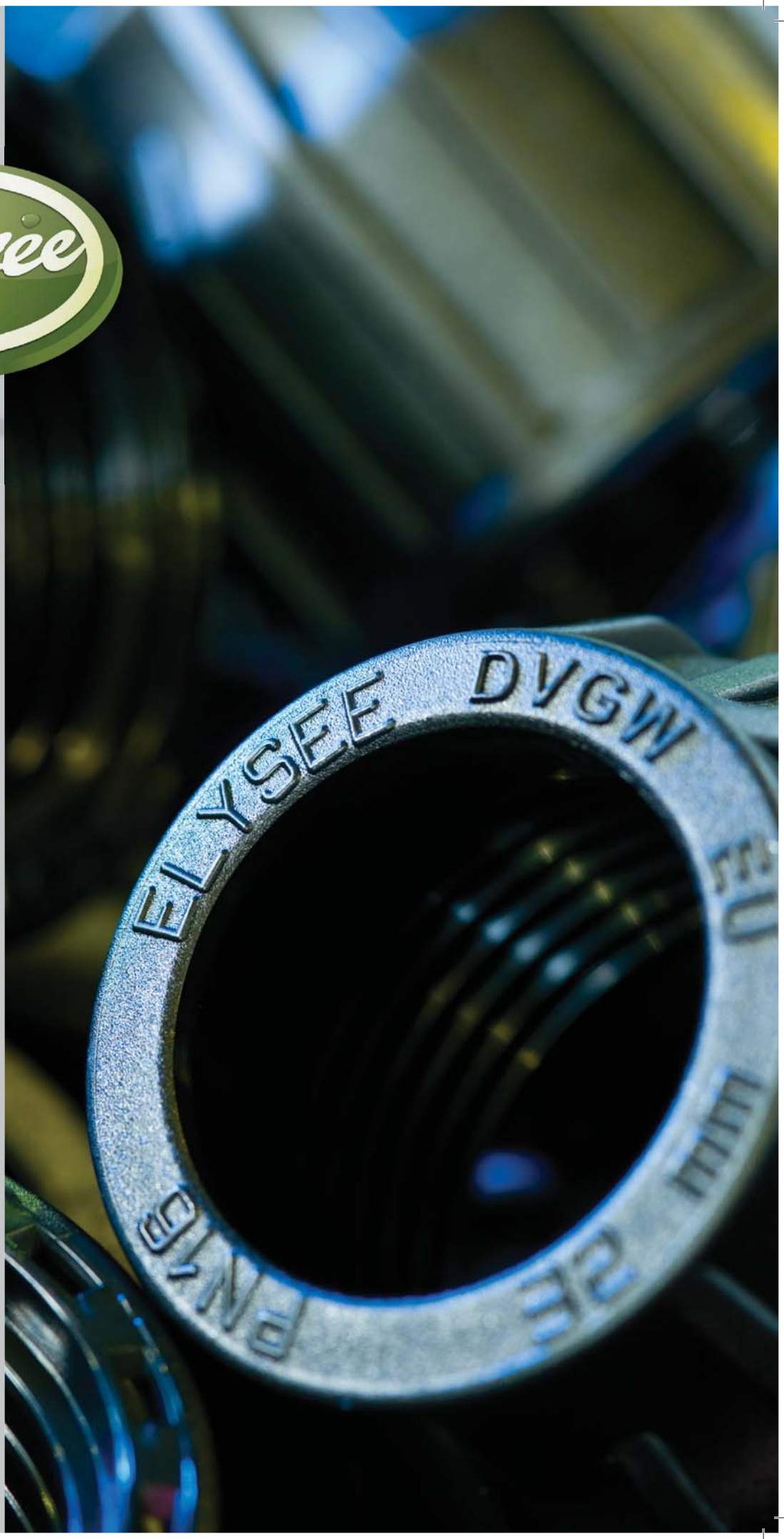
Elysee

TECHNICAL MANUAL COMPRESSION FITTINGS



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 2500 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 60 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

Be a sustainable World Class supplier in piping systems through: Constant profitability, a leading position in our local markets, advanced technology and High-added-value products in worldwide markets.

Love for water led to Elysee conception more than 30 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 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 60 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 and Lebanon.

Certificates

Some of Elysee's certifications are as follows:

DVGW Product Certificate

KIWA Product Certificate

WRAS Product Certificate

OVGW Product Certificate

AUS/NZS 4129
Product Certificate

EN 12201
Product Certificate

ISO 14236
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.

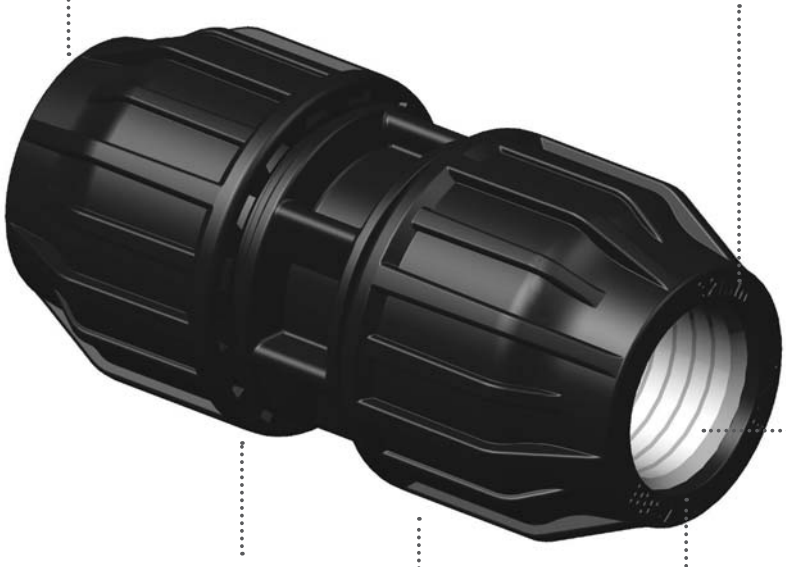
Introduction

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.



