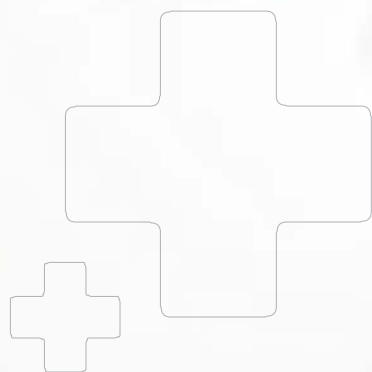


CONNECT + CONTROL

PEGLER 
Valve technology



TRADITIONAL END FEED SOLUTIONS

CONNECT WITH CONFIDENCE

Endex





CONNECT WITH CONFIDENCE

With a wealth of expertise and the broadest range of solutions and systems on the market, Pegler Yorkshire's **Connect** products mean you'll complete your installation as seamlessly, efficiently and effectively as possible.

TOTAL FUNCTIONALITY, COMPLETE EFFICIENCY

Pegler Yorkshire's range of **Connect** solutions offer innovatively designed, efficient and reliable products and systems that reduce installation time and cost without compromising quality, aesthetics or reliability.

Our **Tectite**, **Henco** and **XPress** product ranges are designed to perform faultlessly in a variety of applications and environments – so you can always be sure to connect with confidence whatever your challenge.

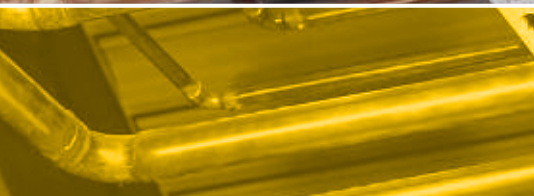
GLOBAL EXPERIENCE, COMBINED EXPERTISE

With over 100 years of manufacturing and innovation combined with extensive industry knowledge and worldwide market experience, Pegler Yorkshire offers the most advanced and complete **Connect & Control** systems on a global scale.

As one of Britain's largest and most respected manufacturers and suppliers of products for the plumbing and heating industries, Pegler Yorkshire is confident we can provide you with all the connection, control and support your project needs.

For more information visit
www.pegler-yorkshire.co.uk





Endex

CONNECT + CONTROL

CONTENTS

1.0 PRODUCT RANGE OVERVIEW

The Endex range	4-6
Standards, approvals and guarantees	7

2.0 PRODUCT RANGE DETAILS

General range	8-25
Degreased and individually bagged Endex fittings for use on medical gas lines	26-34
Endbrazed fittings	35-38
Degreased and individually bagged Endbrazed fittings for use on medical gas lines	39-41
Metric flanges	42
Endex wastes	43-45
Accessories	46

3.0 TECHNICAL DATA

Tube compatibility and applications	48
Working temperatures and pressures	49
Performance and equipotential bonding	50-51
System design considerations and tube expansion	52-53

4.0 INSTALLATION INSTRUCTIONS

For soft solder

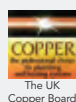
Preliminaries	54
Preparation	54
Joining	55

For brazing alloys

Preliminaries	56
Preparation	56
Joining	57

Notes	58-59
-------	-------

Pegler Yorkshire is pleased to be associated with several influential industry organisations:



Brass

The Brass Page for specifiers, designers, engineers and manufacturers



British Electrotechnical Allied Manufacturers Association



Construction Products Association



The Copper Development Association



Scottish and Northern Ireland Plumbing Employers Federation



Builders Merchants Federation



Institute of Plumbing



The UK District Energy Association



The Chartered Institution of Building Services Engineers



THE COMPLETE RANGE

At Pegler Yorkshire we are constantly striving to develop jointing solutions that meet the changing needs of specifiers and installers alike. The Endex suite of end feed fittings comprises a number of product ranges which suit a broad spectrum of applications across the domestic and commercial sectors.

ADVANTAGES OF ENDEX

Endex end feed fittings are a simple and cost-effective method of jointing copper tubes to BS EN 1057. Light and neat, they make handling and installation easy. The fittings' compact dimensions make them the ideal choice for use in areas where there is limited space. Additionally, their smooth lines minimise flow restrictions and are unobtrusive on exposed pipelines.

Endex end feed fittings are manufactured from copper, gunmetal or other dezincification resistant alloy (DZR).

THE PRINCIPLE OF THE ENDEX JOINT

The Endex joint is created through the process of capillary action. When the fitting and tube are assembled and heated to the correct temperature, solder applied to the mouth of the fitting becomes molten. Capillary attraction ensures the solder is drawn into the gap between tube and fitting, forming a sturdy and reliable joint. Users of Endex fittings can be confident that they are purchasing an established product with a proven reputation for reliability and quality.



THE RANGE

The Endex end feed fittings range includes standard line fittings, large size and waste fittings, and an extensive selection of flanges and accessories.



PRODUCT OVERVIEW

CONNECT + CONTROL

INDEX END FEED FITTINGS

Index end feed fittings are designed for jointing copper tube manufactured to BS EN 1057 using soft or hard solder (brazing alloy).

For fuel oils, refer to OFTEC for advice.

FEATURES

- ✚ Available in sizes 6mm to 54mm
- ✚ Manufactured from copper, gunmetal or other DZR alloy with nuts supplied in duplex brass (DZR versions also available)
- ✚ Suitable for use on above ground hot and cold domestic/potable water services in small bore and mini bore central heating systems and in low-pressure steam heating and pressurised unvented heating systems
- ✚ Also suitable for sanitation services and compressed air lines, gas distribution systems for natural and manufactured gases, with fuel oils (hard solder only) and Kerosene, and on engineering pipeline services that convey liquids, oils, air and gases at temperatures up to 110°C
- ✚ Available degreased and individually bagged for use on medical gas lines
- ✚ WRAS approved

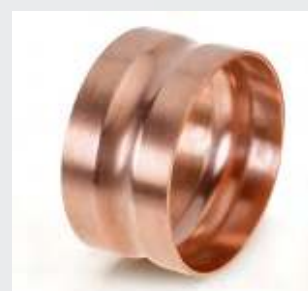


INDEX ENDBRAZE

Endbrazed large size end feed fittings are designed for jointing copper tubes to BS EN 1057 using hard solder (brazing alloy). 67mm fittings can be soft soldered.

FEATURES

- ✚ Available in sizes 67mm to 159mm
- ✚ Manufactured from copper or copper alloy with sizes 133mm and above fabricated from copper components
- ✚ Suitable for use with hot and cold potable water services, heating systems, gas installation pipework and many engineering applications
- ✚ Includes bi-metal, gunmetal and slip on flanges designated PN10 designed to aid pipework assembly
- ✚ Available degreased and individually bagged for use on medical gas lines
- ✚ WRAS approved





PRODUCT OVERVIEW

ENDEX WASTE

Endex waste fittings are designed for use in domestic and commercial waste systems for connecting basins, baths, sinks and other sanitary appliances.

FEATURES

- ✚ Available in sizes 35mm to 54mm
- ✚ Range includes bends, tees, crosses and fittings with rodding eyes to enable inspection and maintenance
- ✚ Bends, tees and crosses designed with built-in fall, in line with good plumbing practice



ENDEX ACCESSORIES

Endex fittings are complemented by a range of accessories which includes solders, fluxes and tap connector washers.

TRADITIONAL CRAFTSMAN'S FLUX

Available in the Yorkshire range it will maintain its consistency over a long period and has excellent lubricating properties which enables close-fitting joints to be readily assembled. The flux can be used with all sizes of soft solder fitting for applications, including gas, and is char-resistant to normal heating levels of 250°C.

YORKSHIRE FLUX

Like Traditional Craftsman's Flux, this will maintain its consistency and be used with all types and sizes of soft solder fittings. It must not be used for gas applications.

DEGUSSA H

A ready-mixed paste for brazing copper and copper alloys such as Endbraz large size fittings.





STANDARDS, APPROVALS AND GUARANTEES

CONNECT + CONTROL

It is Pegler Yorkshire's policy to provide a range of products and services which meet, or exceed, the requirements of our customers in respect of quality, cost and delivery.

