

TIMCO



TECHNICAL MANUAL COMPRESSION FITTINGS





A fitting partnership

When sourcing a range of compression fittings it was paramount we found a company that specializes in the production of piping systems who had the experience and knowledge of this market. We are therefore proud and excited to bring you a range that has been manufactured by Elysee in Cyprus.

Elysee are global experts in manufacturing compression fittings with over 40 years of experience, they currently distribute across 5 continents and supply over 65 countries. Their state of art manufacturing facilities use high precision injection moulding equipment to give a consistent precise product every time. Their range complies with all international testing standards and are certified by WRAS and ISO 17855.

Elysee

Join the Professionals!

The professional's choice for complete solutions in piping systems.

Best value for money. Top quality at competitive prices

One- stop shop experience. Elysee offers a complete range with 5000 products.

Extensive Know-how. Through 40 years of experience Elysee has a leading presence in the area of Plastic Piping Systems, Water Supply, Irrigation, Sewage Systems and Cable Management Systems.

Truly International. Presence in 65 countries in all 5 continents through an ever-increasing family of distributors.

Top class manufacturing. Sustainability through solid innovation, growth of people and care for nature.

Reliability & Quality Assurance. Elysee is certified by the most reputable international standardization organizations such as DVGW, OVGW, WRAS and KIWA among others.

High-quality user experience. Elysee products are designed with close cooperation with the end user. Designed for robust handling, ease of installation and long-term performance.



Vision

“To be a green leader worldwide through Innovative, Smart, Easy to use Piping Systems”

Love for water led to Elysee conception more than 40 years ago. Commitment to quality and long term vision led to the success of the Company making it the largest production unit in the country on piping systems for water supply, irrigation, sewage and energy.

Technology and Quality Assurance

Ever since its foundation, quality has been one of the company's top priorities.

Thanks to the introduction of a complete quality management system, the company monitors all its activities and their applications, from raw materials to the end product with an aim to optimize overall performance.

A well-equipped testing room with qualified and devoted staff, situated on site, ensures that every product is tested according to the standards already set.

Continuous monitoring of the receiving, production and storing processes, ensures that the end products conform to the National and International Quality Standards.

Our Research and Development department is responsible for conducting research and experimental study. With an aim to develop new and improve existing products and to improve all phases of production, in terms of productivity, implementation of procedures and efficiency of operations. The company applies the principles of Lean Manufacturing, according to international best practices in industry.

International Presence

Elysee has presence in 65 countries in all 5 continents, gained through 40 years of presence in the global markets. Elysee has active involvement in European and International Standards development reflected in our international manufacturing facilities in Cyprus, Austria, Italy, Greece, Russia and Lebanon.

Certificates

Some of Elysee's certifications are as follows:



DVGW Product Certificate



KIWA Product Certificate



WRAS Product Certificate



OVGW Product Certificate



AS/NZS 4129 Product Certificate



EN 12201 Product Certificate



ISO 17885 Product Certificate



DIN 8076 Product Certificate

Moreover, Elysee fittings are certified locally in several countries worldwide such as: Bulgaria, Moldova, Poland, Romania, Russia, Ukraine, etc.



Introduction

Elysee offers a complete range of mechanical compression fittings designed for conveyance of fluids, gaseous fuels, compressed air, chemical solutions and slurries under high pressure.

Our mechanical compression fittings comply with all relevant international standards in terms of dimensions and mechanical properties.

They are also ideal for the conveyance of potable water and fluids for human consumption, since they are produced in accordance with national and international standards and regulations for health and safety.

To ensure that all requirements of standards and regulations are fulfilled, our fittings are tested regularly and approved worldwide by the main testing institutes and certification bodies.



Certificates



Technical Data

Quality Management

Our quality management system ensures top-class products in terms of performance, reliability and durability. This is a crucial parameter to ensure customer satisfaction and loyalty. Elysee quality system, ISO 9001:2015, is approved by CCC and IQNet.

Since Quality is subjective and it is a matter of personal opinion and what constitutes an acceptable level of quality will vary from one individual to another, a process was adopted to classify the quality levels. This process called "product certification", which verifies that products conform to applicable standard, results in the issuing of a statement or certificate of conformity and approval to apply the relevant standard to the product.