Nut
Modern design and unique shape

Split ring
Grips the pipe firmly when the system is assembled ensuring that the pipe is not pulled out, even under maximum force

Body
Made by top quality and certified raw materials

Insert
Captive with the body during disassembly even if the pipe is pulled-off

System
Unbreakable, corrosion resistant, suitable for tough working conditions such as pipe bending and pulling out

O-Ring
Certified for being in contact with water intended for human consumption

Certificates

DVGW CERT GMBH DW-8616BS0468

WRAS Water Regulations Advisory Scheme

kiwa Partner for progress

OVGW ÖSTERREICHISCHE VEREINIGUNG FÜR DAS GAS- UND WASSERFACH

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 9001:2008, 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), BV (AUS) and many others worldwide. Furthermore, Elysee fittings are honored with product certifications on all related standards such as ISO 14236, 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 14236
- 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 / 14236
- 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

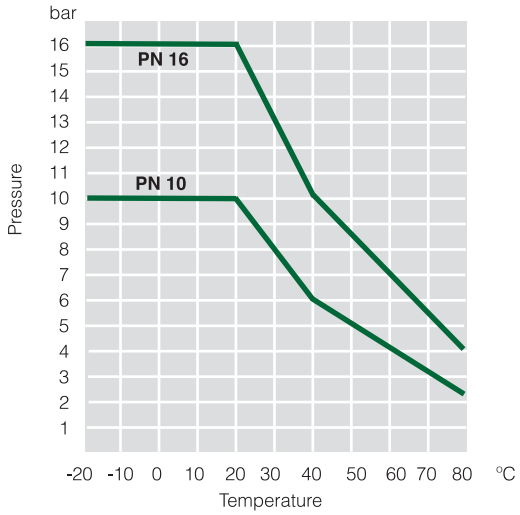
For fittings from ∅16 up to ∅63 mm - 16 bar
For fittings from ∅75 up to ∅110 mm - 12.5 bar
Note: System temperature should not exceed 20°C. Refer to operating temperature section for more details.

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 aesthetical (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 then 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 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) and AUS/NZ 4020 (AUS).

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 the information available and the successful performance under the nominated test regime, the life expectancy is rated at 50 years before replacement or major repair. This rating is only a general guide to life expectancy and may increase or decrease depending on the quality of the installation, system operation and environment conditions as well as other geographical and site-specific factors.

Threading
Threads (BSP) are manufactured according to: ISO 7, DIN 2999 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 drop in fittings can be calculated with the following formula:

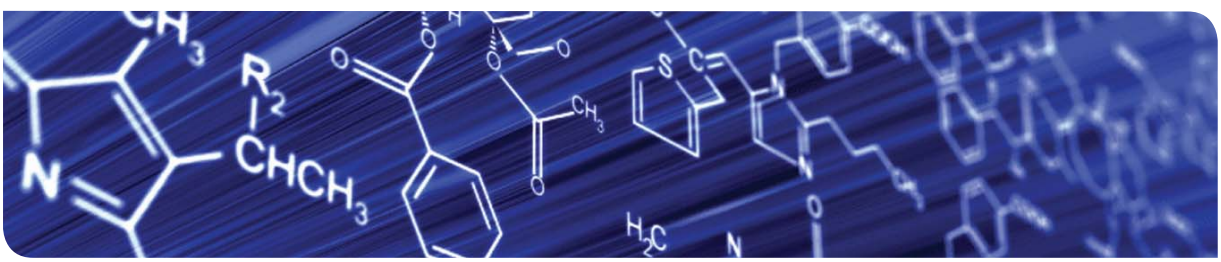
$L = ID \times K$

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

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.



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	Oxigen	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	Proponic acid	50%	A	C
Ethyl alcohol	tg-L	A	A	Sodium acetate	Saturated	A	A
Ethyl alcohol + acetic acid	Work-S	A	B	Potassium 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 eter	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 to10% 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.

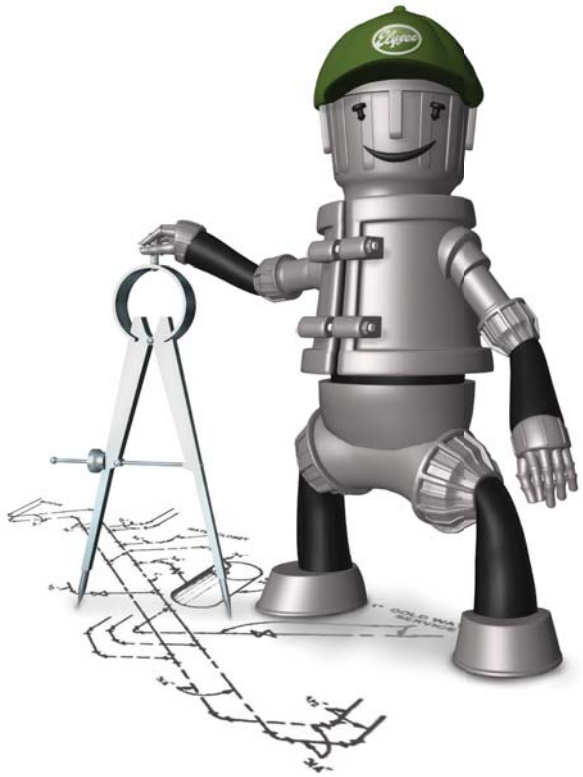
For this warranty to be effective, the buyer must certify the date of acquisition and reception of the product and follow the manufacturer's indications.

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 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.

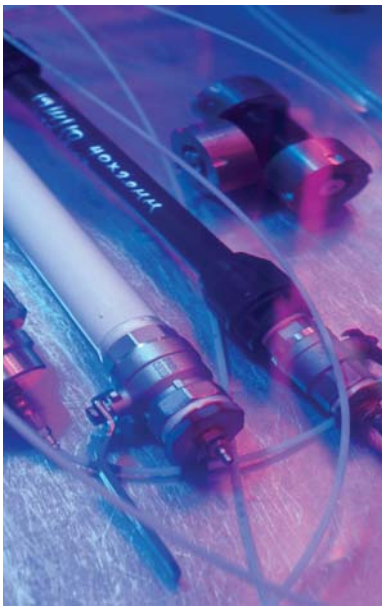
NUT - The main purpose of this component is the tightening of pipe with the fitting system. Internally, a female trapezoidal thread is applied to enable the connection with the fitting body. Externally, it has an ergonomic designed surface for easy handling during assembly with a pipe. Made by black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

INSERT - 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 - 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 - Main purpose of this component is to ensure optimum grip between the fitting system and pipe. Internally, several sharp triangular teeth are applied and are in contact with pipe when inserted to the fitting system. Externally, conical ribs are applied to fit and tight progressively on 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. 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:

(i) 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).

(ii) 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 with pipe, is tested in long-term under hydrostatic pressure at 40°C, 0.8 times the indicated pressure rating (For ex. 90°C 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 -0.2 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):

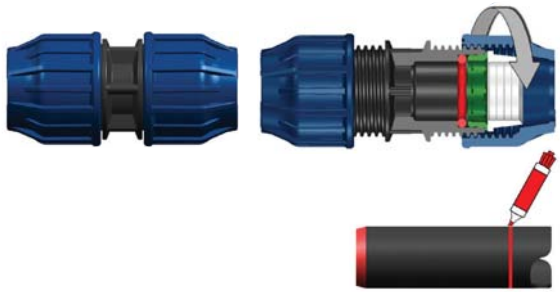
The Mass Flow Rate of the fitting body is measured and then compared in opposition to the measured mass flow rate of the raw material. The difference between the two values should not exceed the 10%.