GUARANTEES

Our policy of continuously and rigorously testing Endex end feed fittings means we are confident they will give you years of trouble free service. To demonstrate the total confidence we have in our products and our commitment to customer service, all Endex end feed fittings are guaranteed against manufacturing defects for 25 years, when installed in accordance with our instructions on specified tube materials and applications.



QUALITY

Quality is of paramount importance to Pegler Yorkshire. Our products conform to current British, European and International standards where applicable and also meet our own rigorous internal quality approvals.



Pegler Yorkshire operates a Quality Management System

for the development, manufacture and supply of fittings, tube, valves and accessories which complies with the requirements of BS EN ISO 9001:2000.

Pegler Yorkshire is a British Standards Institution registered company.



27630

THE ENDEX RANGE MEETS THE FOLLOWING STANDARDS: ENDEX FITTINGS

All Endex general range fittings are listed and comply with the requirements of The Water Supply (Water Fittings) Regulations/Byelaws (Scotland).



BS EN 1254 Part 1 Specification for copper and copper alloy fittings with capillary ends for soldering and brazing for use with copper tubes.

BS EN ISO 228 (formerly BS 2779/ISO 228/1) Specification for tubes and fittings where pressure tight joints are not made on the threads (metric dimensions).

BS 7786 Specification for PTFE tape for water and general applications.

BS EN 751-3 (formerly BS 6974) Specification for PTFE tape for gas applications.

ENDBRAZE FITTINGS

BS EN 1254 Part 5 Specification for copper and copper alloy fittings with short ends for capillary brazing to copper tube.

BS 10 (obsolescent) Specification for flanges and bolting for pipes, valves and fittings.

BS EN 1092-3 (formerly BS 4504 Part 3.3) Specification for copper alloy circular flanges and their joints. PN designated.

BS EN 1044 (formerly BS 1845) Specification for filler metals for brazing.

ENDEX WASTE FITTINGS

Endex waste fittings are manufactured to our own exacting standards.

PRODUCT APPROVALS

Product	WRAS	Kiwa	DVGW	Kitemark	GL Industries	Gute	EM1
Endex end feed	✓	✓	✓	✓	✓	✓	✓

MARKINGS

UNIVERSAL MARKING

All dezincification resistant Endex fittings carry the distinctive CR mark.



All Endex products display the RYW symbol, a brand recognised throughout Europe.



GUNMETAL

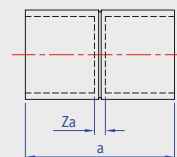
Some Endex fittings and valves are manufactured from gunmetal and can be identified by the mark on the body.





N1/5270 Straight coupling

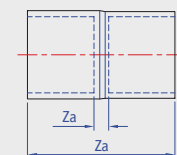
Copper x copper



Size	a	Za	Code
6mm	16	1	88010
8mm	20	1	88011
10mm	17	1	88012
12mm	19	2	88013
15mm•	23	1	88015
16mm	25	1	88016
18mm	27	1	85890
22mm•	32	1	88019
28mm	38	1	88022
35mm	48	2	88023
42mm	56	2	88026
54mm	65	2	88027

N1IM/5241 Adaptor coupling

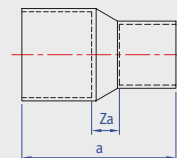
Imperial copper x metric copper



Size	a	Za	Code
15mm x 1/2"	23	1	88047
22mm x 3/4"	35	2	88048
28mm x 1"	42	1	88049

N1R/5240 Reducing coupling

Copper x copper



Size	a	Za	Code
8 x 6mm	16	3	88051
10 x 8mm	19	2	88053
12 x 8mm	23	4	85657D
12 x 10mm	21	3	88055
15 x 10mm	26	6	88059
15 x 12mm	24	5	88060
16 x 12mm	26	4	88062
18 x 10mm	30	7	88064

•These items comprise the NS range.



FEATURES

✚ Endex general range is designed for end-feeding with soft solder or hard solder (brazing alloy)

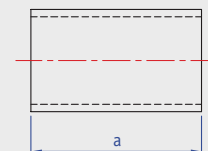
✚ Available in sizes from 6mm to 54mm ideal for use in hot and cold water services, central heating, fuel services and general engineering applications

Size	a	Za	Code
18 x 12mm	29	6	85668D
18 x 15mm	29	4	85670D
18 x 16mm	28	2	85671D
22 x 12mm	36	10	85676D
22 x 15mm	35	7	88076
22 x 16mm	35	6	88077
22 x 18mm	35	5	80601D
28 x 12mm	43	15	85682D
28 x 15mm	45	14	88089
28 x 16mm	44	13	85685D
28 x 18mm	42	10	85686D
28 x 22mm	42	7	88094
32 x 22mm			89895
35 x 18mm	55	17	85692D
35 x 28mm	50	7	88099
42 x 22mm	66	23	88101
42 x 28mm	62	14	89898
42 x 35mm	60	7	88103
54 x 28mm	76	24	80603
54 x 35mm	78	18	85700
54 x 42mm	77	14	88108

N1SLIP/5270S

Straight coupling, slip pattern

Copper x copper



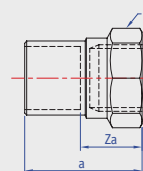
Size	a	Code
12mm	17	85969D
15mm	23	88037
18mm	26	85892
22mm	41	88039
28mm	38	88042
35mm	46	88031
42mm	54	88032
54mm	64	88033



N2/4270G

Straight female connector

Copper x BSP parallel female thread

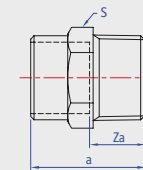


Size	a	Za	S	Code
10mm x 3/8"	22	14	20	88123
12mm x 3/8"	22	13	20	84734D
12mm x 1/2"	26	17	25	84735D
15mm x 1/4"	18	8	20	88128
15mm x 3/8"	23	12	20	88129
15mm x 1/2"	32	21	25	88130
15mm x 3/4"	30	19	30	84739D
18mm x 1/2"	29	16	25	84741D
18mm x 3/4"	32	19	30	84742D
22mm x 1/2"	31	15	25	84743D
22mm x 3/4"	34	18	30	88137
22mm x 1"	37	21	39	88138
28mm x 1/2"	35	16	30	84746D
28mm x 3/4"	35	16	30	84747D
28mm x 1"	39	22	37	88142
28mm x 1 1/4"	43	24	46	84749
35mm x 1"	43	20	37	84751D
35mm x 1 1/4"	48	24	46	88143
42mm x 1 1/4"	45	18	48	84754
42mm x 1 1/2"	51	23	55	88144
54mm x 2"	60	28	67	88145

N3/4243G

Straight male connector

Copper x BSP taper male thread



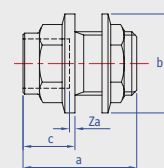
Size	a	Za	S	Code
10mm x 3/8"	21	13	15	88166
10mm x 1/2"	26	18	17	84677D
12mm x 3/8"	21	12	15	88169
12mm x 1/2"	26	17	19	88170
15mm x 1/4"	25	15	19	88173
15mm x 3/8"	24	13	19	88174
15mm x 1/2"	26	15	19	88175
15mm x 3/4"	28	17	19	88176
16mm x 1/2"	25	14	19	84684D
18mm x 1/2"	28	15	21	84686D
18mm x 3/4"	28	15	21	84687D



Size	a	Za	S	Code
22mm x 1/2"	32	16	25	88184
22mm x 3/4"	32	17	25	88185
22mm x 1"	33	17	27	88186
28mm x 1/2"	36	17	32	84670D
28mm x 3/4"	36	18	32	88188
28mm x 1"	38	19	32	88189
28mm x 1 1/4"	39	20	34	84693D
35mm x 1"	43	19	40	84694D
35mm x 1 1/4"	40	17	45	88192
35mm x 1 1/2"	40	17	40	84696
42mm x 1 1/4"	50	23	46	84697D
42mm x 1 1/2"	52	25	51	88195
54mm x 1 1/2"	56	24	59	84648
54mm x 2"	65	31	81	88198

N5/4350 Tank connector

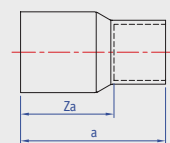
Copper x BSP parallel male thread with backnut



