SIDR
3G Fittings

Philmac

The connection you can trust.

Technical Manual

CONTENTS

Committed to sustainable development, Philmac is well renowned for quality products and services. Philmac manufactures pipe fittings and valves under a Quality Assurance System assessed and approved to ISO 9001-2000 and has obtained the prestigious environmental management certification ISO 14000. Philmac has a NATA accredited laboratory and tests fittings and valves to international and national standards. Third party accreditation is carried out by SAI Global.

Metric version published May 2022

Reference Number: PHI1110

NATA Accredited Laboratory Number: 14673

Certified to NSF/ANSI/CAN 61

Disclaimer

Please note that the information, opinions, recommendations and advice given in this manual are supplied only to provide an improved understanding of the technical aspects of fitting systems.

So far as the law allows, Philmac Pty Ltd will not accept liability in respect of any loss or damage of any kind claimed to arise as a result of reliance upon any information claimed in this manual.

Please refer to our Terms and Conditions of sale.

ID Series fittings for IPS Inside Dimensioned (SIDR) PE Pipe (suits PE to ASTM D2239)

3G™ ID Series compression fittings represent the next generation of Philmac fittings for ID Series pipe.

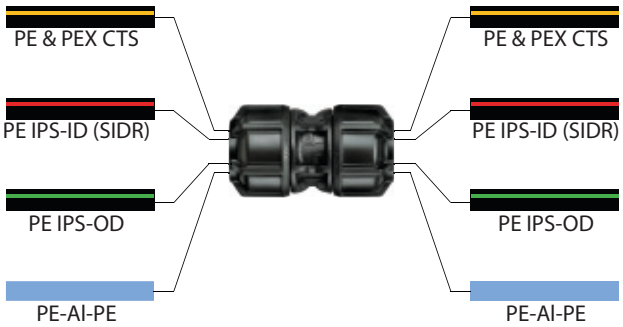
Offering complete flexibility, this one fitting connects to all types of ID Series pipe, thereby eliminating the need to carry dedicated fittings.

Installation is easy with a simple to use insert assembly, and the fitting allows for straightforward disconnection and reconnection.

Importantly, the fitting has been manufactured from high performance, advanced thermoplastic materials so it is resistant to corrosion and has the strength and durability to provide a 50+ year service life.

The 3G™ ID Series plastic compression fitting is the product of Philmac's unrelenting commitment to continuous improvement and a culture based on innovation and ingenuity.

Common Body enables Cross Connection Between Different Pipe Standard



The innovative design of the 3G® fitting uses a common body across the entire range. By simply changing the connection components 3G® can connect to pipes from all the major standards including CTS, IPS-OD, IPS-ID, Kitec XPA pipes.

By installing a Conversion Kit any fitting can be used to join pipes of different standards. Couplers and Elbows can be used and a Tee can be used to connect three pipes all of different standards.

Complete range

The SIDR 3G® compression fittings range is comprehensive: straight and reducing couplers, tees, elbows, male and female adapters and caps ranging from 1/2" to 2".

Standards and Tests

Philmac 3G® range of compression fittings hold certificates for the following standards:

NSF-61 (USA & Canada),

Fitting materials approved for use in drinking water applications.

BS 6920, (United Kingdom and Middle East)

Fitting materials approved for use in drinking water applications.

ACS, (France)

Fitting materials approved for use in drinking water applications.

AS/NZS 4020, (Australia)

Testing of products for use in contact with drinking water.

B137 .1:2 2017 (Canada)

Polyethylene pipe, tubing and fittings for cold water pressure services.

Philmac 3G® fittings meet the following thread standards:

ANSI/ASME B1.20.1,

Pipe threads, General purpose (inch).

ASTM F1498,

Standard specification for tapered pipe threads 60° for thermoplastic pipe and fittings.

AS/ISO 7.1,

Pipe threads where pressure joints are made on the threads. Part 1 Dimensions, tolerances and designations.

3G® fittings meet the requirements of the following codes:

AWWA C800,

Underground Service line valves and fittings. Philmac 3G® fittings comply with the relevant dimensional and performance requirements of AWWA C800.

