

Water distribution PRODUCT AND INSTALLATION MANUAL



CONNECT TO BETTER

Trigon Barrier Pipe System



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Trigon



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System Overview

Trigon

Trigon Barrier Pipe

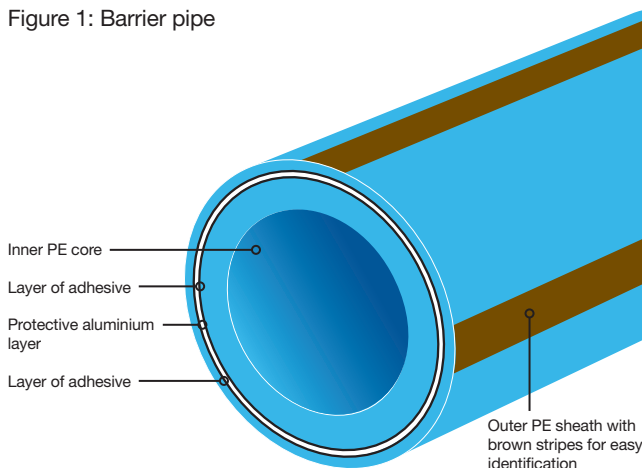
A composite, multi-layer product for use in service pipe installations that transport potable water. Trigon is available in 25, 32 and 63mm sizes (27, 34 and 67mm outside diameters) for use at pressures up to 12.5 bar.

Trigon is specifically designed for use in areas of contaminated ground. These are typically urban brownfield sites under development where there are known contaminants in the ground. Such sites would normally exclude the use of conventional plastic pipe products and require the use of specialist protected barrier products.

The Trigon Barrier Pipe is multi-layered, and incorporates an aluminium barrier layer. This is sandwiched between two layers of conventional polyethylene which is widely used for the manufacture of potable water pipe systems.

Trigon can be installed using conventional open cut trenching methods. Where trenchless methods are being considered, please seek advice from the Wavin Technical Services Helpdesk.

Figure 1: Barrier pipe

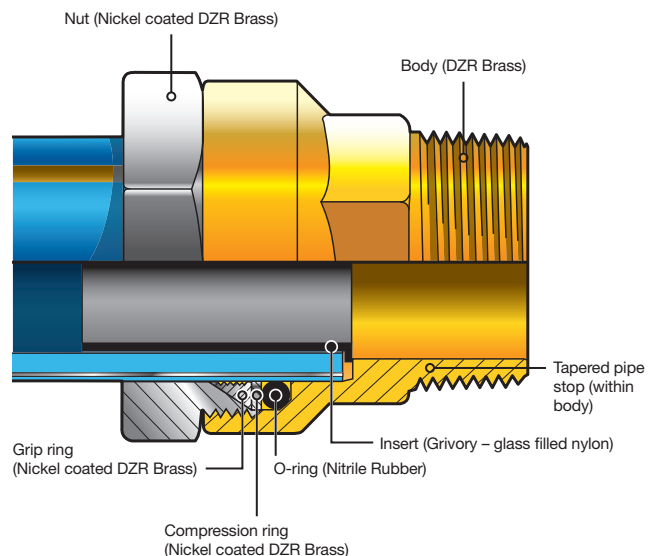


Trigon Fittings

The system includes a range of fittings (see pages 3–5), which have been specifically designed for use with the Trigon pipe. Each fitting is supplied with an insert designed to maintain the integrity of the pipe.

The fitting incorporates an integral O-ring seal and grip ring, providing a fully sealed and end load resistant joint, which guarantees total impermeability to contaminant ingress.

