xflo Meter is available for use with E85 and Ultra High Capacity applications, with future plans for use in LPG applications.

www.wayne.com

Austin, Texas, USA I Malmö, Sweden I Rio de Janeiro, Brazil I Shanghai, China

Wayne FUELING SYSTEMS

VEEDER-ROOT

Veeder-Root
125 Powder Forest Drive
P. O. Box 2003
Simsbury, CT 06070-7684
USA
Phone: (860) 651-2700
Fax: (869) 651-2719

January 13, 2011

Concerned Regulatory Agency

Re: Veeder-Root Compatibility with E85

To whom it may concern:

Veeder-Root TLS branded automatic tank gauging products have UL listings for product safety. The wetted component materials used with the below listed products are deemed by Veeder-Root to be compatible with ethanol 85 applications.

VR Part Number	Description
848480-003	Pressurized Line Leak Detector
846391-4XX, 5XX, 6XX	Mag Plus Probes for Alternative Fluids without water detection
846400-004,304,104	Mag Float Kit (5" cable) for Alternative Fluids 4", 3" & 2" floats
846400-014,314,114	Mag Float Kit (10" cable) for Alternative Fluids 4", 3" & 2" floats
846400-024,324,124	Mag Float Kit (20" cable) for Alternative Fluids 4", 3" & 2" floats
794380-323	Position Sensitive Pan/Sump Sensor
794380-344	MicroSensor
794380-345	Interstitial Solid State Sensor for Fiberglass Tanks
794380-430	Interstitial Sensor for Steel Tanks

The following sensor is exposed to Brine and is not of concern in an E85 application.

794380-301	Hydrostatic Sensor

Please contact Veeder-Root Technical Support at 1-800-323-1799 with further questions.

Regards,

Bob Moss
VP Engineering

Sensor Application Matrix

			Where Used							Category						Fuel Compatibility														
																	ASTM D975			ASTM D7547				ASTM D7467	ASTM D6751	ASTM D975			
Sensor Description	**Form #**	**Page #**	Dispenser Pan	Spill Containment	STP Sump	Convault Tank	Annular Space	Monitoring Well	Oil/Water Separator tank	Discriminating	Non-Discriminating	Position Sensitive	Level Sensing	Static Testing	Hydrostatic	100% Gasoline	Diesel	Kerosene	Jet Fuel	Aviation Gas	E-15	E-85	E-100	Bio-Diesel 20	Bio-Diesel 100	Renewable (Green) Diesel	Diesel Exhaust Fuel (DEF)	Waste Oil	Motor Oil
DPS Standard Dispenser Pan	794380-322	2	X	X						X						X	X	X	X	X	X	X[1]		X		X		X	X
CSS Standard Containment Sump	794380-352	3		X	X					X						X	X	X	X	X	X	X[1]		X		X		X	X
DPO Optical Dispenser Pan	794380-320	4	X	X						X						X	X	X	X	X	X	X[1]		X		X		X	X
CSO Optical Containment Sump	794380-350	5		X	X					X						X	X	X	X	X	X	X[1]		X		X		X	X
MSS Mag Sump Sensor	857080-XXX	6	X	X	X					X		X	X	X		X	X	X	X	X	X	X	X	X	X	X	X	X	X
SSDP Solid-State Dispenser Pan	794380-321	7	X	X							X					X	X	X	X	X	X			X	X	X		X	X
SSCS Solid-State Containment Sump	794380-351	8		X	X						X					X	X	X	X	X	X			X	X	X		X	X
Piping Sump	794380-208	9	X	X	X						X					X	X	X	X	X	X			X		X		X	X
Non-Discriminating Standalone Dispenser Pan	847990-001	10	X	X	X						X					X	X	X	X	X	X			X		X		X	X
Position-Sensitive	794380-323	11	X	X	X						X	X				X	X	X	X	X	X	X	X	X		X		X	X
Interstitial for Fiberglass Tanks, Discriminating	794380-343	12					X			X						X	X	X	X	X	X			X	X	X	X	X	X
Interstitial for Fiberglass Tanks	794390-409	13					X				X					X	X	X	X	X	X			X		X			
Interstitial for Fiberglass Tanks, High Alcohol	794380-345	14					X				X					X	X	X	X	X	X	X	X	X	X	X	X	X	X
Interstitial for Steel Tanks	794390-4X0	15			X		X				X					X	X	X	X	X	X			X		X		X	X
Interstitial for Steel Tanks, Position Sensitive[2]	794380-333	16		X			X				X	X				X	X	X	X	X	X	X	X	X	X	X		X	X
Interstitial for Steel Tanks, High Alcohol	794380-430	17					X				X					X	X	X	X	X	X	X	X	X	X	X		X	X
Interstitial for Steel Tanks, High Alcohol, small footprint	794380-344	18		X			X				X					X	X	X	X	X	X	X	X	X	X	X	X	X	X
Hydrostatic Reservoir (Dual Point)	794380-303	19					X								X	X	X	X	X	X	X	X[1]	X[1]	X		X		X	X
Single-Point Hydrostatic Sensor	794380-301	20					X								X	X	X	X	X	X	X	X[1]	X[1]	X		X			
Single-Point Mini-Hydrostatic Reservoir (High Alcohol)	794380-304	21					X								X	X	X	X	X	X	X	X	X	X	X	X		X	X
Vapor	794390-700	22						X								X			X	X	X								
Groundwater	794380-62X	23						X								X	X	X	X	X	X			X		X		X	X
Oil / Water Separator	794690-XXX	24							X							X	X	X	X	X	X			X				X	X

[1]Single use only if sensor was exposed to E85 or E100 (Test per Sensor Operability Guide [P/N 577013-814] in E-10 or less)

[2]Small Containment Areas (i.e. Spill Buckets)

VEEDER-ROOT

ELECTRONIC PRESSURIZED LINE LEAK DETECTION SYSTEM

Patented measurement technology

The Veeder-Root Electronic Pressurized Line Leak Detection system can be used in a variety of pressurized line applications. Our patented technology performs leak test at full pump pressure for 0.1 gph precision and a pressure decay test to meet the US EPA's continuous 3.0 gph gross test requirement. When partnered with our TLS-450PLUS Automatic Tank Gauge, large volume customers can now monitor lines that exceed 1100 gallons.

VEEDER-ROOT

Part Number	Description	Supported Console
859080-001	Digital Pressurized Line Leak Detector (DPLLD) without Swiftcheck Valve	TLS-450PLUS
859080-002	Digital Pressurized Line Leak Detector (DPLLD) with Swiftcheck Valve	TLS-450PLUS
332812-001	16 Input Universal Sensor Module	TLS-450PLUS
332813-001	5 Input and Output Interface Module (STP Control)	TLS-450PLUS

Key Features

- Proven pressure transducer technology
- No restriction of fuel flow
- Utilizes Swift Check Valve on early generation Red Jacket Submersible Pumps
- Test lines at full pressure for quick and accurate result
- Standard 3.0 gph, Optional 0.2 and 0.1 gph testing
- Not impacted by thermal contraction of fuel
- Installs without breaking piping or adding a new sump
- Supports a wide-range of pump and pipe types
- Several options based on TLS system
- Pressure Sensor constructed with Stainless Steel to meet the challenges of a highly corrosive environment

Specifications

VEEDER-ROOT

- Leaded Gasoline
- 5% Methanol
- Up to 100% Ethanol
- 15% MTBE
- Diesel
- Biodiesel (Up to B100)
- Kerosene
- Jet Fuel
- Aviation Gasoline

Line Flow Rate	120 GPM Max w/ Swiftcheck Valve
Operating Range	0 – 70 PSI
Proof Pressure	200 PSI
Maximum Vertical Pipeline Height Above Transducer	11 Feet
Minimum Pump Output Pressure	23 PSI

Documents

- Line Leak Application Guide (577013-465)
- Exterior Dimensions \ Digital PLLD Sensor (333526-001)
- PLLD & WPLLD Troubleshooting Manual (577013-344)
- PLLD Site Prep and Installation Manual (576013-902)
- WPPLD Site Prep and Installation Manual (576013-923)

VEEDER-ROOT

TLS-450PLUS Automatic Tank Gauge

The TLS-450PLUS automatic tank gauge provides the most comprehensive fuel site data for advanced fuel asset management.

