



GFS-H₂

the future of CSST

Hydrogen ready products



THINK SAFE
THINK
GFS

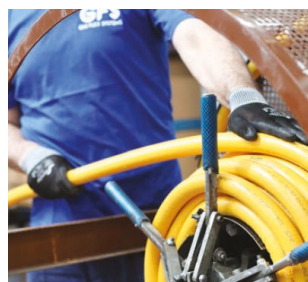
DESIGN AND INSTALLATION GUIDE

A corrugated stainless steel tubing system with secondary containment sleeve for gas installations in buildings.

gfsflex.com

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This design and installation guide relates only to the installation of GFS P-Max®.

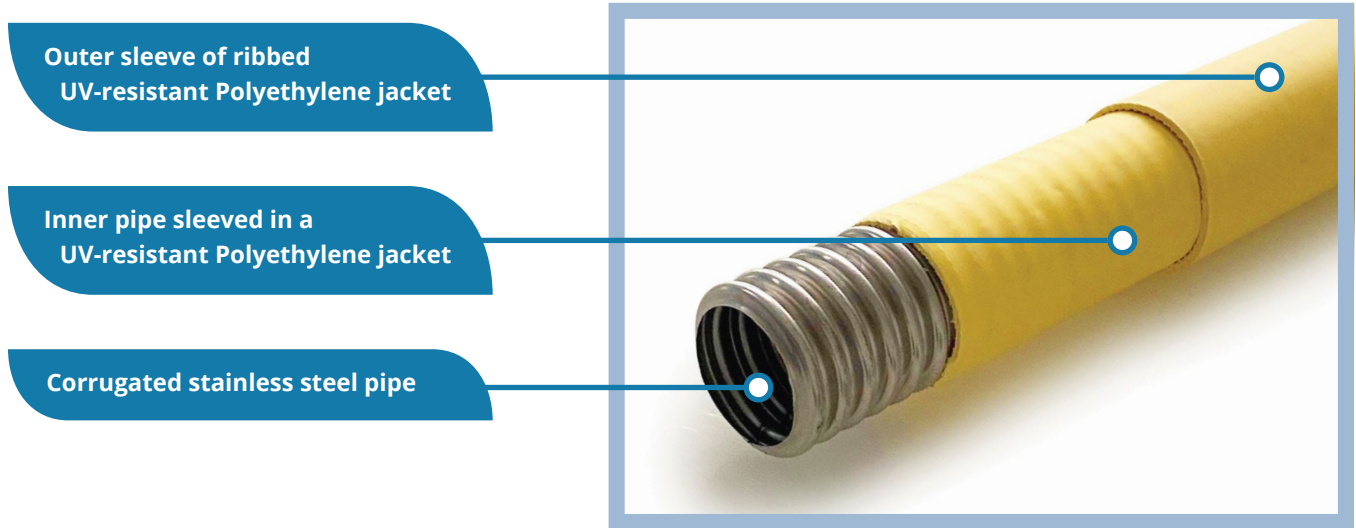
This guide should be used in conjunction with the latest edition GFS Design & Installation Guide which is available to download at www.gfsflex.com/downloads.

GFS P-Max® features an integrated containment sleeve which wraps around the inner GFS CSST, a stainless steel metal hose with a corrugated construction. It conforms to EN 10380 produced in 316L (1,4404) stainless steel to EN 10028-7 standards.

The outer sleeve is ridged on the underside, creating space between the outer sleeve and the pipe jacket, allowing any gas to ventilate in the event of a leak.




FEATURES AND BENEFITS OF GFS P-MAX[®]



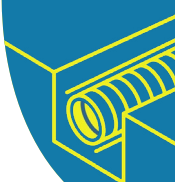
Outer sleeve of ribbed UV-resistant Polyethylene jacket

Inner pipe sleeved in a UV-resistant Polyethylene jacket


Corrugated stainless steel pipe




Negates the need to install a secondary containment sleeve when passing through unvented voids.




Can be direct buried in the ground or screed without further mechanical protection. Minimal burial depths apply.




Can be used on horizontal runs and compliant on vertical runs. Ridges on the internal surface offer support to the internal pipe whilst maintaining a free space for the movement of gas should there be an escape.




Installs up to 70% quicker than traditional piping methods – saving both time and labour costs.




Suitable for install in areas such as escape corridors, lobbies and protected shafts when installed in one continuous length with no joints.



No hot works make GFS P-Max[®] a quicker, safer choice too.