Figure 2: Fitting



System Benefits

✓ Impermeable Barrier

Protects potable drinking water from organic and inorganic contamination

✓ Flexible Construction

Easy to handle and install

✓ Cost Effective

Enables the development of brownfield sites with a flexible, corrosion resistant plastic pipe system

✓ Corrosion Resistant

Long term, reliable solution

✓ Engineered Joint Fitting

Offering no path for the ingress of contaminants

✓ Ease of Installation


Requires no pipe preparation or external wrapping

Quality Approvals and Testing Trigon

The Trigon Barrier Pipe system provides protection where there is doubt about site conditions. It is effective against:

- ④ Permeation from inorganic contaminants such as acids, alkalis, sulphates and chlorides
- ④ Permeation from organic contaminants including petroleum hydrocarbons, ketones and aromatic hydrocarbons
- ④ Corrosion from contaminants due to outer PE sheath

Pipe Product Approvals

- ④ The core pipe and outer layer of Trigon are conventional MDPE (PE 80) material meeting the requirements of:
 - WIS 4-32-19 2007: Polyethylene Pressure Pipe systems with an Aluminium Barrier layer for potable water supply in contaminated land
 - BS6920 Water Quality testing
 - ④ The core pipe – standard WavinSure service pipe – is kitemarked to BS EN 12201-2 (KM 80817) 
 - ④ The Trigon pipe is Kitemarked to WIS 4-32-19 (KM 533039)
 - ④ Trigon pipe is approved under Regulation 31 (England and Wales), Regulation 27 (Scotland) and Regulation 30 (Northern Ireland)
- NB: Formally Regulation 25

Fitting Product Approvals

Trigon fittings are WRc, DVGW and KIWA approved



Independent Testing

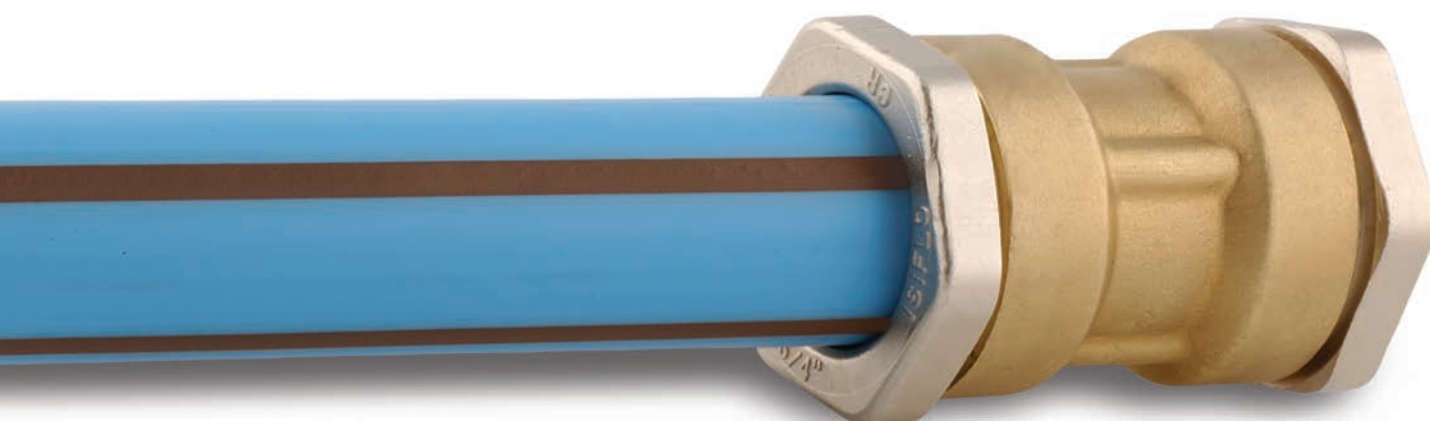
Trigon pipes and fittings have been extensively tested by independent academic and industry research bodies, confirming complete system integrity for its design life.

