

**Brymec** 

**CSST (Corrugated Stainless-steel  
Tube) Technical Manual 2025**

# 0.1 Introducing Brymec Products

A proud family business with almost 50 years of experience, we understand the challenges you face and the solutions you require.

From a humble beginning based in south London, Brymec has grown to become one of the country's leading manufacturers and suppliers of quality products to the construction industry.

Our philosophy is to always provide the ultimate service and peace of mind to our customers. A key feature of our pledge to you is to ensure that we always have the best possible range of products for you to choose from.

By investing in innovation, we have been able to engineer our own range of products, all manufactured to our exacting specifications, to deliver quality solutions for the building services industry.

Each one of Brymec's products is not only manufactured to the highest quality standards, but they are also all backed up by robust quality controls, Brymec's industry-leading guarantees and all are supported by our in-house Technical Support team.

Our efficient approach of 'direct supply' enables you to buy a full range of products straight from the

manufacturer, Brymec. This innovative approach simplifies your supply chain, speeds up your deliveries, provides greater support and gives you greater control.

This complete understanding of industry products and systems enables us to collaborate with you more effectively and efficiently. We partner with our customers, offering our knowledge and service, allowing us to deliver a more comprehensive range of products that are just what you want, where you want them and exactly when you need them.



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Cert. 288342018



Cert. 1313072



## 0.3. Sustainability Our commitment to a sustainable future

The '2021 Global Status Report for Buildings and Construction' by the UN states that "The buildings and construction sector accounted for 36% of global energy demand and 37% of energy and energy-related carbon dioxide (CO2) emissions in 2020". Currently, data for the UK shows that the construction industry is responsible for 40% of total emissions, so we all have a major part to play in achieving the UK's goals.



Cert. 459902024

### Our Vision

'To be the greenest, most environmentally friendly supplier to the Building Services industry.'

### Our Business

As a leading manufacturer and distributor of quality valves, tubes and fittings we are always seeking ways to improve our operations to lower our environmental impact and to better serve the industries we supply.

Our signature phrase 'Built for Tomorrow' underpins what we do as a business, whether that be through innovative products which are more environmentally friendly, or by adopting ever more efficient processes.

### Certification

Working with accredited independent assessors, our UK based facilities and operations identified key areas of improvement. By enacting these recommended changes, since June 2022 Brymec has been awarded the status of 'Carbon Neutral Organisation' by Carbon Neutral Britain\*.



\* Certified for scope 1, 2 & 3.6 emissions



### Core sustainability goals

In 2021 Brymec's board set our goals to focus the activities of our sustainability agenda.

Sustainability goals set in January 2021 - Brymec operations and core product ranges					
Goal	40.1% reduction in emissions per £ million by 2030	Core product ranges from 50% recycled feedstock by 2030	50% reduction of single use plastic packaging	All wooden products certified as sustainable FSC approved	30% of company vehicles to be electric by 2030

### Key areas of focus

Our journey towards an ever more environmentally friendly solution continues, and our focus falls in to several key categories;

- › Sustainable packaging solutions including plastic packaging.
- › Development of product ranges to include sustainable materials and processes.
- › UK based operations heating and energy from renewable technologies.
- › New software to optimise efficiencies for onward logistics.
- › Shortening of the supply chain (below);

### Our environmentally friendly business model

Standard models of distribution in the UK can involve up to 6 movements of products by the time they are delivered from the manufacturing facility to the construction location. Brymec's model is to shorten this process to make all deliveries as efficient as possible so as to reduce emissions.

With over 99 % of orders being delivered fully complete with no balances, transport emissions are kept to a bare minimum by avoiding the need for follow-on deliveries to complete the order. This further drives efficiencies by reducing the need for extra packaging and also by reducing on-site waste.



# 1.0 Brymec CSST Gas System

## 1.1 System Overview

Ideal for use in domestic, industrial and commercial applications, Brymec CSST (Corrugated Stainless-Steel Tubing) is a flexible tube system for use within a building to connect appliances to a supply of natural gas or LPG where the maximum operating pressure does not exceed 500Mbar.

The flexible system uses a high-quality, corrosion resistant, annealed stainless-steel tube which can easily be formed to contours and bends allowing a connection free pipe length between the supply and the appliance.

Connections are made quickly using the special compression connections, which feature a special snap-fit system to give reassurance that the assembly has engaged correctly.

To avoid the need for specialist ducting, the Brymec CSST Duo range comes with its own Integral Containment Sleeve to ensure venting of any gases to a safe, controlled area.



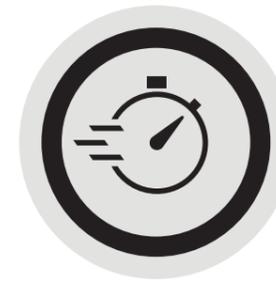
### Advantages

- > Sizes from DN15 - DN50 to suit most designs
- > Protective Polyethylene sleeve
- > Highly flexible
- > Effortless installation
- > No hot-works
- > Durable and corrosion resistant
- > Minimal in-line connections
- > No need for specialist tooling
- > Cost effective

### Applications

The Brymec CSST and CSST Duo gas pipe systems can be used for a broad range of applications such as;

- > Single family homes
- > Healthcare
- > Education
- > Retail
- > Commercial
- > Industrial



#### Time saving

One continuous tube, with no need for additional inline connections.



#### Easy Installation

Installation is extremely straightforward, and requires no specialist ducting (Duo).



#### Fire Safety

No hot-works. Permits are not required, and fire watch periods are not necessary.



#### Clean Jointing

The simple compression connections require no cutting lubricants, pastes or sealants.



#### Pressure Resistance

Brymec CSST is highly resistant to corrosion and is protected by a durable Polyethylene barrier.



#### Leakproof

Following the assembly, each connection is sealed with a highly effective NBR O-ring.



#### UV resistance

The Polyethylene protective sleeve is resistant to UV.



#### Reaction to fire

System has a very low contribution to fire B-s1,do to BS EN 13501-1.



#### Specialist Tools

Brymec CSST is assembled without the need for specialist tooling.

## ➤ 1.2 CSST\* (Corrugated Stainless-steel Tube)

CSST is a flexible gas pipe technology that is commonly used in many different building types.

First developed in Japan in the mid 1980's as a flexible pipe system to improve the safety of gas lines within buildings and structures in the event of earthquakes, CSST has more recently been adopted in countries where there is no risk of seismic events due to some huge benefits over a standard metal-based pipe system.

Used as a direct replacement for traditional copper and steel-based systems, CSST has become extremely popular due to the ease and speed of installation, and due to the overall cost effectiveness of the installed product. Gas supply lines can quickly be routed through a building's structure, often with no need to add costly, and time consuming, in-line connections.

Brymec CSST is manufactured from the highest grades of material to ensure the system is as durable as the building it serves. The robust 316L stainless-steel pipe has extremely high levels of corrosion resistance, which is further protected by a sturdy UV resistant Polyethylene sleeve, colour coded yellow to identify that it's installed to convey gas.

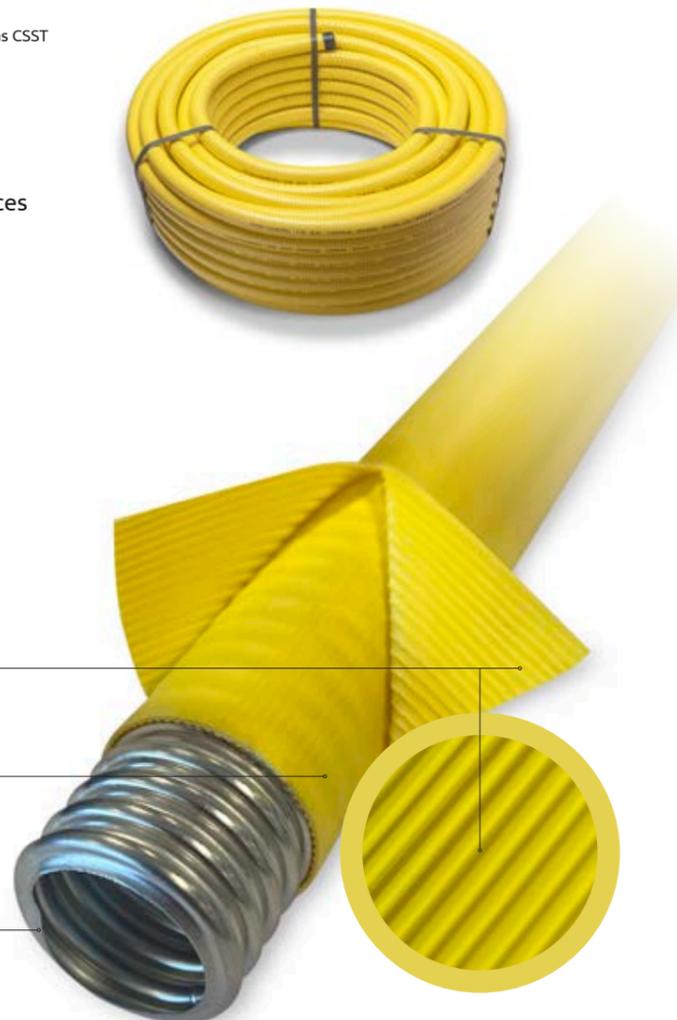
\* For the purposes of this document Pliable Tube kits to BS EN 15266 shall be referred to as CSST

### CSST Duo

For situations where a gas service needs to be installed within an unvented void - such as within a floor void, a shaft, or services duct, it is a mandatory requirement that any potential escape of gas is vented to a safe space. Ordinarily, this would involve adding a secondary sleeve around the existing polyethylene protective cover, or by constructing a dedicated, specialised conduit.