ISO 14236,

Plastic pipe and fittings - Mechanical joint compression fittings use with polyethylene pipes in water supply systems

ASTM D2565,

UV Resistance, Grade 8. 3G® fittings are rated 8 on a 1 to 8 scale.

Philmac tests the 3G® fitting range using the following test methods:

ASTM D2444,

Standard Test Method for Determination of the Impact Resistance of Thermoplastic Pipe and Fittings by Means of a Tup (Falling Weight).

ASTM D1598,

Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure.

ASTM F 1674,

Standard Test Method for Joint Restraint Products for Use with PVC Pipe.

ASTM F 2164,

Standard Practice for Field Leak Testing of Polyethylene (PE) Pressure Piping Systems Using Hydrostatic Pressure.

3G® fittings are designed for connection to PE pipes and tubes manufactured to the following specifications:

ASTM D2737,

Standard Specification for Polyethylene (PE) Plastic Tubing to Copper Tube Size (CTS) dimensions.

ASTM F876,

Standard Specification for Crosslinked Polyethylene (PEX) Tubing to Copper Tube Size (CTS) dimensions.

ASTM D2239,

Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter (IPS-ID or ID-Series).

ASTM D3035,

Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter (IPS-OD or SDR).

ASTM D2447,

Standard Specification for Polyethylene (PE) Plastic Pipe, Schedules 40 and 80, Based on Outside Diameter.

ASTM F1282,

Standard Specification for Polyethylene/Aluminum/Polyethylene (PE-AL-PE) Composite Pressure Pipe

ASTM F1281,

Standard Specification for Crosslinked Polyethylene/Aluminum/Crosslinked Polyethylene (PEX-AL-PEX) Pressure Pipe.

ASTM B88,

Standard Specification for Seamless Copper Tube, Type K, L & M

3G® Engineered for Strength

Philmac 3G® High-Performance Fittings are stronger than the pipe

Under an endload test the length of 2" SIDR pipe failed before the

3G® ID-Series fitting.

CSA INTERNATIONAL

Certificate of Compliance

Certificate: 1616428 **Master Contract:** 152989

Project: 1616428 **Date Issued:** 2005/06/21

Issued to: **Philmac Pty. Limited**
53 Deeds Rd
North Plympton
South Australia, South Australia 5037
Australia
Attention: Mr. Leigh Bunting

The products listed below are eligible to bear the CSA Mark shown with adjacent indicators 'C', 'US' and ▲

C US
Drinking Water
NSF/ANSI 61

Issued by: Franco DiFolco, B.Sc.,C.Chem

Authorized by: Nick Alfano, Operations Manager

PRODUCTS

CLASS 6861 04 - PIPES AND RELATED PRODUCTS - ANSI/NSF 61 SECTION 4 - Certified to ANSI/NSF 61

3G Fittings – (Material evaluated for use in contact with drinking water only)

3G Fitting Model Numbers:

End Cap Assemblies: 99312200, 99412200, 99313300, 99413300, 99314400, 99414400, 99315500, 99415500, 99316600, 99416600, and 99417700

DQD 507 Rev. 2004-06-30

NSF®

Certified to NSF/ANSI/CAN 61

System Design Considerations

Projected life of Compression fittings

Whilst Philmac 3G™ Compression fittings conforms to institutionalized specifications written to have a minimum life of 50 years, its compression fittings are intentionally developed to exceed the expectations of these specifications.

Head Losses

To calculate head loss, fittings can be replaced with an equivalent length of pipe. The following formula is used to estimate this equivalent length of PE pipe based on the conveyance of water;

L (feet) = ID (inch) x F
where L = head loss based on equivalent pipe length (feet)
ID = pipe inner diameter (inch)
F = fitting constant

Fitting	Fitting Constant (F)
90° elbow	2.5
90° tee - straight through	1
90° tee - side branch	5

Resistance to Impact

The thermoplastic materials used in the Philmac 3G™ Compression fittings have excellent impact properties.

Abrasion Resistance

Philmac 3G™ Compression fittings are suitable for the transportation of abrasive slurries and will withstand normal conditions found in urban, mining, industrial, rural water and waste water systems.

Weathering

The materials used contain pigments to provide excellent protection to degradation due to ultra-violet radiation. Continuous use of the Philmac 3G™ Compression fittings in systems above ground is therefore permissible without additional protection.