Size	a	b	c	Za	Code
15mm x 1/2"	35	30	17	11	88210
22mm x 3/4"	42	37	20	26	88215
28mm x 1"	43	50	21	27	88220

N6/5243 Reducer

Larger end male copper for insertion into fitting x female copper



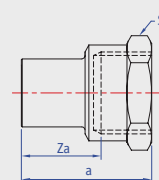
Size	a	Za	Code
8 x 6mm	18	12	88240
10 x 6mm	18	12	88241
10 x 8mm	19	12	88247
12 x 8mm	21	14	88244
12 x 10mm	21	13	88245
15 x 8mm	25	17	88248
15 x 10mm	24	16	88249
15 x 12mm	23	15	88250
16 x 10mm	26	18	88258
16 x 12mm	24	15	88259
18 x 10mm	29	21	85736D
18 x 12mm	27	17	85737D
18 x 15mm	28	17	85739D



Size	a	Za	Code
22 x 10mm	35	28	88264
22 x 12mm	34	26	88265
22 x 15mm•	33	22	88267
22 x 16mm	32	21	88261
22 x 18mm	33	19	85750
28 x 12mm	43	33	85753D
28 x 15mm	41	29	88280
28 x 16mm	33	22	89852
28 x 18mm	41	28	85757D
28 x 22mm	42	24	88284
35 x 15mm	56	43	88287
35 x 18mm	54	41	89902
35 x 22mm	50	35	88289
35 x 28mm	49	21	88290
42 x 15mm	62	49	88293
42 x 22mm	61	45	88296
42 x 28mm	60	40	88297
42 x 35mm	58	34	88298
54 x 15mm	84	73	88300
54 x 22mm	66	49	88301
54 x 28mm	59	38	88302
54 x 35mm	74	50	88303
54 x 42mm	71	42	88304

N7/4246G Female adaptor

Male copper for insertion into fitting x BSP parallel female thread



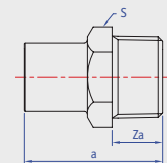
Size	a	Za	S	Code
15mm x 1/2"	30	20	25	88320
22mm x 1/2"	34	23	25	84717D
22mm x 3/4"	37	22	30	88321
28mm x 1"	43	30	37	88322
35mm x 1 1/4"	51	38	46	88323
42mm x 1 1/2"	55	40	52	88324
54mm x 2"	64	66	40	88325

•These items comprise the NS range.



N8/4280G Male adaptor

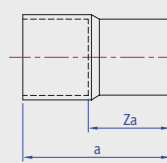
Male copper for insertion into fitting x BSP taper male thread



Size	a	Za	S	Code
15mm x 1/2"	37	15	24	88330
22mm x 3/4"	40	16	25	88331
28mm x 1"	46	17	32	88332
35mm x 1 1/4"	54	20	40	88333
42mm x 1 1/2"	61	20	50	88334
54mm x 2"	63	21	60	88335

N9 Adaptor

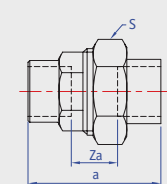
Imperial female copper x metric male copper.
Adapts imperial tube of older 17G standard to metric fittings



Size	a	Za	Code
1/2" x 15mm	29	16	88390
3/4" x 22mm	43	23	88391

N11 Union coupling cone face

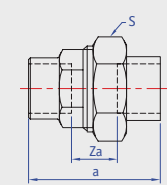
Copper x copper cone joint to BS 1010



Size	a	Za	S	Code
15mm	56	30	30	88400
22mm	60	44	38	88401
28mm	57	39	46	88402
35mm	61	24	53	88403
42mm	70	43	65	88404
54mm	88	56	82	88405

N11/4340L Union coupling flat face

Copper x copper cone joint to BS 1010



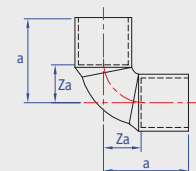
Size	a	c	Za	Zc	Code
12mm					84826D
18mm					84828D



N12/5090

Elbow

Copper x copper

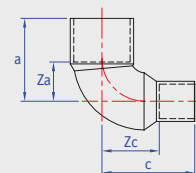


Size	a	Za	Code
6mm	17	10	88441
8mm	19	11	88440
10mm	17	9	88442
12mm	19	10	88443
15mm•	22	12	88445
16mm	23	12	80347
18mm	25	12	80701
22mm•	29	10	88450
28mm	37	18	88451
35mm	46	23	88452
42mm	56	29	88454
54mm	66	33	88455

N12R/5090

Reducing elbow

Copper x copper

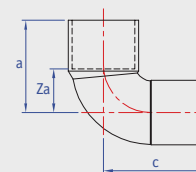


Size	a	c	Za	Zc	Code
22 x 15mm	37	28	17	17	88483
22 x 18mm	33	38	18	26	88484

N12S/5092

Street elbow

Female copper x male copper for insertion into fitting



Size	a	c	Za	Code
8mm	15	18	10	88463
10mm	18	20	9	85321D
12mm	20	21	11	85322D
15mm•	23	25	12	88465
18mm	29	30	15	80221
22mm	35	33	16	88470
28mm	41	39	19	88471
35mm	49	45	25	88472
42mm	54	54	30	88474
54mm	71	68	34	88475

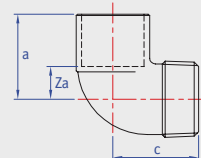
•These items comprise the NS range.



N13/4092G

Male elbow

Copper x BSP taper male thread

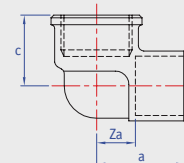


Size	a	c	Za	Code
12mm x 3/8"	15	24	6	84535
15mm x 1/2"	20	33	9	88497
15mm x 3/4"	22	29	11	84541
18mm x 1/2"	22	30	9	84543
18mm x 3/4"	25	31	12	84544
22mm x 3/4"	27	34	11	88505
22mm x 1"	30	38	14	84547
28mm x 1"	34	38	15	88509
35mm x 1 1/4"	45	50	21	88510
42mm x 1 1/2"	48	52	20	88511
54mm x 2"	60	60	27	88512

N14/4090G

Female elbow

Copper x BSP parallel female thread

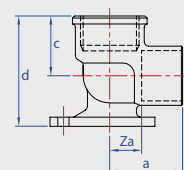


Size	a	c	Za	Code
15mm x 1/2"	23	21	12	88525
15mm x 3/4"	25	23	14	88526
18mm x 1/2"	25	22	12	89825
18mm x 3/4"	28	25	15	84516
22mm x 1/2"	27	24	12	88534
22mm x 3/4"	30	27	14	88535
22mm x 1"	33	32	18	84519
28mm x 1"	34	37	15	88540
35mm x 1 3/4"	36	40	13	88542
42mm x 1 1/2"	39	47	12	88543
54mm x 2"	52	53	20	88544

N15

Backplate elbow

Copper x BSP parallel female thread.
Triangular backplate with three hole fixing



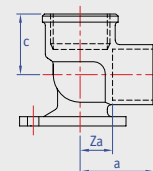
Size	a	c	d	Za	Code
15mm x 1/2"	23	41	40	12	88555
22mm x 3/4"	31	27	49	15	88559

•These items comprise the NS range.



