

# flamefree

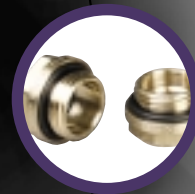
IBP Oyster

APRIL 2002

A versatile flame free threaded converter



**FLAME  
FREE**





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## Introduction

Described as the 'last great invention of the 20th century' the **>B< Oyster** converter is simple in its concept but very versatile and efficient in practice. The only tools you require are the special pliers and a standard open ended or adjustable spanner, ideal for flame-free installations.

The **>B< Oyster** converter is designed with a male parallel thread allowing it to be connected to a wide variety of female threaded fittings without the need for any additional sealants, such as PTFE. Sealing is achieved via two EPDM 'O' rings, one internal to seal on the tube, the other to make the fitting seal.

## Quality

**>B< Oyster**, as with all IBP products, has undergone extensive testing and has WRAS approval. All **>B< Oyster** products are manufactured in accordance with accredited EN ISO 9002 Quality Management Procedures.

**>B< Oyster** can be used on drinking water and other hot and cold water systems, including central heating.

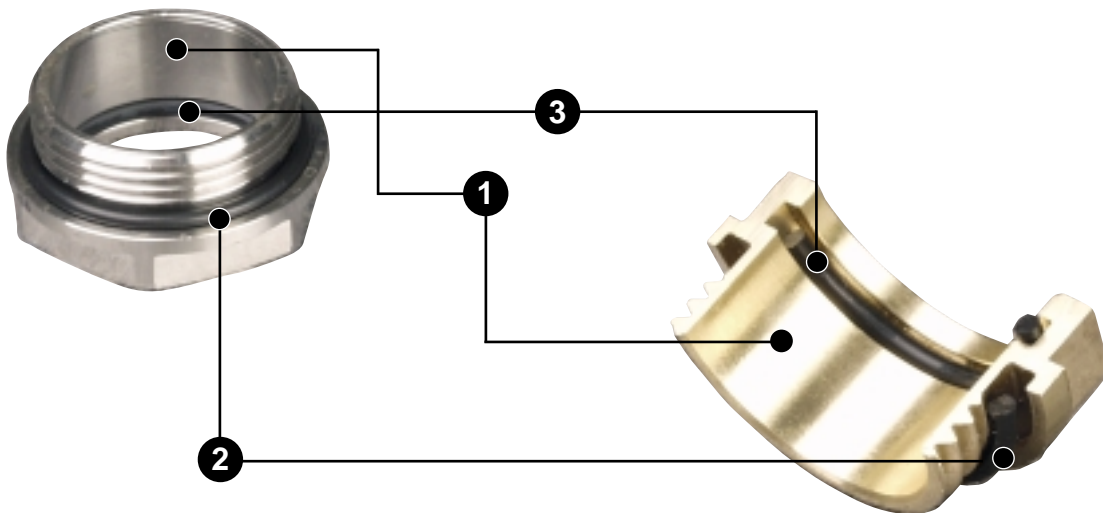
Each **>B< Oyster** fitting is permanently marked with the trade mark **>B<** as well as the size.

Clear identification of the fitting is therefore possible even after years of use.



## Product Structure

1. Body in either yellow brass (EN12164 CW614N), red brass (DIN 50930-6) or stainless steel (AISI 316, 4401.1)
2. EPDM 'O' ring face seal (EN681-1)
3. EPDM 'O' ring tube seal (EN681-1)



## Features

- Can be used on new and retrofit applications
- Flame free installation
- Economic, simple, quick and versatile
- Reliable
- Compatible with EN 1057 copper tube, soft half-hard and hard
- Compatible with BS4127, DIN17455 and DIN17457
- Compatible with thin wall metallic tube that are dimensionally as EN1057
- WRAS approved, DVGW pending
- WRAS, KTW, ACS approved 'O' ring seals
- Design life of minimum 50 years
- Slimline, unobtrusive
- Can be painted
- No expensive tools required
- Tube can be rotated through 360°
- Demountable
- Angularity capacity
- No lubricant required



## Tube Compatibility

### Copper

>B< Oyster is suitable for use with copper tube to EN1057, all wall thickness in R220 soft, R250 half-hard and R290 hard conditions.