Learn More >

VEEDER-ROOT

Learn More >

REQUEST FOR QUOTE

First name*

Last name*

Company name

Email*

Phone number

Country*

Please Select

Product Interest

- [ ] Automatic Tank Gauges
- [ ] Tank Gauge Sensors or Probes
- [ ] Submersible Turbine Pumps
- [ ] DEF Submersible Turbine Pumps
- [ ] Electronic Meter Registers
- [ ] Mechanical Meter Registers
- [ ] Vapor Recovery / ISD / Carbon Canister

VEEDER-ROOT

SUBMIT

125 Powder Forest Drive PO Box 2003
Simsbury, CT 06070
1.888.561.7942

OPW 71SO Overfill Prevention Valves

The CARB-certified OPW 71SO vapor-tight Overfill Prevention Valve is designed to prevent the overfill of underground storage tanks by providing a positive shut-off of product delivery. The shut-off valve is an integral part of the drop tube used for gravity filling. The OPW 71SO allows easy installation (without breaking concrete) and requires no special manholes.

The OPW 71SO is a vapor-tight two-stage shut-off valve. When the liquid level rises to about 95% of tank capacity, the valve mechanism is released, closing automatically with the flow. This reduces the flow rate to approximately 5 gpm through a bypass valve. The operator may then stop the filling process and disconnect and drain the delivery hose. As long as the liquid exceeds the 95% level, the valve will close automatically each time delivery is attempted.

If the delivery is not stopped and the liquid rises to about 98% of tank capacity, the bypass valve closes completely. No additional liquid can flow into the tank until the level drops below a reset point.

NOTE: The 71SO Overfill Prevention Valve can be adjusted to shutoff at any desired tank capacity. Please contact the Authority Having Jurisdiction (AHJ) and review local, state, and national codes to determine the regulatory requirements governing shut-off capacity in your region, as well as take into account other considerations such as extreme tank tilt. In all cases, the upper tube must protrude into the tank at least 6 1/2" to ensure that the valve can shut off flow into the tank completely before the top of the tank is wetted as per EPA requirements.

71SO Instruction Sheet Order Number: **H15524PA**

Listings and Certifications

California Air Resources Board

Materials

Valve Body: Cast aluminum
Float: Nitrile rubber, closed cell foam
Valve: Aluminum
Seals: Viton®
Upper & lower Drop Tube: Aluminum
Plastic parts: Acetal
Hardware: Stainless steel

Features

- **Simple, Easy and Quick Installation –** no excavation or special manholes required.
- **Economical –** costs a fraction of expensive, complicated and difficult-to-install valves.
- **Furnished Complete –** supplied with new upper and lower drop tubes, mounting hardware and thorough instructions for quick job site time.
- **Completely Automatic Operation –** no prechecks to perform, no resets and no overrides to be broken or abused.
- **No Pressurization of the Tank –** operates directly from liquid level.
- **Will Accept a Dipstick for Gauging**
- **Retrofits Directly –** for both new and existing tanks with 4" fill risers.
- **Quick Drain Feature –** automatically drains hose when head pressure is relieved.
- **Best Flow Rate in The Industry***

*** OPW Test Lab results**

Important

In order to prevent product spillage from the Underground Storage Tank (UST), properly maintained delivery equipment and a proper connection at the tight-fill adaptor are essential. Delivery personnel should be managed and trained to inspect delivery elbows and hoses for damaged and missing parts. They should always make certain there is a positive connection between the adaptor and elbow. If delivery equipment is not properly maintained, or the elbow is not securely coupled to the adaptor, a serious spill may result when the OPW 71SO closes, causing a hazard and environmental contamination.

NOTE: The OPW 71SO is designed for use on tight-fill gravity drop applications only. Do not use for pressure fill applications.

Advantages of Overfill Prevention Compared to Overfill Warning Systems:

- **Completely Automatic Operation –** does not rely on the alertness or speed of response of the delivery attendant for certainty of overfill prevention.
- **Keeps the Top of UST "Dry," per EPA Requirements –** eliminating possible leaks at loose bung fittings and the need for double containment on vent lines.
- **Does Not Rely on Pressure in the UST to Stop Flow –** allowing faster fill times and reducing spill risk.
- **Speeds Delivery Operations –** product flows unimpeded into the tank until the hose "kick" that accompanies the valve shut-off provides a clear signal that the liquid has reached the shut-off level.
- **Simple and Inexpensive Installation –** in both two-point and coaxial fill applications, no additional excavation, manholes or vent piping are required.

Look for this label for authentic OPW EVR Approved products.
OPW 71SOM is EVR Approved for E85

Raising The Standard In Overfill Prevention

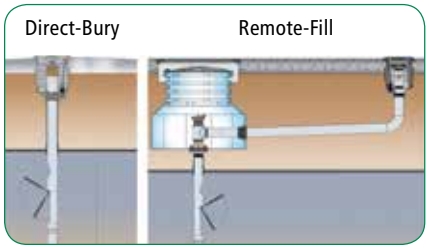
From the company that brought you the industry standard OPW 61SO, OPW raises the standard with the introduction of the **71SO Overfill Prevention Valve** – breakthrough innovation that takes overfill prevention to a whole new level of overfill perfection.

- **Eliminates curing issues due to hot or cold temperatures**
- **Easier, quicker, installation**
- **Higher quality, more reliable installation**
- **Lower costs**
- **Greater protection against fugitive emissions and pressure decay**
- **Fastest flow rate in the industry**

The new 71SO is a two-stage, positive shut-off valve, providing completely automatic operation with no pre-checks to perform, no resets, and no overrides to be broken or abused. The valve closes when the tank level rises to 95% capacity and provides a special bypass valve so the tank can be filled to a maximum capacity of 98%. The 71SO is available for direct-bury and remote applications.

All Vapor-Tight Overfill Valves are CARB EVR Certified

No Epoxy Sealants Required!



Replacement Parts

Part #	Description
61SOK-0001	Replacement Float Kit
H11931M	Drop Tube Seal
H14840M	Lower Tube Seal
C05117	Lower Tube
D02508	Vapor-Tight Inlet Tube
C03899M	Non-Vapor-Tight Inlet Tube
D02508	Vapor-Tight Inlet Tube (Blue)