Electrolytic Corrosion - 'Dielectric' fitting

Philmac 3G™ Compression fittings are non magnetizing and does not cause electrolytic deterioration.

Thermal Insulation

Polypropylene has natural thermal insulation of 2000 times over copper and 200 times over steel.

Light Transmission

The all black Philmac 3G™ Compression fittings do not transmit light, thus protecting the water quality in potable water pipelines from growth of micro organizms.

Effect on Water

Philmac 3G™ Compression fittings do not impart to water any odor, taste, color, or any constituents in concentrations that could be injurious to health.

Temperature

3G Compression fittings are designed for cold water applications only. Exposure to elevated temperatures has a significant impact on the lifetime of the fittings. All projected lifetimes are based on an operating temperature of 73 degrees Fahrenheit.

Fluids other than Water

Many factors can affect the chemical resistance of plastics. Some of these include temperature, pressure, exposure time, continuous or cyclic expose and the type of mechanical stress applied.

The fact that certain combinations of chemicals and mechanical load can induce stress cracking in many otherwise chemically resistant materials, both metallic and non-metallic, is of particular significance.

Mixtures of chemicals can result in a performance quite different than that of each individual chemical. Equally vapors and corrosive liquids can often be combinations of chemicals.

Due to the number of parameters that influence the performance of metals and plastics in the presence of chemicals and the performance can differ from a laboratory test. Philmac strongly recommends that the final decision be based on the results of a trial installation evaluated under actual service conditions.

Evaluation method

To evaluate the performance of Philmac 3G® fittings in the presence of chemicals, evaluate each materials used in the fitting by using chemical performance tables published by the chemical industry.

Normally only the wetted area of the fitting, ie the body and seal need evaluation. For immersed applications, the nut, split ring and spacer also need evaluation.

Philmac Assistance

To evaluate the performance of a material in the Philmac product in the presence of chemicals please contact Philmac and supply the following five parameters.

Size. What size is the valve or pipe work?

Temperature. What temperature are the chemicals? Is the temperature constant or cycling?

Application. Where and how is the fitting being used? Is the chemical on the inside or is the fitting immersed in the chemical, ie on the outside of the body rather than the inside?

Media. What chemical is being used? Is it a liquid or gas, is it one chemical or are there combinations? Are there surrounding chemicals or gases in the air?

Pressure. What pressure is being applied to the pipe and fitting? Does it vary?

Remember the **STAMP** acronym.

Chemical resistance

Chemical	Satisfactory	Consult Philmac
Air	A	
Ammonium Hydroxide	A	
Alcohol	A	
Acetone		A
Auto Transmission Fluid	A	
Antifreeze	A	
Benzene		A
Butane	A	
Calcium Salts	A	
Caustic Soda (40% aqueous)	A	
Cresol		A
Citric Acid (10% aqueous)	A	
Copper Salts	A	
Ethylene Alcohol	A	
Ethyl Glycol	A	
Diesel	A	
Formic Acid		A
Gasoline		A
Hydrochloric Acid		A
Kerosene		A
Mineral Oils	A	
Methane	A	
Methylene Chloride		A
Nitric Acid		A
Petroleum Oils	A	
Sewerage	A	
Sodium Cyanide	A	
Sulphuric Acid		A
Toluene		A
Turpentine		A
Transformer Oil	A	
Zinc Salt Solution	A	
Note: Fluid Temperature = 68°F		

SIDR installation instructions

1. Cut Pipe Square
Cut the pipe square. There is no need to prepare the pipe end. Chamfering or lubrication is not required.

2. Remove Nut Components
Take nut off body of fitting and remove collet.

3. Place Nut Components on Pipe
Place nut and then collet on the pipe. Ensure the collet is placed with taper facing towards the nut.

4. Place Insert in Pipe
Remove the insert from the fitting and then place in end of pipe.

5. Insert Fully Installed
Tap insert fully (up to the shoulder of the insert) into the pipe using a flat object.

6. Push Insert into Body of Fitting
Push pipe with insert and seal ring assembly into the end of the central fitting. Ensure the seal ring is correctly positioned on the insert.

7. Position Collet and Nut
Slide collet up to insert shoulder and then engage nut on body of fitting and tighten by hand.