Table A

Copper tube sizes suitable for brass >B< Oyster

Nominal Outside Diameter	Wall Thickness							
	EN 1057, Tempers R220, R250, & R290							
	0.6mm	0.7mm	0.8mm	0.9mm	1.0mm	1.1mm	1.2mm	1.5mm
10mm	✓	✓	✓		✓			
12mm	✓	✓	✓		✓			
14mm		✓	✓		✓			
15mm		✓	✓		✓			
16mm			✓		✓			
18mm			✓		✓			
22mm				✓	✓	✓	✓	✓
28mm				✓	✓		✓	✓

Copper tube to EN 1057, based on European recommended dimensions

### Stainless Steel

>B< Oyster is suitable for use with stainless steel tube to DIN17455, DIN17457, and BS4127

Table B

Stainless steel tube sizes suitable for stainless steel >B< Oyster ratchet pliers

Nominal Outside Diameter	Wall Thickness	
	DIN 17455 DIN 17457	BS 4127
12mm	1.0mm	0.6mm
15mm	1.0mm	0.6mm
18mm	1.0mm	0.7mm
22mm	1.2mm	0.7mm
28mm	1.2mm	0.8mm
35mm	1.5mm	1.0mm
42mm	1.5mm	1.1mm
54mm	1.5mm	1.2mm

## Tool Requirements

To install **>B< Oyster** only **>B< Oyster** pliers and either open-ended spanners or an adjustable spanner are required, as shown in diagram 1. Table C shows the hexagon/spanner sizes for each fitting.

### Standard pliers



Standard **>B< Oyster** pliers can be used to form the required number of retaining dimples in the following tube materials and sizes;  
copper - up to 28mm

### Ratchet pliers



**>B< Oyster** ratchet pliers can be used to form the required number of retaining dimples in the following tube materials and sizes;  
copper - 12mm to 54mm  
stainless steel - 15mm to 54mm

### Spanners

Diagram 1

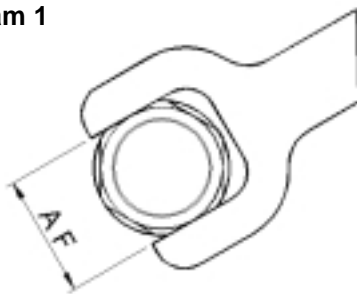


Table C

Hexagon across flats and spanner sizes

Fitting Size	Spanner Size A F
10mm x 3/8"	19mm
10mm x 1/2"	19mm
12mm x 3/8"	19mm
12mm x 1/2"	19mm
14mm x 1/2"	22mm
15mm x 1/2"	22mm
16mm x 1/2"	24mm
16mm x 3/4"	24mm
18mm x 3/4"	26mm
22mm x 3/4"	30mm
22mm x 1"	30mm
28mm x 1"	36mm
35mm x 1 1/4"	43mm
42mm x 1 1/2"	51mm
54mm x 2"	63mm





## Installation Guide

### Guide to >B< Oyster Converter Installation

1. Cut the tube using a tube cutter, de-burr tube end and for soft copper re-round.

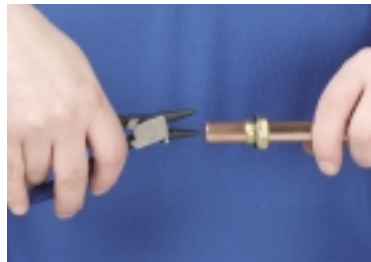


2. Insert the tube through the >B< Oyster converter.

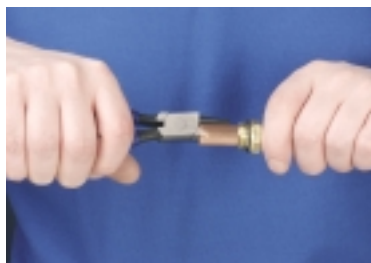


If installing on to soft copper do not force the >B< Oyster converter onto any tube where ovality has occurred. The soft copper tube must be re-rounded before >B< Oyster converter is installed.