Test requirements: Core pipe

Test	Method	
Tensile strength	WIS 4-32-19	8.2.1
Elongation at break	WIS 4-32-19	8.2.1
Thermal Stability (Induction Temperature)	WIS 4-32-19	8.2.2
Hydrostatic strength 80°C	WIS 4-32-19	8.2.4
Hydrostatic strength 20°C	BSEN ISO 1167	25 BAR – 1 Hour

Test requirements: Trigon pipe

Test Regime	Test Results:
Permeability Testing	Meets the requirements of WIS 4-32-19, Clause 7.7
Peel strength to outer sheath	1.5N/mm
Pullout testing of pipe and fitting	Exceeds Requirements of WIS 4-22-01
Corrosion testing and microscopy analysis	95°C salt water for 1 week – no measurable level of corrosion on aluminium
Hydrostatic testing	Integrity proven at 20°C and 80°C



Product Details

Trigon

PE Barrier Pipe for Portable Water – 12.5 bar



Coil

Material: Polyethylene PE80 with Aluminium barrier layer

Nominal Size (mm)	Part Number	Length (m)	Weight (Kg/m)
63	71061025	25	1.48
25	71021050	50	0.28
32	71031050	50	0.41
63	71061050	50	1.48



Pipe

Material: Polyethylene PE80 with Aluminium barrier layer

Nominal Size (mm)	Part Number	Length (m)
63	71061006	6

Fittings for Portable Water – 12.5 bar



Straight Couplings

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902500
32	71903500
63	71906500



Reducer

Material: DZR Brass

Nominal Size (mm)	Part Number
32 x 25	71903225
50 x 32	71905232
63 x 50	71906250

Product Details

Trigon



Transition Coupling to Copper

Material: DZR Brass

Nominal Size (mm)	Part Number
25 x 15	71902515
25 x 22	71902522



Transition Coupling to PE

Material: DZR Brass

Nominal Size (mm)	Part Number
25 x 25	71902525
63 x 63	71906525



Male Couplings

Material: DZR Brass

Nominal Size (mm)	Part Number
25 x 3/4"	71902570
32 x 1"	71903570
63 x 2"	71906570



Female Couplings

Material: DZR Brass

Nominal Size (mm)	Part Number
25 x 3/4"	71902580
32 x 1"	71903580
63 x 2"	71906580



Equal Tee

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902700
32	71903700
63	71906700



Reduced Tee

Material: DZR Brass

Nominal Size (mm)	Part Number
32 x 25 x 32	71903725
63 x 32 x 63	71906732



Elbow – 90°

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902590
32	71903590
63	71906590



Elbow – 45°

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902595
32	71903595
63	71906595



Gate Valve

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902400
32	71903400
63	71906400

Spares



Nut – Spare

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902430
32	71903430
63	71906430

Product Details

Trigon



Pressure Ring – Spare

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902440
32	71903440
63	71906440



Clamp Ring – Spare

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902450
32	71903450
63	71906450



Seal – Spare

Material: EPDM

Nominal Size (mm)	Part Number
25	71902460
32	71903460
63	71906460



Blanking Plug

Material: DZR Brass

Nominal Size (mm)	Part Number
25	71902410
32	71903410
63	71906410



Support Inserts

Material: Polyethylene PE80

Nominal Size (mm)	Part Number
25	71902420
32	71903420
63	71906420

Installation Trigon

Trigon Installation

The Trigon Barrier Pipe system is constructed primarily from polyethylene and provides an effective and economic pipework solution for potentially contaminated ground.

The system has all the proven benefits of polyethylene pipe systems, including flexibility, long lengths and corrosion resistance.

As with standard polyethylene pipe systems, Trigon should be installed in accordance with:

- Relevant sections of the current WRc Manual for Polyethylene
- Any local requirement of the water company in whose area the work is being carried out