Our production facilities are inspected regularly, where random products are tested to ensure their continued compliance with the relevant standards. Once the products are determined to meet such standards, the certification body reissues the product certification documents. The complete range of mechanical compression fittings of Elysee Irrigation have been tested and approved by all leading certification bodies, including DVGW (D), KIWA (NL), WRAS (GB), SAI GLOBAL (AUS) and many others worldwide. Furthermore, Elysee fittings are honored with product certifications on all related standards such as ISO 17885, EN 12201, DIN 8076 and AS/NZS 4129.

Dimensions and Characteristics

Our fittings comply with the dimensional requirements and characteristics of the following relevant standards:

- EN 712 / 713 / 715 / 911
- ISO 3458 / 3459 / 3501 / 3503 ISO 17885- DIN 8076 (Performance Series)

Application Fields

Our fittings are suitable for joining high and low density polyethylene pipes (PE-HD, PE-LD, PE40, PE63, PE80, PE100) conforming to:

- EN 12201
- ISO 3607 / 17885
- DIN 8072 / 8074

Fluids other than Water

The fitting may convey a wide variety of fluids.

Note: Refer to chemical resistance section for additional information. Contact us for advice on specific applications.

Operating pressure

For fittings from Ø16 up to Ø63 mm - 16 bar

For fittings from Ø75 up to Ø110 mm - 12.5 bar & 16 bar

Note: It is possible to upgrade the system components to increase the operating pressure up to 16 bar.

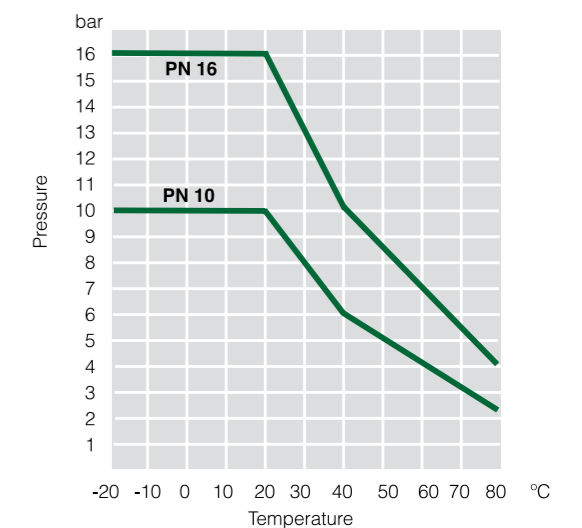
Effect on Water

Water is essential to health and to the preservation of the environment. Water quality is commonly defined by its physical, chemical, biological and aesthetic (appearance and smell) characteristics. A healthy environment is one in which the water quality supports a rich and varied community of organisms and protects public health. Unsuitable non-metallic materials can

cause changes in the quality of the water that they are in contact with. These changes can affect the flavor and appearance of the water, as well as introducing toxic substances and promoting microbial growth. Over thirty years ago some specific methods were developed to study how materials could affect water quality. The methods developed were used to develop the current standards for testing non-metallic materials in contact with drinking water. All fittings intended to be used for potable water supply systems or agricultural practices should be manufactured according to the requirements of the relevant standards. Elysee fittings fully conform to international hygiene and sanitary requirements specified by standards such as BS6920 (UK), KTW (DE), AUS/NZ 4020 (AUS) and KIWA-ATA (NL).

Operating Temperature

The fittings are not to be used in hot water although they withstand the same temperature as the polyethylene pipe itself. The fittings withstand sub-zero temperatures. The pressure rating has to be adjusted as shown in the figure below, if the fittings are to be used at higher temperatures.



Resistance to Impact

The thermoplastic materials used for manufacturing the fittings have excellent impact properties.

Abrasion Resistance

The 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.

Electrolytic Corrosion

Plastic fittings are non-magnetizing and do not cause electrolytic deterioration.

Weathering

Elysee fittings offer excellent weathering properties which protects against degradation due to ultra-violet radiation. Therefore, their use is permissible on exposed systems without additional protection.