However, The Brymec CSST Duo tube system comes preassembled with an Integral Containment Sleeve. When installed correctly, this specialist sleeved pipe provides containment of any escape of gas and negates the need for further ventilation considerations.

- Outer sleeve of ribbed UV resistant polyethylene jacket
- Inner pipe sleeved in a resistant polyethylene jacket
- Corrugated stainless steel pipe



## ➤ 1.3 CSST Pipe Coils



Central to the success of the CSST and CSST Duo product ranges is the availability of the pipes to be delivered as flexible coils.

This key feature of the product has not only enabled a qualified gas engineer to choose to run a single continuous pipe from the source of supply right the way to the point of use, but it also means that the CSST Duo pipe, with the uninterrupted Integral Containment Sleeve, can be installed with no need for additional ventilation considerations.

Coils of the annealed, flexible stainless-steel CSST gas pipe are available in many different lengths from as little as 5m, to as much as 75m to suit each application.

Cutting the required length from the coil is as simple as using a standard wheeled pipe cutting tool. Once cut to the correct length, the pipe can then be carefully snaked throughout the building following the curves, contours, rises and falls, with the only additional works required is to provide bracketry to support the pipe where necessary.

For easy handling and to ensure the minimum of waste, where a particular installation theme is required, Brymec offers a range of contractor kits which can be selected to cater for common installation designs.

## ➤ 1.4 CSST fittings

Each fitting is manufactured to recognised international standards using high performance materials and precise engineering.

In keeping with the overall ethos of an easy, quick and reliable installation, the Brymec CSST fittings have been designed with some special features.

Firstly, the Brymec CSST fitting ranges come fully assembled, and ready to install. The simple compression style fittings are set during their manufacturing and come ready to be applied onto the associated pipe with no need for extra work, or configuration.



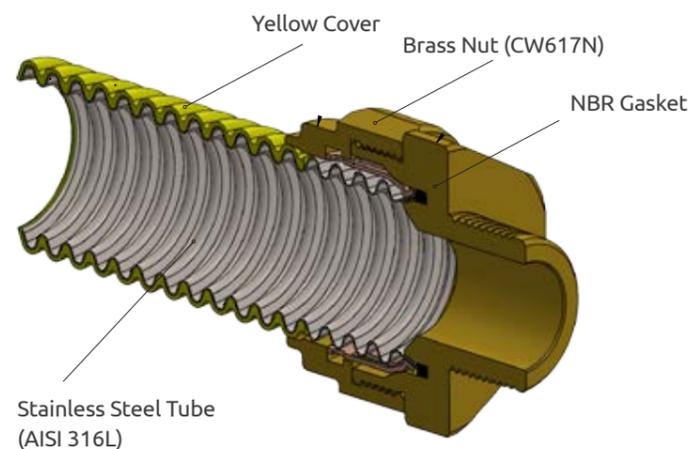
Making the CSST connections could not be more simple.

Each CSST connection is assembled with a special yellow Polyethylene captive clip to control the exact location of the compression nut.

Once the tube has been prepared using the correct procedures (see instructions on page 30), the fitting is simply offered up to the end of the tube, and with gentle pressure the fitting will engage onto the end of the tube.

One of the special features of the Brymec CSST range is the identification of the correct assembly of the fitting onto the tube, in the form of both a tactile and audible 'click'. Once this important indicator has been observed, it signals that the fitting is correctly located, and the next part of the assembly process can begin.

Removing the yellow captive clip releases the compression nut, which is then tightened using the correct procedure.



## ➤ 1.5 Perfect sealing

The final essential part of the connection is the sealing O-ring. Made of NBR (Nitrile Butadiene Rubber). This enables Brymec CSST systems to be suitable for use with 1st, 2nd and 3rd family gases. When the compression nut is tightened to the correct torque, the sealing O-ring is compressed ensuring a reliable, gas-tight connection.

## ➤ 1.6 Operating conditions

The range of Brymec CSST products are suitable for the connection of appliances and equipment to a supply of 1st, 2nd or 3rd family gas where the operating pressure does not exceed 500mbar (0.5bar), and the temperature does not exceed a temperature range of -40 °C to 60 °C BS EN 15266.

Installations must follow the guidance and regulations as detailed within the appropriate standards – such as, but not limited to:

- **BS 6891:2015+A1:2019** - Specification for the installation and maintenance of low pressure gas installation pipework of up to 35 mm
- **BS EN 5482-1** - Installations at permanent dwellings, residential park homes and commercial premises, with installation pipework sizes not exceeding DN 25 for steel and DN 28 for corrugated stainless steel or copper
- **IGEM/UP2 Edition 3** - Installation pipework on industrial and commercial premises
- **IGEM/UP/7 Edition 2 +A:2008** - Gas installations in timber framed and light steel framed buildings IGEM/
- **UP/11 Edition 3** - Gas installations for educational establishments
- **IGEM/UP/16 Edition 2** - Design for natural gas installations on industrial and commercial premises with amendments November 2023
- **IGEM/G/5 Edition 3** - Gas in multi-occupancy buildings with amendments April 2023

	1st Family (Group A)		2nd Family (Group H, L, E)		3rd Family (Group B/P, P, B)	
	Town Gas	Methane Air	Natural Gas	Propane Air	LPG	Butane
CSST	500mbar (0.5bar)					
CSST Duo	500mbar (0.5bar)					

## ➤ 1.7 CSST and Hydrogen

Brymec CSST System is certified for Hydrogen by BSI.

As a fuel source, Hydrogen and Natural Gas have a number of similarities, including safety considerations, transportability, and versatility. In addition, hydrogen is a much less carbon intensive fuel at the point of use.

As such, it is expected to be a significant contributor in the world's shift to a cleaner and greener economy, by diversifying the energy mix and helping to meet emission reduction targets. Hydrogen represents an excellent fuel alternative to Natural Gas in a range of applications, including power production and heating - both process heating (industrial) and space heating (residential and commercial).

The production of Hydrogen is also an excellent way of storing excess energy from renewable sources when demand from the network is low.

With increasing interest in hydrogen as a fuel source, blending hydrogen with natural gas provides an opportunity to increase hydrogen demand while lowering carbon emissions.

Currently, blend ratios of up to 20% hydrogen are being tested.

## ➤ 1.8 Certification

The Kitemark is a UK product quality trade-mark which is operated by the British Standards Institution (BSI Group).

According to BSI, Kitemark certification confirms that a product or service's claim has been independently and repeatedly tested by experts, meaning that our customers can have trust and confidence in our products and services that hold a BSI Kitemark certificate.

Kitemarks are most frequently used to identify products where safety is paramount, such as crash helmets, smoke alarms and products for the conveyance of gas.

The term kite mark is sometimes used colloquially as a level of quality that can be used as a standard against which something of a similar type can be measured or judged.



Brymec CSST has been manufactured to the international standard BS EN15266:2007, and is suitable for use in installation used for natural gas and LPG.

The whole system is approved under BSi Kitemark for dimensions DN15-DN50.

Kitemark KM 696197 to :

- **BS EN 15266: 2007** - Stainless steel pliable corrugated tubing kits in buildings for gas with an operating pressure up to 0.5bar
- **PP1547:2021** - Controls and ancillaries for use with Hydrogen

Kitemark 782249 to :

- **PP1644** - Flexible ventilated ducting for Corrugated Stainless-steel Tubing.

## ➤ 2.0 Regulation & compatibility

### 2.1 Installer competence

Brymec CSST must only be installed, adjusted or inspected by a qualified engineer who must ensure that the work complies with all applicable requirements of the Building Regulations.

All CSST Gas pipework must comply with the Gas Safety (Installation & Use) Regulations and be installed by an operative or business registered with a body approved by the Health and Safety Executive (HSE). Currently the Gas Safe Register.

All Gas engineers should be familiar with the requirements of the below standards:



### Installation reference standards

- **Gas Safety (Installation and Use) Regulations 1998** - as amended
- **BS 6891:2015+A1:2019** - Specification for the installation and maintenance of low-pressure gas installation pipework of up to 35 mm
- **BS EN 5482-1** - Installations at permanent dwellings, residential park homes and commercial premises, with installation pipework sizes not exceeding DN 25 for steel and DN 28 for corrugated stainless steel or copper
- **IGEM/UP/1 Edition 2 +A:2005** - Strength testing/tightness testing/direct purging of industrial and commercial gas installations
- **IGEM/UP/1A Edition 2 +A: 2005** - Strength/tightness testing/purging of small, low pressure industrial & commercial installations
- **IGEM/UP/1B Edition 3 +A:2012** - Tightness testing and direct purging of small Liquefied Petroleum Gas/Air, NG and LPG installations
- **IGEM/UP/2 Edition 3** - Installation pipework on industrial and commercial premises
- **IGEM/UP/7 Edition 2 +A:2008** - Gas installations in timber framed and light steel framed buildings
- **IGEM/UP/11 Edition 3** - Gas installations for educational establishments
- **IGEM/UP/16 Edition 2** - Design for natural gas installations on industrial and commercial premises with amendments November 2023
- **IGEM/G/5 Edition 3** - Gas in multi-occupancy buildings with amendments April 2023
- **BS EN 7671:2018** - Requirements for Electrical Installations, IET Wiring Regulations 18th Edition
- **BS EN 10226-1** - Pipe threads where pressure tight joints are made on the threads - Part 1: Taper external threads and parallel internal threads - Dimensions, tolerances and designation

## 2.2 System Compatibility

It is a matter of paramount safety that only proprietary components supplied by Brymec as part of the CSST, or CSST Duo, ranges are approved for use as part of the approved piping system.

Mixing of another manufacturer's products could result in an unsafe system.