71SO Ordering Specifications

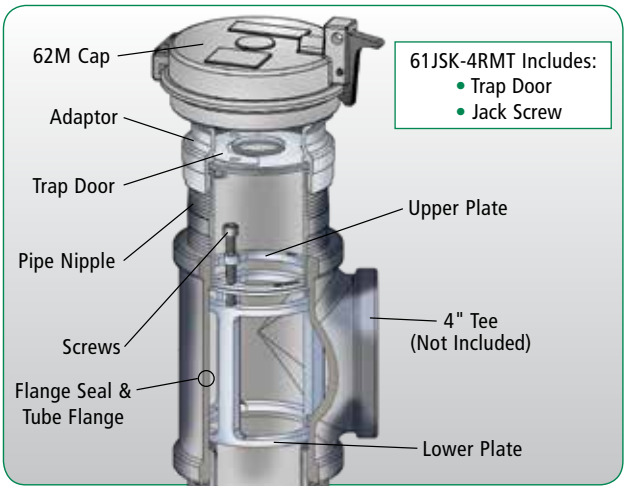
Product #	Description	Bury Depth ft.	Bury Depth m	Tank Diameter ft.	Tank Diameter m	Upper Tube Length in.	Upper Tube Length m	Lower Tube Length in.	Lower Tube Length m	Overall Length in.	Overall Length m	Max. Riser Length in.	Max. Riser Length m	Max. Nominal Tank Dia. in.	Max. Nominal Tank Dia. m	Max. Actual Tank Dia. in.	Max. Actual Tank Dia. m	Weight lbs.	Weight kg
71SO-400CB*	Vapor-Tight Overfill Valve	5	1.5	8	2.4	60	1.5	83	2.1	155 3/4	3.9	53 1/2	1.4	96	2.4	107	2.7	16	7
71SO-410CB*	Vapor-Tight Overfill Valve	10	3.0	10	3.0	120	3.1	102	2.6	234 3/4	5.9	113 1/2	2.9	120	3.1	126	3.2	25	11
71SO-420CB*	Vapor-Tight Overfill Valve	10	3.0	12	3.6	120	3.1	126	3.2	258 3/4	6.5	113 1/2	2.9	144	3.7	150	3.8	26	12
71SO-4000	Non Vapor-tight Overfill Valve	5	1.5	8	2.4	60	1.5	83	2.1	155 3/4	3.9	53 1/2	1.4	96	2.4	107	2.7	16	7
71SO-4010	Non Vapor-tight Overfill Valve	10	3.0	10	3.0	120	3.1	102	2.6	234 3/4	5.9	113 1/2	2.9	120	3.1	126	3.2	25	11
71SOM-412C	E85 Vapor-tight Overfill Valve	10	3.0	10	3.0	120	3.1	102	2.6	234 3/4	5.9	113 1/2	2.9	120	3.1	126	3.2	38	17.3
71SO-TOOLCT	71SO Installation Tool																	2.5	1
61JSK-4RMT	Jack Screw Kit For Vapor-Tight Remote Applications																	1.5	0.7
61JSK-4410	Jack Screw Kit For Composite Base Spill Bucketst																	1	0.5
61JSK-44CB	Jack Screw Kit For Cast Iron Base Spill Buckets																	1	0.5
71JSK-4RMT	E85 Jack Screw for Remote-Fill Applications																	1	0.5
71JSK-44MA	E85 Jack Screw for Direct-Fill Applications																	1.5	0.7

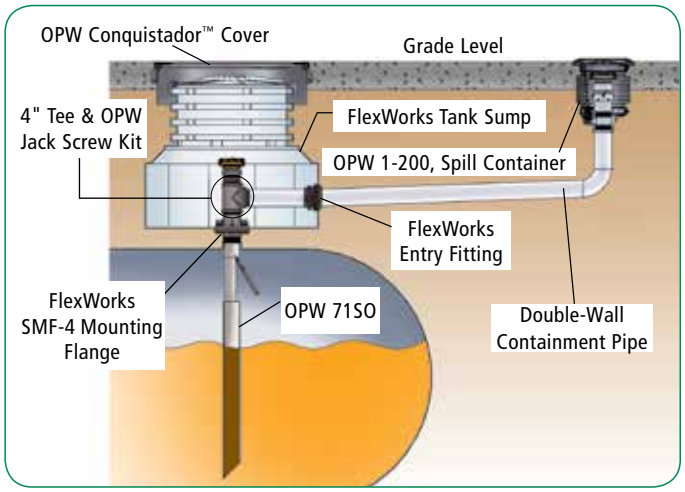
61JSK-4410 AND 61JSK-44CB Instruction Sheet Order Number: **H15289M**

*ULC B100 Compatible

71SO Vapor-Tight Remote Fill

The OPW Vapor-Tight Remote Fill is designed for two-point vapor-tight remote-fill applications, where the fill point is not directly over the UST. A CARB approved vapor-tight 71SO overfill valve is installed in the sump through a riser pipe directly over the tank.





9393 Princeton-Glendale Road ◆ Hamilton, Ohio USA 45011 ◆ Phone: (800) 422-2525 ◆ Fax: (800) 421-3297

ADVANCED PROTECTION SUBMERSIBLE TURBINE PUMPS

Available as a factory installed option on STPAG and IST biofuel compatible submersible turbine pumps, Advanced Protection defends STPs from accelerated corrosion caused by the acetic byproduct of microbial activity.

Highlights

- Powder-coated and E-coated finishes protect exterior cast surfaces from accelerated corrosion.
- Stainless steel fasteners, riser, variable length column pipe and coupler protect against corrosion and provide long service life.
- UL and cUL listed.

Ordering Information

A typical turbine model designation has up to five components to define the pump being supplied as follows:

STP XXXXX Y-A-B

STP = Basic Model Designation (IST for variable speed models)

XXXXX = Factory Installed Options (Model designations may include one or more of the following characters in alphabetical order.)

AP = Advanced protection with coated exterior cast surfaces, stainless steel fasteners and piping, alcohol-gasoline compatible)

F = Floating suction adapter (1½" NPT female adapter)

H = High pressure deadhead output (150 and 200 models only)

K = Intake filter screen (IFS, factory installed to PMA)

M = MagShell™ (flow enhancing, expanded PMA shell)

R = Model R check valve (24 psi relief/22 psi reset for PLLD)*

W = Model W check valve (16 psi relief/13 psi reset for PPM4000)*

Y = Pump Motor Horsepower Rating

33 = 1/3 hp fixed speed

75 = ¾ hp fixed speed

150 = 1½ hp fixed speed

200 = 2 hp fixed speed

VS2 = 2 hp variable speed**

VS4 = 4 hp variable speed***

A = Model Length

VL1 = Variable length range #1

VL2 = Variable length range #2

VL3 = Variable length range #3

B = Riser Pipe Length

Riser pipe length is expressed as two numeric characters that indicate the total length of the riser in inches. Riser pipes are available from 7" to 60" in 1" increments (additional charge for risers 31" or longer).

Notes:

*If not otherwise specified, all STP models are supplied with standard model check valve (40 psi relief /35 psi reset for MLD, TS-LS300, and TS-LS500).

**Implied on IST models unless VS4 is specified.

*** IST models only.

(Advanced Protection STP shown with MLD+ and IFS, sold separately)

Ordering Information continued

Advanced Protection Submersible Turbine Pumps

Model	Description	Model Length Range*
ISTAPMVS4-VL1	4 hp AP variable speed with MagShell™	64"-92"
ISTAPMVS4-VL2	4 hp AP variable speed with MagShell™	95"-156"
ISTAPMVS4-VL3	4 hp AP variable speed with MagShell™	127"-218"
ISTAPM-1	2 hp AP variable speed with MagShell™	59"-87"
ISTAPM-2	2 hp AP variable speed with MagShell™	90"-151"
ISTAPM-3	2 hp AP variable speed with MagShell™	122"-213"
STPAPM200-VL1	2 hp AP fixed speed with MagShell™	63"-91"
STPAPM200-VL2	2 hp AP fixed speed with MagShell™	94"-154"
STPAPM200-VL3	2 hp AP fixed speed with MagShell™	126"-217"
STPAPHM200-VL1	2 hp AP high pressure fixed speed with MagShell™	63"-92"
STPAPHM200-VL2	2 hp AP high pressure fixed speed with MagShell™	94"-155"
STPAPHM200-VL3	2 hp AP high pressure fixed speed with MagShell™	126"-218"
STPAP150-VL1	1-1/2 hp AP fixed speed	60"-88"
STPAP150-VL2	1-1/2 hp AP fixed speed	91"-152"
STPAP150-VL3	1-1/2 hp AP fixed speed	123"-214"
STPAPH150-VL1	1-1/2 hp AP high pressure fixed speed	61"-89"
STPAPH150-VL2	1-1/2 hp AP high pressure fixed speed	92"-152"
STPAPH150-VL3	1-1/2 hp AP high pressure fixed speed	124"-215"
STPAP75-VL1	3/4 hp AP fixed speed	57"-86"
STPAP75-VL2	3/4 hp AP fixed speed	88"-149"
STPAP75-VL3	3/4 hp AP fixed speed	120"-212"

Notes:

1. Remove "M" from model number for non-MagShell™ pump motor assembly (where applicable).
2. STPAP/ISTAP models are listed for compatibility with fuel mixtures containing diesel fuel with up to 20% biodiesel, 100% biodiesel, up to 85% ethanol with gasoline, and 20% MTBE, 20% ETBE or 17% TAME with gasoline.
3. All models are supplied with a standard check valve unless factory option "R" or "W" is specified.
4. All above ISTAP models can only be powered by a MagVFC™. 4 hp models require three-phase incoming power supply, 2 hp models can be supplied with single- or three-phase incoming power.
5. All above STPAP models require single-phase, 208-230 VAC, 60 Hz incoming power.
6. 4" riser pipe, if supplied locally, must be 4½" OD by 3/16" WT tubing.
7. For riser pipe lengths 31" to 60", adder charge applies.