Projected life Expectancy

Based on performance under normal operating conditions the life expectancy is rated at 50 years before replacement or major repair. This rating is only a general guide to life expectancy. It may increase or decrease depending on the quality of the installation, system operation, environmental conditions as well as other geographical and site-specific factors.

Threading

Threads (BSP) are manufactured according to: ISO 7, DIN 2999, EN 10226 and BS 21.

Threads (NPT) are manufactured according to: ANSI/ASME B1.20.1. All internal (female) threads smaller than 3" are parallel. All other threads (male and female) are tapered.

It is recommended that PTFE tape is used when making threaded joints/connections. Any other sealing compound must be confirmed as suitable. Assembly should be carried out by hand and final tightening by a strap wrench, if necessary. Extra care must be taken not to over tighten and otherwise damage the thread.

Thermal Insulation

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

Light Transmission

The all black fitting does not transmit light, thus protecting the water quality in potable water pipelines against growth of micro organisms.

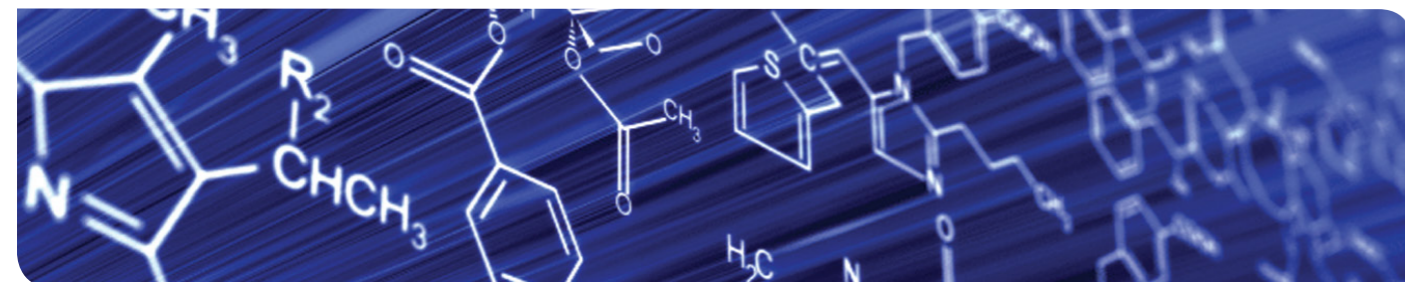
Pressure Drop (Head losses)

To determine the total pressure drop in the system, the total straight pipe length calculated for the fittings is added to the total straight pipe length to obtain the total drop. The pressure

Effects of Chemicals on Fittings

Chemicals can affect the strength, flexibility, surface appearance, colour, dimensions or weight of polypropylene. The basic modes of interaction causing these changes are:

1. Chemical attack on the polymer chain, which results in the reduction of physical properties, including oxidation, reaction of functional groups in or on the chain.
2. Depolymerisation.
3. Physical change, including absorption of solvents resulting in softening and swelling of the plastic, permeation of solvent through the plastic and dissolution in a solvent.
4. Stress cracking from the interaction of a "stress cracking agent" with internal or external stresses.
5. The Chemical Resistance Chart that follows is a general guide only. Since several factors can affect the chemical resistance of a given product, they should be tested specifically under the required conditions. If the inquired chemical is not included in the following table, a more detailed chart will be made upon request.



drop in fittings can be calculated with the following formula:

$$L = ID \times K$$

L = Head loss based on equivalent pipe length (m)

ID = Pipe inner diameter (m)

K = Fitting constant as shown on table

Fitting Type	K
Elbow 90°	30
Tee 90° (Straight through)	12
Tee 90° (Side branch)	60
Bends 90°	12
Reducing Bush (per size reduction)	15