Connections of Brymec CSST to third party equipment such as valves, meters, appliances and existing rigid pipe systems, can only be made by use of the male or female threaded connections, or the range of Brymec CSST to copper compression adapters.

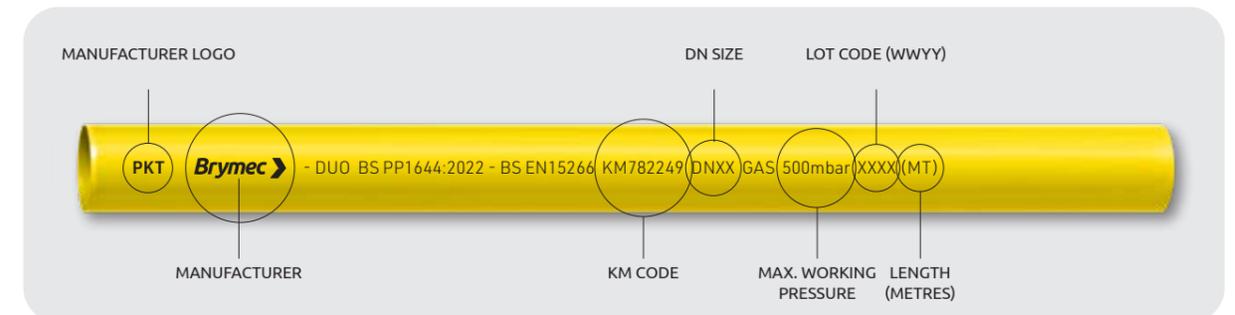
- › Brymec CSST threaded fittings are manufactured to BS EN 10226-1 to enable safe connection when installed to the correct installation procedures as detailed on page 30.
- › A suitable approved sealing medium must be applied to the threads before assembly.



## 2.3 Pipe Technical Information

Brymec CSST & CSST Duo (Corrugated Stainless Steel Tube) Technical Information						
Size	DN15	DN20	DN25	DN32	DN40	DN50
CSST OD (mm)	22.60	25.50	32.40	39.90	47.90	59.20
CSST Pipe Weight - Kg/m	0.25	0.23	0.38	0.52	0.67	0.94
CSST Duo OD (mm)	24.60	27.50	34.40	41.90	49.90	61.30
CSST Duo Pipe Weight - Kg/m	0.31	0.30	0.46	0.61	0.80	1.13
Nominal Wall Thickness - mm	0.25	0.20	0.25	0.25	0.30	0.30
Internal Diameter - mm	16.00	20.00	25.00	32.00	40.00	50.00
Max. Operating Pressure	0.5 bar (500 mbar)					
Pipe Material	Pliable 1.4404 (316L) corrugated Stainless Steel, to BS EN10088					
Polyolefin Sleeve	Protective sleeve, and integral Containment Sleeve (Duo only), from yellow, UV resistant Polyethylene					
Reaction To Fire	B-s1-d0 to BS EN 13501-1					
Pipe identification Markings	Markings at 1m intervals as required by BS EN 15266					
Manufacturing Standard	BS EN 15266 - Stainless Steel Pliable Corrugated Tubing Kits in Buildings for Gas With an Operating Pressure Up to 0.5 bar					
Approvals	BS EN 15266, PP1547 and PP1644					

### Tube Markings



## 2.4 Fittings Technical Information

Brymec CSST Fittings Technical Information	
Body Material	Brass - CW617N
O-ring Material	NBR to BS EN 549 - Yellow for use with 1st, 2nd and 3rd family gases
Safety	Single assembly compression fittings with click-fit safety feature
Compression retaining ring	Plastic Polyethylene retaining clip to control compression nut
Thread Standard	BSP - R & Rp BS EN10226: - 1 2004
Approvals	BS EN 15266, PP1547 and PP1644
Manufacturing Standard	BS EN 15266 - Stainless Steel Pliable Corrugated Tubing Kits in Buildings for Gas With an Operating Pressure Up to 0.5 bar

## 3.0 Safety Considerations

Where any uncertainty over the correct procedures or regulations exists, please postpone the installation process and seek guidance from a competent, qualified engineer, or recognised authority.

Before conducting any installation works, it is of paramount importance that the installer considers all matters of safety, and the relevant legislation that covers the details relating to the safe installation of CSST products, including the following conditions:

### 3.1 Isolation of gas services

When making a connection to a primary meter, or when undertaking works on an existing installation, the installer must ensure that services are isolated, and where necessary, secured using a suitable termination fitting, or lockable valve. Installers need to consider the risk of persons restoring the gas supply at the primary meter should they leave the general location where the work is underway.

No incomplete, or untested works, should be left unattended, unless the whole system is completely isolated with no opportunity for a 3rd party to reinstate the supply.

### 3.2 Not a flexible appliance connector

Brymec CSST pipe work is NOT to be used as a flexible appliance connector.

IGEM/UP/2 Edition 3 - 6.7.6 states "Pliable corrugated stainless-steel tube (CSST) should not be used as the final gas appliance connection if it would be subject to vibration and/or heat"

7.3.3 states "pliable corrugated stainless-steel tube or flexible connections shall not be directly connected to any primary meter outlet, unless the meter is rigidly secured to a fixed meter bracket/bar".

Where a flexible connection is incorporated within the meter installation, or where Brymec CSST is to be connected to an appliance by use of a flexible connector, it is particularly important to ensure that the CSST installation pipework is secure and adequately supported.

### 3.3 Risk from mechanical damage

Brymec CSST systems must not be installed in such a manner where mechanical or environmental damage could occur during, or following, installation.

IGEM/UP/2 Edition 3 – 7.6.3.8 "pliable stainless-steel corrugated tube pipework that is exposed, or surface mounted, shall not be used in areas where it is particularly vulnerable to damage and unauthorised interference; for example, in public areas".

### 3.4 Risk of contamination

During transport, storage and installation, the open ends of the CSST pipe must always be covered so as to avoid any risk of contamination.

At no time should any waste be permitted to enter the system. Small amounts of debris in the installed system could work through the pipework eventually finding the connected service, and potentially causing a blockage of gas control equipment or combustion equipment.

Brymec CSST coils come protected with removable plastic caps. It is recommended that once the required length is cut from the coil, the caps are replaced onto the end of the remaining coil length. The cut length should then be taped, or closed, prior to installation to prevent any debris entering the pipe.

### 3.5 Equipotential Bonding

Equipotential bonding must be completed in line with the legislation and guidance within BS EN 7671:2018 - Requirements for Electrical Installations, IET Wiring Regulations 18th Edition.

The Gas Safety (Installation and Use) Regulations 1998 states: 18(2) "Any person who connects any installation pipework to a primary meter shall, in any case where equipotential bonding may be necessary, inform the responsible person that such bonding should be carried out by a competent person."

## 3.6 Protection from chemical corrosion

Brymec CSST systems must not be exposed to any products or materials that may contain acids, salts, or strong alkaline components. Some building materials may contain harmful compounds which may cause corrosion of the metallic components within the system.

Contact of any metal components with harmful chemicals must be completely avoided.

Examples of harmful agents that must not come into contact with CSST;

- › Sodium Hypochlorite and Chlorine
- › Hydrochloric Acid (Muriatic)
- › Sodium Chloride
- › Phosphoric Acid
- › Phenolic Acid
- › Sulphuric Acid
- › Leak detector products that may contain Chlorides, including washing liquid.

Although the CSST Polyethylene protective layer should not be affected by infrequent contact with most chemicals, any accidental contact must be immediately washed from the CSST system, using potable water.

## 3.7 Fire protection requirements

Building regulations in the United Kingdom are statutory instruments, or statutory regulations, that seek to ensure that the policies set out in the relevant legislation are carried out. Building regulation approval is required for most building work in the UK.

In the UK, the requirements for fire protection are detailed in the relevant government documents:

- › England - Fire Safety, Approved Document B - fire safety volume 1: Dwellings, 2019 edition incorporating 2020 and 2022 amendments or Fire Safety Approved Document B - 2019 edition incorporating 2020 and 2022 amendments.
- › Scotland – Building standards technical handbook June 2023: Domestic and Building standards technical handbook June 2023: non-domestic
- › Wales - Welsh Building Regulations 2010, Volume 1 - Dwellinghouses, Approved Document incorporating 2010, 2016 and 2020 amendments or Welsh Building Regulations 2010, Volume 2 - Buildings other than Dwellinghouses, Approved Document incorporating 2010, 2013, 2016, 2017 and 2020 amendments.

In modern buildings, there are strict regulations governing fire safety and the protection of all areas of a building.

It is sometimes necessary for pipes and other services to pass through fire-separating elements. If a fire-separating element is to be effective, every opening to allow services to pass through should be adequately protected by sealing with appropriate fire-stopping methods so that the fire resistance of the element is not impaired.

In order to guarantee preventive fire protection, the choice of the right building materials is very important. The selection of building materials is regulated and detailed in the above national standards and these standards also contain a list of technical building regulations which must be observed.

In addition to the relevant national standards, product information to the European standard BS EN 13501-1 'Fire Classification of Construction Products and Building Elements' and the British National standard BS 476 'Fire tests on building materials and structures - methods of test to determine the classification of the surface spread of flame of products' are also important information required by the projects' engineers.

With regards to the Brymec CSST pipe system and the use fire stopping measures, our advice is to always follow the guidance from the project's engineers. If deemed suitable by the engineers, fire collars and fire bandages available from the Brymec range of products may be used if any adhesive or methods of application do not damage or compromise the materials of the pipe system.

In many circumstances, intumescent sealants need to be applied. Please consult with any passive fire product supplier to confirm their products are suitable for use in combination with Brymec CSST system materials.