3. Put the jaw of the pliers with the pin inside the tube, ensuring that the tube is pushed tight up to the pliers.



4. Squeeze the pliers to form a dimple projecting outward from the tube. Turn the tool and repeat the dimpling operation so that the appropriate number of equi-spaced dimples are produced as follows:  
 up to 16mm - 3 dimples  
 18m to 42mm - 4 dimples  
 54mm - 6 dimples



5. The face of the mating product should be examined prior to installation, to ensure that there is no visible damage or burrs that may affect the seal.

6. Slide the >B< Oyster converter to the end of the tube, tight against the dimples.

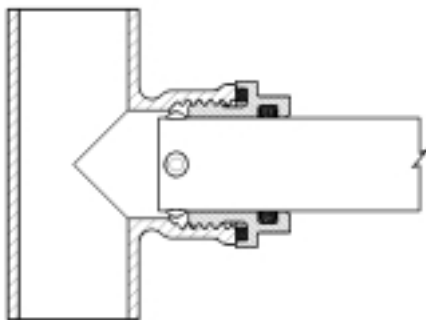


7. Screw into the mating product until finger tight, then with a suitable spanner tighten until metal to metal contact is achieved between the flange of the >B< Oyster converter and the mating product. Then further tighten by 1/8 turn.



**Final Installation Positioning** - ensure tube retention dimples are engaged against >B< Oyster fitting.

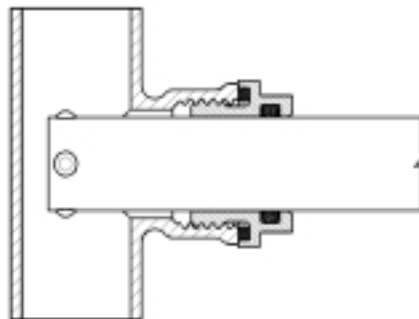
Diagram 2



CORRECT - no flow restriction



Diagram 3



INCORRECT - potential flow restriction

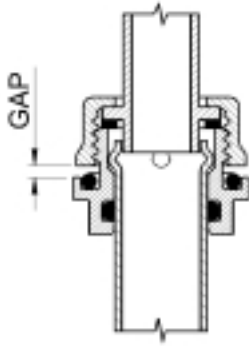




**Tap and Swivel Connections - recessed >B< Oyster fittings only.**

See Tables E and G for suitable fittings.

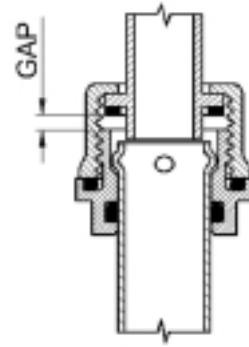
**Diagram 4**



CORRECT - seal achieved on inherent washer



**Diagram 5**

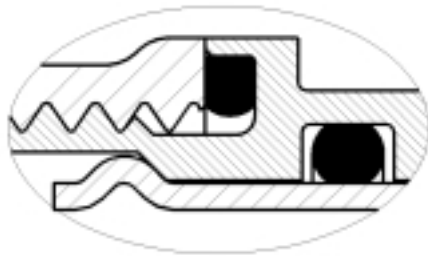


INCORRECT - no seal achieved on inherent washer



**Mating Female Part Minimum Diameters**

**Diagram 6**



CORRECT - metal flange contact of both parts



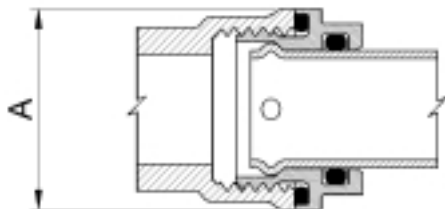
**Diagram 7**



INCORRECT - female part screws inside flange



**Diagram 8**



**Table D**

BSP Size	Minimum Dimension A (mm)
3/8"	20.5
1/2"	24.5
3/4"	29.9
1"	36.9
1 1/4"	40.3
1 1/2"	48.9
2"	60.7