Polypropylene PP - Chemical Resistance

Chemical	Concentration	PP-B	NBR	Chemical	Concentration	PP-B	NBR
Acetic acid	10%	A	A	Lubricating oils		B	A
Acetic acid	50%	A	C	Methane (natural gas)	tg-G	A	A
Acetone	tg-L	A	C	Methanol (methyl alcohol)	tg-L	A	A
Benzene	tg-L	B	B	Methyl acetate	tg-L	A	C
Benzine	Work-S	B	A	Methyl chloride	tg-G	C	C
Benzoic acid	Saturated	A	A	Methylene acetate	tg-L	B	C
Boric acid	Saturated	A	A	Methyl ethyl ketone	tg-L	A	C
Butyl acetate	tg-L	B	C	Nitric acid	6.30%	A	C
Calcium hydroxide	Saturated	A	A	Oleic acid	tg-L	A	B
Carbon dioxide, gas	tg-G	A	A	Oxalic acid	Saturated	A	B
Carbon disulphide	tg-L	A	C	Oxygen	tg-G	A	C
Carbon monoxide, gas	tg-G	A		Ozone	tg-G		C
Carbon tetrachloride	tg-L	C	C	Petroleum	Work-S	A	A
Caustic soda solution	50%	A	B	Petroleum ether	Work-S	B	B
Chlorine, gas	tg-L	C	C	Phenol	10%	A	C
Chlorine, water	Saturated	A	C	Phenylhydrazine	tg-L	B	C
Chloroacetic acid, mono	Solution	A	C	Phosphoric acid	50%	A	B
Chloroform	tg-L	B	C	Phosphorus chlorides	tg-L	A	C
Chlorosulphonic acid	tg-S	C	C	Phosphorus pentoxide	tg-L	A	B
Citric acid	10%	A	A	Phtalic acid	Saturated	A	C
Compressed air with oil		B	A	Potassium carbonate	Saturated	A	A
Cyclohexane	tg-L	A	A	Potassium nitrate	50%	A	A
Cyclohexanol	Saturated	A	B	Potassium sulphate	Saturated	A	A
Cyclohexanone	tg-L	B	C	Propane	tg-L ; tg-G	A	A
Diesel oil		B	A	Propionic acid	50%	A	C
Ethyl alcohol	tg-L	A	A	Sodium acetate	Saturated	A	A
Ethyl alcohol + acetic acid	Work-S	A	B	Sodium permanganate	Saturated	A	B
Ethyl benzene	tg-L	B	C	Potassium persulphate	Saturated	A	C
Ethyl chloride	tg-G	B	C	Sodium acetate	Saturated	A	A
Ethyl ether	tg-L	A	C	Sodium chlorate	Saturated	A	A
Ethylene chloride	tg-L	B	B	Sodium hydroxide	40%	A	A
Fluorine	tg-G	C	C	Sodium Hypochlorite	12.50%	B	C
Formic acid	50%	A	C	Sodium sulphate	Saturated	A	A
Frigen 12 (Freon 12)	Work-S	C	B	Sulphur dioxide	tg-G	A	C
Fuel oil (Gasoline)	Work-S	B	A	Sulphur trioxide	tg-G	C	C
Gelatine	Solution	A	A	Sulphuric acid	40%	A	B
Glucose	Solution	A	A	Sulphurous acid	Saturated	A	C
Glycerine	tg-L	A	A	Sulphuryl chloride	tg-L	C	C
Glycolic acid	37%	A	A	Tartaric acid	Saturated	A	A
Heptane	tg-L	A	A	Tetrachloroethane	tg-L	B	C
Hexane	tg-L	A	A	Toluene	tg-L	B	C
Hydrobromic acid	50%	A	B	Trichloroethane	tg-L	B	C
Hydrochloric acid	10%	A	B	Trichloromethane	tg-L	B	C
Hydrocyanic acid	tg-L	A	B	Triethanolamine	Solution	A	B
Hydrofluoric acid	40%	A	C	Trioctyl phosphate		A	B
Hydrogen	tg-G	A	A	Turpentine oil		C	A
Hydrogen chloride	tg-G	A	B	Vegetable oils and fats		A	A
Hydrogen peroxide	10%	A	B	Vinegar	Work-S	A	C
Hydrogen sulphide	Saturated	A	B	Vinyl acetate	tg-L	A	A
Lactic acid	10%	A	C	Xylene	tg-L	C	C

Notes of Table:

- A-** Resistant no indication that serviceability would be impaired
- B-** Variable resistance, depending on conditions of use
- C-** Not resistant, not recommended for service applications under any conditions

- Diluted = Diluted solution in concentrations up to 10%
- Solution = Solution in concentrations up to 10% but not saturated
- Saturated = Saturated solution
- tg-L = Pure substance in liquid state
- tg-G = Pure substance in gaseous state
- tg-S = Pure substance in solid state
- Work-S = Solution in the concentration usually used in the industry

Warranty

All our products are warranted for a period of TWO (2) YEARS from the delivery date. Our warranty includes the repair or replacement of defective parts in our production plant or in the after-sale service location. Replacement or repair of parts under this warranty will not extend the warranty period of the original product. Such parts carry their own warranty.

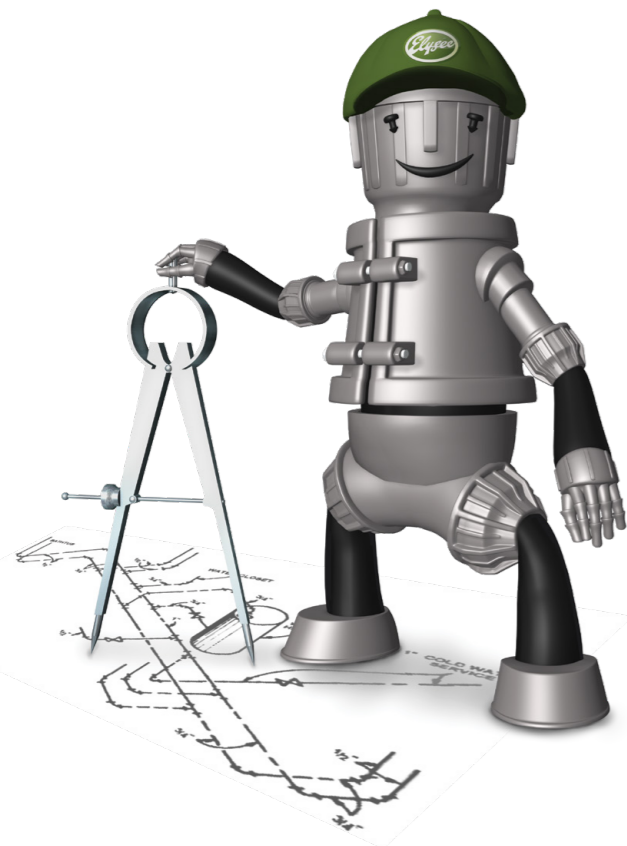
For this warranty to be effective, the buyer must certify the date of acquisition and reception of the product and follow the manufacturer's indications.

No warranties are given in regard to normal wear and tear due to use of the products. Regarding consumable components and/or materials, the provision contained in the accompanying documentation shall apply.

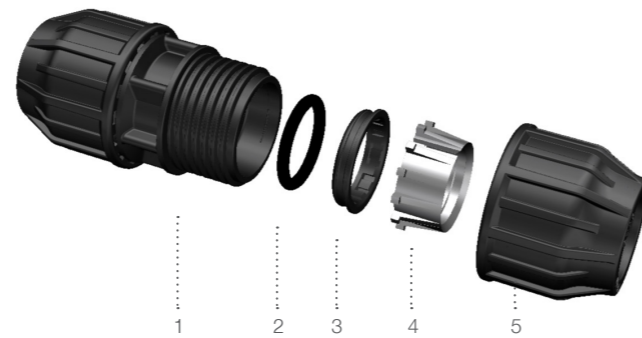
This warranty does not cover those cases in which the product:

- Has been incorrectly handled
- Has been repaired, maintained, or modified by an unauthorized person
- Has been repaired or maintained with other than original pieces
- Has been installed or placed in operation incorrectly

Except from mandatory regulations to the contrary, the expenses for return and shipment of defective materials shall be paid by the buyer. The present warranty does not limit or prejudice the rights of consumers under national mandatory standards.