*Model length (A) defined as the dimension from the turbine manifold bottom to the pump motor inlet.

Factory Installed Options

Specified in model number at time of STP order.

Model	Description
F	Floating suction adapter, 1½" NPT female, must be factory installed
K	IFS (intake filter screen) factory assembled to pump motor assembly
R	Model R check valve, factory installed, for Veeder-Root™ PLLD Line Leak
W	Model W check valve, factory installed, for Red Jacket PPM4000 Line Leak

Ordering Information

Field Installed Options

Model	Description
5874202800	MagVFC™, 2 hp or 4 hp variable frequency controller, one required per IST
400137908	Syphon check valve (when ordered with STP)
400818921	STP-CBS, single-phase control box with lockout switch, 110 Volt coil
402312921	STP-DHI-SCI, combo DHI with factory wired STP-SCI (when purchased with a 4" STP)*
402312921	STP-DHI-SCI, combo DHI with factory wired STP-SCI (when purchased without a 4" STP)
402313921	STP-DHI-CBS, combo DHI with factory wired STP-CBS
402459931	Model 65 psi check valve (for slave of manifolded STPs with Veeder-Root™ PLLD)
402507930	Secondary syphon kit (when two syphon primes are required for one STP)
5800100215	STP-SCI, single-phase smart controller (when purchased without a 4" STP)
5800100215	STP-SCI, single-phase smart controller (when purchased with a 4" STP)*
5800300100	STP-DHI, dispenser hook isolation for 110 Volt dispenser handle switches, up to eight each

*When purchasing STP-SCI or STP-DHI-SCI in equal quantities of fixed speed 4" STPs, the STP-SCI or STP-DHI-SCI will be invoiced at special discount pricing.

FE PETRO®
A Franklin Fueling Systems Brand
franklinfueling.com
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Tel: +1 608 838 8786 • Fax: +1 608 838 6433
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Tel: Mex 001 800 738 7610 • Tel: FR +33 (0)1 69 21 41 41 • Tel: CH +86 10 8565 4566

Magnetostrictive Probes for Alternative Fluids

Magnetostrictive Probes for Alternative Fluids are available in 0.1 GPH and 0.2 GPH Versions

Certified performance for inventory control and in-tank leak detection in fuel blends up to 100% alcohol

Veeder-Root offers two types of Magnetostrictive Probes for Alternative Fluids to provide highly accurate, trouble-free in-tank leak detection and inventory control in fluids of up to 100% alcohol. The Magnetostrictive Probe for Alternative Fluids with water detection is ideal for fuel blends with less than 20% alcohol. The Magnetostrictive Probe for Alternative Fluids without water detection has been developed for fluids up to 100% alcohol.

Series 8463 0.1 GPH Mag Probe for Alternative Fluids

The 0.1 GPH Mag Probe for Alternative Fluids has been third-party tested and certified to perform far better than the U.S. E.P.A. standards for both 0.1 GPH volumetric tank tightness testing and 0.2 GPH automatic tank gauging. (See the summary of leak test performance on back or call us for a copy of the complete test results.)

0.1 GPH Mag Probe and CSLD — Leak detection without shutting down your tanks!

CSLD, Continuous Statistical Leak Detection, is an advanced tank testing technology that makes full use of the TLS-300 and TLS-350(R)'s in-tank monitoring capabilities. CSLD eliminates the need for tank shutdown to perform a leak test — no lost business, no lost operating time!

The TLS-300 and TLS-350(R) equipped with CSLD use the 0.1 GPH Mag Probe to continuously monitor fuel height and temperature information to detect idle times in the tank. During each idle time, data collected forms a highly accurate leak detection database. Sophisticated statistical analysis techniques in CSLD constantly evaluate the database to discard invalid data and perform leak tests based on only high-quality information in the current database. In fact, a new leak test is performed every time new data from an idle period is added.

Series 8463 0.2 GPH Mag Probe for Alternative Fluids

The 0.2 GPH Mag Probe for Alternative Fluids provides the same reliable inventory control features and fluid compatibility as the 0.1 GPH Mag Probe for Alternative Fluids, but offers 0.2 GPH leak detection at a lower cost.

The 0.2 GPH Mag Probe for Alternative Fluids has also been third-party tested and certified to exceed U.S. E.P.A. standards for 0.2 GPH automatic tank gauging. (See the summary of leak test performance on back or call us for a copy of the complete test results.)

Approved for Aboveground Tank Applications

Veeder-Root Magnetostrictive Probes are approved for use in aboveground storage tanks to monitor fuel inventory. An AST installation Kit (Form Number 312020-984) is required for these applications and is available from Veeder-Root, Customer Service 800-873-3313 or your authorized Veeder-Root distributor.

Features & Benefits

- Non-corrosive, stainless steel tubing for long-life monitoring in fuels up to 100% alcohol
- Highly accurate Magnetostrictive measurement technology
- Fast accurate leak tests
- 0.1 GPH Mag Probe for Alternative Fluids is third-party certified to exceed U.S. E.P.A. performance standards for 0.1 GPH Volumetric Tank Tightness Testing
- 0.1 GPH Mag Probe for Alternative Fluids is compatible with TLS-300 and TLS-350R with CSLD for continuous statistical leak detection
- 0.2 GPH Mag Probe for Alternative Fluids is third-party certified to exceed U.S. E.P.A. performance standards for 0.2 GPH Automatic Tank Gauging
- 2", 3" and 4" Float Kits available

VEEDER-ROOT

Probe Models

Tank I.D.	Mag Plus Probes for Alternative Fluids with Water Detection Part No*			Mag Plus Probes for Alternative Fluids without Water Detection Part No*		
	0.1 GPH Leak Detection	0.2 GPH Leak Detection	Inventory Only	0.1 GPH Leak Detection	0.2 GPH Leak Detection	Inventory Only
4'	846391-101	846391-201	846391-301	846391-401	846391-501	846391-601
5'	846391-102	846391-202	846391-302	846391-402	846391-502	846391-602
5'4"	846391-103	846391-203	846391-303	846391-403	846391-503	846391-603
6'	846391-104	846391-204	846391-304	846391-404	846391-504	846391-604
7'	846391-105	846391-205	846391-305	846391-405	846391-505	846391-605
7'6"	846391-106	846391-206	846391-306	846391-406	846391-506	846391-606
8'	846391-107	846391-207	846391-307	846391-407	846391-507	846391-607
9'	846391-108	846391-208	846391-308	846391-408	846391-508	846391-608
9'6"	846391-117	846391-217	846391-317	846391-417	846391-517	846391-617
10'	846391-109	846391-209	846391-309	846391-409	846391-509	846391-609
10'6"	846391-110	846391-210	846391-310	846391-410	846391-510	846391-610
11'	846391-111	846391-211	846391-311	846391-411	846391-511	846391-611
12'	846391-112	846391-212	846391-312	846391-412	846391-512	846391-612
2.0M	846391-113	846391-213	846391-313	846391-413	846391-513	846391-613
2.5M	846391-114	846391-214	846391-314	846391-414	846391-514	846391-614
2.67M	846391-116	846391-216	846391-316	846391-416	846391-516	846391-616
3.0M	846391-115	846391-215	846391-315	846391-415	846391-515	846391-615
Custom Length	846391-199	846391-299	846391-399	846391-499	846391-599	846391-699