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 in the fitting.
  *Lubricate the end pipes.

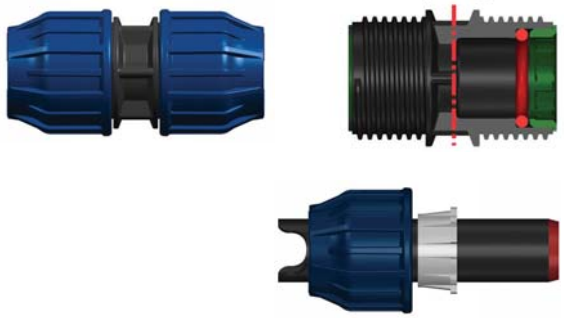
- Push the PE pipe into the fitting, through the nut, split the ring and O-ring, as far as it will go until it meets the 1st resistance. (The mark on the pipe is now just in front of the nut).

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

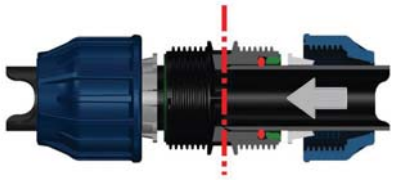
Notes:

- *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.*

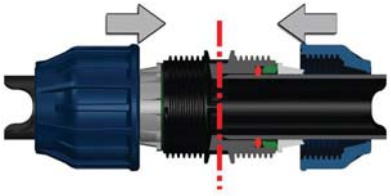
Sizes 75 Up to 110 mm



- Cut the pipe straight, remove burrs & chamfer the end of the pipe with a chamfering tool.
- Apply 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 pipe, O-ring & inside of fitting with silicone lubricant.



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



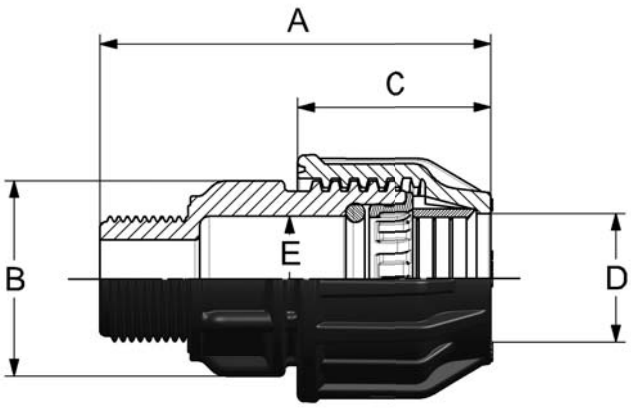
- Push nut & split ring forward until they reach the fitting.

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

Nominal Dimensions

MALE ADAPTOR
No. 330

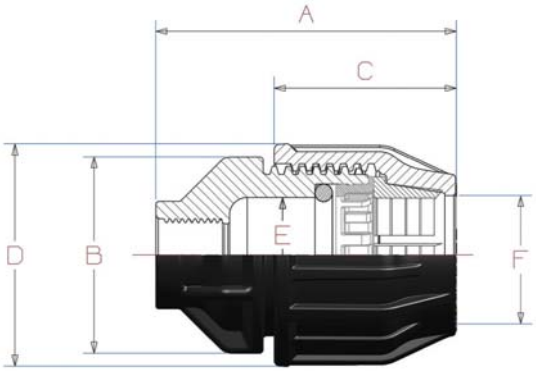
CODE	SIZE (mm x in)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
330001601	16 X ½	70.13	34.00	35.00	17.50	17.50
330001602	16 X ¾	71.88	34.00	35.00	17.50	17.50
330002001	20 X ½	88.35	41.50	39.50	22.20	21.50
330002002	20 X ¾	88.35	41.00	39.50	22.20	21.50
330002002	20 X 1	91.85	42.50	39.50	22.20	21.50
330002501	25 X ½	92.38	46.00	41.25	26.75	26.50
330002502	25 X ¾	82.63	46.00	41.25	26.75	26.50
330002503	25 X 1	84.13	46.00	41.25	26.75	26.50
330003201	32 X ½	100.25	56.25	51.75	34.00	33.50
330003202	32 X ¾	95.25	55.50	51.75	34.00	33.50
330003203	32 X 1	96.25	55.50	51.75	34.00	33.50
330003204	32 X 1¼	98.75	55.50	51.75	34.00	33.50
330003205	32 X 1½	99.25	55.50	51.75	34.00	33.50
330004003	40 X 1	110.13	69.50	60.75	41.50	42.00
330004004	40 X 1¼	108.88	68.50	60.75	41.50	42.00
330004005	40 X 1½	109.38	69.75	60.75	41.50	42.00
330004006	40 X 2	112.63	69.00	60.75	41.50	42.00
330005003	50 X 1	129.58	81.25	60.75	41.50	53.00
330005004	50 X 1¼	132.33	80.50	60.75	41.50	53.00
330005005	50 X 1½	124.08	79.50	60.75	41.50	53.00
330005006	50 X 2	127.08	79.50	60.75	41.50	53.00
330006305	63 X 1½	166.00	98.50	82.75	64.50	65.00
330006306	63 X 2	164.75	97.50	82.75	64.50	65.00
330006307	63 X 2½	164.25	99.00	82.75	64.50	65.00
330007506	75 X 2	171.95	117.50	107.50	76.00	77.50
330007507	75 X 2½	172.95	117.50	107.50	76.00	77.50
330007508	75 X 3	176.70	116.50	107.50	76.00	77.50
330009006	90 X 2	199.83	136.50	131.25	94.00	92.75
330009007	90 X 2½	201.33	137.50	131.25	94.00	92.75
330009008	90 X 3	207.33	138.00	131.25	94.00	92.75
330009009	90 X 4	213.58	137.00	131.25	94.00	92.75
330011006	110 X 2	241.80	164.00	166.50	112.50	113.25
330011008	110 X 3	250.55	164.25	166.50	112.50	113.25
330011009	110 X 4	257.05	164.25	166.50	112.50	113.25