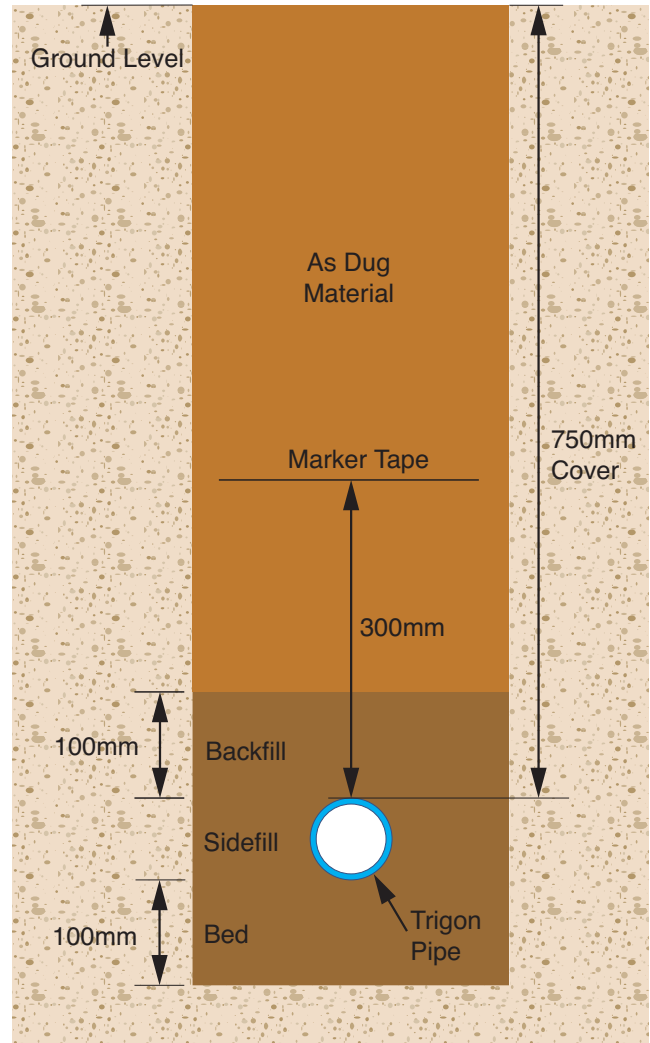
General Considerations

(See Figure 3)

- Service pipes should be installed with a minimum cover of 750mm
- Where soil conditions permit, pipe can be laid directly onto the excavated trench bottom. The as-dug material should be free from large stones, free flowing and uniform
- In all other situations a 100mm (min) bed of sand, pea gravel or suitable crushed stone should be provided
- Initial trench backfilling should use similar material to that used for pipe bedding, with a minimum 100mm cover over the pipe crown
- Subsequent backfilling should follow the guidance given in the WRc Manual for Polyethylene and also the requirements of the local water company



Figure 3: Installation



Repairs Advice

If the Trigon system is damaged after installation, and the normal stop valve cannot be located for emergency shut-off, the standard “squeeze-off” technique for polyethylene may be adopted as a temporary repair.

It is recommended to replace the squeeze off section with a permanent repair at a later stage.

Joining Trigon

The principal aim of the Trigon Barrier Pipe system is to prevent any contaminants in the soil or ground water getting into the water supply. Accordingly, the joining method used must be equally robust in its design.

The Trigon barrier fitting design incorporates an integral O-ring seal and grip ring, providing a fully sealed and end load resistant joint.

Step 1



Ensure the pipe is cut square and cleanly, using approved 'ratchet style' pipe cutters on the 25 and 32mm and using a fine tooth saw or wheeled cutter on the 63mm.

Important Note: If the pipe end is not cut cleanly, deburred and square prior to connection to a fitting, a satisfactory seal will not be achieved.

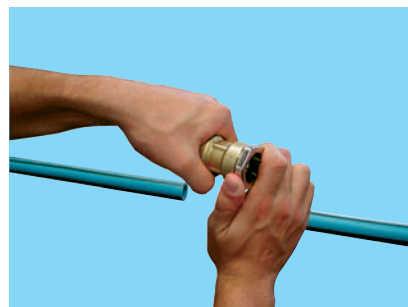
Step 2



Check the pipe is clean, push the insert fully into the pipe end.

For 63mm the pipe end needs to be chamfered on both the inner and outer edges. The rubber o'rings on the insert should be lubricated using a suitable approved WRC lubricant. The insert on the 63mm may need to be tapped in using a soft face mallet or timber across the end.