N15F/4471G Backplate elbow

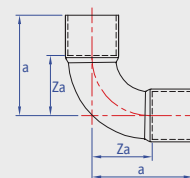
Copper x BSP parallel female thread.
Triangular backplate with three hole fixing



Size	a	c	Za	Code
12mm x 1/2"	21	19	12	84915
18mm x 1/2"	25	22	12	84919
18mm x 3/4"	27	24	15	84920

N18/5002A Slow bend

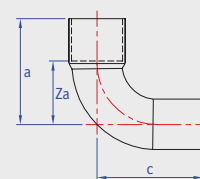
Copper x copper



Size	a	Za	Code
6mm	15	9	88582
8mm	17	10	88583
10mm	20	10	80674
12mm	24	15	80675
15mm	29	7	88584
18mm	34	22	88585
22mm	43	26	88588
28mm	52	33	88590
35mm	65	41	88591
42mm	79	54	88593
54mm	95	62	88594

N18S/5001A Slow street bend

Female copper x male copper for insertion into fitting

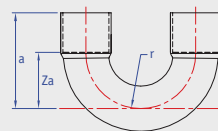


Size	a	c	Za	Code
12mm	23	24	8	80663
15mm	29	31	18	88602
16mm	31	32	20	88603
18mm	34	35	22	88100
22mm	43	44	26	88604
28mm	52	54	33	88605
35mm	65	67	42	85030
42mm	77	79	50	85032
54mm	97	99	65	85033



N20/5060 Return bend

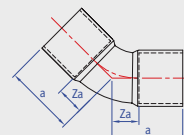
Copper x copper



Size	a	r	Za	Code
12mm	26	17	17	88621
15mm	35	22	23	88622
18mm	39	26	26	85196D
22mm	49	33	36	88624
28mm	62	40	42	88625
35mm	75	52	52	85199D

N21/5041 Obtuse elbow 45°

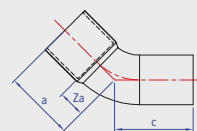
Copper x copper



Size	a	Za	Code
12mm	14	5	85163D
15mm	18	7	88640
18mm	20	7	85167D
22mm	26	10	88645
28mm	29	10	88647
35mm	38	15	88648
42mm	43	16	88650
54mm	54	22	88651

N21S/5040 Obtuse street elbow 45°

Female copper x male copper for insertion into fitting

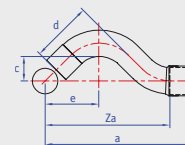


Size	a	c	Za	Code
10mm	14	16	6	85128D
12mm	12	13	4	85129D
15mm	17	19	6	88661
16mm	19	19	8	85132D
18mm	20	21	7	85133D
22mm	26	27	12	88665
28mm	29	30	10	88667
35mm	38	39	15	88671
42mm	42	15	46	88673
54mm	61	29	62	88674



N22/5086 Partial crossover

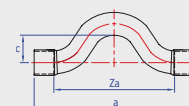
Female copper x male copper for insertion into fitting



Size	a	c	d	e	Za	Code
12mm	80	20	44	31	71	85238D
15mm	87	19	36	36	81	88682
18mm	99	20	42	36	86	85242D
22mm	115	20	49	44	100	88685

N23/5085 Full crossover

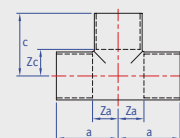
Copper x copper



Size	a	c	Za	Code
12mm	98	20	81	85217D
15mm	113	20	89	88692
18mm	126	20	101	85221D
22mm	142	20	110	88695

N24/5130 Equal tee

All ends for copper



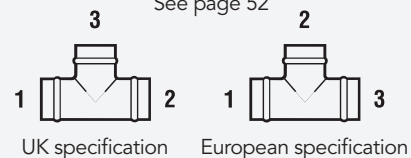
Size	a	c	Za	Zc	Code
6mm	11	11	5	5	88700
8mm	13	13	6	6	88701
10mm	15	15	6	6	88702
12mm	17	17	8	8	88703
15mm•	19	19	7	7	88705
16mm	20	20	10	10	85354D
18mm	23	23	10	10	80250
22mm•	29	29	13	13	88709
28mm	36	36	16	16	88711
35mm	43	43	21	21	88713
42mm	51	51	24	24	88716
54mm	62	62	30	30	88717

•These items comprise the NS range.



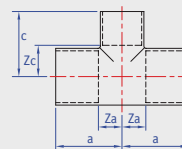
Tee specification

See page 52



N25/5130 Tee reduced branch

All ends for copper



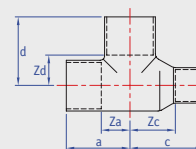
Size UK	Size European	a	c	Za	Zc	Code
10 x 10 x 6mm	10 x 6 x 10mm	13	14	5	8	88726
10 x 10 x 8mm	10 x 8 x 10mm	14	15	6	7	88727
12 x 12 x 8mm	12 x 8 x 12mm	16	15	6	8	88729
12 x 12 x 10mm	12 x 10 x 12mm	15	16	10	8	88730
15 x 15 x 8mm	15 x 8 x 15mm	17	17	6	10	88733
15 x 15 x 10mm	15 x 10 x 15mm	18	20	7	12	88734
15 x 15 x 12mm	15 x 12 x 15mm	19	18	7	9	88735
16 x 16 x 12mm	16 x 12 x 16mm	19	20	7	10	88737
18 x 18 x 12mm	18 x 12 x 18mm	22	21	8	13	85415D
18 x 18 x 15mm	18 x 15 x 18mm	21	21	9	10	80251
22 x 22 x 10mm	22 x 10 x 22mm	22	29	7	21	88752
22 x 22 x 12mm	22 x 12 x 22mm	23	23	7	16	85426D
22 x 22 x 15mm•	22 x 15 x 22mm•	25	25	9	13	88755
22 x 22 x 16mm	22 x 16 x 22mm	26	24	10	13	85429
22 x 22 x 18mm	22 x 18 x 22mm	27	25	11	12	80368
28 x 28 x 12mm	28 x 12 x 28mm	26	25	8	16	85434D
28 x 28 x 15mm	28 x 15 x 28mm	28	26	9	17	88764
28 x 28 x 18mm	28 x 18 x 28mm	30	30	10	16	85438D
28 x 28 x 22mm	28 x 22 x 28mm	33	36	14	20	88770
35 x 35 x 15mm	35 x 15 x 35mm	40	47	17	36	88775
35 x 35 x 18mm	35 x 18 x 35mm	36	36	12	12	85443D
35 x 35 x 22mm	35 x 22 x 35mm	38	45	15	29	88778
35 x 35 x 28mm	35 x 28 x 35mm	38	42	14	19	88779
42 x 42 x 15mm	42 x 15 x 42mm	38	49	11	38	88788
42 x 42 x 18mm	42 x 18 x 42mm	38	38	11	20	85448D
42 x 42 x 22mm	42 x 22 x 42mm	41	48	13	32	88793
42 x 42 x 28mm	42 x 28 x 42mm	43	49	16	29	88794
42 x 42 x 35mm	42 x 35 x 42mm	57	64	24	36	88795
54 x 54 x 15mm	54 x 15 x 54mm	43	45	12	33	88797
54 x 54 x 22mm	54 x 22 x 54mm	46	62	14	47	88799
54 x 54 x 28mm	54 x 28 x 54mm	49	63	16	29	88800
54 x 54 x 35mm	54 x 35 x 54mm	52	61	20	40	88801
54 x 54 x 42mm	54 x 42 x 54mm	57	64	24	36	88802

•These items comprise the NS range.



N26/5130 Tee, one end reduced

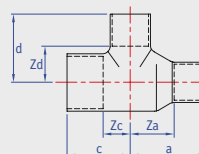
All ends for copper



Size UK	Size European	a	c	d	Za	Zc	Zd	Code
12 x 10 x 12mm	12 x 12 x 10mm	16	21	16	7	13	7	85487D
15 x 10 x 15mm	15 x 15 x 10mm	19	23	19	8	15	8	85500D
15 x 12 x 12mm	15 x 12 x 12mm							89953
15 x 15 x 12mm	15 x 12 x 15mm	19	23	19	8	14	8	85501
18 x 12 x 18mm	18 x 18 x 12mm	23	26	23	10	17	10	85523D
18 x 15 x 18mm	18 x 18 x 15mm	22	23	21	8	11	9	85525D
22 x 15 x 22mm	22 x 22 x 15mm	29	32	29	13	20	13	88845
22 x 18 x 22mm	22 x 22 x 18mm	28	31	28	12	18	12	85553D
28 x 15 x 28mm	28 x 28 x 15mm	35	41	35	16	30	16	88850
28 x 18 x 28mm	28 x 28 x 18mm	34	38	34	15	25	15	85571D
28 x 22 x 28mm	28 x 28 x 22mm	35	38	35	15	21	15	88853
35 x 15 x 35mm	35 x 35 x 15mm	45	53	45	21	42	21	88856
35 x 22 x 35mm	35 x 35 x 22mm	43	50	43	10	33	10	88854
35 x 28 x 35mm	35 x 35 x 28mm	43	47	43	21	28	21	88855
42 x 28 x 42mm	42 x 42 x 28mm	51	62	51	22	39	22	88857
42 x 35 x 42mm	42 x 42 x 35mm	51	56	51	24	33	24	88858
54 x 35 x 54mm	54 x 54 x 35mm	62	81	64	48	38	50	88860
54 x 42 x 54mm	54 x 54 x 42mm	61	74	61	29	48	29	88859