In all instances, any fire-stopping solutions used must demonstrate the ability to provide the correct fire rating by means of certificated 3rd party fire test data.

In a fire situation, different types of pipe system perform differently. Any fire stop solutions must therefore be tested on specific pipe types, and this performance testing can then provide engineers with the necessary evidence and information to maintain the correct fire rating for that specific sealing element.

# 4. Installation Planning

## 4.1 Sizing CSST Pipe Systems

No matter what gas media is being conveyed, all pipe systems will cause a loss of pressure to the flow. The precise amount of pressure that will be lost is reliant on several factors. Firstly, the key factor of the equation is relating to the internal diameter of the pipe, the surface roughness of the pipe material, and the overall length of the proposed pipe run.

Secondly, the amount of gas being passed through the pipe (m<sup>3</sup>/h), and the density of the gas media will also influence the results of the calculation.

Finally, any in-line connections and bends will also affect the available pressure at the outlet. Where possible, formed bends in the pipe should follow the guidance given for the recommended bending radius.

When 'sizing' a system, the installer determines the smallest size pipe that will deliver the required flow given the maximum allowable amount of pressure loss.

Sizing tables provide the maximum load for a specific situation given the gas pressure, the 'allowable pressure drop', the size of pipe, and the length of the run.

The 'allowable pressure drop' is the maximum pressure loss that can occur and still maintain a suitable supply pressure for the correct operation of equipment or appliances. For natural gas, the pressure at the meter outlet should be 21 mbar, and the pressure drop between the meter outlet and the connected appliances shall not exceed 1 mbar at maximum flow conditions. Low pressure 3rd family gas supplies should be regulated at 28 mbar (butane) or 37 mbar (propane), with a pressure drop not exceeding 2 mbar.

Different sizing tables are used for each combination of system pressure and pressure drop.



# UK - Natural Gas

UK - Natural Gas - ΔP 1.0 mbar Max. - 10,35 kWh/m <sup>3</sup>																
	1m		2m		3m		4m		5m		6m		7m		8m	
	kWh	m <sup>3</sup> h														
DN15	45.60	4.41	32.20	3.11	26.30	2.54	22.80	2.20	20.40	1.97	18.50	1.79	17.20	1.66	16.10	1.56
DN20	89.50	8.65	63.30	6.12	51.70	5.00	44.80	4.33	40.10	3.87	36.50	3.53	33.70	3.26	31.80	3.07
DN25	157.9	15.26	111.7	10.79	91.20	8.81	78.90	7.62	70.80	6.84	64.40	6.22	59.50	5.75	56.00	5.41
DN32	298.9	28.88	211.5	20.43	172.6	16.68	149.4	14.43	134.0	12.95	121.9	11.78	112.6	10.88	106.1	10.25
DN40	532.8	51.48	376.8	36.41	307.6	29.72	266.3	25.73	238.8	23.07	217.3	21.00	200.6	19.38	189.1	18.27
DN50	952.4	92.02	673.7	65.09	549.8	53.12	476.0	45.99	426.8	41.24	388.4	37.53	358.6	34.65	338.0	32.66
	10m		12m		14m		16m		18m		20m		22m		24m	
	kWh	m <sup>3</sup> h														
DN15	14.50	1.40	13.10	1.27	12.20	1.18	11.30	1.09	10.70	1.03	10.30	1.00	9.70	0.94	9.30	0.90
DN20	28.30	2.73	25.80	2.49	23.90	2.31	22.40	2.16	21.10	2.04	20.20	1.95	19.10	1.85	18.10	1.75
DN25	49.90	4.82	45.40	4.39	42.10	4.07	39.50	3.82	37.20	3.59	35.70	3.45	33.60	3.25	32.00	3.09
DN32	94.6	9.14	86.0	8.31	79.80	7.71	74.80	7.23	70.40	6.80	67.60	6.53	63.70	6.15	60.50	5.85
DN40	168.5	16.28	153.3	14.81	142.2	13.74	133.3	12.88	125.4	12.12	120.4	11.63	113.4	10.96	107.9	10.43
DN50	301.3	29.11	274.0	26.47	254.2	24.56	238.3	23.0	224.2	21.7	215.3	20.80	202.8	19.6	192.9	18.64
	26m		28m		30m		32m		35m		40m		45m		50m	
	kWh	m <sup>3</sup> h														
DN15	8.90	0.86	8.60	0.83	8.30	0.80	8.10	0.78	7.60	0.73	7.30	0.71	6.70	0.65	6.50	0.63
DN20	17.50	1.69	16.80	1.62	16.50	1.59	15.70	1.52	15.20	1.47	14.20	1.37	13.40	1.29	12.90	1.25
DN25	30.80	2.98	29.60	2.86	29.00	2.80	27.80	2.69	26.80	2.59	25.10	2.43	23.60	2.28	22.80	2.20
DN32	58.40	5.64	56.10	5.42	55.00	5.31	52.60	5.08	50.70	4.90	47.40	4.58	44.70	4.32	43.20	4.17
DN40	104.1	10.06	100.1	9.67	98.00	9.47	93.70	9.05	90.40	8.73	84.60	8.17	79.60	7.69	77.00	7.44
DN50	186.0	17.97	178.9	17.29	175.2	16.93	167.5	16.18	161.6	15.61	151.2	14.61	142.3	13.75	137.6	13.29
	60m		70m		75m		80m		90m		100m					
	kWh	m <sup>3</sup> h														
DN15	5.90	0.57	5.50	0.53	5.20	0.50	5.00	0.48	4.70	0.45	4.40	0.43				
DN20	11.50	1.11	11.00	1.06	10.50	1.01	9.90	0.96	9.30	0.90	8.60	0.83				
DN25	20.30	1.96	19.40	1.87	18.50	1.79	17.50	1.69	16.40	1.58	15.30	1.48				
DN32	38.50	3.72	36.70	3.55	35.00	3.38	33.10	3.20	31.10	3.00	28.90	2.79				
DN40	68.50	6.62	65.50	6.33	62.30	6.02	58.90	5.69	55.40	5.35	51.50	4.98				
DN50	122.5	11.84	117.1	11.31	111.4	10.76	105.3	10.17	98.90	9.56	92.00	8.89				

## UK - Propane

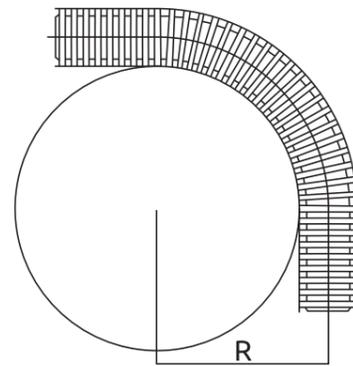
UK - Propane - ΔP 2.0 mbar Max. - 26,04 kWh/m <sup>3</sup>																
	1m		2m		3m		4m		5m		6m		7m		8m	
	kWh	m <sup>3</sup> h														
DN15	103.7	3.98	73.3	2.81	59.8	2.30	51.8	1.99	46.3	1.78	42.3	1.62	39.1	1.50	36.6	1.41
DN20	204.0	7.83	144.1	5.53	117.6	4.52	101.9	3.91	91.2	3.50	83.1	3.19	76.9	2.95	71.9	2.76
DN25	359.7	13.81	254.2	9.76	207.4	7.96	179.7	6.90	160.8	6.18	146.5	5.62	135.7	5.21	126.8	4.87
DN32	681.0	26.15	481.3	18.48	392.6	15.08	340.2	13.06	304.4	11.69	277.5	10.65	256.8	9.86	240.0	9.22
DN40	1214	46.61	857.7	32.94	699.7	26.87	606.3	23.28	542.6	20.84	494.5	18.99	457.7	17.58	427.8	16.43
DN50	2170	83.31	1533	58.88	1251	48.03	1084	41.62	969.9	37.25	884.0	33.94	818.2	31.42	764.7	29.37
	10m		12m		14m		16m		18m		20m		22m		24m	
	kWh	m <sup>3</sup> h														
DN15	32.8	1.26	29.7	1.14	27.5	1.06	25.9	0.99	24.4	0.94	23.1	0.89	21.9	0.84	21.0	0.81
DN20	64.4	2.47	58.6	2.25	54.0	2.07	50.9	1.95	47.9	1.84	45.3	1.74	42.9	1.65	41.1	1.58
DN25	113.6	4.36	103.3	3.97	95.3	3.66	89.8	3.45	84.4	3.24	79.9	3.07	75.7	2.91	72.6	2.79
DN32	215.1	8.26	195.6	7.51	180.5	6.93	170.0	6.53	159.9	6.14	151.3	5.81	143.3	5.50	137.4	5.28
DN40	383.3	14.72	348.5	13.38	321.6	12.35	302.9	11.63	284.9	10.94	269.6	10.35	255.5	9.81	244.9	9.40
DN50	685.2	26.31	623.1	23.93	575.0	22.08	541.5	20.79	509.3	19.56	482.0	18.51	456.7	17.54	437.8	16.81
	26m		28m		30m		32m		35m		40m		45m		50m	
	kWh	m <sup>3</sup> h														
DN15	20.2	0.78	19.5	0.75	18.8	0.72	18.1	0.70	17.3	0.66	16.3	0.63	15.2	0.58	14.5	0.56
DN20	39.7	1.52	38.1	1.46	36.9	1.42	35.7	1.37	34.0	1.31	32.1	1.23	29.7	1.14	28.7	1.10
DN25	69.9	2.68	67.2	2.58	65.1	2.50	62.9	2.42	59.9	2.30	56.7	2.18	52.5	2.02	50.6	1.94
DN32	132.4	5.08	127.3	4.89	123.3	4.74	119.2	4.58	113.4	4.35	107.3	4.12	99.3	3.81	95.8	3.68
DN40	236.1	9.07	226.9	8.71	219.8	8.44	212.4	8.16	202.2	7.76	191.3	7.35	177.0	6.80	170.8	6.56
DN50	422.0	16.21	405.6	15.58	392.9	15.09	379.7	14.58	361.4	13.88	342.0	13.13	316.5	12.15	305.4	11.73
	60m		70m		75m		80m		90m		100m					
	kWh	m <sup>3</sup> h														
DN15	13.1	0.50	12.0	0.46	11.7	0.45	11.4	0.44	10.5	0.40	10.2	0.39				
DN20	26.0	1.00	23.6	0.91	22.9	0.88	22.2	0.85	20.9	0.80	20.1	0.77				
DN25	45.8	1.76	41.6	1.60	40.4	1.55	39.2	1.51	36.8	1.41	35.5	1.36				
DN32	86.7	3.33	78.7	3.02	76.5	2.94	74.3	2.85	69.7	2.68	67.2	2.58				
DN40	154.6	5.94	140.3	5.39	136.4	5.24	132.4	5.08	124.2	4.77	119.7	4.60				
DN50	276.3	10.61	250.8	9.63	243.9	9.37	236.8	9.09	222.0	8.53	214.0	8.22				