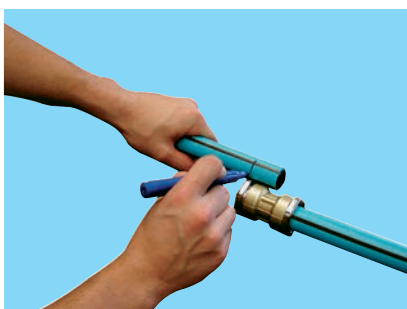
Step 3



Take the fitting and loosen the nut by one complete turn.

Do not dismantle completely, only sufficient to ensure the grip ring is loose.

Step 4

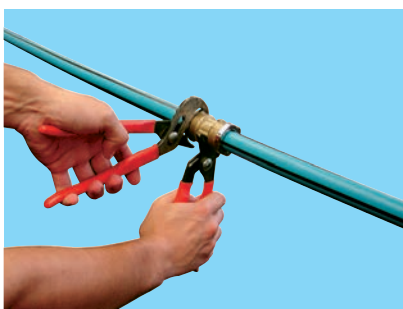


Using an indelible marker pen clearly mark the depth of entry on the pipe, measured up to the pipe stop – and push the pipe fully home. *

The depths of entries for a fully tightened fitting are:

25mm Trigon = 30mm
32mm Trigon = 34mm
63mm Trigon = 70mm

Step 5



Fully tighten the nut until it is up against the body to ensure the fitting seals correctly.

Large pipe wrenches (min 24") will be needed for 63mm fittings.

Important Note: Check that the depth of entry mark is visible and aligns with the edge of the nut once tightened fully.

Step 6



A secure joint and seal should now have been achieved.

*** Important Note:** A good seal is only achieved when the pipe is pushed past the 'O' ring up to the pipe stop. The 63mm fitting has 2 sets of rubber o'ring seals. Please ensure the pipe is pushed fully home up to the stop.

General Information

Trigon

Handling

Trigon Polyethylene Barrier Pipe system is tough, light and easy to handle and install.

However, polyethylene may be damaged by sharp objects causing scoring or gouging. To ensure both protection of the product and safety of site operatives, it is important to handle pipe with reasonable care.

Trigon pipe should not be dropped or thrown from vehicles, or dragged across rough ground, which may cause scoring. Do not use pipe with scoring. It should be clearly marked as damaged for disposal.

Where practical, all protective packaging should be left intact for as long as possible prior to installation.

Storage

Coils

Small diameter coils, if delivered on pallets as part of a full load, should remain on the pallet and be stored on flat, level ground. The storage area should be free of large stones or sharp objects.

Individual, loose coils should similarly be stored on flat level ground.

Key Considerations

- ② Storage should be well away from any exhaust or heat sources and any solvents or oils
- ② Pipe may be stored externally for up to 12 months. For longer-term storage, pipe should be kept under cover
- ② Fittings should be kept under cover in their protective boxes and packaging

General Information

Descriptions

Descriptions and illustrations in this publication are for guidance only. No responsibility can be accepted for any errors, omissions or incorrect assumptions. Refer to the product itself if more detailed information is required. Due to the continuing programme of product improvement the Company reserves the right to amend any published information or to modify any product without prior notice.

Dimensions

Unless otherwise stated all dimensions are in millimetres (mm).

Symbols

British Standard Kitemark

Identifies pipes and fittings which are manufactured under the B.S.I. Certification Scheme.

Colour

Trigon Pipe – Light Blue with Brown Stripes

Supply

All Trigon components are supplied through a nationwide network of merchant distributors. For further information contact Customer Services on 0844 856 5152.

Technical Advice

Trigon Barrier Pipe is backed by Wavin's comprehensive technical advice service. This is available to provide expert assistance at every stage of a project, from planning and product selection to installation and maintenance.

Contact Wavin Technical Design Department:

Tel: 0844 856 5165

Email: technical.design@wavin.co.uk or via online enquiry at wavin.co.uk

Wavin Online

Details of other Wavin and Osma systems can be found online at: wavin.co.uk

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