N27/5130 Tee, one end and branch reduced

All ends for copper

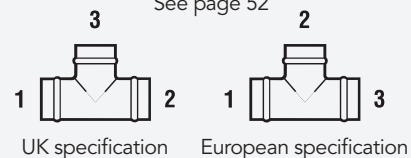


Size UK	Size European	a	c	d	Za	Zc	Zd	Code
12 x 10 x 10mm	12 x 10 x 10mm	20	15	15	12	6	7	85486D
15 x 10 x 10mm	15 x 10 x 10mm	21	17	17	13	6	9	88901
15 x 10 x 12mm	15 x 12 x 10mm	12	18	18	14	7	9	88902
18 x 12 x 12mm	18 x 12 x 12mm	23	21	19	14	8	10	85511D
18 x 12 x 15mm	18 x 15 x 12mm	24	21	21	15	8	10	88906
18 x 15 x 12mm	18 x 12 x 15mm	24	21	19	13	8	10	85513D
18 x 15 x 15mm	18 x 15 x 15mm	22	21	21	11	8	10	85417D
22 x 15 x 12mm	22 x 12 x 15mm	23	27	21	7	16	12	88908
22 x 15 x 15mm	22 x 15 x 15mm	28	24	24	17	14	14	88910
22 x 15 x 18mm	22 x 18 x 15mm	28	27	26	19	17	14	85546D
22 x 16 x 16mm	22 x 16 x 16mm	29	24	26	18	8	15	80354
22 x 18 x 12mm	22 x 12 x 18mm	26	23	21	13	7	12	88909
22 x 18 x 15mm	22 x 15 x 18mm	27	25	23	14	9	12	85541D
22 x 18 x 18mm	22 x 18 x 18mm	29	27	25	16	11	12	85547D



Tee specification

See page 52

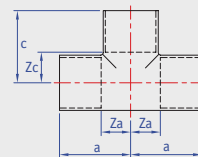


Size UK	Size European	a	c	d	Za	Zc	Zd	Code
28 x 15 x 15mm	28 x 15 x 15mm	33	28	28	23	18	18	88925
28 x 15 x 22mm	28 x 22 x 15mm	36	33	33	25	18	18	88926
28 x 18 x 18mm	28 x 18 x 18mm	34	29	28	21	10	15	85562D
28 x 18 x 22mm	28 x 22 x 18mm	38	32	31	25	13	15	85567D
28 x 22 x 15mm	28 x 15 x 22mm	33	27	27	9	16	16	88935
28 x 22 x 18mm	28 x 18 x 22mm	36	31	32	12	23	19	85563D
28 x 22 x 22mm	28 x 22 x 22mm	36	32	32	20	13	13	88940
35 x 22 x 22mm	35 x 22 x 22mm	41	36	36	25	20	20	88942
35 x 22 x 28mm	35 x 28 x 22mm	47	39	38	31	15	19	88943
35 x 28 x 15mm	35 x 15 x 28mm	38	45	45	19	32	32	88944
35 x 28 x 22mm	35 x 22 x 28mm	44	36	36	25	20	20	88947
35 x 28 x 28mm	35 x 28 x 28mm	47	40	40	28	19	19	88948
42 x 28 x 28mm	42 x 28 x 28mm	51	41	41	31	22	22	88950
42 x 35 x 28mm	42 x 28 x 35mm	48	42	42	25	23	23	88952
42 x 35 x 35mm	42 x 35 x 35mm	53	53	53	29	30	30	88957
54 x 42 x 42mm	54 x 42 x 42mm	67	59	59	40	30	30	88958

N28/5130

Tee, both ends reduced

All ends for copper

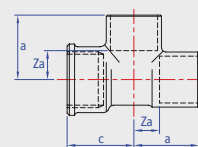


Size UK	Size European	a	c	Za	Zc	Code
12 x 12 x 15mm	12 x 15 x 12mm	18	18	9	7	85396D
15 x 15 x 18mm	15 x 18 x 15mm	21	22	10	9	85406D
15 x 15 x 22mm	15 x 22 x 15mm	33	30	22	16	88978
18 x 18 x 22mm	18 x 22 x 18mm	29	28	16	12	85419D
22 x 22 x 28mm	22 x 28 x 22mm	35	32	19	13	88990
28 x 28 x 35mm	28 x 35 x 28mm	43	42	24	19	88993
35 x 35 x 42mm	35 x 42 x 35mm	51	49	27	22	88995

N29/4134G

Female tee

Copper x BSP parallel female end x copper branch



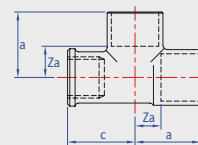
Size UK	Size European	a	c	Za	Code
15 x 1/2" x 15mm	15 x 15mm x 1/2"	22	22	11	89005
22 x 3/4" x 22mm	22 x 22mm x 3/4"	29	29	14	89010



N29R/4134G

Female tee

As N29 but with reduced female end

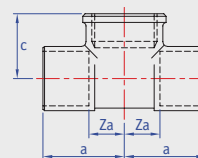


Size UK	Size European	a	c	Za	Code
22 x 1/2" x 22mm	22 x 22mm x 1/2"	27	25	12	89020
28 x 1/2" x 28mm	28 x 28mm x 1/2"	34	30	15	89021

N30/4130G

Female tee

Copper ends x BSP parallel female branch

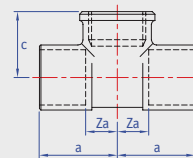


Size UK	Size European	a	c	Za	Code
15 x 15mm x 1/2"	15 x 1/2" x 15mm	23	21	12	89033
22 x 22mm x 3/4"	22 x 3/4" x 22mm	30	27	14	89034
28 x 28mm x 1"	28 x 1" x 28mm	37	26	19	89035

N30R/4130G

Female tee

As N30 but with reduced branch

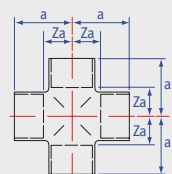


Size UK	Size European	a	c	Za	Code
22 x 22mm x 1/2"	22 x 1/2" x 22mm	27	25	12	89040
28 x 28mm x 1/2"	28 x 1/2" x 28mm	30	28	11	89041
28 x 28mm x 3/4"	28 x 3/4" x 28mm	34	34	16	89042
35 x 35mm x 1/2"	35 x 1/2" x 35mm	34	31	11	84640

N50/5180

Cross

All ends for copper

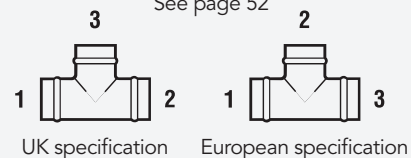


Size	a	Za	Code
15mm	20	9	89050
18mm	24	11	89051
22mm	28	13	89052
28mm	35	17	89053



Tee specification

See page 52



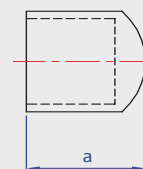
UK specification

European specification

N61/5301

Stop end

For use with copper tube

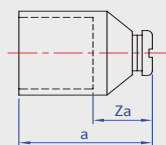


Size	a	Code
8mm	14	89076
10mm	11	89077
12mm	12	86045
14mm	14	86046
15mm	14	89080
16mm	14	86048
22mm	18	89084
28mm	21	89085
35mm	27	89087
42mm	31	89088
54mm	36	89089

N61AV/5301AV

Air release stop end

Female end for use on copper tube

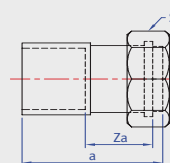


Size	a	Za	Code
15mm	25	7	89091
22mm	29	8	89092

N62/5240G

Straight tap connector

Copper x BSP hexagonal union nut spigot and washer joint



Size	a	Za	S	Code
15mm x 1/2"•	37	24	24	89103
15mm x 3/4"	38	24	30	89104
22mm x 3/4"	48	29	30	89106

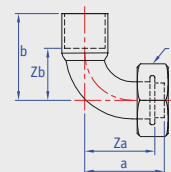
•These items comprise the NS range.