## UK - Butane

UK - Butane - ΔP 2.0 mbar Max. - 33,83 kWh/m <sup>3</sup>																
	1m		2m		3m		4m		5m		6m		7m		8m	
	kWh	m <sup>3</sup> h														
DN15	128.6	4.94	90.9	3.49	74.2	2.85	64.3	2.47	57.5	2.21	52.5	2.02	48.6	1.87	45.5	1.75
DN20	227.2	8.73	160.7	6.17	131.1	5.03	113.6	4.36	101.6	3.90	92.7	3.56	85.8	3.29	80.4	3.09
DN25	400.7	15.39	283.4	10.88	231.2	8.88	200.4	7.70	179.3	6.89	163.6	6.28	151.3	5.81	141.8	5.45
DN32	758.6	29.13	536.5	20.60	437.9	16.82	379.4	14.57	339.4	13.03	309.7	11.89	286.5	11.00	268.4	10.31
DN40	1352	51.92	956.1	36.72	780.3	29.97	676.2	25.97	604.9	23.23	552.0	21.19	510.7	19.61	478.4	18.37
DN50	2417	92.81	1709	65.63	1395	53.57	1209	46.42	1081	41.52	986.7	37.88	912.9	35.06	855.2	32.84
	10m		12m		14m		16m		18m		20m		22m		24m	
	kWh	m <sup>3</sup> h														
DN15	40.7	1.56	37.1	1.42	34.3	1.32	32.2	1.24	30.3	1.16	28.8	1.11	27.3	1.05	26.3	1.01
DN20	71.9	2.76	65.5	2.52	60.6	2.33	56.9	2.19	53.6	2.06	50.9	1.95	48.3	1.85	46.4	1.78
DN25	126.8	4.87	115.6	4.44	106.9	4.11	100.3	3.85	94.6	3.63	89.8	3.45	85.2	3.27	81.8	3.14
DN32	240.1	9.22	218.8	8.40	202.4	7.77	190.0	7.30	179.1	6.88	170.0	6.53	161.3	6.19	155.0	5.95
DN40	428.0	16.44	390.0	14.98	360.8	13.86	338.6	13.00	319.1	12.25	303.0	11.64	287.5	11.04	276.2	10.61
DN50	765.1	29.38	697.2	26.77	645.0	24.77	605.3	23.25	570.5	21.91	541.6	20.80	514.0	19.74	493.7	18.96
	26m		28m		30m		32m		35m		40m		45m		50m	
	kWh	m <sup>3</sup> h														
DN15	25.1	0.96	24.3	0.93	23.4	0.90	22.7	0.87	21.8	0.84	20.4	0.78	19.2	0.74	18.3	0.70
DN20	44.4	1.71	42.9	1.65	41.4	1.59	40.1	1.54	38.5	1.48	36.1	1.39	33.9	1.30	32.3	1.24
DN25	78.3	3.01	75.7	2.91	73.0	2.80	70.8	2.72	67.9	2.61	63.6	2.44	59.7	2.29	57.0	2.19
DN32	148.3	5.70	143.4	5.51	138.3	5.31	134.0	5.15	128.6	4.94	120.5	4.63	113.1	4.34	107.9	4.14
DN40	264.3	10.15	255.6	9.82	246.4	9.46	238.9	9.17	229.2	8.80	214.8	8.25	201.6	7.74	192.3	7.38
DN50	472.6	18.15	456.9	17.55	440.6	16.92	427.1	16.40	409.7	15.73	383.9	14.74	360.4	13.84	343.8	13.20
	60m		70m		75m		80m		90m		100m					
	kWh	m <sup>3</sup> h														
DN15	16.6	0.64	15.3	0.59	14.8	0.57	14.5	0.56	13.6	0.52	13.0	0.50				
DN20	29.4	1.13	27.1	1.04	26.1	1.00	25.6	0.98	24.1	0.93	23.0	0.88				
DN25	51.8	1.99	47.8	1.84	46.1	1.77	45.2	1.74	42.5	1.63	40.5	1.56				
DN32	98.1	3.77	90.5	3.48	87.3	3.35	85.6	3.29	80.4	3.09	76.8	2.95				
DN40	174.9	6.72	161.3	6.19	155.6	5.98	152.6	5.86	143.3	5.50	136.8	5.25				
DN50	312.7	12.01	288.4	11.08	278.1	10.68	272.8	10.48	256.3	9.84	244.6	9.39				

## 4.2 Equivalent length - Bend Radius

When forming any bends in Brymec CSST systems, an equivalent length calculation should be added to your overall length.



Pipe Size	Recommended Radius		Minimum Radius (Tight Bend)	
	R/mm	Equivalent Length/m	R/mm	Equivalent Length/m
DN15	75	0.25	25	0.5
DN20	90	0.25	30	0.5
DN25	125	0.25	45	0.5
DN32	140	0.25	60	0.5
DN40	140	0.25	76	0.5
DN50	150	0.25	100	0.5

## 4.3 Equivalent length - fittings

Tube Size	Brymec CSST Fitting Equivalent Length (eL) - m				
	Coupling	M/F Threaded	Tee		
			Cross Flow	Branch Outlet	Branch Supply
DN15	0.0m	0.0m	0.0m	0.5m	0.5m
DN20	0.0m	0.0m	0.0m	0.5m	0.5m
DN25	0.0m	0.0m	0.0m	0.5m	0.5m
DN32	0.0m	0.0m	0.0m	0.5m	0.5m
DN40	0.0m	0.0m	0.0m	0.5m	0.5m
DN50	0.0m	0.0m	0.0m	0.5m	0.5m

Where a reduced branch tee is to be used, the equivalent length of the smaller branch shall be used for the equivalent length calculation.

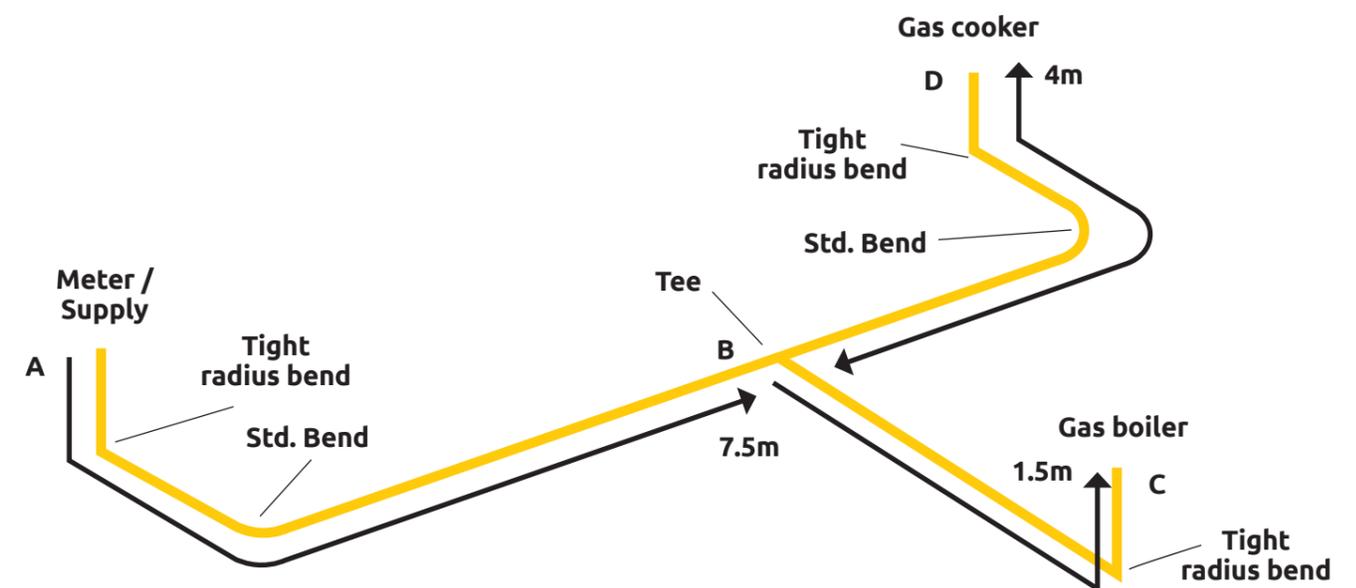
## 4.4 Pipe sizing example

For the calculation of the necessary pipe size for the supply of natural gas (LPG gasses require different tables), the below method of calculation should be applied.

Design standards recommend that a maximum pressure drop of 1mbar is to be applied to calculate the pipe size between the meter and each individual service or outlet.