Flexible forming by hand, making installation in even complex structures easy.



Compatible with our “Push to Seal” innovative fittings.

GFS H₂

the future of CSST



AN INDUSTRY FIRST

In a first for any CSST manufacturer; GFS CSST and our EN14800 cooker hoses have been approved by BSI for use with Hydrogen.

Tested and approved by BSI covering use with 98% with hydrogen gas and methanol hydrogen blends.

DN15 UP TO DN50



We're certified for Hydrogen. We're the first CSST manufacturer to be certified for hydrogen use on its products. Not only is this a first, but it's future proofing our CSST system. All current and future projects are certified, as there's no change to our existing product range. GFS EN14800 domestic cooker hoses are also certified for use with Hydrogen.

The recent test at Keele University showed it was possible to continue using appliances built to run on natural gas by using a mix of 20% hydrogen, 80% natural gas.

Unlike natural gas, which releases carbon dioxide when it's burned, burning hydrogen only releases water. That means it has the potential to be a zero-carbon fuel.



TAKE OFF SERVICE

We offer a FREE sizing and 'Take Off' service from any drawings | plans or gas schematics. Our technical team will provide a detailed, but simple proposed sizing and Take Off for your project, including a bill of materials.

We manufacture 3 CSST systems to cover any project type and installation requirement.



CUSTOMER MEETING ROOM

We have a customer meeting room onsite at our offices in St. Albans.



TECHNICAL SPECIFICATIONS

Material specifications

- **Tubing:** stainless steel 1.4404 - 316L
- **Inner sleeve:** UV resistant polyethylene
- **Outer jacket:** ribbed, UV resistant polyethylene

DN size	Outer diameter with both sleeves	Outer diameter inner sleeve	Outer diameter no sleeves	Inside diameter	Lengths available (m)
DN15	22.5	20.9	19.9	16.0	30,75
DN20	28.9	26.4	25.4	20.0	30,75
DN25	34.0	32.4	31.4	25.4	30,45,75,90
DN32	43.4	41.8	40.8	33.0	45,75,90
DN40	50.6	49.0	48.0	40.7	45,75
DN50	62.9	61.3	60.3	50.8	45.0



GFS P-Max® product range

Part number	Product description	Package quantity
15266-FLX-15-30MAX	DN15 GFS P-MAX CSST Sleeved Coil	30M Coil
15266-FLX-15-45MAX	DN15 GFS P-MAX CSST Sleeved Coil	45M Coil
15266-FLX-15-60MAX	DN15 GFS P-MAX CSST Sleeved Coil	60M Coil
15266-FLX-15-75MAX	DN15 GFS P-MAX CSST Sleeved Coil	75M Coil
15266-FLX-15-90MAX	DN15 GFS P-MAX CSST Sleeved Coil	90M Coil
15266-FLX-20-30MAX	DN20 GFS P-MAX CSST Sleeved Coil	30M Coil
15266-FLX-20-45MAX	DN20 GFS P-MAX CSST Sleeved Coil	45M Coil
15266-FLX-20-60MAX	DN20 GFS P-MAX CSST Sleeved Coil	60M Coil
15266-FLX-20-75MAX	DN20 GFS P-MAX CSST Sleeved Coil	75M Coil
15266-FLX-20-90MAX	DN20 GFS P-MAX CSST Sleeved Coil	90M Coil
15266-FLX-25-15MAX	DN25 GFS P-MAX CSST Sleeved Coil	15M Coil
15266-FLX-25-30MAX	DN25 GFS P-MAX CSST Sleeved Coil	30M Coil
15266-FLX-25-45MAX	DN25 GFS P-MAX CSST Sleeved Coil	45M Coil
15266-FLX-25-60MAX	DN25 GFS P-MAX CSST Sleeved Coil	60M Coil
15266-FLX-25-75MAX	DN25 GFS P-MAX CSST Sleeved Coil	75M Coil
15266-FLX-25-90MAX	DN25 GFS P-MAX CSST Sleeved Coil	90M Coil
15266-FLX-32-30MAX	DN32 GFS P-MAX CSST Sleeved Coil	30M Coil
15266-FLX-32-45MAX	DN32 GFS P-MAX CSST Sleeved Coil	45M Coil
15266-FLX-32-60MAX	DN32 GFS P-MAX CSST Sleeved Coil	60M Coil
15266-FLX-32-75MAX	DN32 GFS P-MAX CSST Sleeved Coil	75M Coil
15266-FLX-32-90MAX	DN32 GFS P-MAX CSST Sleeved Coil	90M Coil
15266-FLX-40-30MAX	DN40 GFS P-MAX CSST Sleeved Coil	30M Coil
15266-FLX-40-45MAX	DN40 GFS P-MAX CSST Sleeved Coil	45M Coil
15266-FLX-40-60MAX	DN40 GFS P-MAX CSST Sleeved Coil	60M Coil
15266-FLX-40-75MAX	DN40 GFS P-MAX CSST Sleeved Coil	75M Coil
15266-FLX-40-90MAX	DN40 GFS P-MAX CSST Sleeved Coil	90M Coil
15266-FLX-50-30MAX	DN50 GFS P-MAX CSST Sleeved Coil	30M Coil
15266-FLX-50-45MAX	DN50 GFS P-MAX CSST Sleeved Coil	45M Coil
15266-FLX-50-60MAX	DN50 GFS P-MAX CSST Sleeved Coil	60M Coil