N63

Bent tap connector

Copper x BSP hexagonal union nut spigot and washer joint

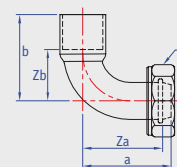


Size	a	b	Za	Zb	s	Code
15mm x 1/2"	38	28	33	18	24	89110
15mm x 3/4"	37	34	24	18	24	89116
22mm x 3/4"	51	42	45	22	30	89111

N64/4096C

Bent union adaptor

Copper x BSP union nut. Cone joint to BS 1010. The 15mm and 22mm sizes are supplied with bent copper tails

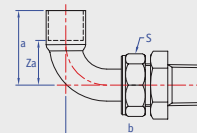


Size	a	b	Za	Zb	S	Code
15mm x 3/4"	47	40	40	29	31	89120
22mm x 1"	64	49	56	33	37	89127
28mm x 1 1/4"	49	51	39	32	46	89135

N65

Bent male union connector

Copper x BSP taper male thread. Cone joint to BS 1010. The 15mm and 22mm sizes are supplied with bent copper tails

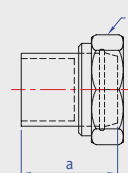


Size	a	b	Za	S	Code
15mm x 1/2"	38	82	24	30	89145
22mm x 3/4"	46	100	30	37	89152
28mm x 1"	49	88	30	46	89155
35mm x 1 1/4"	81	114	58	53	89156

N68

Straight union adaptor

Copper x BSP union nut. Cone joint to BS 1010

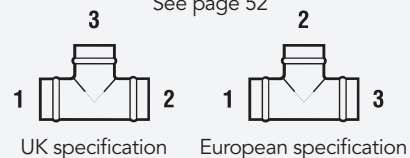


Size	a	S	Code
15mm x 3/4"	27	30	89190
22mm x 1"	31	37	89197
28mm x 1 1/4"	33	46	89205



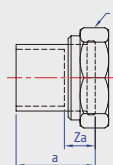
Tee specification

See page 52



N68FF Flat faced union adaptor

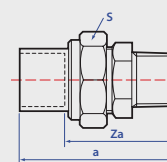
Copper x BSP union nut. Suitable for use with water meters



Size	a	Za	S	Code
22mm x 3/4"	38	21	29	89535

N69 Straight male union connector

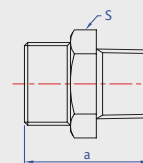
Copper x BSP taper male thread. Cone joint to BS 1010



Size	a	Za	S	Code
15mm x 1/2"	61	46	30	89235
22mm x 3/4"	66	48	37	89242
28mm x 1"	74	55	46	89245
35mm x 1 1/4"	74	50	53	89248
42mm x 1 1/2"	81	53	65	89250
54mm x 2"	108	71	82	89251

YP70 Male nipple

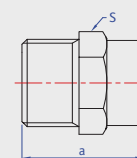
Union thread x BSP taper male thread. Cone joint to BS 1010. Enables N64 and N68 female ends to be adapted to reduce male union ends



Size	a	S	Code
1/2" x 3/8"	31	23	08871
3/4" x 1/2"	39	28	08872
1" x 3/4"	41	33	08873
1 1/4" x 1"	46	44	08874

YP72 Female nipple

Union thread x BSP parallel female thread. Cone joint to BS 1010. Enables N64 and N68 female ends to be adapted to reduce female union ends



Size	A	B	Code
3/4" x 1/2"	31	28	08892
1" x 3/4"	33	34	08893
1 1/4" x 1"	36	44	08894
1 1/2" x 1 1/4"	43	50	08895
2" x 1 1/2"	45	62	08896
2 1/2" x 2"	48	77	08897

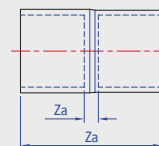
*Supplied and priced from the Yorkshire range. **Special order.

DEGREASED AND INDIVIDUALLY BAGGED ENDEX FITTINGS FOR USE ON MEDICAL GAS LINES



N1DW Straight coupling

Copper x copper



Size	a	Za	Code
6mm	16	1	88010DW
8mm	20	1	88011DW
10mm	17	1	88012DW
12mm	19	2	88013DW
15mm	23	1	88015DW
22mm	32	1	88019DW
28mm	38	1	88022DW
35mm	48	2	88023DW
42mm	56	2	88026DW
54mm	65	2	88027DW

N1DW Slip Straight coupling, slip pattern

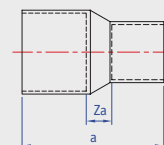
Copper x copper



Size	a	Code
35mm	46	88031DW
42mm	54	88032DW
54mm	64	88033DW

N1RDW Reducing coupling

Copper x copper



Size	a	Za	Code
10 x 8mm	19	2	88053DW
12 x 10mm	21	3	88055DW
15 x 10mm	26	6	88059DW
15 x 12mm	24	5	88060DW
22 x 15mm	35	7	88076DW
28 x 15mm	45	14	88089DW
28 x 22mm	42	7	88094DW
35 x 28mm	50	7	88099DW
42 x 22mm	66	23	88101DW
42 x 35mm	60	7	88103DW
54 x 42mm	77	14	88108DW



FEATURES

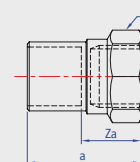
✚ Suitable for medical gas lines

✚ Available in sizes 6mm to 159mm

✚ Individually wrapped

N2DW Straight female connector

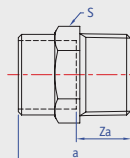
Copper x BSP parallel female thread



Size	a	Za	S	Code
15mm x 1/2"	32	21	25	88130DW
22mm x 3/4"	34	18	30	88137DW
22mm x 1"	37	21	39	88138DW
28mm x 1"	39	22	37	88142DW

N3DW Straight male connector

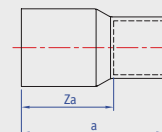
Copper x BSP taper male thread



Size	a	Za	S	Code
15mm x 1/4"	25	15	19	88173DW
15mm x 1/2"	26	15	19	88175DW
22mm x 1/2"	32	16	25	88184DW
22mm x 3/4"	32	17	25	88185DW
28mm x 1"	38	19	32	88189DW
35mm x 1 1/4"	40	17	45	88192DW
42mm x 1 1/2"	52	25	51	88195DW
54mm x 2"	65	31	81	88198DW

N6DW Reducer

Larger end male copper for insertion into fitting x female copper



Size	a	Za	Code
8 x 6mm	18	12	88240DW
10 x 8mm	19	12	88247DW
12 x 10mm	21	13	88245DW
15 x 8mm	25	17	88248DW
15 x 10mm	24	16	88249DW
15 x 12mm	23	15	88250DW
22 x 12mm	34	26	88265DW
22 x 15mm	33	22	88267DW
28 x 15mm	41	29	88280DW
28 x 22mm	42	24	88284DW
35 x 15mm	56	43	88287DW
35 x 22mm	50	35	88289DW

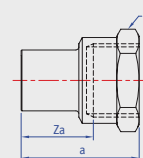
DEGREASED AND INDIVIDUALLY BAGGED ENDEX FITTINGS FOR USE ON MEDICAL GAS LINES



Size	a	Za	Code
35 x 28mm	49	21	88290DW
42 x 15mm	62	49	88293DW
42 x 22mm	61	45	88296DW
42 x 28mm	60	40	88297DW
42 x 35mm	58	34	88298DW
54 x 15mm	84	73	88300DW
54 x 22mm	66	49	88301DW
54 x 28mm	59	38	88302DW
54 x 35mm	74	50	88303DW
54 x 42mm	71	42	88304DW

N7DW Female adaptor

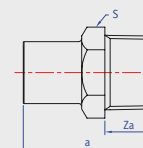
Male copper for insertion into fitting x BSP parallel female thread



Size	a	Za	S	Code
15mm x 1/2"	30	20	25	88320DW
22mm x 3/4"	37	22	30	88321DW

N8DW Male adaptor

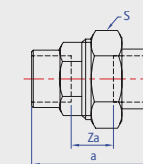
Male copper for insertion into fitting x BSP taper male thread