## Installation Dimensions

### Brass >B< Oyster

Diagram 9

Recessed Fittings

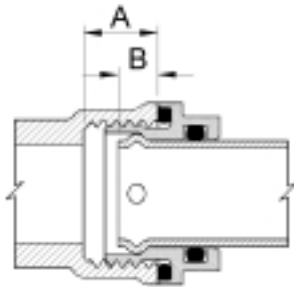


Table E

Fitting Size	A (mm) Min	B (mm)
10mm x 3/8"	6.5	5
10mm x 1/2"	8	6.5
12mm x 1/2"	8	5
14mm x 1/2"	8	5
16mm x 3/4"	8	5
18mm x 3/4"	8	5
22mm x 1"	10	8.5

Diagram 10

Non-Recessed Fittings

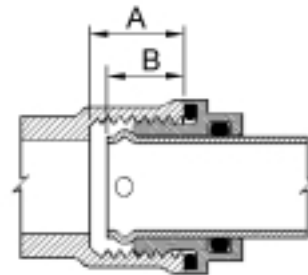


Table F

Fitting Size	A (mm) Min	B (mm)
12mm x 3/8"	11	10.5
15mm x 1/2"	11.5	11
16mm x 1/2"	11.5	11
22mm x 3/4"	12	11.5
28mm x 1"	14	13.5

### Stainless Steel >B< Oyster

Diagram 11

Recessed Fittings

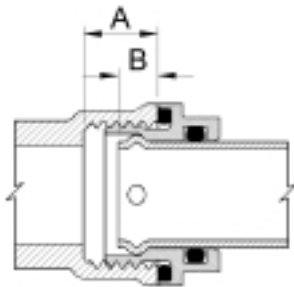


Table G

Fitting Size	A (mm) Min	B (mm)
15mm x 1/2"	8	6
18mm x 3/4"	8	6
35mm x 1 1/4"	10	8

Diagram 12

Non-Recessed Fittings

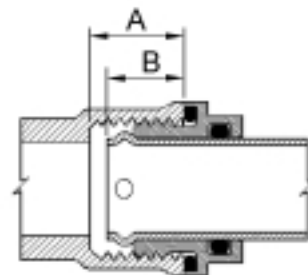


Table H

Fitting Size	A (mm) Min	B (mm)
22mm x 3/4"	12	11.5
28mm x 1"	14	13.5
42mm x 1 1/2"	14	13.5
54mm x 2"	14	13.5



## Additional Information

### Applications

A terminal connector to any ISO 228 or ISO 7 female threaded product with a flat sealing face, **>B< Oyster** can be used to install products such as lever ball valves, radiator valves, gate valves, cylinder unions, manifolds and tank connections etc.

A pre-packed radiator adapter is also available. Please contact our Technical Department for further details.

When the mating product does not possess a suitable flat sealing face, traditional thread sealing methods can be employed with the **>B< Oyster** connector.

**>B< Oyster** can be used for drinking water, plus cold and hot sanitary and heating installations, in domestic, industrial and commercial applications.

Other applications include chilled beams and various OEM uses.

**>B< Oyster is for use with water only, and must not be used on any gas installations.**

### Earth Continuity

**>B< Oyster** does not maintain earth continuity. Building Regulations currently recommend that the water supply tubes are not used to earth out new installations. In existing installations where the tube is used as an earth, the contact should be correctly re-established by installing a separate earth connection. If earth continuity is required the fitting should be bridged with a continuity strap.

### Soldering/Brazing

**>B< Oyster** requires no flames, fluxes or filler metals. External heat sources should not be applied when installing any **>B< Oyster** product.

### EPDM (Ethylene Propylene Diene Monomer) 'O' Ring Compatibility

EPDM is compatible with drinking water, plus other hot and cold heating and sanitary applications within the working pressure and temperature limitation of the material.