Custom lengths also available.

GUIDE TO WORKING WITH GFS P-MAX®

GFS P-Max® is compatible with our “Push and Seal” fittings which should be installed as per the manufacturer’s instructions. For more detailed information on the complete fitting range, see section 2.3 of the GFS Design & Installation Guide, available to download from www.gfsflex.com/downloads



STEP 1 – Cut the pipe to length

Using a cutter designed to cut stainless steel, cut GFS P-Max® to the desired length by placing the cutter’s rollers between two of the pipe’s corrugations. Using light pressure, rotate the cutter in one direction to create a neat cut. To ensure a quality flare, all cuts should be made on a straight section of the tubing.



STEP 2 – Remove outer sleeve

Using the GFS hose peeler (15266-BKM-02 or 15266-BKM-03) place onto the outer sleeve approximately 100mm from the cut edge of the pipe. After a minimum of three rotations, you will have cut through the outer sleeve without damage to the inner jacket below.



STEP 3 – Twist and pull to remove unwanted sleeve

To fully remove the outer sleeve, place a hand either side of the cut and simply twist and pull the unwanted sleeve off and away from the pipe whilst firmly holding the other side securely in your other hand.



STEP 4 – Remove inner jacket

Using the GFS hose peeler (15266-BKM-02 or 15266-BKM-03) place onto the inner jacket approximately 30mm from the cut edge of the pipe. After a minimum of three rotations, you will have cut through the inner jacket without damage to the stainless-steel pipe below. Remove the unwanted jacket by simply sliding off and away from the pipe.



STEP 5 – Attach fittings

Your length of GFS P-Max® is now ready for the “Push and Seal” fitting to be attached.

STRAIGHT, REDUCED AND COMPRESSION COUPLERS

Product code	Description	Size
15266-DRC-01	GFS DN20 X DN15 REDUCING COUPLING	DN20 X DN15
15266-DRC-02	GFS DN25 X DN20 REDUCING COUPLING	DN25 X DN20
15266-DRC-03	GFS DN32 X DN25 REDUCING COUPLING	DN32 X DN25
15266-NRC-01	GFS DN15 COUPLING	DN15 X DN15
15266-NRC-02	GFS DN20 COUPLING	DN20 X DN20
15266-NRC-03	GFS DN25 COUPLING	DN25 X DN25
15266-NRC-04	GFS DN32 COUPLING	DN32 X DN32
15266-NRC-05	GFS DN40 COUPLING	DN40 X DN40
15266-NRC-06	GFS DN50 COUPLING	DN50 X DN50
15266-CAD-01	GFS DN15 X 15MM REDUCING COUPLING	DN15 X 15MM
15266-CAD-02	GFS DN20 X 15MM REDUCING COUPLING	DN20 X 15MM
15266-CAD-03	GFS DN20 X 22MM REDUCING COUPLING	DN20 X 22MM
15266-CAD-04	GFS DN25 X 22MM REDUCING COUPLING	DN25 X 22MM
15266-CAD-05	GFS DN25 X 28MM REDUCING COUPLING	DN25 X 28MM
15266-CAD-06	GFS DN32 X 28MM REDUCING COUPLING	DN32 X 28MM
15266-CAD-07	GFS DN32 X 35MM REDUCING COUPLING	DN32 X 35MM
15266-CAD-08	GFS DN32 X 22MM REDUCING COUPLING	DN32 X 22MM