Size	a	Za	S	Code
15mm x 1/2"	37	15	24	88330DW
22mm x 3/4"	40	16	25	88331DW
28mm x 1"				88332DW
42mm x 1 1/2"				88334DW

N11DW Union coupling

Copper x copper. Cone joint to BS 1010

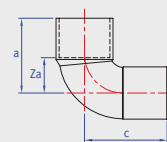


Size	a	Za	S	Code
15mm	56	30	30	88400DW
22mm	60	44	38	88401DW
28mm	57	39	46	88402DW
35mm	61	24	53	88403DW
42mm	70	43	65	88404DW
54mm	88	56	82	88405DW



N12DW Elbow

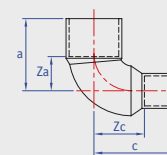
Copper x copper



Size	a	Za	Code
6mm	17	10	88441DW
8mm	19	11	88440DW
10mm	17	9	88442DW
12mm	19	10	88443DW
15mm	22	12	88445DW
22mm	29	10	88450DW
28mm	37	18	88451DW
35mm	46	23	88452DW
42mm	56	29	88454DW
54mm	66	33	88455DW

N12RDW Reducing elbow

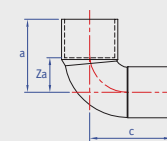
Copper x copper



Size	a	c	Za	Zc	Code
22 x 15mm	37	28	17	17	88483DW

N12SDW Street elbow

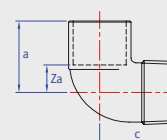
Female copper x male copper for insertion into fitting



Size	a	c	Za	Code
15mm	23	25	12	88465DW
22mm	35	33	16	88470DW
28mm	41	39	19	88471DW
35mm	49	45	25	88472DW

N13DW Male elbow

Copper x BSP taper male thread



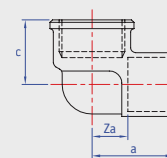
Size	a	c	Za	Code
15mm x 1/2"	20	33	9	88497DW

DEGREASED AND INDIVIDUALLY BAGGED ENDEX FITTINGS FOR USE ON MEDICAL GAS LINES



N14DW Female elbow

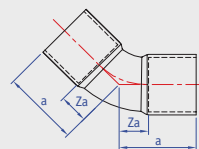
Copper x BSP parallel female thread



Size	a	c	Za	Code
15mm x 1/2"	23	21	12	88525DW

N21DW Obtuse elbow 45°

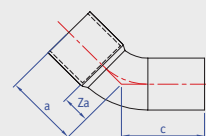
Copper x copper



Size	a	Za	Code
15mm	18	7	88640DW
22mm	26	10	88645DW
28mm	29	10	88647DW
35mm	38	15	88648DW
42mm	43	16	88650DW
54mm	54	22	88651DW

N21SDW Obtuse street elbow 45°

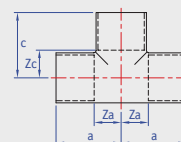
Female copper x male copper for insertion into fitting



Size	a	c	Za	Code
15mm	17	19	6	88661DW
22mm	29	30	10	88667DW

N24DW Equal tee

All ends for copper

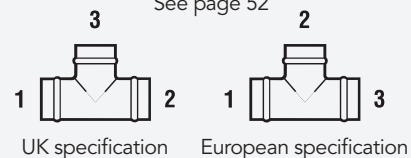


Size	a	c	Za	Zb	Code
6mm	11	11	5	5	88700DW
8mm	13	13	6	6	88701DW
10mm	15	15	6	6	88702DW
12mm	17	17	8	8	88703DW
15mm	19	19	7	7	88705DW
22mm	29	29	13	13	88709DW
28mm	36	36	16	16	88711DW



Tee specification

See page 52



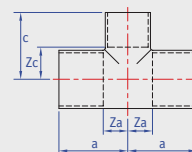
UK specification

European specification

Size	a	c	Za	Zb	Code
35mm	43	43	21	21	88713DW
42mm	51	51	24	24	88716DW
54mm	62	62	30	30	88717DW

N25DW Tee, reduced branch

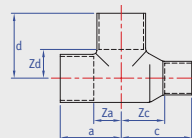
All ends for copper



Size UK	Size European	a	c	Za	Zc	Code
15 x 15 x 8mm	15 x 8 x 15mm	17	17	6	10	88733DW
15 x 15 x 10mm	15 x 10 x 15mm	18	20	7	12	88734DW
15 x 15 x 12mm	15 x 12 x 15mm	19	18	7	9	88735DW
22 x 22 x 10mm	22 x 10 x 22mm	22	29	7	21	88752DW
22 x 22 x 12mm	22 x 12 x 22mm	23	23	7	16	85426DW
22 x 22 x 15mm	22 x 15 x 22mm	25	29	9	10	88755DW
28 x 28 x 15mm	28 x 15 x 28mm	28	35	9	23	88764DW
28 x 28 x 22mm	28 x 22 x 28mm	33	36	14	20	88770DW
35 x 35 x 15mm	35 x 15 x 35mm	40	47	17	36	88775DW
35 x 35 x 22mm	35 x 22 x 35mm	38	45	15	29	88778DW
35 x 35 x 28mm	35 x 28 x 35mm	38	42	14	19	88779DW
42 x 42 x 15mm	42 x 15 x 42mm	38	49	11	38	88788DW
42 x 42 x 22mm	42 x 22 x 42mm	41	48	13	32	88793DW
42 x 42 x 28mm	42 x 28 x 42mm	43	49	16	29	88794DW
42 x 42 x 35mm	42 x 35 x 42mm	57	64	24	36	88795DW
54 x 54 x 15mm	54 x 15 x 54mm	43	45	12	33	88797DW
54 x 54 x 22mm	54 x 22 x 54mm	46	62	14	47	88799DW
54 x 54 x 28mm	54 x 28 x 54mm	49	63	16	29	88800DW
54 x 54 x 35mm	54 x 35 x 54mm	52	61	20	40	88801DW
54 x 54 x 42mm	54 x 42 x 54mm	57	64	24	36	88802DW
108 x 108 x 76mm	108 x 76 x 108mm	70	85	48	68	89002DW

N26DW Tee, one end reduced

All ends for copper



Size UK	Size European	a	c	d	Za	Zc	Zd	Code
22 x 15 x 22mm	22 x 22 x 15mm	29	32	29	13	20	13	88845DW
28 x 15 x 28mm	28 x 28 x 15mm	35	41	35	16	30	16	88850DW
28 x 22 x 28mm	28 x 28 x 22mm	35	38	35	15	21	15	88853DW
35 x 15 x 35mm	35 x 35 x 15mm	45	53	45	21	42	21	88856DW
35 x 22 x 35mm	35 x 35 x 22mm	43	50	43	10	33	10	88854DW
35 x 28 x 35mm	35 x 35 x 28mm	43	47	43	21	28	21	88855DW

DEGREASED AND INDIVIDUALLY BAGGED ENDEX FITTINGS FOR USE ON MEDICAL GAS LINES

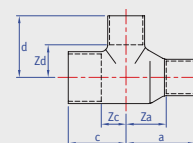


Size UK	Size European	a	c	d	Za	Zc	Zd	Code
42 x 35 x 42mm	42 x 42 x 35mm	51	56	51	24	33	24	88858DW
54 x 35 x 54mm	54 x 54 x 35mm	62	81	64	48	38	50	88860DW
54 x 42 x 54mm	54 x 54 x 42mm	61	74	61	29	48	29	88859DW

N27DW

Tee, one end and branch reduced

All ends for copper

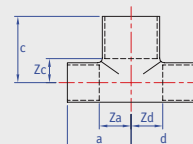


Size UK	Size European	a	c	d	Za	Zc	Zd	Code
22 x 15 x 15mm	22 x 15 x 15mm	28	24	24	17	14	14	88910DW
28 x 15 x 15mm	28 x 15 x 15mm	33	28	28	23	18	18	88925DW
28 x 15 x 22mm	28 x 22 x 15mm	36	33	33	25	18	18	88926DW
28 x 22 x 15mm	28 x 15 x 22mm	33	27	27	9	16	16	88935DW
28 x 22 x 22mm	28 x 22 x 22mm	36	32	32	20	13	13	88940DW
35 x 22 x 22mm	35 x 22 x 22mm	41	36	36	25	20	20	88942DW
35 x 28 x 28mm	35 x 28 x 28mm	47	40	40	28	19	19	88948DW
42 x 28 x 28mm	42 x 28 x 28mm	51	41	41	31	22	22	88950DW
54 x 42 x 42mm	54 x 42 x 42mm	67	59	59	40	30	30	88958DW