**Float kits must be ordered separately from probes, water floats not recommended for fuel blends with >20% alcohol*

Floats Match Table

Product	Probe	Functions	Float Kit
Gasoline (<=20% Alcohol)	Mag Plus Probe for Alternative Fluids with Water Detection P/N 846391-1xx or -2xx	Inventory: Yes Leak Detection: Yes Water detection: Yes	Gasoline Float Kit P/N 846400-xy0* (*see note for definition of xy below)
	Inventory Only Mag Plus Probe for Alternative Fluids with Water Detection P/N 846391-3xx	Inventory: Yes Leak Detection: No Water detection: Yes	
Alcohol / Ethanol (<=100% Alcohol, including E85) Methanol (<=100% Alcohol) ETBE (<=100% Ether) MTBE (<=100% Ether) Used Oil	Mag Plus Probe for Alternative Fluids without Water Detection P/N 846391-4xx or -5xx	Inventory: Yes Leak Detection:Yes Water Detection: No	Alternative Fluids Float Kit P/N 846400-xy4* *Notes: x=0 -> 4" floats x=1-> 2" floats x=3 -> 3" floats y=0 -> 5' cable y=1 ->10' cable y=2 -> 20' cable
	Mag Plus Probe for Alternative Fluids without Water Detection P/N 846391-6xx	Inventory: Yes Leak Detection:No Water Detection: No	
Fuel Oil #4 & #6 Fuel Oil #4 & #6 Ethylene Glycol Propylene Glycol Windshield Washer Fluid	Mag Plus Probe for Alternative Fluids without Water Detection P/N 846391-6xx		

Leak Test Performance (Third Party Certified for all TLS-3xx Consoles*)

PROBE	TEST TYPE	P(D)	P(FA)	TEST TIME
0.1 GPH Mag Probe	0.1 GPH	99%	1%	3 Hours
0.1 GPH Mag Probe	0.2 GPH	99%	<.1%	2 Hours
0.1 GPH Mag Probe w/CSLD	0.2 GPH	99%	<.1%	Continuous
0.2 GPH Mag 2	0.2 GPH	99%	<.1%	2 Hours

Veeder-Root reserves the right to change product specifications without advance notice. Please ensure that you are using the latest version of product literature.

• 125 Powder Forest Drive • Simsbury, CT 06070 • USA
Telephone: 860-651-2700 • Fax : 860-651-2719 • www.veeder.com

S. Bravo Systems, Inc.
2929 Vail Avenue
Commerce, CA 90040
1-800-AT-BRAVO
www.sbravo.com

Wednesday - August 25 - 2010 R3 10.21.13

RE: Bravo Fiberglass Sumps and Alternative fuels

This letter is to certify the compatibility of Bravo (S. Bravo Systems, Inc.) Single and Double Wall Fiberglass Containment Sumps with Alternative Fuels such as Biodiesel and Ethanol blended fuels. It also addresses compatibility with DEF Diesel Exhaust Fluid.

Bravo Fiberglass products are engineered with the same UL Listed materials used in the manufacture and certification of Fiberglass Tanks, matching the UL Standard 1316. Since our Fiberglass containment sumps are Built like a Tank, they can withstand continuous fuel exposure to Biodiesel, Ethanol and Alcohol blends without failure.

All DoubleWall Containment Sumps are engineered to be fully compliant with the California State Water Resource Control Board Assembly Bill AB-2481 for DoubleWall Sumps and Continuous Monitoring Systems.

The following Single and Double Wall Containment Sumps manufactured by Bravo Systems in Commerce, California are compatible with Biodiesel and Ethanol fuel blends up to B100 and E100, respectively.

> B3XX Series Spill Buckets
> B4XX Series Tank Sumps & Covers
> B5XX Series Planter Transition Sumps
> B6XX Series Walkover Transition Sumps
> B7XX Series H-20 Rated Transition Sumps
> B8XX Series Transition Sumps
> B1XXX Series UDC Sumps
> B7XXX Series UDC Sumps
> B8XXX Series UDC Sumps
> B9XXX Series UDC Sumps

Bravo Systems also certifies that these products are compatible with and approved for use in secondarily containing DEF Diesel Exhaust Fluid.

Each respective Series may be UL Listed in addition to being manufactured of UL recognized materials approved for use in the manufacture of Fiberglass UST tanks. Any other relevant documentation will be located in the documents area of each product's respective webpage.

Please feel free to contact us with any questions you may have at 800-AT-BRAVO.

Additionally, you may find further information at www.sbravo.com.

Sincerely,

Jonathan E. Smith
Director of Brand Management
S. Bravo Systems, Inc.

made in USA

PEI MEMBER

Certified WBENC Women's Business Enterprise

Red Thread™ IIA

(Product Data)

FUEL HANDLING

Applications

- Service Station
- Vent/Vapor Recovery
- Bulk Plant Terminals
- Fueling Terminals
- Central Fuel Oil Systems
- Marinas Terminals
- Ethanol Fuel Blends
- Biodiesel Fuel
- Diesel Exhaust Fluid
- UL/ULC Systems that require MV, HB, CT, A&M Fuels

Materials and Construction

All pipe is manufactured by filament winding process using amine-cured epoxy thermosetting resin to impregnate strands of continuous glass filaments with a resin-rich interior surface. The operating pressure of the pipe is up to 250 psig (17.2 bar) with continuous operating temperature to 150°F (66°C).

Red Thread IIA is Listed with Underwriters Laboratories Standard 971-2004 for non-metallic underground piping for motor vehicle (MV), high blend (HB), concentrated (CT) and aviation and marine (A&M) fuels. The pipe and fittings are also Listed with Underwriters Laboratories of Canada with both Listings under File MH9162.

Fittings

Fittings are manufactured with the same chemical and temperature capabilities as the pipe. Depending on the configurations and size, the fittings construction method will be compression molded, contact molded, fabricated or filament wound and are described in FH1250.

Testing

Installed pipe systems should be tested prior to use to assure soundness of all joints and connections. Locate pressure gauge in close proximity to the pressurizing equipment, not directly on the piping system. A pressure gauge with the test pressure at mid-scale is recommended.

Joining System

- **T.A.B.™** - The primary joining method for pipe joints promoting fast, positive make-up and prevents "backout" during curing.
- **Bell & Spigot** - The primary joining method for fitting joints.

These joints assist the installer and assures a fast trouble-free installation. Adhesive for this system is Series 8000. T.A.B. spigots can be bonded into tapered bells and tapered spigots can be Bonded into T.A.B. bells using standard bonding procedures for tapered joints.

ASTM D2996 Designation Code - RTRP-11AW13110

Nominal Dimensional Data

Pipe Size		Inside Diameter		Outside Diameter		Wall Thickness		Weight		Pressure/ Temperature Max. Rating at 150°F (66°C)		Mill Test Pressure		Minimum Bending Radius	
in	mm	in	mm	in	mm	in	mm	lbs/ft	kg/m	psig	MPa	psig	MPa	ft	m
2	50	2.238	57	2.372	60	0.067	1.70	0.42	0.63	250	1.72	375	2.59	102	31.0
3	80	3.363	85	3.559	90	0.098	2.49	0.92	1.37	175	1.21	300	2.07	153	46.5
4	100	4.364	111	4.554	116	0.095	2.41	1.15	1.71	125	0.86	265	1.83	195	59.5
6	150	6.408	163	6.686	170	0.139	3.53	2.47	3.68	20	0.14	265	1.83	287	87.4

View of Joint Illustrations

T.A.B.