(See Table J, page 12).

### Lifespan

Accelerated life tests show that the 'O' ring and the other components within a **>B< Oyster** fitting have a life expectancy greater than 50 years.

### Tube Compatibility

**>B< Oyster** is suitable for use with copper tube to EN1057 and stainless steel to DIN17455, DIN17457 and BS 4127 (see Tables A and B, page 6 for specific details).

Tubes should be free from dirt, grease, grit and surface damage such as dents, scratches, score marks etc, at the 'O' ring sealing area.

### Glycol Compatibility

**>B< Oyster** can be used with a 25% Glycol: 75% Water solution.

### Chlorination

Chlorinating the line in accordance with BS6700:1997 will have no detrimental effect upon the fittings. If the concentration of the chlorination solution exceeds 50mg/l (50 p.p.m), damage to the pipeline could occur.

### Storage

As with all fittings that include an EPDM 'O' ring, the **>B< Oyster** converter should be stored in such a way as to prevent stress upon the 'O' ring as indicated in EN681-1 which includes:

- out of direct sunlight and artificial light with high ultra-violet content
- below 25°C
- away from equipment capable of generating ozone eg. mercury vapour lamps and high voltage electrical equipment.

It is also recommended that **>B< Oyster** converter is stored in the supplied packaging to maintain the product and the 'O' ring seals in a clean condition.

### Temperature and Pressure Ratings

Table J

Size (mm)	Application	Continuous working conditions	
		Operating Temp °C	Max Pressure (bar)
10mm to 54mm	Potable hot and cold water	30	16
		65	12
		95	10

Surge temperatures/pressures beyond the ranges shown can be accommodated within a **>B< Oyster** installation. Contact our Technical Department with specific details for further advice.



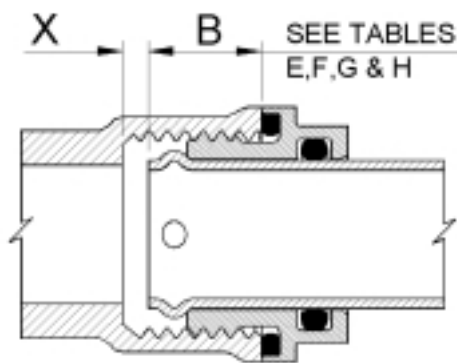
## Effects of Expansion

The coefficient of linear expansion of copper is  $16.8 \times 10^{-6}$  per °C (stainless steel  $10.0 \times 10^{-6}$  per °C) and hence a 10m length of copper tube, irrespective of its size, wall thickness or temper, will increase in length by 10.08mm when heated through 60°C. Pipes installed on hot water services must be free to accommodate this expansion, otherwise stresses will build up in the pipework, which may lead to joints being pulled apart and/or tubes fracturing. Clearly the magnitude and frequency of such changes in length will determine the life of the joint or failure of the tube.

In the case of copper tube in domestic hot water and heating installations the limited size of rooms and hence straight pipe runs, together with the many bends and offsets that normally occur will result in thermal movement being accommodated automatically. However where long straight pipe runs are encountered, allowance for expansion should be made.

The **>B<** Oyster converter will allow for thermal expansion but the amount will depend on the depth of the mating socket and the temperature rise of the system. The extent of expansion capability is limited to the distance 'X' between the depth of the mating socket and the end of the tube or **>B<** Oyster connector, whichever is the greater, as shown in Diagram 13 below.

Diagram 13



Care should be taken that expansion in this case does not interfere with another waterway (eg tee fitting) or a control device, as shown in Diagram 3 on page 8.

Tables K and L show the increase in length due to thermal expansion as a function of change in temperature  $\Delta t$  and the length of the tube at the lower temperature, irrespective of temper or wall thickness. (Coefficient of linear expansion  $16.8 \times 10^{-6}$  per  $^{\circ}\text{C}$  for copper and  $10.0 \times 10^{-6}$  per  $^{\circ}\text{C}$  for stainless steel.)