Nominal Dimensions

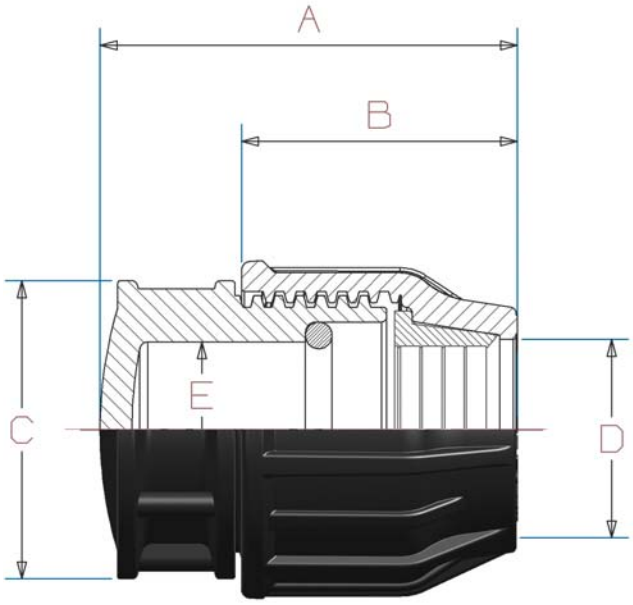
FEMALE ADAPTOR
No. 330A

CODE	SIZE (mm x in)	NOMINAL DIMENSIONS (mm)					
		A	B	C	D	E	F
330A01610	16 X 3/8	71.88	36.75	35.00	39.25	17.50	17.50
330A01601	16 X ½	73.38	34.25	35.00	39.25	17.50	17.50
330A01602	16 X ¾	72.88	34.25	35.00	39.25	17.50	17.50
330A02001	20 X ½	70.10	40.50	39.50	46.00	22.00	22.20
330A02002	20 X ¾	70.35	41.00	39.50	46.00	22.00	22.20
330A02501	25 X ½	73.13	46.50	41.25	52.50	26.50	26.75
330A02502	25 X ¾	73.13	46.50	41.25	52.50	26.50	26.75
330A02503	25 X 1	77.88	54.00	41.25	52.50	26.50	26.75
330A03201	32 X ½	86.25	56.00	51.75	63.75	33.50	34.00
330A03202	32 X ¾	86.25	56.00	51.75	63.75	33.50	34.00
330A03203	32 X 1	87.75	56.00	51.75	63.75	33.50	34.00
330A03204	32 X 1¼	101.75	68.75	51.75	63.75	33.50	34.00
330A03205	32 X 1½	103.75	55.75	51.75	63.75	33.50	34.00
330A04003	40 X 1	115.13	70.00	60.75	78.25	41.50	41.50
330A04004	40 X 1¼	106.38	68.25	60.75	78.25	41.50	41.50
330A04005	40 X 1½	106.63	69.00	60.75	78.25	41.50	41.50
330A05004	50 X 1¼	120.58	82.50	68.50	92.50	51.50	51.50
330A05005	50 X 1½	122.33	82.75	68.50	92.50	51.50	51.50
330A05006	50 X 2	132.58	74.25	68.50	92.50	51.50	51.50
330A06305	63 X 1½	141.75	99.00	82.75	109.00	64.50	64.50
330A06306	63 X 2	151.50	99.00	82.75	109.00	64.50	64.50
330A06307	63 X 2½	153.00	99.00	82.75	109.00	64.50	64.50
330A07506	75 X 2	167.95	116.50	107.50	132.50	77.25	76.00
330A07507	75 X 2½	172.70	117.00	107.50	132.50	77.25	76.00
330A07508	75 X 3	173.20	117.00	107.50	132.50	77.25	76.00
330A09007	90 X 2½	208.58	136.50	131.25	151.50	91.50	94.00
330A09008	90 X 3	221.08	137.50	131.25	151.50	91.50	94.00
330A09009	90 X 4	219.58	156.50	131.25	151.50	91.50	94.00
330A11008	110 X 3	279.55	156.50	166.50	175.50	112.50	112.50
330A11009	110 X 4	292.55	157.00	166.50	175.50	112.50	112.50



END PLUG
No. 330B

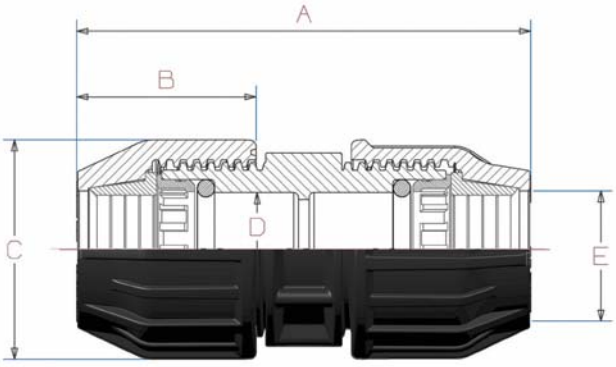
CODE	SIZE (mm)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
330B00016	16	54.88	35.00	34.50	17.50	17.50
330B00020	20	63.85	39.50	41.25	22.20	22.00
330B00025	25	66.63	41.25	46.25	26.75	26.50
330B00032	32	78.00	51.75	55.75	34.00	33.50
330B00040	40	89.63	60.75	69.00	41.50	41.50
330B00050	50	104.58	68.50	80.00	51.50	51.50
330B00063	63	125.75	82.75	98.00	64.50	64.50
330B00075	75	149.70	107.50	117.50	76.00	77.00
330B00090	90	175.33	131.25	137.00	94.00	92.00
330B00110	110	224.80	166.50	164.00	112.50	113.25

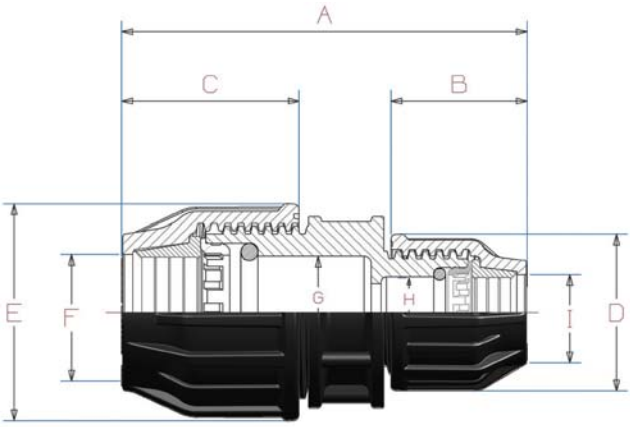


Nominal Dimensions

COUPLING
No. 331

CODE	SIZE (mm x mm)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
331016016	16 x 16	89.00	35.00	39.25	17.50	17.50
331020020	20 x 20	104.00	39.50	46.00	22.00	22.20
331025025	25 x 25	109.00	41.25	52.50	26.50	26.75
331032032	32 x 32	132.00	51.75	63.75	33.50	34.00
331040040	40 x 40	146.00	60.75	78.25	41.50	41.50
331050050	50 x 50	174.40	68.50	92.50	51.50	51.50
331063063	63 x 63	208.00	82.75	109.00	64.50	64.50
331075075	75 x 75	250.90	107.5	132.50	77.25	76.00
331090090	90 x 90	293.40	131.25	151.50	91.50	94.00
331110110	110 x 110	382.60	166.50	175.50	112.50	112.50