8. Tighten Nut with a Wrench
The nut must then be tightened with a wrench.

9. Fully Installed
The fitting is fully installed when the nut cannot be tightened further with reasonable force.

Note: Philmac recommends the use of PTFE tape on NPT threads to ensure a positive seal.

Threaded fittings - installation instructions

Philmac CTS 3G® Compression fittings offer a range of advantages over metal threaded fittings

- **Faster, Easier and Reliable Installation.**
- **Less Effort through lower friction**
- **Based on over 40 years of experience in Europe and Australia**
- **Exploits the material properties of Polypropylene which reduce the installation effort compared to metal threads**

Based on over 40 years experience

Philmac manufactured the World's first all-plastic compression fitting in 1968. With over 40 years experience you can trust Philmac CTS 3G™ to perform.

Manufactured from Engineering Plastics

Philmac threaded fitting bodies are manufactured from high performance engineering plastics which delivers significant benefits.

Less Friction

Philmac threaded fittings require significantly less effort to install. Delivered through the use of high performance plastic that provide far less friction than metal on metal threads.

New Approach to Installation

Philmac CTS 3G® fittings usher in a new era of thread connection. The high performance materials comform to slight irregularities in metal threads, whereas metal to metal joints tend to bind increasing the installation effort.

Smaller Lighter tools

A simple set of Channel-Locks can be used to install a Philmac threaded fitting. Gone are the days when you need a four-foot wrench to install and tighten a threaded fitting.

Proven Performance

Philmac threaded fittings are built tough and are used world-wide by water companies, civil contractors, plumbers and in rural applications.

Example - Male Adapter into a metal valve

1. Apply PTFE tape or suitable* sealant to the plastic thread ensuring sufficient is applied to ensure a watertight seal.

2. Using your hands, screw the thread of the Male Adapter into the valve until firm.

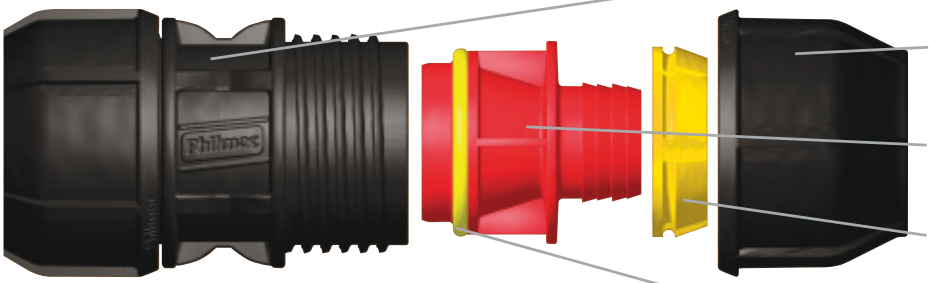
3. Grip the body of the 3G fitting with Channel Locks or similar plumbing tools and continue to screw the Male Adapter into the valve until tight.

   Stop if the shoulder of the 3G™ fittings touches the other fitting.

* Note: Philmac recommends the use of PTFE tape on threads to ensure a positive seal. If a liquid or paste sealant is used ensure it is suitable to be used with both Polypropylene and the material being connected to the Philmac fitting.