**Table K**

**Thermal expansion (mm) of copper tube as a function of tube length and temperature difference.**

Tube Length M	Temperature difference $\Delta t$ $^{\circ}\text{C}$							
	$\Delta t=30^{\circ}$	$\Delta t=40^{\circ}$	$\Delta t=50^{\circ}$	$\Delta t=60^{\circ}$	$\Delta t=70^{\circ}$	$\Delta t=80^{\circ}$	$\Delta t=90^{\circ}$	$\Delta t=100^{\circ}$
0.1	0.05	0.07	0.08	0.10	0.12	0.13	0.15	0.17
0.2	0.10	0.13	0.17	0.20	0.24	0.27	0.30	0.34
0.3	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50
0.4	0.20	0.27	0.34	0.40	0.47	0.54	0.60	0.67
0.5	0.25	0.34	0.42	0.50	0.59	0.67	0.76	0.84
0.6	0.30	0.40	0.50	0.60	0.71	0.81	0.91	1.01
0.7	0.35	0.47	0.59	0.71	0.82	0.94	1.06	1.18
0.8	0.40	0.54	0.67	0.81	0.94	1.08	1.21	1.34
0.9	0.45	0.60	0.76	0.91	1.06	1.21	1.36	1.51
1.0	0.50	0.67	0.84	1.01	1.18	1.34	1.51	1.68
2.0	1.01	1.34	1.68	2.02	2.35	2.69	3.02	3.36
3.0	1.51	2.02	2.52	3.02	3.53	4.03	4.54	5.04
4.0	2.02	2.69	3.36	4.03	4.70	5.40	6.05	6.72
5.0	2.52	3.36	4.20	5.04	5.88	6.72	7.56	8.40
10.0	5.04	6.72	8.40	10.80	11.76	13.44	15.12	16.80
15.0	7.56	10.80	12.60	15.12	17.64	20.16	22.68	25.20
20.0	10.08	13.44	16.80	20.16	23.52	26.88	30.24	33.60
25.0	12.60	16.80	21.00	25.20	29.40	33.60	37.80	42.00

**Table L**

**Thermal expansion (mm) of stainless steel tube as a function of tube length and temperature difference.**

Tube Length M	Temperature difference $\Delta t$ $^{\circ}\text{C}$							
	$\Delta t=30^{\circ}$	$\Delta t=40^{\circ}$	$\Delta t=50^{\circ}$	$\Delta t=60^{\circ}$	$\Delta t=70^{\circ}$	$\Delta t=80^{\circ}$	$\Delta t=90^{\circ}$	$\Delta t=100^{\circ}$
0.1	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.10
0.2	0.06	0.08	0.10	0.12	0.14	0.16	0.18	0.20
0.3	0.09	0.12	0.15	0.18	0.21	0.24	0.27	0.30
0.4	0.12	0.16	0.20	0.24	0.28	0.32	0.36	0.40
0.5	0.15	0.20	0.25	0.30	0.35	0.40	0.45	0.50
0.6	0.18	0.24	0.30	0.36	0.42	0.48	0.54	0.60
0.7	0.21	0.28	0.35	0.42	0.49	0.56	0.63	0.70
0.8	0.24	0.32	0.40	0.48	0.56	0.64	0.72	0.80
0.9	0.27	0.36	0.45	0.54	0.63	0.72	0.81	0.90
1.0	0.30	0.40	0.50	0.60	0.70	0.80	0.90	1.00
2.0	0.60	0.80	1.00	1.20	1.40	1.60	1.80	2.00
3.0	0.90	1.20	1.50	1.80	2.10	2.40	2.70	3.00
4.0	1.20	1.60	2.00	2.40	2.80	3.20	3.60	4.00
5.0	1.50	2.00	2.50	3.00	3.50	4.00	4.50	5.00
10.0	3.00	4.00	5.00	6.00	7.00	8.00	9.00	10.00
15.0	4.50	6.00	7.50	9.00	10.50	12.00	13.50	15.00
20.0	6.00	8.00	10.00	12.00	14.00	16.00	18.00	20.00
25.0	7.50	10.00	12.50	15.00	17.50	20.00	22.50	25.00