STRAIGHT CONN MI

Product code	Description	Size
15266-SCM-01	GFS DN15 X 1/2" STRAIGHT CONN MI	DN15 X 1/2"
15266-SCM-02	GFS DN15 X 3/4" STRAIGHT CONN MI	DN15 X 3/4"
15266-SCM-03	GFS DN20 X 1/2" STRAIGHT CONN MI	DN20 X 1/2"
15266-SCM-04	GFS DN20 X 3/4" STRAIGHT CONN MI	DN20 X 3/4"
15266-SCM-05	GFS DN20 X 1" STRAIGHT CONN MI	DN20 X 1"
15266-SCM-06	GFS DN25 X 1/2" STRAIGHT CONN MI	DN25 X 1/2"
15266-SCM-07	GFS DN25 X 3/4" STRAIGHT CONN MI	DN25 X 3/4"
15266-SCM-08	GFS DN25 X 1" STRAIGHT CONN MI	DN25 X 1"
15266-SCM-09	GFS DN25 X 1 1/4" STRAIGHT CONN MI	DN25 X 1 1/4"
15266-SCM-10	GFS DN32 X 1/2" STRAIGHT CONN MI	DN32 X 1/2"
15266-SCM-11	GFS DN32 X 3/4" STRAIGHT CONN MI	DN32 X 3/4"
15266-SCM-12	GFS DN32 X 1" STRAIGHT CONN MI	DN32 X 1"
15266-SCM-13	GFS DN32 X 1 1/4" STRAIGHT CONN MI	DN32 X 1 1/4"
15266-SCM-14	GFS DN40 X 1 1/2" STRAIGHT CONN MI	DN40 X 1 1/2"
15266-SCM-15	GFS DN50 X 1 1/4" STRAIGHT CONN MI	DN50 X 1 1/4"
15266-SCM-16	GFS DN50 X 2" STRAIGHT CONN MI	DN50 X 2"

MALE IRON TEST POINT

Product code	Description	Size
15266-STN-01	GFS DN20 X 3/4" STRAIGHT CONN MI C/W TEST POINT	DN20 X 3/4"
15266-STN-02	GFS DN25 X 1" STRAIGHT CONN MI C/W TEST POINT	DN25 X 1"
15266-STN-03	GFS DN32 X 1 1/4" STRAIGHT CONN MI C/W TEST POINT	DN32 X 1 1/4"

STRAIGHT CONN FI

Product code	Description	Size
15266-FRD-01	GFS DN15 X 1/2" STRAIGHT CONN FI	DN15 X 1/2"
15266-FRD-02	GFS DN15 X 3/4" STRAIGHT CONN FI	DN15 X 3/4"
15266-FRD-03	GFS DN20 X 1/2" STRAIGHT CONN FI	DN20 X 1/2"
15266-FRD-04	GFS DN20 X 3/4" STRAIGHT CONN FI	DN20 X 3/4"
15266-FRD-05	GFS DN25 X 1/2" STRAIGHT CONN FI	DN25 X 1/2"
15266-FRD-06	GFS DN25 X 3/4" STRAIGHT CONN FI	DN25 X 3/4"
15266-FRD-07	GFS DN25 X 1" STRAIGHT CONN FI	DN25 X 1"
15266-FRD-08	GFS DN32 X 1 1/4" STRAIGHT CONN FI	DN32 X 1 1/4"

TEE'S

Product code	Description	Size
15266-RTE-01	GFS DN20 X DN15 X DN15 REDUCING TEE	DN20 X DN15 X DN15
15266-RTE-02	GFS DN20 X DN20 X DN15 REDUCING TEE	DN20 X DN20 X DN15
15266-RTE-03	GFS DN25 X DN20 X DN15 REDUCING TEE	DN25 X DN20 X DN15
15266-RTE-04	GFS DN20 X DN20 X DN25 REDUCING TEE	DN20 X DN20 X DN25
15266-RTE-05	GFS DN25 X DN20 X DN25 REDUCING TEE	DN25 X DN20 X DN25
15266-RTE-06	GFS DN25 X DN20 X DN20 REDUCING TEE	DN25 X DN20 X DN20
15266-RTE-07	GFS DN25 X DN25 X DN15 REDUCING TEE	DN25 X DN25 X DN15
15266-RTE-08	GFS DN25 X DN25 X DN20 REDUCING TEE	DN25 X DN25 X DN20
15266-RTE-09	GFS DN25 X DN25 X DN32 REDUCING TEE	DN25 X DN25 X DN32
15266-RTE-10	GFS DN32 X DN25 X DN25 REDUCING TEE	DN32 X DN25 X DN25
15266-RTE-11	GFS DN32 X DN25 X DN32 REDUCING TEE	DN32 X DN25 X DN32
15266-RTE-12	GFS DN32 X DN32 X DN25 REDUCING TEE	DN32 X DN32 X DN25
15266-ETE-01	GFS DN15 EQUAL TEE	DN15 X DN15 X DN15
15266-ETE-02	GFS DN20 EQUAL TEE	DN20 X DN20 X DN20
15266-ETE-03	GFS DN25 EQUAL TEE	DN25 X DN25 X DN25