EASY RELIABLE CONNECTIONS, EVERYTIME

Materials & components



BODY – Polypropylene

NUT – Acetal

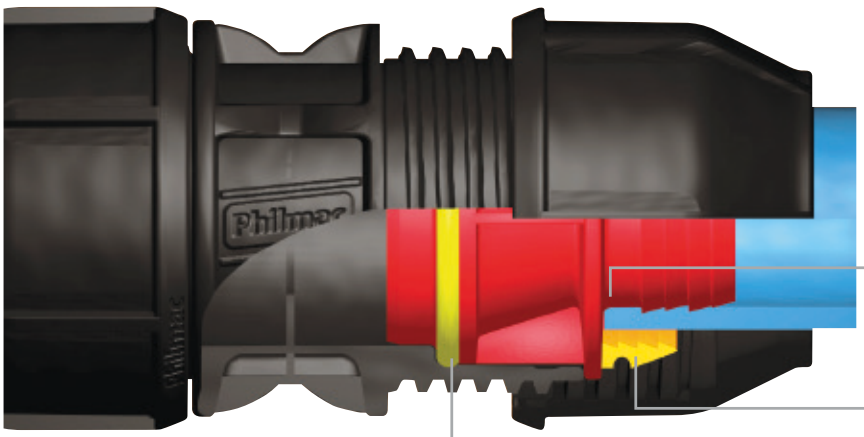
INSERT – Nylon

SPLIT COLLET – Acetal

SEAL – Nitrile Rubber

Principals of operation

FULLY OPEN

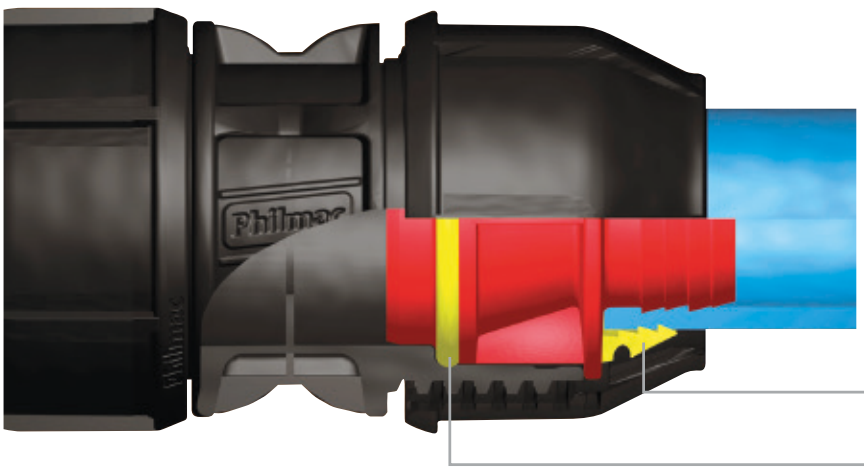


Insert fully installed into the pipe up to the shoulder of the insert.

Split collet is in the relaxed position

Insert with seal ring attached has been pushed back into the fitting body.

FULLY CLOSED



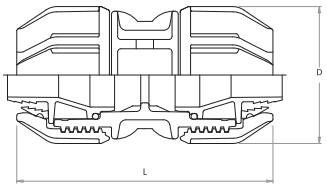
Split collet bites into the pipe providing end load resistance

ID Series fittings for IPS Inside Dimensioned (SIDR) PE Pipe

(suits PE to ASTM D2239)

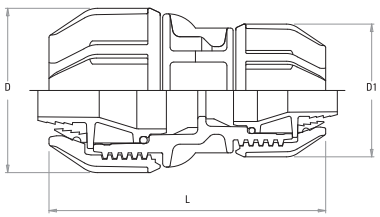
COUPLERS (POL X POL)

			Dimensions inches		lb.
Harco Code	Philmac Code	Size	D	L	Wt
75-20833	99013300	3/4" x 3/4"	2.17	4.14	0.31
75-20844	99014400	1" x 1"	2.64	4.89	0.52
75-20855	99015500	1-1/4" x 1-1/4"	3.19	5.75	0.85
75-20866	99016600	1-1/2" x 1-1/2"	3.70	6.82	1.33
75-20888	99017700	2" x 2"	4.33	7.72	2.03



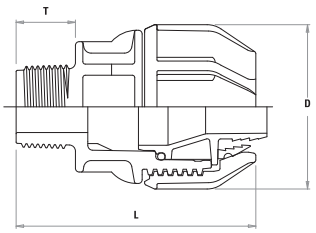
REDUCING COUPLERS (POL X POL)

			Dimensions inches			b.
Harco Code	Philmac Code	Size	D	D1	L	Wt
75-21743	99014300	1" x 3/4"	2.64	2.17	4.53	0.42
75-21754	99015400	1-1/4" x 1"	3.19	2.64	5.40	0.71
75-21765	99016500	1-1/2" x 1-1/4"	3.70	3.19	6.30	1.14
75-21784	99017400	2" x 1"	4.33	2.64	7.41	1.39
75-21785	99017500	2" x 1-1/4"	4.33	3.19	7.29	1.55
75-21786	99017600	2" x 1-1/2"	4.33	3.70	7.37	1.73