Bell & Spigot

Typical Mechanical Properties

Pipe Property	75°F	24°C	200°F	93°C	Method
	psi	MPa	psi	MPa	
Axial Tensile					
Ultimate Stress	9,530	65.7	6,585	45.4	ASTM D2105
Modulus of Elasticity	1.68×10^6	11,584	1.42×10^6	9,791	ASTM D2105
Poisson's Ratio, ν_{ah} (ν_{ha})[1]	0.35 (0.61)				
Axial Compression					
Ultimate Stress	12,510	86.3	8,560	59.0	ASTM D695
Modulus of Elasticity	0.677×10^6	4,668	0.379×10^6	2,613	ASTM D695
Beam Bending					
Modulus of Elasticity (Long Term)	2.6×10^6	17,927	0.718×10^6	4,951	ASTM D2925
Hydrostatic Burst					
Ultimate Hoop Tensile Stress	40,150	277	36,480	252	ASTM D1599
Hydrostatic Hoop Design Stress					
Static 20 Year Life LTHS - 95% LCL	-	-	18,203 - 14,689	125.5 - 101.3	ASTM D2992 - Procedure B
Static 50 Year Life LTHS - 95% LCL	-	-	16,788 - 13,142	115.7 - 90.6	ASTM D2992 - Procedure B
Parallel Plate					
Hoop Modulus of Elasticity	3.02×10^6	20,822	-	-	ASTM D2412
Shear Modulus	1.76×10^6	12,135	1.63×10^6	11,250	-

Typical Physical Properties

Pipe Property	Value	Value	Method
Thermal Conductivity	0.23 BTU/hr•ft•°F	0.4 W/m°C	ASTM D177
Thermal Expansion	10.7×10^{-6} in/in °F	19.3×10^{-6} mm/mm °C	ASTM D696
Absolute Roughness	0.00021 in	0.00053 mm	
Specific Gravity	1.8		ASTM D792

[1] ν_{ha} = The ratio of axial strain to hoop strain resulting from stress in the hoop direction.
ν_{ah} = The ratio of hoop strain to axial strain resulting from stress in the axial direction.

[2] The differential pressure between internal and external pressure which causes collapse.

[3] A 0.67 design factor is recommended for short duration vacuum service. A full vacuum is equal to 14.7 psig (0.101 MPa) differential pressure at sea level.

[4] A 0.33 design factor is recommended for sustained (long-term) differential collapse pressure design and operation.

Ultimate Collapse Pressure

Size		Collapse Pressure[2][3][4]			
		psig		MPa	
in	mm	75°F	150°F	24°C	66°C
2	50	177	133	1.22	0.92
3	80	171	129	1.18	0.89
4	100	69	51	0.48	0.35
6	150	69	51	0.48	0.35

Pipe Length

Size		Standard		Random	
in	mm	ft	m	ft	m
2-6	50-150	15	4.57	22-25	6.7-7.62

Fiber Glass Systems
17115 San Pedro Avenue, Ste 200
San Antonio, Texas 78232 USA
Phone: 210 477 7500
Fax: 210 477 7560

FH1200ENG February 2017

Red Thread™ IIA Primary Fittings

(Product Data)

FUEL HANDLING

90° and 45° Elbow, Flange and Tee

Pipe Size		A		B		C		D		E		F		O		X_1 (1)		X_2 (1)	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2	50	3 ⅜	86	2 ¼	57	¾	19	4 ¾	121	¾ D-4 Holes	19 D-4 Holes	2 ⅝	67	6	152	1 ⅜	35	1 ½	38
3	80	4 ⅝	117	2 ⅝	67	1 ⅜	35	6	152	¾ D-4 Holes	19 D-4 Holes	3 ¾	95	7 ½	191	1 ⅝	41	1 ⅞	48
4	100	5 ⅛	130	2 ⅝	67	1 ⅜	35	7 ½	191	¾ D-4 Holes	19 D-4 Holes	3 ⅞	98	9	229	1 ½	38	1 ⅞	48

(1) X dimension is a nominal makeup dimension for layout only. Do not use for assembly dimensions.

90° Elbow

(Belled Ends)

Part	Part Number
2” 90° Elbow	012020-360-4
3” 90° Elbow	012030-360-4
4” 90° Elbow	012040-360-4

45° Elbow

(Belled Ends)

Part	Part Number
2” 45° Elbow	012020-310-4
3” 45° Elbow	012030-310-4
4” 45° Elbow	012040-310-4

Flange

(Belled Ends)

Part	Part Number
2” Flange	012020-170-4
3” Flange	012030-170-4
4” Flange	012040-170-4

Tee

(Belled Ends)

Part	Part Number
2” Tee	012020-410-4
3” Tee	012030-410-4
4” Tee	012040-410-4

Sleeve Coupling, End Cap and Nipple

Pipe Size		Sleeve Coupling				End Cap				Nipple (Overall Length "A")				
		A		X_1 (1)		A		X_1 (1)		4"	6"	8"	10"	12"
in	mm	in	mm	in	mm	in	mm	in	mm	102 mm	152 mm	203 mm	254 mm	305 mm
2	50	6	152	2 ⅛	54	2 ¾	70	1 ⅜	35	†	†	†	†	†
3	80	6	152	2 ⅜	60	3 ¼	83	1 ¾	44	-	†	†	†	†
4	100	7	178	2 ⅞	73	3 ¾	95	1 ⅝	41	-	†	†	†	†

(1) X dimension is a nominal makeup dimension for layout only. Do not use for assembly dimensions.

† Available from stock.

Sleeve Coupling

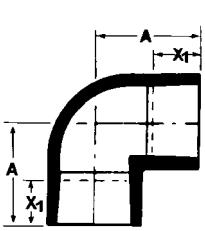
(Belled Ends)

Part	Part Number
2” Sleeve Coupling	012020-101-8
3” Sleeve Coupling	012030-101-8
4” Sleeve Coupling	012040-101-4

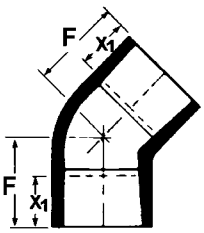
End Cap

Part	Part Number
2” End Cap	012020-180-4
3” End Cap	012030-180-4
4” End Cap	012040-180-4

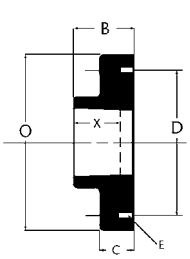
View of Fitting Illustrations



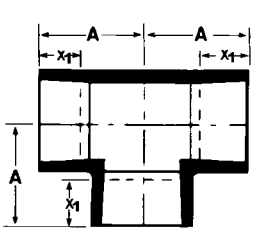
90° Elbow



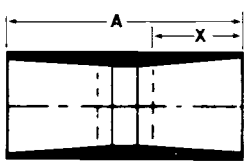
45° Elbow



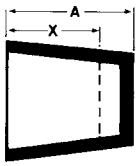
Flange



Tee



Sleeve Coupling



End Cap

Threaded Adapter[2] - NPT Thread

Pipe Size		Bell x Male						Spigot x Male				Bell x Female				Spigot x Female			
		A		B		X_1[1]		A		B		A		X_1[1]		A		B	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
2	50	4 ¼	108	2	51	1 ⅜	35	3 ⅝	92	2	51	3 ½	89	1 ⅜	35	3 ⅞	98	2 ⅛	54
3	80	5 ½	140	3	76	1 ⅝	41	4 ⅝	117	3	76	4 ½	114	1 ⅝	41	4 ¾	121	3 ⅛	79
4	100	5 ½	140	4	102	1 ½	38	4 ⅞	124	4	102	4 ½	114	1 ½	38	4 ⅞	124	4 ⅛	105

[1] X dimension is a nominal makeup dimension for layout only. Do not use for assembly dimensions.

Bell x Male (BxM)

Part	Part Number
2” BxM	012020-191-4
3” BxM	012030-191-4
4” BxM	012040-191-4

Bell x Female (BxF)

Part	Part Number
2” BxF	012020-194-4
3” BxF	012030-194-4
4” BxF	012040-194-4

Spigot x Male (SxM)

Part	Part Number
2” SxM	012020-192-4
3” SxM	012030-192-4
4” SxM	012040-192-4

Spigot x Female (SxF)

Part	Part Number
2” SxF	012020-195-4
3” SxF	012030-195-4
4” SxF	012040-195-4

Reducer Bushing

Pipe Size		A		X[1]	
in	mm	in	mm	in	mm
2 x 1	50 x 25	1 ¾	44	*	*
2 x 1 ¼	50 x 32	2	51	*	*
2 x 1 ½	50 x 40	1 ¾	44	*	*
3 x 2	80 x 50	2 ¼	57	1 ½	38
4 x 3	100 x 80	2 ⅜	60	1 ⅞	48

[1] X dimension is a nominal makeup dimension for layout only. Do not use for assembly dimensions.