ELBOW

Product code	Description	Size
15266-ELB-01	GFS DN20 X 3/4" ELBOW 90 DEGREE MI	DN20 x 3/4"
15266-ELB-02	GFS DN25 X 1" ELBOW 90 DEGREE MI	DN25 X 1"
15266-ELB-03	GFS DN32 X 1 1/4" ELBOW 90 DEGREE MI	DN32 X 1 1/4 "

HOSE CUTTER AND PEELER

Product code	Description	Size
15266-BKM-01	GFS HOSE CUTTER	DN15 - DN25
15266-BKM-02	GFS HOSE PEELER	UP TO DN32
15266-BKM-03	GFS HOSE PEELER	UP TO DN50
15266-BKM-04	GFS HOSE CUTTER	DN32 - DN50

ACCESSORIES

Product code	Description	Size
15266-IDC-15	GFS DN15 SILICON GASKET	DN15
15266-IDC-20	GFS DN20 SILICON GASKET	DN20
15266-IDC-25	GFS DN25 SILICON GASKET	DN25
15266-IDC-32	GFS DN32 SILICON GASKET	DN32
15266-IDC-40	GFS DN40 SILICON GASKET	DN40
15266-IDC-50	GFS DN50 SILICON GASKET	DN50
15266-SCO-01	GFS DN15 WASHER BRASS	DN15
15266-SCO-02	GFS DN20 WASHER BRASS	DN20
15266-SCO-03	GFS DN25 WASHER BRASS	DN25
15266-SCO-04	GFS DN32 WASHER BRASS	DN32
15266-SCO-05	GFS DN40 WASHER BRASS	DN40
15266-SCO-06	GFS DN50 WASHER BRASS	DN50
15266-SAT-25	GFS SELF-AMALGAMATING TAPE 25 MM	25 MM
15266-SAT-50	GFS SELF-AMALGAMATING TAPE 50 MM	50 MM

GFS CSST SLEEVING

Product code	Description	Length
15266-SLV-01	GFS SLEEVE DN15-DN20-DN25	30M
15266-SLV-02	GFS SLEEVE DN32-DN40	30M

GFS SUPAWRAP

Product code	Description	Length
15266-SLV-01	GFS CSST Supawrap DN15-DN32	DN15,20,25 and 32
15266-SLV-02	GFS CSST Supawrap DN40-DN50	DN40 and 50

USER WARNINGS

All gas installation work shall be carried out by a business or self-employed operative who is a member of a class of persons approved by the Health and Safety Executive (HSE).

The current registration body is the Gas Safe Register. Acceptable certificates of competence are those issued under the:

- Nationally Accredited Certification Scheme (ACS) for individual gas fitting operatives.
- Scottish/National Vocational Qualifications (NVQ) that have been aligned to ACS in matters of gas safety.

Only those components provided or specified by GFS as part of the approved Corrugated Stainless Steel Tube (CSST) system are to be used in the installation.

The GFS system of CSST and fittings is not compatible with other manufacturer's flexible gas piping systems. It is important to note that any mixing of products may result in failure of the system with potentially serious consequences.

All gas appliances and other gas fittings must be installed with due regard to the manufacturer's installation instructions, the Gas Safety (Installation and Use) Regulations 1998 and the relevant requirements of the Building Regulations and British Standards.

Improper installation methods or procedures could lead to accidents such as explosions, fires, gas poisoning, asphyxiation, etc.

The GFS CSST system shall be installed with strict adherence to this guide as well as local building regulation.

All installed systems must pass installation inspections by the authorized local building official prior to being placed in service. GFS shall have no responsibility for any misinterpretation of the information contained in this guide or any improper installation or repair work or other deviation from procedures recommended in this guide, whether pursuant to local building regulations or engineering specifications or otherwise.

NOTE: Users of GFS P-Max® must liaise with those responsible for building control and, if appropriate, the home warranty provider to establish their preferred method of installation.