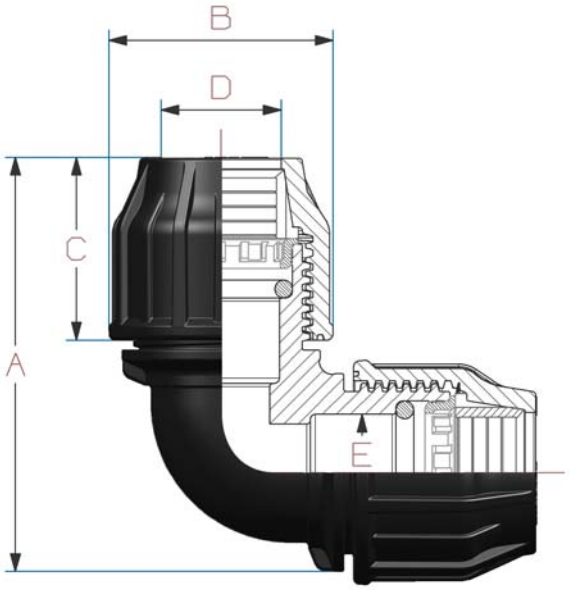


REDUCING COUPLING
No. 331A

CODE	SIZE (mm x mm)	NOMINAL DIMENSIONS (mm)								
		A	B	C	D	E	F	G	H	I
331A02016	20 X 16	99.98	35.00	39.25	39.50	46.00	22.20	22.00	17.50	17.00
331A02516	25 X 16	101.50	35.00	39.25	41.25	52.50	26.75	26.50	17.50	17.00
331A02520	25 X 20	106.48	39.50	46.00	41.25	52.50	26.75	26.50	22.20	21.50
331A03220	32 X 20	120.10	39.50	46.00	51.75	63.75	34.00	33.50	22.20	21.50
331A03225	32 X 25	125.38	41.25	52.50	51.75	63.75	34.00	33.50	26.75	26.50
331A04025	40 X 25	129.75	41.25	52.50	60.75	78.25	41.50	41.50	26.75	26.50
331A04032	40 X 32	140.38	51.75	63.75	60.75	78.25	41.50	41.50	34.00	33.50
331A05032	50 X 32	162.08	51.75	63.75	60.75	78.25	41.50	53.00	34.00	33.50
331A05040	50 X 40	162.70	60.75	78.25	60.75	78.25	41.50	53.00	41.50	42.00
331A06332	63 X 32	169.00	51.75	63.75	82.75	109.00	64.50	64.50	34.00	33.00
331A06350	63 X 50	193.33	60.75	78.25	82.75	109.00	64.50	64.50	41.50	52.00
331A07563	75 X 63	231.95	82.75	109.00	107.50	132.50	76.00	77.25	64.50	65.50
331A09063	90 X 63	253.08	82.75	109.00	131.25	151.50	94.00	93.25	64.50	65.25
331A09075	90 X 75	264.78	107.50	132.50	131.25	151.50	94.00	93.75	76.00	78.00
331A11075	110 X 75	347.75	107.50	132.50	166.50	175.50	112.50	113.00	76.00	77.50
331A11090	110 X 90	352.88	131.25	151.50	166.50	175.50	112.50	113.50	94.00	92.50

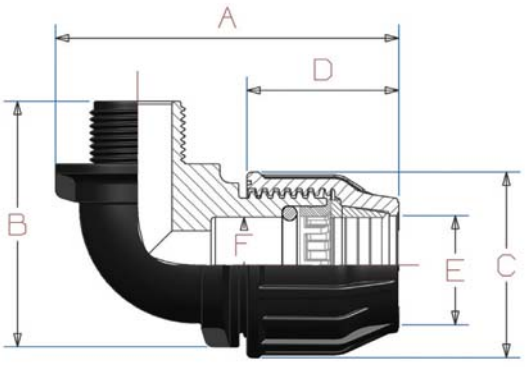
Nominal Dimensions

90° ELBOW
No. 332



CODE	SIZE (mm x mm)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
332016016	16 x 16	75.13	39.25	35.00	17.50	17.50
332020020	20 x 20	87.85	46.00	39.50	22.20	22.00
332025025	25 x 25	97.88	52.50	41.25	26.75	26.50
332032032	32 x 32	118.25	63.75	51.75	34.00	33.50
332040040	40 x 40	140.43	78.25	60.75	41.50	41.50
332050050	50 x 50	158.18	92.50	68.50	51.50	51.50
332063063	63 x 63	197.00	109.00	82.75	64.50	64.50
332075075	75 x 75	215.45	132.50	107.50	76.00	77.25
332090090	90 x 90	267.83	151.50	131.25	94.00	91.50
332110110	110 x 110	369.05	175.50	166.50	112.50	112.50