Each length of pipe should be calculated in turn, making allowances for the pipe losses, and for additional losses through any fittings, or any formed bends. Differentials in the height of the meter/supply and the height of the service must also be catered for in the calculation.

Where the required flow rate from table A1 on page 21 does not match the calculated volume required, the next highest value must be selected from the table – i.e. increase pipe diameter to the next available size.



Pipe run	Services	Gas flow rate	Pipe length (a)	Equivalent length		Total length (a+b)	Tube diameter (DN)
				Fittings / Bends	Equivalent length (b)		
A - B	Gas Boiler + Gas Cooker	3.6 m <sup>3</sup> /h	7.5m	1 tight radius bend + 1 std. bend	0.75m	8.25m	DN25
B - C	Gas Boiler	2.4 m <sup>3</sup> /h	1.5m	1 tee + 1 tight radius bend	1.0m	2.5m	DN15
B - D	Gas Cooker	1.2 m <sup>3</sup> /h	4m	1 tee + 1 bend + 1 tight radius bend	0.75m	4.75m	DN15

Gas pipe sizes are best calculated allowing for the maximum load that is likely to be applied, including a provision for any later additions to the pipe scheme, and for the largest reasonable appliance that is likely to be connected.

## 5. Installation

### 5.1 Pipe Support

It is a legal requirement to ensure that all gas pipework is adequately supported. BS 6891: 2015 + A1 2019 sets out the requirements for adequate support.

The support should be designed:

- › To prevent the pipework from coming into contact with surfaces that are likely to cause corrosion; and
- › To prevent movement where damage could occur.

Where pipe clips are required to provide support, they must be suitable to support the weight of the installed product, and they must be suitably secured to a capable structure.

All pipework must be secured at each end, maximum of 100mm from each point or termination, using suitable clips and/or the meter bracket to provide support and to prevent movement.

According to BS EN 15266 section 4.8 states - Supports shall be designed to carry the system load for a minimum of 30 min in case of fire. The standard temperature/time curve shall be as given in BS EN 1363-1:1999, Figure 7.

Diameter of Pipe	Maximum spacing in straight sections		Maximum spacing for a change of direction
	Horizontal Sections	Vertical Sections	
DN15	500	1000	500
DN20	500	1000	500
DN25	600	1200	600
DN32	750	1500	750
DN40	1000	1750	900
DN50	2000	2500	2000

## 5.2 Sleeving of pipes through walls and structures

Where Brymec CSST passes through a wall or building structure, it must be sleeved to prevent mechanical damage, and to ensure that any potential escape of gas does not lead to an undetected dangerous and potentially explosive build-up of gas within the structure.

In accordance with BS 6891:2015, gas pipework sleeves shall be:

- › Resistant to corrosion
- › Impermeable to gas, for example, copper, steel, polyethylene (PE) or polyvinyl chloride (PVC)
- › Adequate size in dimension and length to pass through full width of the wall
- › Capable of protecting the pipework from mechanical damage from structural movement
- › Fixed securely and the outer wall of the sleeve must be sealed to the building structure (a sleeve is often slightly longer than the full width of the wall to allow this sealing between sleeve and wall)
- › In the case of catering installations as specified by BS 6173:2020, the sleeve shall protrude 25mm beyond the internal finished surface within the kitchen
- › Sealed with a suitably fire-resistant flexible sealant in accordance with BSEN1366-3, between the gas pipe and the sleeve (annular space) – please consult with any passive fire product supplier to confirm their products are suitable for use in combination the Brymec CSST system materials.
- › Sealed at both ends as specified by IGEM/G/5 Edition3 in multiple occupancy buildings, at one end in other building types.

Brymec's CSST Polyethylene protective sleeving, and the additional Integral Containment Sleeve, does NOT constitute the description of a sleeve as detailed in this section.

## 5.3 Pipework buried within a concrete or screed floor

CCST Pipework buried within a concrete or screed floor shall only be installed if the below conditions are followed:

- › Brymec CSST must be protected from mechanical damage by a suitable depth of cover, minimum of 40mm below the surface of the floor, and/or by a protective material cover.
- › CSST pipe should not have any fittings, joints or connections buried within the floor structure.
- › Before the pipe is buried within the floor structure, an inspection of the pipe and conduit must be made to identify any potential damage. Any damaged polyethylene layers must be repaired using the procedures on page 37
- › All exposed metal pipe must be protected from corrosion and must not come into contact with any construction materials. Exposed pipework must be protected using the Brymec Self-amalgamating tape using the procedures on page 37
- › Pipe support spacing must not exceed the distances detailed within the table on page 26
- › Buried services must be protected from movement and must be deep enough so as not to affect the critical loading of the floor surface.
- › CSST should not be installed within a screed or concrete which is to be used as a heat emitting surface.

## 5.4 Protection of services within a wooden floor or ceiling spaces

Brymec CSST services to be fitted within a joisted floor space if the following conditions are observed:

- › If a floor void is considered an unvented space, see IGEM/UP/2 - Edition 3 for definitions of vented/ unvented floor/roof spaces, suitable control of any escaped gas must be accommodated by the use of an approved duct installation, or by using Brymec CSST Duo with an Integral Containment Sleeve – see Brymec CSST Duo on page 8.
- › Brymec CSST must be protected from mechanical damage by a suitable depth of cover, minimum of 40mm below the surface of the floor, and/or by a protective material cover.
- › When installing CSST pipework in a shared space with electrical services, sufficient separation of 200mm should be provided.
- › Where pipework is to be installed in a joisted floor or a roof space, the installation should run parallel to the direction of the joist timbers. Where the pipes must traverse the timber joist, the pipe should be installed at 90° to joists. Diagonal pipe installations must be avoided.
- › Pipe support spacing must not exceed the distances detailed within the table on page 26
- › Notching or drilling of timber floor and ceiling joists must follow the guidance as detailed with IGEM/UP/2 – Edition 3 section 7.4.4
- › Where passing through a metal web joist, the pipework may pass through the metal joist as long as the pipe is supported in a way so as to ensure that the pipe does not come into contact with the joist.

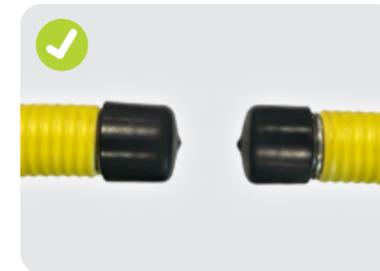
## 5.5 Outdoor installations

Brymec CSST pipework is protected by a durable, UV stabilised, Polyethylene protective sleeve, and can be used for external installations as long as the following conditions are observed:

- › Heat-shrink tube, or self-amalgamating tape, must be used to protect all metal parts of the system.
- › All stainless-steel pipework must be fully sealed and protected from direct contact with any chemical cleaning products, or from the affects of weathering.
- › Once tested, all CSST fittings must be completely wrapped and sealed to protect from any detrimental environmental influences.
- › Exposed pipework at low level (below 2m from ground level) should be protected from accidental or malicious damage (see page 17 'Risk from mechanical damage').

## 5.6 Correct methods of installation

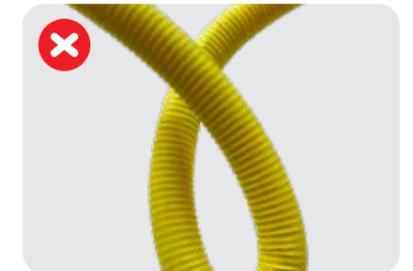
To ensure a safe, trouble-free installation, it is of the utmost importance that the below conditions are followed.



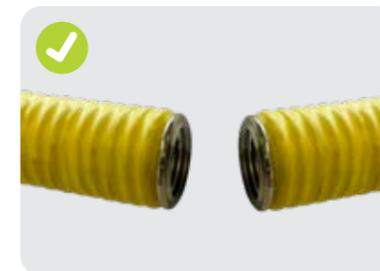
Always keep tubes capped to prevent dirt and rubble entering the pipe



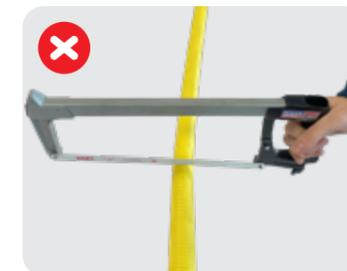
Do not step on the pipe, or allow any object to be placed on the pipe



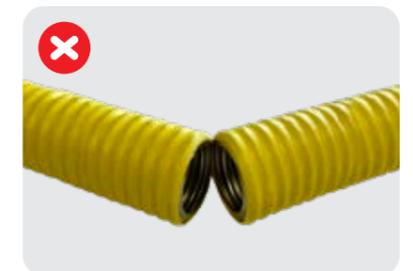
Do not twist or make kinks in the pipe



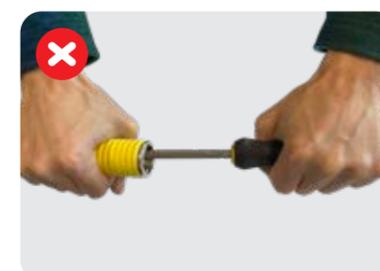
Cut tubing completely



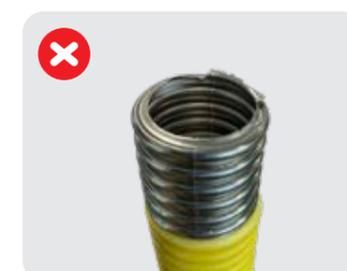
Do not cut with a saw



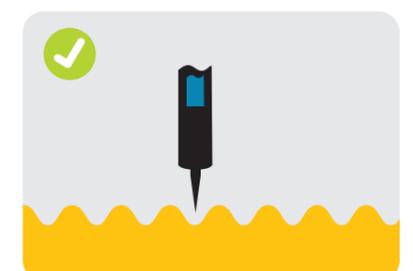
Do not break off



Do not use a file to remove any burrs



Do not start installation if the tubing is burred



Cut the tube in between the corrugations

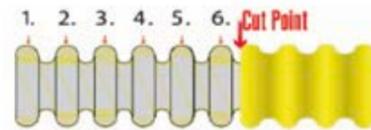
## 5.7 CSST Fittings - Installation



1 Cut the coiled pipe to the required length using the smooth wheeled CSST pipe cutting tool, which must be applied between two corrugations. Do not cut the pipe using a saw-toothed, or abrasive cutting tool. If the cut end of the pipe is not smooth or has a burr, the pipe cutting process must be repeated. Files and abrasive tools should not be used to remove any sharp edges.