* Also available with British Standard Threads. Specify when ordering.

Part	Part Number
2” x 1” Female NPT	012020-233-4
2” x 1 ¼” Female NPT	012020-232-4
2” x 1 ½” Female NPT	012020-231-4
3” x 2” Red. Bushing	012030-231-4
4” x 3” Red. Bushing	012040-231-4

Saddle

Pipe Size		A		B		X[1]	
in	mm	in	mm	in	mm	in	mm
2 x 1 ½	50 x 40	2 ⅞	73	4	102	1	25

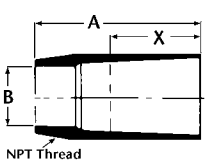
Part	Part Number
2” x 1½” Female NPT	012020-516-4

Nipple

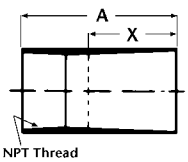
Part	Part Number
2” x 4”	012020-004-5
2” x 6”	012020-006-5
2” x 8”	012020-008-5
2” x 10”	012020-010-5
2” x 12”	012020-012-5
3” x 6”	012030-006-5
3” x 8”	012030-008-5
3” x 10”	012030-010-5
3” x 12”	012030-012-5

Part	Part Number
4” x 6”	012040-006-4
4” x 8”	012040-008-4
4” x 10”	012040-010-4
4” x 12”	012040-012-4

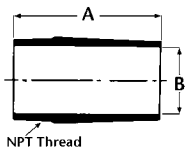
View of Fitting Illustrations



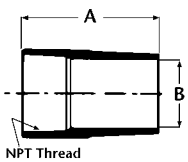
Threaded Adapter - BxM



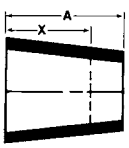
Threaded Adapter - BxF



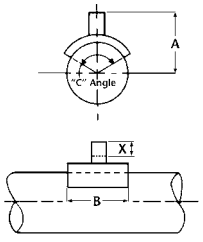
Threaded Adapter - SxM



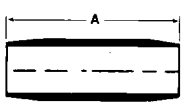
Threaded Adapter - SxF



Reducer Bushing



Saddles



Nipple

Secondary Containment Fittings

90°, 45° Elbow, Tee, Sleeve Coupling, Termination Fitting

Pipe Size		A		B		C		D		E		F		G	
in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm
3	80	6	152	7	178	14	356	3	76	2 ½	64	2 ½	64	8	203
4	100	7 ½	191	8	203	14	356	3	76	3	76	2 ½	64	8 ½	216
6	150	8	203	9	229	16	406	4	102	4	102	3	76	11	279

90° Elbow

Part	Part Number
3” 90° SC Elbow	012030-360-3
4” 90° SC Elbow	012040-360-3
6” 90° SC Elbow	012060-360-9

45° Elbow

Part	Part Number
3” 45° SC Elbow	012030-310-3
4” 45° SC Elbow	012040-310-3
6” 45° SC Elbow	012060-310-9

Tee

Part	Part Number
3” SC Tee	012030-410-3
4” SC Tee	012040-410-3
6” SC Tee	012060-410-9

Sleeve Coupling

Part	Part Number
3” SC Sleeve Coupling	012030-101-3
4” SC Sleeve Coupling	012040-101-3
6” SC Sleeve Coupling	012060-101-9

Termination Fitting

(with NPT TAP)

Part	Part Number
3” x 2” WITH ¾ NPT Tap	012030-236-3
4” x 3” WITH ¾ NPT Tap	012040-236-3
6” x 4” WITH ¾ NPT Tap	012060-234-7

Termination Fitting

(without TAP)

Part	Part Number
3” x 2” Without Tap	012030-235-3
4” x 3” Without Tap	012040-235-3
6” x 4” Without Tap	012060-235-9

Sleeve Coupling

(One-peice, scarfed O.D.)

Pipe Size		A		X[1]	
in	mm	in	mm	in	mm
2	50	5	127	2 ⅛	54
3	80	6	152	2 ⅜	60
4	100	6	152	2 ⅞	73

Part	Part Number
2” SC Sleeve Coupling	012020-101-9
3” SC Sleeve Coupling	012030-101-9
4” SC Sleeve Coupling	012040-101-9

Threaded Adapter

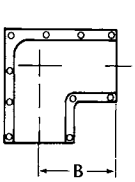
(Bell x Male, scarfed O.D.)

Pipe Size		A		B		X[1]	
in	mm	in	mm	in	mm	in	mm
2	50	4 ¼	108	2	51	1 ⅜	35
3	80	5 ½	140	3	76	1 ⅝	41
4	100	5 ½	140	4	102	1 ½	38

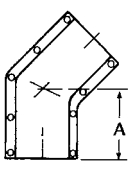
Part	Part Number
2” B x M Threaded Adapter	002020-191-7
3” B x M Threaded Adapter	002030-191-7
4” B x M Threaded Adapter	002040-191-7

[1] X dimension is a nominal makeup dimension for layout only. Do not use for assembly dimensions.

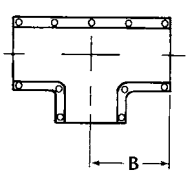
View of Fitting Illustrations



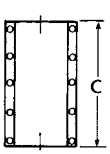
SC 90° Elbow



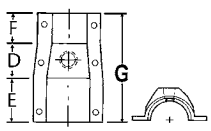
SC 45° Elbow



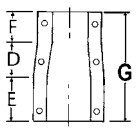
SC Tee



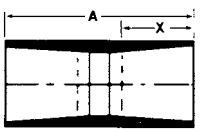
SC Sleeve Coupling



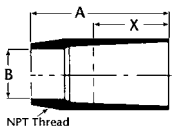
SC Temination Fitting with NPT Tap



SC Temination Fitting without Tap



Sleeve Coupling



Threaded Adapter - BxM

Crossover 45° Elbow, Crossover Tee, Crossover Nipple

Pipe Size		Crossover 45				Crossover Tee				Crossover Nipple (Overall Length "C")	
		A1		A2		B1		B2		6"	8"
in	mm	in	mm	in	mm	in	mm	in	mm	152 mm	203 mm
3	80	6	152	4 ¾	121	7	178	5 ½	140	†	-
4	100	7 ½	191	5 ½	140	8	203	6 ⅜	162	†	-
6	150	-	-	-	-	-	-	-	-	-	†

†Available from stock.

Crossover 45° Elbow

Part	Part Number
3" 45° SC Crossover	012030-311-3
4" 45° SC Crossover	012040-311-3

Crossover Tee

Part	Part Number
3" SC Crossover Tee	012030-411-3
4" SC Crossover Tee	012040-411-3

Crossover Nipple

(Scarf both ends)

Part	Part Number
3" x 6" Crossover Nipple	012030-006-7
4" x 6" Crossover Nipple	012040-006-7
6" x 8" Crossover Nipple	012060-008-7

Ruducer Bushing

(Scarfed O.D.)

Pipe Size		A		X(1)	
in	mm	in	mm	in	mm
3 x 2	80 x 50	2 ¼	57	1 ½	38
4 x 3	100 x 80	2 ⅜	60	1 ⅞	48

(1) X dimension is a nominal makeup dimension for layout only. Do not use for assembly dimensions.