Materials & Components



1. BODY - Polypropylene PP-B / 2. O-RING - Nitrile Rubber (NBR 70) / 3. INSERT - Polypropylene PP-B / 4. SPLIT RING - Polyacetal / 5. NUT - Polypropylene PP-B

BODY - It is the main and most important component of the fitting system. It can be shaped in several dimensions and configurations to satisfy the requirements and arrangements of the fluid's direction. It has a snagging arrangement internally to position the O-ring and insert, ensuring leak tightness when assembled with a pipe.

A male trapezoidal thread is used externally to join the body with the nut. The body is made with black high performance polypropylene copolymer PP-B. It offers an excellent long-term pressure resistance and also high impact resistance compared to other plastic materials.

NUT - The main purpose of this component is the tightening of the pipe with the fitting system. Internally, a female trapezoidal thread is used to enable the connection with the fitting body. Externally, it has an ergonomic designed surface for easy handling during assembly with a pipe. Made by black high performance polypropylene copolymer PP-B.

INSERT - The main purpose of this component is to secure the o-ring and keep it in position during handling and operation. Made by black high performance polypropylene copolymer PP-B.

O-RING - The main purpose of this component is to ensure leaktightness between the fitting system and the inserted pipe. Made by Nitrile rubber (NBR 70) with the ability to withstand high service temperature, excellent compression set, tear, and abrasion resistance.

SPLIT RING - The main purpose of this component is to ensure optimum grip between the fitting system and the pipe. Internally, several sharp triangular teeth are in contact with the pipe when inserted to the fitting system. Externally, conical ribs tighten progressively on the cap's cone and pipe while pressure is applied in the system or pulling force is increased. Made by high performance polyacetal material with sufficient stiffness and hardness to provide high-end load resistance. They can be used to join all types of polyethylene pipes.

Testing of Fittings



Several tests are carried out to verify the compliance of compression fittings with the relevant standards through in-house testing as well as tests in external accredited laboratories. Furthermore, all quality procedures and practices are checked from reception of raw material at the stores until delivery of the fittings to customers.

Testing of Raw Material (MRS value):

The selected raw materials of the fitting body (PP-B) is tested for long-term physical behavior with successful MRS values in the range of 10 MPa, being the highest in the market.

Internal Pressure Test Of Fitting Body:

- All fitting bodies are tested under hydrostatic pressure at 20°C, 2.5 times the indicated pressure rating of the fitting (For ex. COUPLING 32mm is tested for one hour at 40 bar without any failure).
- All fitting bodies are also tested under long-term hydrostatic pressure at 95°C, 0.4 times the indicated pressure rating of the fitting (For ex. 90° TEE 50 mm is tested for 1000 hours at 6.4 bar without any failure).

Pull-Out Test Of The Compression Fittings Connected With PE-Pipes:

The entire assembly, body with pipe is tested for pull-out force in relation to the pressure rating of the connected pipe (For ex. Coupling 63mm is tested with a pull-out force of 11,256 N when connected with PN16 pipe, without any failure).

Internal Pressure Test Of Compression Fitting

Fixed With PE-Pipes:

The entire assembly, body and pipe, undergoes a long term hydrostatic pressure test at 40°C and 0.8 times the indicated pressure rating (For ex. 90° ELBOW 40mm is tested for 1000 hours at 12.8 bar without any failure).

Leak Tightness Against Low Pressure:

The entire assembly, body with pipe, is tested at negative pressure or vacuum at 20°C (For ex. END PLUG 25mm is tested for 1 hour at -0.8 bar followed by -0.1 bar without any failure).

Leak Tightness Under Bending:

The entire assembly, body with pipe, is tested by bending the pipe on the prescribed radius under hydrostatic pressure at 20°C, 1.8 times the indicated pressure rating (For ex. MALE ADAPTOR 20mm is tested for 1 hour at 28.8 bar without any failure).