2 Taking care not to damage the surface of the CSST stainless tube, cut the inner protective sleeve at the 6th corrugation for DN15, 20, 25 and 32, and at the 5th corrugation for DN40 and DN50



3 Using a sharp knife, cut along the protective sleeve making sure that you do not mark or damage the stainless steel tube.



4 Remove the Polyethylene protective sleeve.



5 Apply the fitting onto the exposed stainless-steel tube until an audible 'click' is heard. The 'click' is necessary to confirm the correct engagement of the fitting onto the corrugations. Once correctly located onto the pipe, the fitting should butt against the remaining protective inner sleeve.



6 Before tightening, ensure that the fitting is aligned with the outlet to which it will be attached, and remove the yellow retaining clip from the fitting. Tighten the nut until finger tight.



7 Using an appropriate spanner, tighten the nut whilst bracing the body of the fitting to prevent movement. The nut should be tightened to abutment but must not exceed the torque values detailed within the table below.



8 Cut the heat-shrink tube to the required length in order to cover the nut and protective Polyethylene sleeve of the CSST pipe. Using a flame-free heat gun, gently warm the heat-shrink tubing until the assembly is tightly sealed.



9 If required, Brymec CSST Self-amalgamating tape can be used instead of the heat-shrink tube. The tape must cover at least 50mm of the protective Polyethylene sleeve, and should cover the CSST fitting leaving the threads exposed.

Tube Diameter	EN15266 CSST Assembly Torque Values (N.m)	
DN	MIN.	MAX.
15	65	95
20	90	130
25	105	150
32	125	170
40	180	230
50	320	370

## 5.8 CSST Duo Fittings Installation



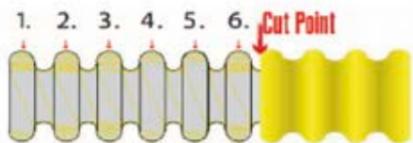
Cut the coiled pipe to the required length using the smooth wheeled CSST pipe cutting tool, which must be applied between two corrugations. Do not cut the pipe using a saw-toothed, or abrasive cutting tool. If the cut end of the pipe is not smooth or has a burr, the pipe cutting process must be repeated. Files and abrasive tools should not be used to remove any sharp edges.



Measure 80mm from the cut end of the tube. Using the CSST Duo sleeve cutting tool, remove the outer Duo containment sleeve.



Taking care not to damage the surface of the CSST stainless tube, cut the inner protective sleeve at the 6th corrugation for DN15, 20, 25 and 32, and at the 5th corrugation for DN40 and DN50



Apply the fitting onto the exposed stainless-steel tube until an audible 'click' is heard. The 'click' is necessary to confirm the correct engagement of the fitting onto the corrugations. Once correctly located onto the pipe, the fitting should butt against the remaining protective inner sleeve.



Before tightening, ensure that the fitting is aligned with the outlet to which it will be attached, and remove the yellow retaining clip from the fitting. Tighten the nut until finger tight.



Tighten the nut until finger tight. Using an appropriate spanner, tighten the nut whilst bracing the body of the fitting to prevent movement. The nut should be tightened to abutment but must not exceed the torque values detailed within the table below.



Cut the heat-shrink tube to the required length in order to cover the nut and protective Polyethylene sleeve of the CSST pipe. Using a flame-free heat gun, gently warm the heat shrink tubing until the assembly is tightly sealed.



If required, Brymec CSST Self-amalgamating tape can be used instead of the heat-shrink tube. The tape must cover at least 50mm of the protective Polyethylene sleeve, and should cover the CSST fitting leaving the threads exposed.

**IMPORTANT** - the heat-shrink tube, or the self-amalgamating tape, must not cover the end of the outer Duo containment sleeve. The special internal profile of the integrated containment sleeve is to allow venting of any gasses captured within the sleeve.

Tube Diameter	EN15266 CSST Assembly Torque Values (N.m)	
DN	MIN.	MAX.
15	65	95
20	90	130
25	105	150
32	125	170
40	180	230
50	320	370

## ➤ 6.0 Pressure Testing

### 6.1 Preparing to undertake a pressure test

Prior to undertaking any pressure testing, a visual inspection of the whole system being tested should be conducted. Any damaged sections of pipe, Polyethylene pipe protective layer, or Polyethylene Integral Containment Sleeve (Duo only), must be identified and repaired in line with the instructions on page 37.

All connections must be completed, and any unconnected appliances must be replaced with a suitable isolating fitting.

All pressure testing equipment must be of a suitable type to conduct the necessary testing and must be free from any damage.

### ➤ 6.2 New installations

When testing a new gas pipe installation, it must be tightness tested using natural gas, propane or butane once the system has been connected to the appropriate gas supply.

If such a gas supply connection is not possible, then pressurised air may be used, following the procedures as detailed within the appropriate standard as listed below.



## ➤ 6.3 Existing installations

When testing an existing gas pipe installation, it must be tightness tested using natural gas, propane or butane provided by the connected gas supply.

Testing must follow the procedures as detailed within the appropriate standard as listed as listed in '6.4 Undertaking a pressure test.

### ➤ 6.4 Undertaking a pressure test

All pressure testing must be undertaken by a suitably qualified engineer who should follow the testing procedures found within;

- IGEM/UP/1 Edition 2 +A:2005 - Strength testing/tightness testing/direct purging of industrial and commercial gas installations
- IGEM/UP/1A Edition 2 +A: 2005 - Strength/tightness testing/purging of small, low pressure industrial & commercial installations
- IGEM/UP/1B Edition 3 +A:2012 - Tightness testing and direct purging of small Liquefied Petroleum Gas/Air, NG and LPG installations

Please ensure that any products used for the purposes of leak detection do not cause damage to the CSST system. Please refer to the list of potentially harmful chemicals on page 18.

### ➤ 6.5 Purging a system

Following a successful tightness pressure test, undertaken to the relevant standard, the confirmed gas-tight system must be considered to confirm if purging is required.

If the installation is new, or if any gas-ways have been exposed to air, or if works have allowed air to enter the system, the installed pipe network must be purged using the appropriate fuel gas.

Consideration must be made to the safety, and environmental impacts of purging methane and other hydrocarbons into the atmosphere. A full risk assessment must be conducted to ensure there is suitable ventilation, no sources of ignition and that any other operatives within the building cannot be affected by the process.

Calculations for purging volumes (PV) should be made using the methods as detailed within IGEM/UP/1b Edition 3 section 6, or an equivalent approved national standard.

## ➤ 7.0 Transport, handling & storage

In order for the Brymec CSST and CSST Duo systems to provide years of trouble-free service, care must be taken when transporting, storing, and installing all of the products.

All components of the system should be stored in a clean, dry location and away from direct sunlight.

To maintain the quality of all the items, it is recommended that all components are stored off the floor on appropriate shelves and racking, and that they all remain in their packaging until each item is ready to be installed.

During installation, open ends of pipes should be closed off by a suitable method in order that construction debris doesn't enter the system during construction.

### ➤ 7.1 CSST tube

CSST tubes are made from a pliable corrugated stainless-steel. They come pre-cut to a set length, and pre-wound onto a sturdy wooden drum. The wooden drum is necessary to protect the tube during transport, and up until the point of installation.

During installation, the coil can be un-wound whilst placing the tube in the necessary position ready for support and connection.

Care must be taken to ensure the pipe is applied throughout the building without damaging any of the materials. Any abrasion to the Polyethylene protective layer of the pipe must be repaired using the methods as detailed within 8.0 Damages & Repairs.

### ➤ 7.2 CSST fittings

CSST fittings should remain within their packaging until the point of installation. Prior to installation, each fitting must be inspected for damage, and to ensure that all yellow retaining clips are in place and not damaged.

Fittings must not be tightened beyond the torque as detailed within the installation instructions.

## ➤ 8.0 Damages & Repairs

Following the installation of a Brymec CSST or CSST Duo system, the whole length of pipe work must be inspected for damage, and to confirm that no sections of stainless-steel tube are exposed. Any exposed stainless-steel tube must be protected from the environment using the correct Brymec Self-amalgamating tape.

Damages and repairs can be split into 3 categories:

- Abrasions, tears or punctures to the Inner protective sleeve
- Abrasion, tears or punctures to the outer Duo Integral Containment Sleeve
- Mechanical damages resulting in a deformation of the pliable corrugated stainless-steel tube

### ➤ 8.1 Inner Polyethylene sleeve

CSST and CSST Duo stainless-steel pipe systems are both protected from corrosion and the effects of environmental degradation by a durable Polyethylene cover. Any exposure of the stainless-steel pipe could lead to corrosion and failure of the assembly.

Any damage to the Polyethylene cover must be repaired using the Brymec Self-amalgamating tape.