MALE ELBOW
No. 332A

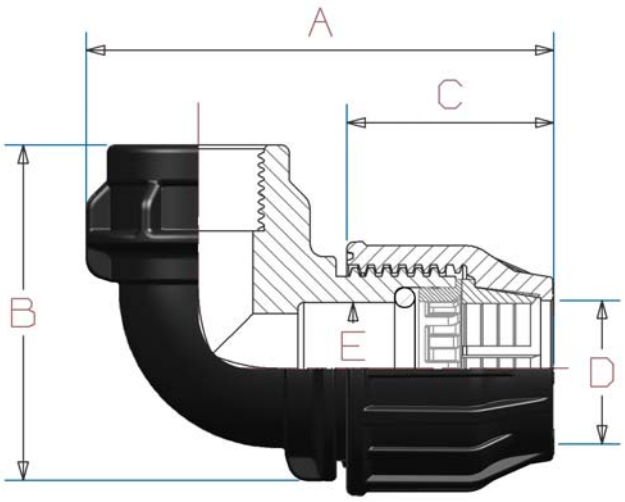


CODE	SIZE (mm x in)	NOMINAL DIMENSIONS (mm)					
		A	B	C	D	E	F
332A01601	16 x ½	74.63	55.75	39.25	35.00	17.50	17.50
332A01602	16 x ¾	74.73	57.00	39.25	35.00	17.50	17.50
332A02001	20 x ½	85.10	61.25	46.00	39.50	22.20	22.00
332A02002	20 x ¾	88.60	32.75	46.00	39.50	22.20	22.00
332A02501	25 x ½	89.63	68.75	52.50	41.25	26.75	26.50
332A02502	25 x ¾	90.88	69.25	52.50	41.25	26.75	26.50
332A02503	25 x 1	92.93	78.25	52.50	41.25	26.75	26.50
332A03202	32 x ¾	120.75	84.50	63.75	51.75	34.00	13.50
332A03203	32 x 1	112.25	83.75	63.75	51.75	34.00	33.50
332A04004	40 x 1¼	136.38	92.00	78.25	60.75	41.50	41.50
332A04005	40 x 1½	137.13	92.25	78.25	60.75	41.50	41.50
332A05005	50 x 1½	152.83	110.75	78.25	60.75	41.50	52.50
332A05006	50 x 2	153.33	115.00	78.25	60.75	41.50	52.50
332A06306	63 x 2	191.25	133.00	109.00	82.75	64.50	65.00
332A06307	63 x 2½	191.00	133.75	109.00	82.75	64.50	65.00
332A07507	75 x 2½	219.20	172.25	132.50	107.50	76.00	78.25
332A07508	75 x 3	218.20	171.75	132.50	107.50	76.00	77.75
332A09008	90 x 3	265.08	171.50	151.50	131.25	94.00	92.25
332A11009	110 x 4	335.80	221.00	175.50	166.50	112.50	113.50

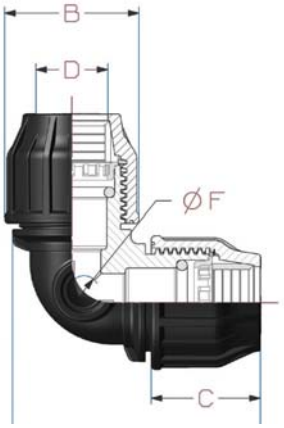
Nominal Dimensions

FEMALE ELBOW
No. 332B

CODE	SIZE (mm x in)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
332B02001	20 X ½	91.35	68.25	39.50	22.20	22.00
332B02002	20 X ¾	91.35	67.50	39.50	22.20	22.00
332B02501	25 X ½	104.13	73.75	41.25	26.75	26.50
332B02502	25 X ¾	103.88	74.25	41.25	26.75	26.50
332B02503	25 X 1	92.38	74.75	41.25	26.75	26.50
332B03202	32 X ¾	121.25	80.00	51.75	34.00	33.50
332B03203	32 X 1	121.00	74.50	51.75	34.00	33.50
332B04004	40 X 1¼	136.63	97.70	60.75	41.50	41.50
332B04005	40 X 1½	137.28	96.95	60.75	41.50	41.50
332B05005	50 X 1½	153.98	111.50	68.50	51.50	51.50
332B05006	50 X 2	156.38	112.60	68.50	51.50	51.50
332B06306	63 X 2	190.65	134.25	82.75	64.50	64.50
332B06307	63 X 2½	190.60	137.50	82.75	64.50	64.50
332B07507	75 X 2½	217.20	173.00	107.50	76.00	77.25
332B07508	75 X 3	219.70	175.00	107.50	76.00	77.25
332B09008	90 X 3	264.83	170.50	131.25	94.00	91.50

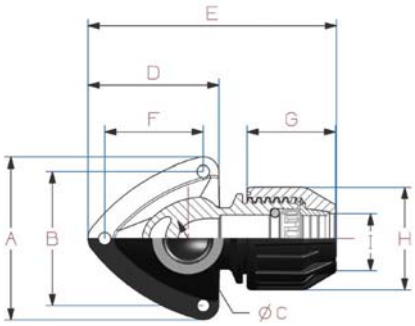


90˚ FEMALE ELBOW FOR POP-UP
No. 332



CODE	SIZE (mm x in x mm)	NOMINAL DIMENSIONS (mm)					
		A	B	C	D	E	F
332025025	25 x ½"x 25	97.88	52.50	41.25	26.75	26.50	½"
332032032	32 x ½"x 32	118.25	63.75	51.75	34.00	33.50	½"
332032032	32 x ¾"x32	118.25	63.75	51.75	34.00	33.50	¾"

WALL FEMALE ELBOW
No. 332D

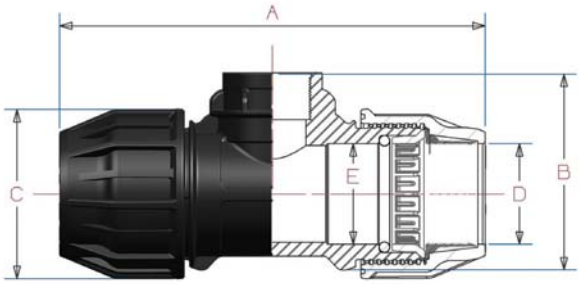


CODE	SIZE (mm x in)	NOMINAL DIMENSIONS (mm)								
		A	B	C	D	E	F	G	H	I
332D02001	20 x ½	72.75	60.00	18.00	58.47	110.52	34.97	39.50	45.97	22.25
332D02502	25 x ¾	85.70	73.45	24.00	69.15	126.70	54.40	41.15	52.42	27.00

Nominal Dimensions

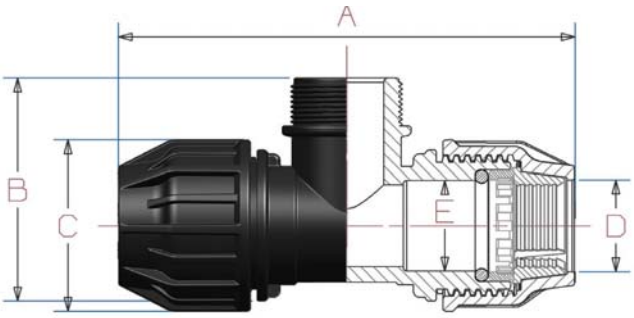
FEMALE TEE
No. 333

CODE	SIZE (mm x in x mm)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
333016001	16 x ½ x 16	110.25	47.00	39.25	17.50	17.00
333001602	16 x ¾ x 16	112.00	47.00	39.25	17.50	17.00
333002001	20 x ½ x 20	132.20	54.50	46.00	22.20	21.50
333002002	20 x ¾ x 20	132.20	54.25	46.00	22.20	21.50
333002501	25 x ½ x 25	139.25	57.75	52.50	26.75	25.75
333002502	25 x ¾ x 25	139.25	57.75	52.50	26.75	25.75
333002503	25 x 1 x 25	141.75	60.75	52.50	26.75	26.25
333003202	32 x ¾ x 32	169.50	66.75	63.75	34.00	33.50
333003203	32 x 1 x 32	169.50	66.75	63.75	34.00	33.50
332004004	40 x 1¼ x 40	209.25	98.50	78.25	41.50	42.25
332004005	40 x 1½ x 40	209.25	100.25	78.25	41.50	42.75
332005005	50 x 1½ x 50	234.65	113.25	92.50	51.50	52.50
332005006	50 x 2 x 50	234.65	113.25	92.50	51.50	52.75
332006306	63 x 2 x 63	281.50	122.00	109.00	64.50	66.50
332006307	63 x 2½ x 63	281.50	142.00	109.00	64.50	65.25
333007506	75 x 2 x 75	321.40	172.00	132.50	76.00	77.75
333007507	75 x 2½ x 75	321.40	173.75	132.50	76.00	77.75
333007508	75 x 3 x 75	321.40	174.75	132.50	76.00	77.75
333009008	90 x 3 x 90	402.15	200.50	151.50	94.00	92.50