## Dimensional Data

### Overall Product Dimensions - Brass >B< Oyster

Diagram 14

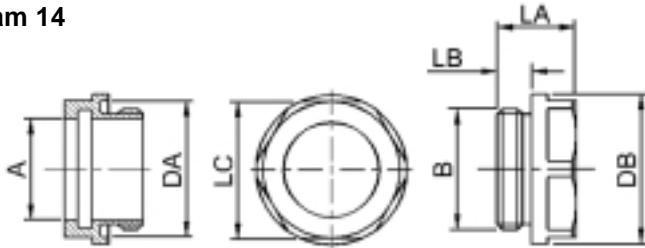


Table M

Fitting Size	A	B	DA	DB	LA	LB	LC A/F hex	Product Code	
								Yellow Brass	Red Brass
10mm x 3/8"	10	3/8"	20.5	22.8	14.7	6.0	19	Y8243G01003000	
10mm x 1/2"	10	1/2"	24.5	26.8	16.2	7.5	19	Y8243G01004000	
12mm x 3/8"	12	3/8"	20.5	22.8	14.7	6.0	19	Y8243G01203000	Y4243G01203000
12mm x 1/2"	12	1/2"	24.5	26.8	16.2	7.5	19	Y8243G01204000	Y4243G01204000
14mm x 1/2"	14	1/2"	24.5	26.8	16.2	7.5	22	Y8243G01404000	
15mm x 1/2"	15	1/2"	24.5	26.8	16.2	7.5	22	Y8243G01504000	Y4243G01504000
16mm x 1/2"	16	1/2"	24.5	26.8	16.2	7.5	24	Y8243G01604000	
16mm x 3/4"	16	3/4"	29.9	32.8	17.2	7.5	24	Y8243G01606000	
18mm x 3/4"	18	3/4"	29.9	32.8	17.2	7.5	26	Y8243G01806000	Y4243G01806000
22mm x 3/4"	22	3/4"	29.9	32.8	17.2	7.5	30	Y8243G02206000	Y4243G02206000
22mm x 1"	22	1"	36.9	39.8	19.5	9.5	30	Y8243G02208000	Y4243G02208000
28mm x 1"	28	1"	36.9	39.8	19.5	9.5	36	Y8243G02808000	Y4243G02808000

### Overall Product Dimensions - Stainless Steel >B< Oyster

Diagram 15

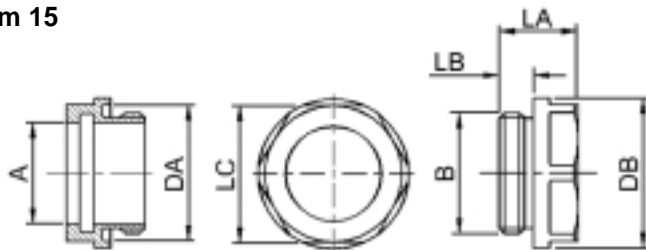


Table N

Fitting Size	A	B	DA	DB	LA	LB	LC A/F hex	Product Code Stainless Steel
15mm x 1/2"	15	1/2"	24.5	26.8	16.2	7.5	22	Y7243G01504000
18mm x 3/4"	18	3/4"	29.9	32.8	17.2	7.5	26	Y7243G01806000
22mm x 3/4"	22	3/4"	29.9	32.8	17.2	7.5	30	Y7243G01806000
28mm x 1"	28	1"	36.9	39.8	19.5	9.5	36	Y7243G02808000
35mm x 1 1/4"	35	1 1/4"	40.3	47.8	20.2	9.5	43	Y7243G03501000
42mm x 1 1/2"	42	1 1/2"	48.9	54.8	20.7	9.5	51	Y7243G01501200
54mm x 2"	54	2"	60.7	67.8	21.5	9.5	63	Y7243G01501600



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