Although the GFS CSST system provides significant advantages over more rigid gas delivery systems, its wall dimensions may make it more likely than steel tubing to be punctured by a nail or other sharp objects, or damaged by other extraordinary forces such as a lightning strike, depending on the circumstances.

The user must ensure that the system is properly bonded and grounded. No naked flame shall be used in the vicinity of any part of the GFS CSST system.

Caution CSST tube ends are sharp. Use care when handling. CSST shall not be used as a flexible appliance connector.

GENERAL INFORMATION

Planning and sizing

When designing an installation, piping size shall be determined by the maximum gas rate of the appliances to be connected.

For further advice and discharge rates, refer to the GFS Design & Installation Guide which is available to download at www.gfsflex.com/downloads.

Sleeving

When passing through unvented voids, GFS P-Max® works as a pipe in pipe solution meaning no additional sleeving is required.

Pipework passing through solid walls and floors still need to be sleeved as per BS 6891.

Upon installation the entire length of the pipe must be inspected for damage. Should any damage have occurred, it must be repaired using GFS self-amalgamating tape. (15266-SAT-25).

Fittings

GFS P-Max® has been designed to work with GFS "Push and Seal" fittings. Fittings must always be installed in a well-ventilated, accessible area and must not be buried. Ensure fittings can be always accessed, GFS P-Max® must not be joined or teed in an unventilated area.



Vertical installations

According to installation standard BS 6891, all pipework must be adequately supported. The ridges within GFS P-Max® offer support to the internal pipe whilst also maintaining channels for the free movement of gas should an escape occur. GFS P-Max® can be clipped, ensuring it is properly secured.

Burial

As per manufacturer's instructions, GFS P-Max® is suitable for both internal and external burial. For burial depths contact info@gfsflex.com.

Fire safety

When installing GFS P-Max® in a protected shaft containing a stair/lift or other protected fire escape route, it must be installed in a continuous length with no joints. The inner pipe of GFS P-Max® is fire rated/tested at 820° for over 30 minutes under EN 1775:007 Annex A.

Best practice

When working with GFS P-Max® best installation practice should always be followed. When working within domestic environments the installation standard is BS 6891 and for commercial installations follow IGEMUP2.

Safety precautions

Safety must always come first and GFS P-Max® should only be installed by a Gas Safe registered installer. Further safety guidance can be found within the full GFS Design & Installation Guide.

Commissioning

Upon successful installation a record should be made for future maintenance/inspections that GFS P-Max® has been installed and that the void therefore does not require additional ventilation.

REFERENCES/ SUPPORTING DOCUMENTS

See section 1.1 of current Design & Installation Guide, available to download from www.gfsflex.com/downloads.

WARRANTY

Gas Flex Systems ("GFS") hereby provides a warranty that its GFS® Products will be free from any defect of workmanship and material. If any of the GFS® Products are determined to be defective, the measure of the damage is the price of the defective goods only. No charge for labour or expense required to repair defective goods, or occasioned by them, will be allowed. GFS® shall have no liability whatsoever for any amount in excess of the price paid for the product. Should any defect of the GFS® Product be claimed, the proposed defective product must be returned to GFS®. The obligation of GFS® under this warranty is, at its discretion, may replace the defective product, repair the defective product, or refund the purchase price paid for the product following proof of purchase of its product.

Exceptions

This warranty shall not apply to any part or parts of the GFS® Products if it has been installed, altered, repaired, or misused, through negligence or otherwise, in a way that in the opinion of GFS® affects the reliability of, or detracts from, the performance of the product. Nor does this warranty cover replacements or repairs necessitated by loss or damage resulting from any cause beyond the control of GFS®, including but not limited to acts of God, acts of government, floods or fires.

In order for the GFS® warranty to apply; its installation must have been performed strictly in accordance with local plumbing and/or building regulations, and in accordance with the GFS® Installation Guide. The GFS® limited will only apply if the GFS® product was installed by a Qualified Installer.

THE FOREGOING IS IN LIEU OF ANY OTHER WARRANTIES EXPRESSED, IMPLIED OR STATUTORY, INCLUDING, WITHOUT LIMITATION, THE IMPLIED WARRANTY OF MERCHANTABILITY, AND GFS® NEITHER ASSUMES NOR AUTHORIZES ANY PERSON TO ASSUME FOR GFS® ANY OTHER OBLIGATION OR LIABILITY IN CONNECTION WITH THE SALE OF ITS PRODUCTS.

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