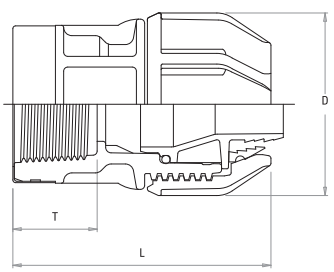
MALE ADAPTER (POL X MI NPT)

			Dimensions inches			lb.
Harco Code	Philmac Code	Size	D	L	T	Wt
75-23022	99022100	1/2" x 1/2"	1.85	2.96	0.78	0.12
75-23033	99023200	3/4" x 3/4"	2.17	3.35	0.83	0.18
75-23044	99024300	1" x 1"	2.64	3.86	0.96	0.31
75-23055	99025400	1-1/4" x 1-1/4"	3.19	4.49	1.05	0.50
75-23066	99026500	1-1/2" x 1-1/2"	3.70	4.89	1.05	0.75
75-23086	99026600	1-1/2" x 2"	3.70	4.93	1.22	0.77
75-23088	99027600	2" x 2"	4.33	5.28	1.22	1.08



FEMALE ADAPTER (POL X FI NPT)

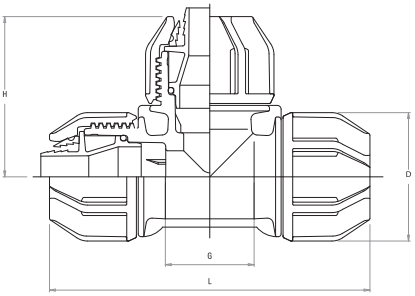
			Dimensions inches			lb.
Harco Code	Philmac Cod	Size	D	L	T	Wt
75-23233	99083200	3/4" x 3/4"	2.17	2.99	0.95	0.19
75-23244	99084300	1" x 1"	2.64	3.62	1.08	0.32
75-23255	99085400	1-1/4" x 1-1/4"	3.19	4.18	1.19	0.51
75-23266	99086500	1-1/2" x 1-1/2"	3.70	4.41	1.19	0.72
75-23288	99087600	2" x 2"	4.33	5.04	1.36	1.15



ID Series fittings for IPS Inside Dimensioned (SIDR) PE Pipe
(suits PE to ASTM D2239)

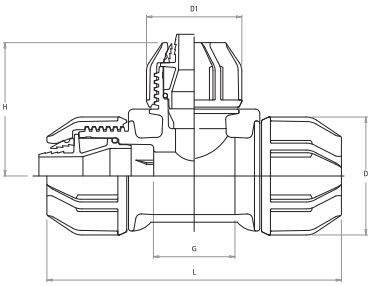
TEES (POL X POL X POL)

			Dimensions inches				lb.
Harco Code	Philmac Code	Size	D	H	G	L	Wt
75-212333	99033300	3/4" x 3/4" x 3/4"	2.17	2.76	1.58	5.52	0.49
75-212444	99034400	1" x 1" x 1"	2.64	3.31	1.89	6.62	0.85
75-212555	99035500	1-1/4" x 1-1/4" x 1-1/4"	3.19	3.94	1.97	7.56	1.36
75-212666	99036600	1-1/2" x 1-1/2" x 1-1/2"	3.70	4.22	2.36	8.43	2.03
75-212888	99037700	2" x 2" x 2"	4.33	4.93	2.88	9.85	3.21



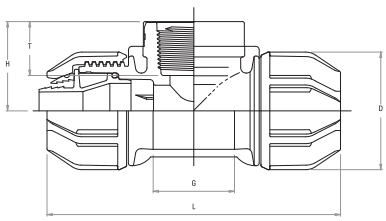
REDUCING TEES (POL X POL X POL)

			Dimensions inches					lb.
Harco Code	Philmac Code	Size	D	D1	H	G	L	Wt
75-212884	99037400	2" x 2" x 1"	4.33	2.64	4.02	1.34	8.47	2.31
75-212886	99037600	2" x 2" x 1-1/2"	4.33	3.70	4.61	2.88	9.26	2.60