MALE TEE
No. 333A

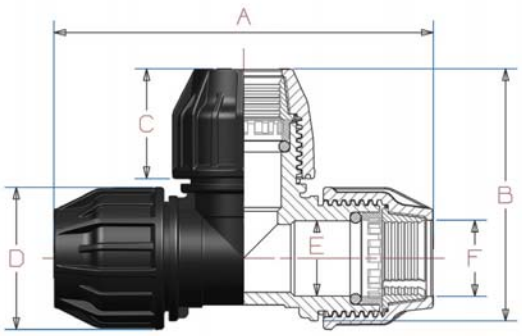
CODE	SIZE (mm x in x mm)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
333A16001	16 x ½ x 16	100.63	55.50	39.25	17.50	17.50
333A01602	16 x ¾ x 16	100.63	57.75	39.25	17.50	17.50
333A02001	20 x ½ x 20	117.10	63.75	46.00	22.20	22.00
333A02002	20 x ¾ x 20	117.10	65.75	46.00	22.20	22.00
333A02003	20 x 1 x 20	117.10	67.75	46.00	22.20	22.00
333A02501	25 x ½ x 25	130.38	72.25	52.50	26.75	26.50
333A02502	25 x ¾ x 25	130.38	72.50	52.50	26.75	26.50
333A02503	25 x 1 x 25	130.38	74.00	52.50	26.75	26.50
333A03201	32 x ½ x 32	152.50	78.50	63.75	34.00	33.50
333A03202	32 x ¾ x 32	152.50	79.00	63.75	34.00	33.50
333A03203	32 x 1 x 32	152.50	83.00	63.75	34.00	33.50
332B04003	40 x 1 x 40	178.13	96.00	78.25	41.50	42.00
332B04004	40 x 1¼ x 40	178.13	101.00	78.25	41.50	42.00
332B04005	40 x 1½ x 40	179.13	110.75	78.25	41.50	42.00
332B05005	50 x 1½ x 50	198.58	110.75	78.25	41.50	52.75
332B05006	50 x 2 x 50	198.58	115.00	78.25	41.50	52.75
332B06306	63 x 2 x 63	248.50	138.25	109.00	64.50	65.00
333A07506	75 x 2 x 75	275.70	170.00	132.50	76.00	77.50
333A07507	75 x 2½ x 75	275.70	171.00	132.50	76.00	77.50
333A07508	75 x 3 x 75	275.70	171.00	132.50	76.00	77.50
333A09008	90 x 3 x 90	344.33	196.50	151.50	94.00	92.50



Nominal Dimensions

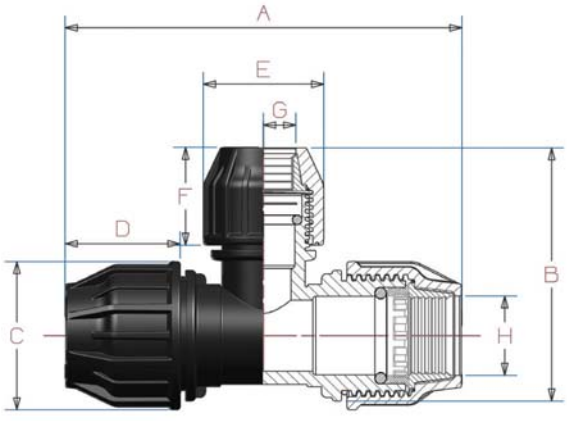
90° TEE
No. 334

CODE	SIZE (mm x mm x mm)	NOMINAL DIMENSIONS (mm)					
		A	B	C	D	E	F
334016016	16 x 16 x 16	115.25	74.63	35.00	39.25	17.50	17.50
334020020	20 x 20 x 20	135.20	87.85	39.50	46.00	22.00	22.20
334025025	25 x 25 x 25	148.25	97.38	41.25	52.50	26.50	26.75
334032032	32 x 32 x 32	178.75	118.00	51.75	63.75	33.50	34.00
334040040	40 x 40 x 40	209.25	203.13	60.75	78.25	41.50	41.50
334050050	50 x 50 x 50	239.40	160.33	68.50	92.50	51.50	51.50
334063063	63 x 63 x 63	296.00	197.25	82.75	109.00	64.50	64.50
334075075	75 x 75 x 75	319.90	216.70	107.50	132.50	77.25	76.00
334090090	90 x 90 x 90	401.65	265.83	131.25	151.50	91.50	94.00
334110110	110 x 110 x 110	564.60	364.55	166.50	175.50	112.50	112.50

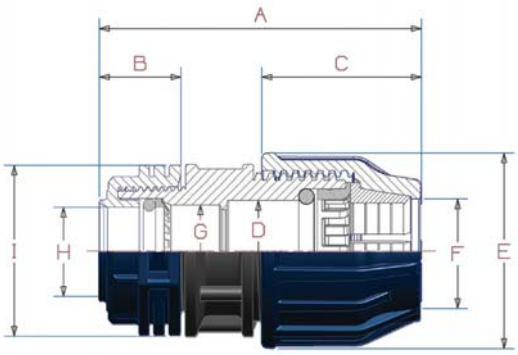


REDUCING TEE
No. 334A

CODE	SIZE (mm x mm xmm)	NOMINAL DIMENSIONS (mm)							
		A	B	C	D	E	F	G	H
334A02016	20 x 16 x 20	135.20	81.88	46.00	39.50	39.25	35.00	17.50	22.20
334A25020	25 x 20 x 25	148.75	98.10	52.50	41.25	46.00	39.50	22.20	26.75
334A03225	32 x 25 x 32	178.00	104.38	63.75	51.75	52.50	41.25	26.75	34.00
334A04032	40 x 32 x 40	208.25	135.75	78.25	60.75	63.75	51.75	34.00	41.50
334A05040	50 x 40 x 50	238.65	150.13	78.25	60.75	78.25	60.75	41.50	41.50
334A06350	63 x 50 x 63	295.50	182.08	109.00	82.75	78.25	60.75	41.50	64.50
334A07563	75 x 63 x 75	318.40	207.55	132.50	107.50	109.00	82.75	64.50	76.00
334A09075	90 x 75 x 90	401.65	246.20	151.50	131.25	132.50	107.50	76.00	94.00
334A11090	110 x 90 x 110	561.85	301.83	175.50	166.50	151.50	131.25	94.00	112.50