Melt Mass-Flow Rate (MFR):

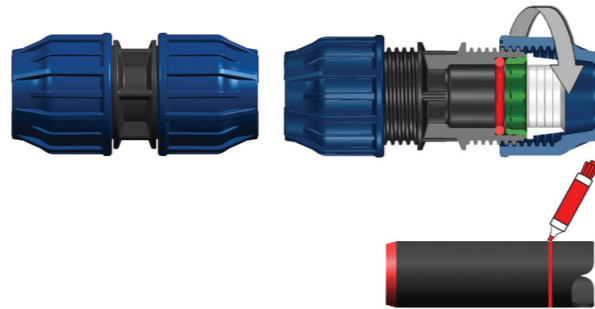
The Mass Flow Rate of the fitting body is measured and then compared in opposition to the measured mass flow rate of the raw material. The difference between the two values should not exceed the 20%.

Hygienic Testing of the Fitting's Body and the Sealing Ring:

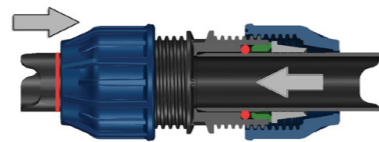
These tests are carried out through external laboratories and their certificates are supplied by the manufacturer, respectively.

Assembly Instructions

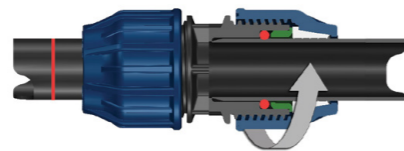
Sizes 16 Up to 63 mm



- Undo the nut up to the last thread. Do not remove the nut from the body.
- Cut the pipe straight, remove burrs & chamfer the end of the pipe with a chamfering tool.
- Mark the length on the PE pipe, to which the pipe must be pushed into the fitting.
*Lubricate the end of the pipe.



- Push the PE pipe into the fitting, through the nut, split ring and O-ring, as far as it will go until it meets the 1st resistance. (The mark on the pipe is now just in front of the nut).

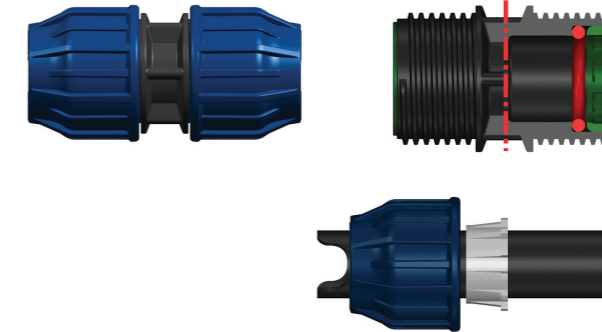


- Firmly hand tighten the nut. For sizes of 40mm and above, use a wrench for a further half turn for final tightening.

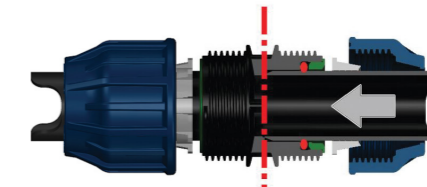
Notes:

- Lubrication of the pipe end is optional and will ease insertion of the pipe (use silicone lubricant).
- The fitting can safely be used again after disassembling.
- The full hydraulic seal is achieved when the pipe passes through the O-ring.

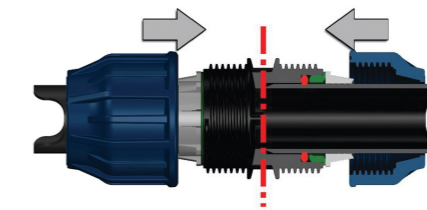
Sizes 75 Up to 110 mm



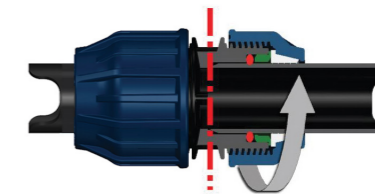
- Cut the pipe straight, remove burrs & chamfer the end of the pipe with a chamfering tool.
- Install the nut & split ring onto the end of the pipe to a distance of about twice the pipe diameter.
- Keep the O-ring and insert fixed on the body.
- Assembly is made easier by lubricating the pipe, O-ring & inside of the fitting with silicone lubricant.



- Insert the pipe into the fitting until it stops at the step.



- Push the nut & split ring forward until they reach the fitting.



- Tighten the nut by means of two special Elysee wrenches.
- The nut should be closed firmly but does not need to actually meet the body.



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