First of all, please ensure that any damage to the protective Polyethylene sleeve has had no detrimental effect on the actual stainless-steel tube itself. If the stainless-steel tube has been damaged, please refer to the details under 8.2 'Mechanical damages to the stainless-steel tube'.

Starting a minimum of 50mm from the point of the damaged area, wrap the self amalgamating tape around the tube and along the damaged area, making sure that the tape overlaps the previous wrap by 50% of the tape's width.

## 8.2 Duo - Integral Containment Sleeve

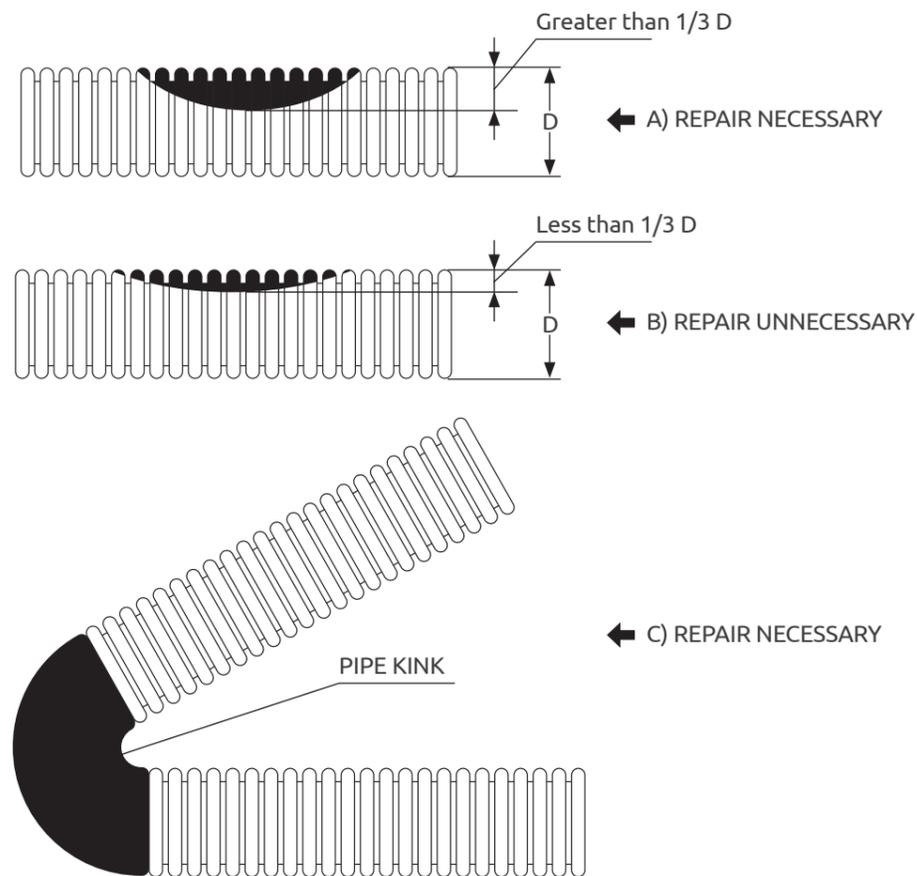
The integral Containment Sleeve of the CSST Duo system is intended as a safety containment for any release of gas through an unventilated space. If damage of any kind is witnessed to this layer, please refer to Brymec for advice on the necessary corrective actions.

## 8.3 Stainless Tube - Mechanical Damage

The stainless-steel tube is highly resistant to many forms of damage. However, in some cases it may be necessary to take corrective measures and replace the whole length of damaged tube.

Any damage that has punctured the stainless-steel tube, or which has caused an abrasion or dent to the surface which could compromise the performance of the tube, will need to have the length of pipe replaced.

For the standard CSST, please use the below conditions to determine if a repair/replacement is necessary:



If there is any substantial damage or deformation to a Brymec CSST Duo pipe length, then the whole pipe length MUST be replaced. The Duo system must NOT have a joining section added to the pipe length. The outer Integral Containment Sleeve must have no interruptions between the two ends which must be terminating in a ventilated area.

## 9.0 Technical Support

We recognise the importance of having top quality support from the manufacturer throughout every phase of the construction process.

At Brymec, our whole team are committed to providing easy access to design support and technical advice right the way from pre-construction to post-contract.

### Key areas of support;

#### > Specification

- o Technical submittal documentation
- o Advice on products and applications
- o Tender documentation
- o Budgetary quotations

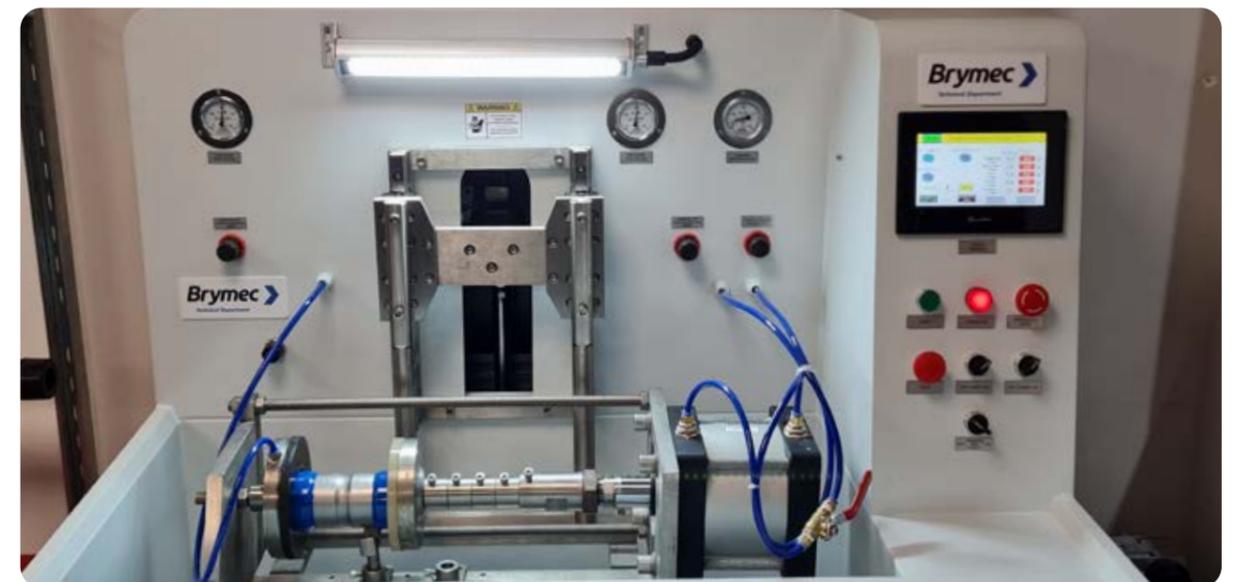
#### > Construction

- o Free, certificated installation training
- o Site visits
- o Observation reports
- o Product verification and testing

#### > Post contract

- o O&M manuals
- o Warranty and after-care support

Whatever your needs, we have a dedicated Technical Support Team which has sophisticated equipment and facilities to support you whenever you need.



## CSST Pipe



ITEM	SIZE
29019	DN15 x 30m
29020	DN15 x 75m
29022	DN20 x 30m
29023	DN20 x 75m
29024	DN25 x 30m
29025	DN25 x 45m
29026	DN25 x 75m
29028	DN32 x 45m
29029	DN32 x 75m
29031	DN40 x 45m
29033	DN50 x 45m

## CSST Duo Pipe

ITEM	SIZE
29043	DN20 x 30m
29044	DN25 x 30m
29045	DN32 x 30m
29046	DN15 x 75m
29047	DN20 x 75m
29048	DN15 x 30m
29049	DN25 x 75m
29050	DN32 x 75m
29051	DN40 x 30m
29052	DN40 x 75m
29053	DN50 x 30m
29054	DN50 x 75m

## CSST Contractors Kits



Contractor pack includes coil of stainless steel tubing plus two male fittings

ITEM	SIZE
29005	DN20 x 5m
29006	DN20 x 10m
29007	DN20 x 15m
29009	DN25 x 5m
29010	DN25 x 10m
29011	DN25 x 15m
29013	DN32 x 5m
29014	DN32 x 10m
29015	DN32 x 15m

## Coupler



ITEM	SIZE
29058	DN15
29059	DN20
29060	DN25
29061	DN32
29062	DN40
29063	DN50

## Female BSPP



ITEM	SIZE
29067	DN15 - 1/2"
29069	DN20 - 3/4"

## Male BSPT



ITEM	SIZE
29037	DN15 - 1/2"
29038	DN20 - 3/4"
29039	DN25 - 1"
29040	DN32 - 1 1/4"
29041	DN40 - 1 1/2"
29042	DN50 - 2"

## Copper Compression



ITEM	SIZE
29071	DN15 x 15mm
29072	DN20 x 15mm
29073	DN20 x 22mm
29074	DN25 x 22mm
29075	DN25 x 28mm
29076	DN32 x 22mm
29077	DN32 x 35mm
29078	DN32 x 28mm

## Heat-shrink Tube



ITEM	SIZE
29081	DN15 - 30m
29082	DN20/25 - 30m
29082	DN32/40 - 30m

## Silicone Tape



Yellow self-amalgamating tape for sheath or fitting overwrap

ITEM	SIZE
39085	25mm x 2m

## Cutters



ITEM	SIZE
29079	DN15-DN32
39080	DN15 - DN50

## Flexible Ducting



Yellow corrugated plastic ducting for underground applications or where embedded in concrete

ITEM	SIZE	DESCRIPTION
39092	DN20-32	50mm x 50m
39093	DN32 - 40	63mm x 50m
39094	DN50	110mm x 50m

**Brymec** 



CO<sub>2</sub>e  
Assessed  
Organisation

[brymec.com](http://brymec.com)

2025-V1.0