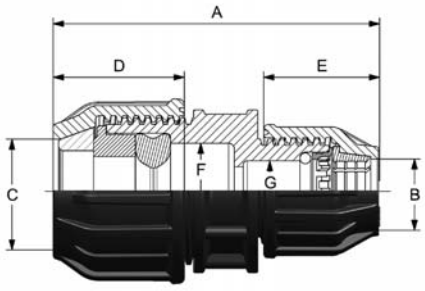
Nominal Dimensions



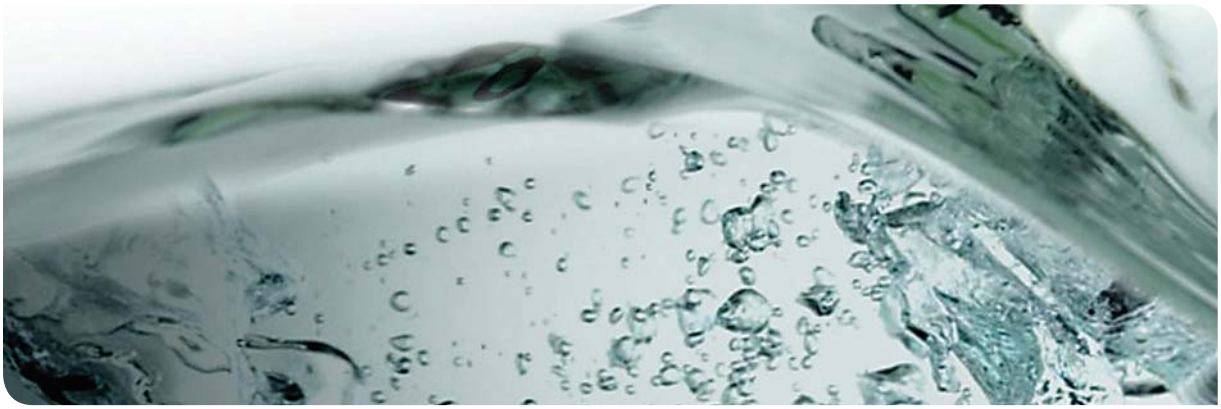
UNIVERSAL FITTING
No. 321C

CODE	SIZE (mm x mm)	NOMINAL DIMENSIONS (mm)								
		A	B	C	D	E	F	G	H	I
321C02015	20 X 15	86.80	26.15	39.50	22.00	46.00	22.20	16.00	15.25	38.00
321C02515	25 X 15	89.30	26.15	41.25	26.50	52.50	26.75	16.00	15.25	38.00
321C02522	25 X 22	85.00	25.60	41.25	26.50	52.50	26.75	22.50	22.50	50.80
321C03222	32 X 22	100.4	25.60	51.75	33.50	63.75	34.00	22.50	22.50	50.80
321C03228	32 X 28	101.50	26.70	51.75	33.50	63.75	34.00	30.00	28.50	60.00

TRANSITION COUPLING
No. 321D



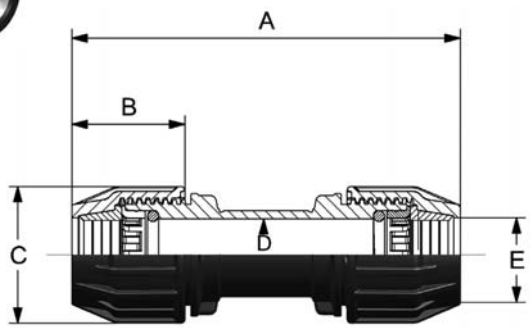
CODE	SIZE (mm/mm x mm)	NOMINAL DIMENSIONS (mm)						
		A	B	C	D	E	F	G
321D02220	15/22 X 20	120.00	21.50	23.00	51.50	39.50	15/22	22.20
321D02225	15/22 X 25	125.10	26.50	23.00	51.50	41.25	15/22	26.75
321D02725	20/27 X 25	123.25	26.50	27.85	54.20	41.25	20/27	26.75
321D02732	20/27 X 32	134.00	33.50	27.85	54.20	51.75	20/27	34.00
321D03425	27/34 X 25	127.25	26.50	35.15	58.20	41.25	27/34	26.75
321D03432	27/34 X 32	137.90	33.50	35.15	58.20	51.75	27/34	34.00



Nominal Dimensions

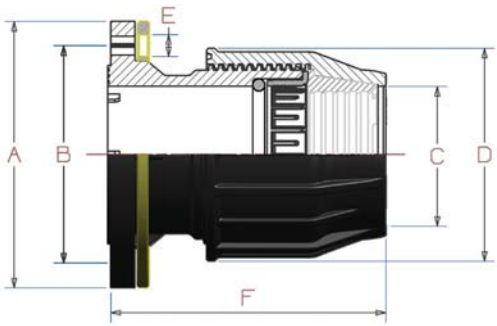
REPAIR COUPLING
No. 311B

CODE	SIZE (mm x mm)	NOMINAL DIMENSIONS (mm)				
		A	B	C	D	E
331B00020	20 x 20	89.00	39.50	46.00	22.00	22.20
331B00025	25 x 25	118.50	41.25	52.50	26.50	26.75
331B00032	32 x 32	178.75	51.75	63.75	33.50	34.00
331B00040	40 x 40	209.25	60.75	78.25	41.50	41.50
331B00050	50 x 50	239.40	68.50	92.50	51.50	51.50
331B00063	63 x 63	296.00	82.75	109.00	64.50	64.50
331B00075	75 x 75	250.90	107.50	132.50	77.25	76.00
331B00090	90 x 90	293.40	131.25	151.50	91.50	94.00
331B00110	110 x 110	382.60	166.50	175.50	112.50	112.50



FLANGE ADAPTOR
No. 330C

CODE	SIZE (mm x in)	NOMINAL DIMENSIONS (mm)						
		A	B	C	D	E	F	n
330C 050 05	50 X 1½	150	110	51.50	92.50	18	136	4
330C 050 06	50 X 2	165	125	51.50	92.50	18	136	4
330C 063 06	63 X 2	165	125	64.50	109.00	18	153	4
330C 075 07	75 X 2½	185	145	76.00	132.50	18	168	4
330C 075 08	75 X 3	200	160	76.00	132.50	18	168	8
330C 090 08	90 X 3	200	160	94.00	151.50	18	200	8
330C 090 09	90 X 4	220	180	94.00	151.50	18	200	8
330C 110 09	110 X 4	220	180	112.50	175.50	18	231	8



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