Part	Part Number
3" x 2" Reducer Bushing	012030-231-7
4" x 3" Reducer Bushing	012040-231-7

Saddle

Pipe Size		A		B		X(1)	
in	mm	in	mm	in	mm	in	mm
3 x 2	80 x 50	4	102	6	152	1 ⅜	35
4 x 2	100 x 50	4 ½	114	6	152	1 ⅜	35
4 x 3	100 x 80	5 ¼	133	6	152	1 ⅝	41
3 x 1	80 x 25	3 ½	89	6	152	*	*
3 x 1 ¼	80 x 32	3 ½	89	6	152	*	*
3 x 1 ½	80 x 38	3 ½	89	6	152	*	*
4 x 1	100 x 25	4	102	6	152	*	*
4 x 1 ¼	100 x 30	4	102	6	152	*	*
4 x 1 ½	100 x 40	4	102	6	152	*	*

* NPT threads.

Centralizer

Part	Part Number
2" x 3" Centralizer	013020-650-3
3" x 4" Centralizer	013030-651-4
4" x 6" Centralizer	013040-650-6

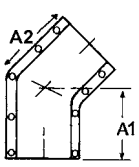
Belled Outlet

Part	Part Number
3" x 2" Saddle	012030-521-4
4" x 2" Saddle	012040-521-4
4" x 3" Saddle	012040-531-4

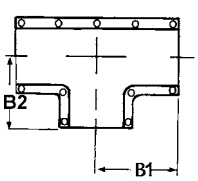
Female NPT Outlet

Part	Part Number
3" x 1" Saddle	012030-511-4
3" x 1 ¼" Saddle	012030-512-4
3" x 1 ½" Saddle	012030-516-4
4" x 1" Saddle	012040-511-4
4" x 1 ¼" Saddle	012040-512-4
4" x 1 ½" Saddle	012040-516-4

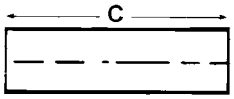
View of Fitting Illustrations



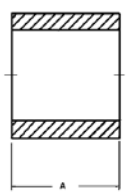
Crossover 45° Elbow



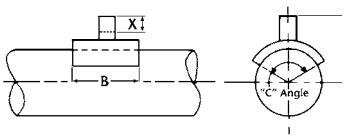
Crossover Tee



Crossover Nipple



Reducer Bushing



Saddle

Sump Fittings

Double Wall Bonded Sump Entry/ Termination Fitting

Pipe Size		A		B		C	
in	mm	in	mm	in	mm	in	mm
3 (3 x 2)	80 (80 x 50)	6 ⅞	175	4	102	4	102
4 (4 x 3)	100 (100 x 80)	6 ⅞	175	4	102	5	127

Part	Part Number
3” Bonded Fitting	012030-626-0
4” Bonded Fitting	012040-626-0

Double Wall Gasketed Sump Entry/ Termination Fitting

Pipe Size		A		B		C	
in	mm	in	mm	in	mm	in	mm
3 (3 x 2)	80 (80 x 50)	6 ⅞	175	4	102	4	102
4 (4 x 3)	100 (100 x 80)	6 ⅞	175	4	102	5	127

Part	Part Number
3” Gasketed Fitting	012030-620-0
4” Gasketed Fitting	012040-620-0

Bonded Sump Entry Fitting

Pipe Size		A		C	
in	mm	in	mm	in	mm
2	50	6	152	2 9⁄16	65
3	18	6	152	3 ¾	95
4	100	6	152	4 ¾	121
6	150	6	152	6 ⅞	175

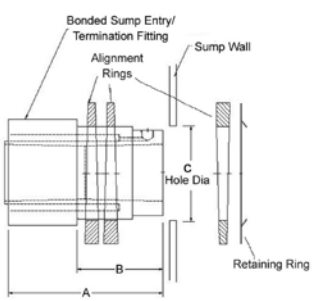
Part	Part Number
2” Bonded Fitting	012020-622-0
3” Bonded Fitting	012030-622-0
4” Bonded Fitting	012040-622-0
6” Bonded Fitting	012060-622-0

Concentric Reducer

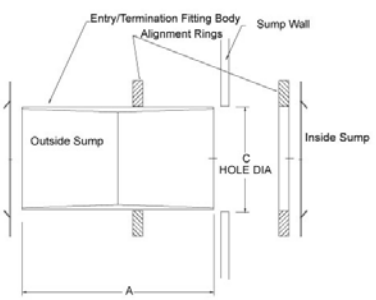
Pipe Size		G ± ⅛		H ± ⅛		I ± ⅛	
in	mm	in	mm	in	mm	in	mm
4 x 3	100 x 80	6	152	2 ½	64	2 ½	64
5 x 4	125 x 100	7	178	2 ½	64	2 ½	64
6 x 4	150 x 100	7	178	3 ¼	83	2 ¾	70

Part	Part Number
4” x 3” Concentric Reducer	012040-238-3
5” x 4” Concentric Reducer	012050-238-3
6” x 4” Concentric Reducer	012060-238-3

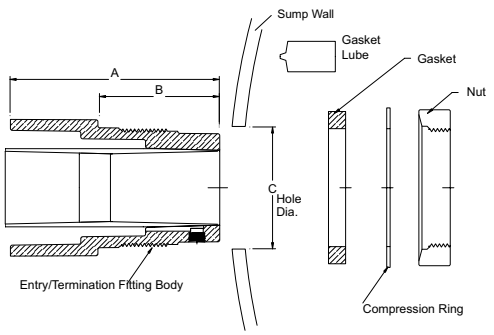
View of Fitting Illustrations



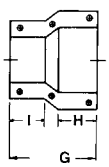
Double Wall Bonded



Bonded Sump Entry



Double Wall Gasketed



Concentric Reducer

Fiber Glass Systems
17115 San Pedro Avenue, Ste 200
San Antonio, Texas 78232 USA
Phone: 210 477 7500
Fax: 210 477 7560

NSF International
(National Sanitation Foundation)

ANSI/NSF Standard No. 61 (Drinking Water System Components—Health Effects) Listing: Note: Standard No. 61 was developed by a consortium and with support from the U.S. Environmental Protection Agency under cooperative agreement No. CR-812144:

2"-24" Red Thread II Pipe and Fittings
1"-36" Green Thread Pipe and Fittings
3033 and 8000 Series (Epoxy Adhesive)
F-Chem Pipe (1)
F-Chem Fittings (1)

(1) Piping greater than 14" diameter using NSF Listed resin system.

Underwriters Laboratories Inc. (UL) and Underwriters' Laboratories of Canada (ULC)
Red Thread II pipe and compatible primary fittings, along with secondary containment pipe and fittings, and adhesives are listed for use in conveying petroleum products, alcohols, and alcohol-gasoline mixtures including ethanol, methanol and MTBE underground (UL). The primary pipe sizes are 2", 3" and 4"; the secondary containment pipe and fittings sizes are 3", 4", and 6".

These products are listed for use in conveying petroleum products, gasoline mixtures and up to 100% ethanol underground (ULC).

TABLE 6.1 Table for Use in Classifying Fiberglass Flanges to ASTM D4024

	Type	Grade	Class	Pressure Rating Designation*	Property Designation
Filament Wound (FW)	1				
Compression Molded	2				
Resin-Transfer Molded	3				
Centrifugally Cast	4				
Epoxy Resin		1			
Polyester Resin		2			
Furan Resin		3			
Integrally-Molded (mfg. on pipe/fitting)			1		
Taper to Taper Adhesive Joint			2		
Straight to Taper Adhesive Joint			3		
Straight Adhesive Joint			4		
*Gauge Pressure (psig) (Flanges must withstand a pressure of 4 times the rating without damage to the flange)					
50				A	
100				B	
150				C	
200				D	
250				E	
300				F	
400				G	
500				H	

PROPERTY	0	1	2	3	4	5	6	7	8
Burst Pressure (psig)	(unspecified)	200	400	600	800	1000	1200	1600	2000
Sealing Test Pressure (psig)		75	150	225	300	375	450	600	750
Bolt Torque Limit (ft.•lbs.)		20	30	50	75	100	125	150	200