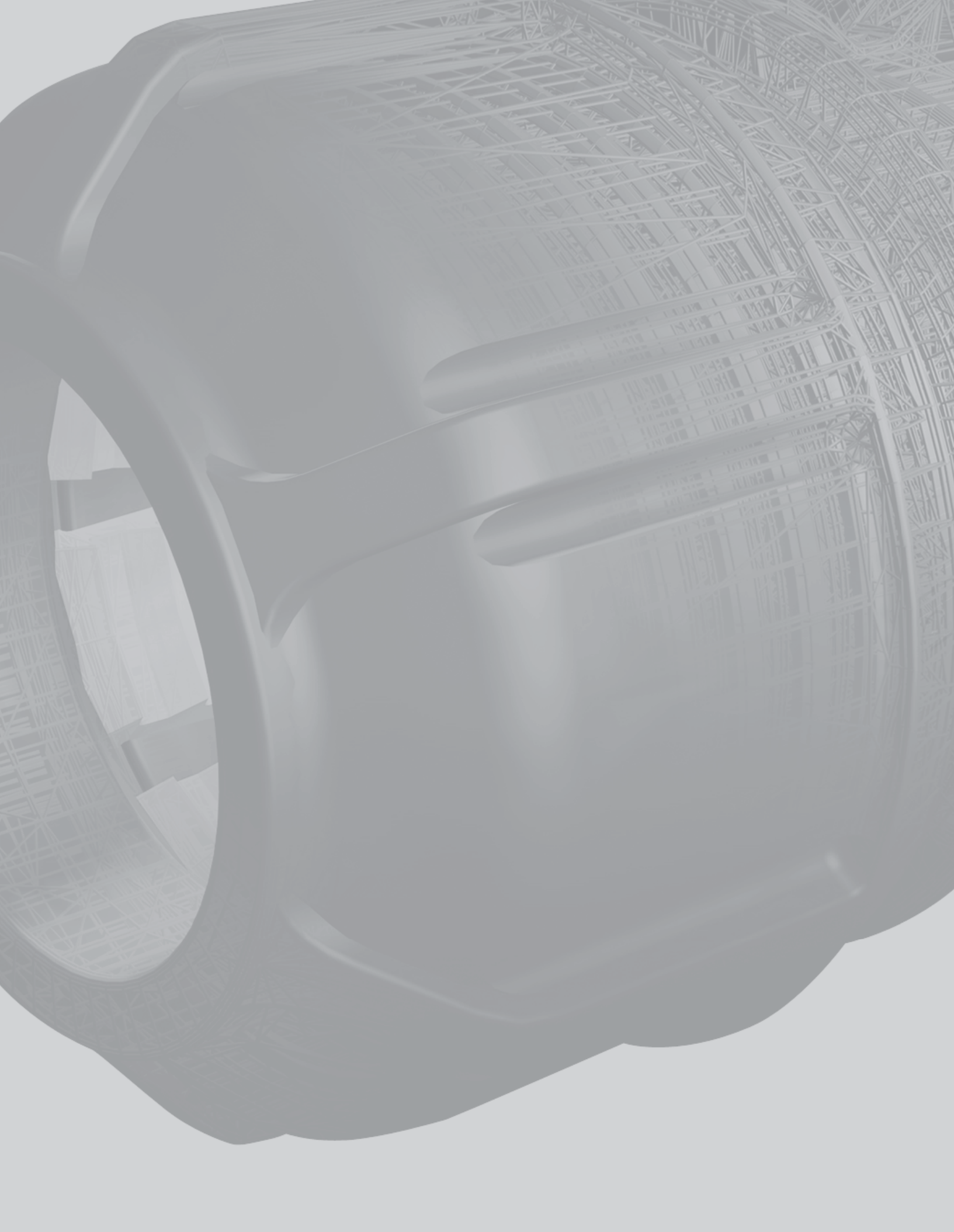


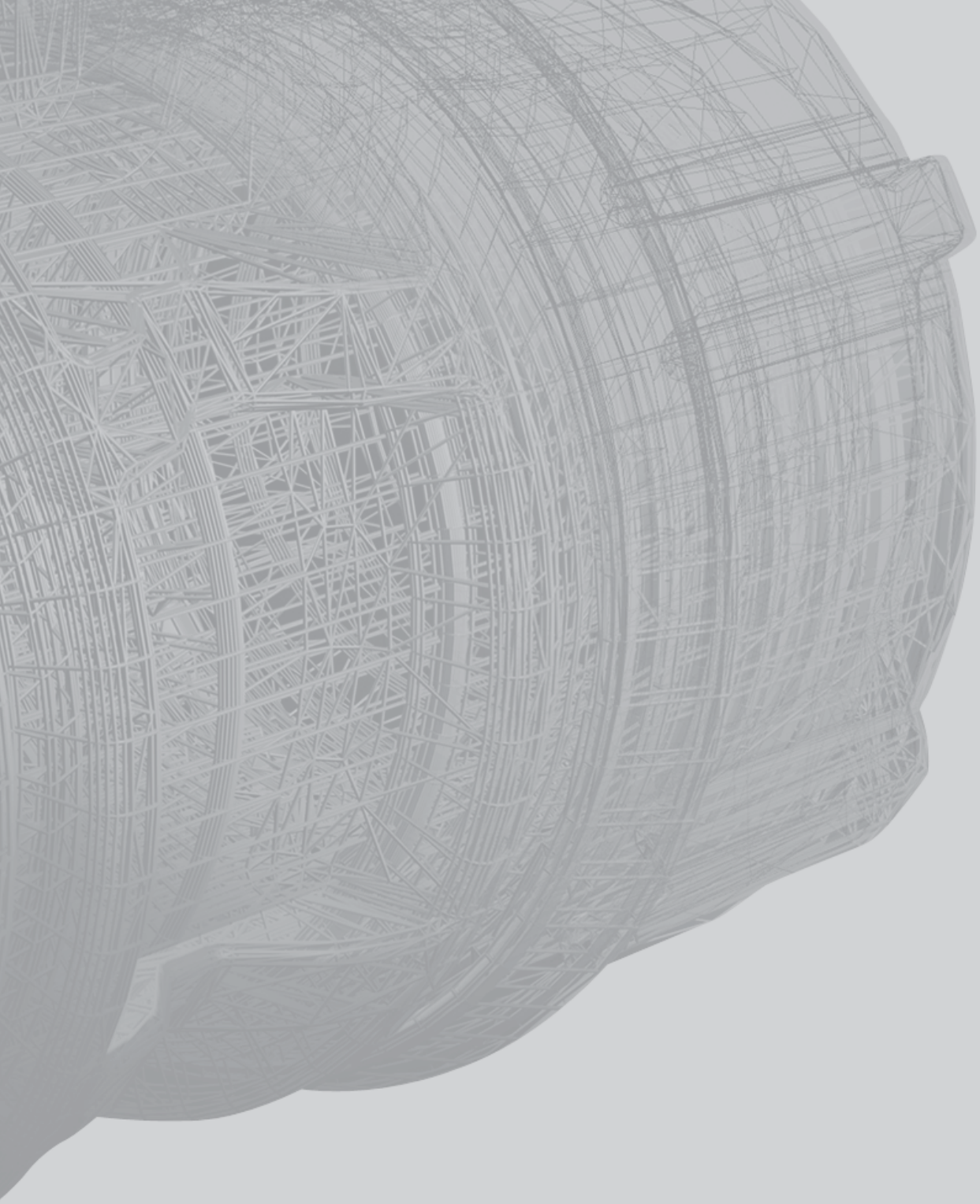
FEMALE TEES (POL X POL X FI NPT)

			Dimensions inches					lb.
Harco Code	Philmac Code	Size	D	H	G	L	T	Wt
75-251333	99043200	3/4" x 3/4" x 3/4"	2.17	1.62	1.58	5.52	0.95	0.37
75-251444	99044300	1" x 1" x 1"	2.64	1.73	1.89	6.62	1.08	0.62
75-251555	99045400	1-1/4" x 1-1/4" x 1-1/4"	3.19	2.21	1.97	7.56	1.19	1.03
75-251666	99046500	1-1/2" x 1-1/2" x 1-1/2"	3.70	2.64	2.36	8.23	1.19	1.46
75-251888	99047600	2" x 2" x 2"	4.33	3.03	2.88	9.46	1.36	2.32



*** NPT compatible, however marked as BSP**





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PHI1749 09/24

Philmac

The connection you can trust.