N28DW

Tee, both ends reduced

All ends for copper

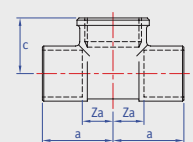


Size UK	Size European	a	c	Za	Zc	Code
15 x 15 x 22mm	15 x 22 x 15mm	33	30	22	16	88978DW
22 x 22 x 28mm	22 x 28 x 22mm	35	32	19	13	88990DW

N30DW

Female tee

Copper ends x BSP parallel female branch

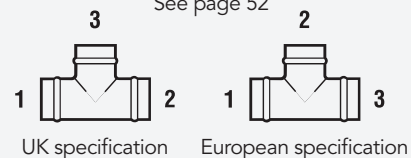


Size UK	Size European	a	c	Za	Code
15 x 15mm x 1/2"	15 x 15mm x 1/2"	22	21	12	89033DW



Tee specification

See page 52

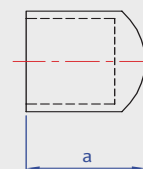


UK specification

European specification

N61DW Stop end

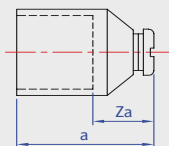
For use with copper tube



Size	a	Code
10mm	11	89077DW
15mm	14	89080DW
22mm	18	89084DW
28mm	21	89085DW
35mm	27	89087DW
42mm	31	89088DW
54mm	36	89089DW

N61AVDW Air release stop end

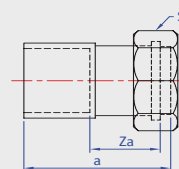
Female end for use with copper tube



Size	a	Za	Code
15mm	25	7	89091DW

N62DW Straight tap connector

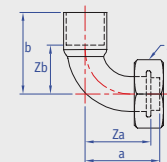
Copper x BSP hexagonal union nut spigot and washer joint



Size	a	Za	S	Code
15mm x 1/2"	37	24	24	89103DW

N63DW Bent tap connector

Copper x BSP hexagonal union nut spigot and washer joint



Size	a	b	Za	Zb	s	Code
15mm x 1/2"	38	28	33	18	24	89110DW

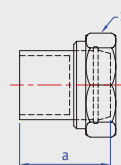
DEGREASED AND INDIVIDUALLY BAGGED ENDEX FITTINGS FOR USE ON MEDICAL GAS LINES



N68DW

Straight union adaptor

Copper x BSP union nut. Cone joint to BS 1010

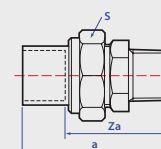


Size	a	S	Code
15mm x 3/4"	27	30	89190DW
22mm x 1"	31	37	89197DW
28mm x 1 1/4"	33	46	89205DW

N69DW

Straight male union connector

Copper x BSP taper male thread. Cone joint to BS 1010



Size	a	Za	S	Code
15mm x 1/2"	61	46	30	89235DW
22mm x 3/4"	66	48	37	89242DW
28mm x 1"	74	55	46	89245DW
35mm x 1 1/4"	74	50	53	89248DW
42mm x 1 1/2"	81	53	65	89250DW
54mm x 2"	108	71	82	89251DW

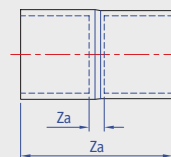


2.0 PRODUCT DETAILS

ENDBRAZE FITTINGS

N1 Straight coupling

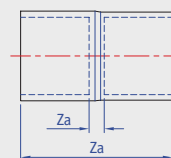
Copper x copper



Size	a	Za	Code
67mm	83	29	88030
76mm	49	29	89600
108mm	62	23	89601
133mm*	97	27	89697
159mm*	99	29	89698

N1IM Metal x imperial coupling

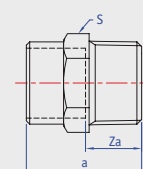
Copper x copper



Size	a	Z	Code
76mm x 3	10a	42	89617
108mm x 4	10a	14	89618

N3 Straight male connector

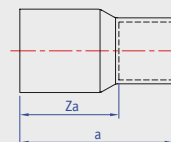
Copper x BSP taper male thread



Size	a	Za	s	Code
67mm x 2 1/2"	64	30	80	88200
76mm x 2 1/2"	63	29	86	84705
76mm x 3"	69	51	93	89615
108mm x 4"	76	55	119	89616

N6 Reducer

Larger end male copper for insertion into fitting x female copper



Size	a	Za	Code
67 x 28mm	75	54	88310
67 x 35mm	77	51	88311
67 x 42mm	77	50	88312
67 x 54mm	77	51	88313
76 x 35mm	57	41	89624

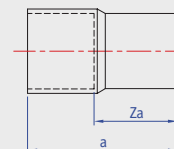
All sizes for brazing only. *Products may be fabricated.



Size		a	Za	Code
76 x 42mm		53	38	89625
76 x 54mm		48	31	89626
76 x 54mm	(LONG SOCKET)	86	54	89907
76 x 67mm		44	26	89627
108 x 42mm		79	61	89630
108 x 54mm		70	52	89631
108 x 67mm		60	44	89632
108 x 76mm		58	42	89633
133 x 42mm*		101	83	89699
133 x 54mm*		95	77	89700
133 x 67mm*		93	74	89701
133 x 76mm*		96	65	89702
133 x 108mm*		84	44	89703
159 x 54mm*		91	56	89704
159 x 67mm*		100	71	89705
159 x 76mm*		98	69	89706
159 x 108mm*		97	61	89707
159 x 133mm*		97	53	89708

N9 Adaptor

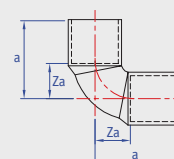
Imperial female copper x metric male copper



Size	a	Za	Code
3" x 76mm	50	27	89635
4" x 108mm	53	31	89636

N12 Elbow

Copper x copper



Size	a	Za	Code
67mm	77	43	88456
76mm			89619

All sizes for brazing only. *Products may be fabricated.



FEATURES

✚ Large size fittings for use with brazing alloys

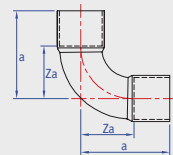
✚ Available in sizes from 64mm to 159mm

✚ The range includes flanges and is ideal for use in hot and cold water services, heating systems, gas service pipework and many engineering applications

✚ Available degreased and individually bagged for use on medical gas lines

N18 Slow bend

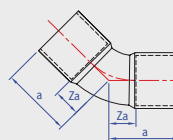
Copper x copper



Size	a	Za	Code
67mm	114	33	89639
76mm	97	79	89640
108mm	135	114	89641
133mm*	253	218	89709
159mm*	303	272	89710

N21 Obtuse elbow 45°

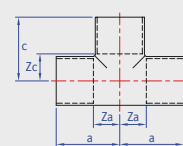
Copper x copper



Size	a	Za	Code
67mm	59	21	88653
76mm	43	25	89645
108mm	64	44	89646
133mm*	120	85	89711
159mm*	155	120	89712

N24 Equal tee

All ends for copper



Size UK	a	c	Za	Zc	Code
67mm	73	73	32	32	88719
76mm	65	70	47	52	89648
108mm	90	96	68	74	89649
133mm*	130	130	98	98	89713
159mm*	135	135	100	100	89714

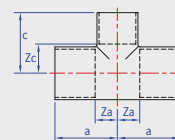
All sizes for brazing only. *Products may be fabricated.



N25

Tee, reduced branch

All ends for copper

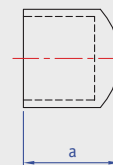


Size UK	Size European	a	c	Za	Zc	Code
67 x 67 x 28mm	67 x 28 x 67mm	54	66	19	47	88807
67 x 67 x 35mm	67 x 35 x 67mm	57	63	57	35	89055
67 x 67 x 42mm	67 x 42 x 67mm	60	68	60	35	89056
67 x 67 x 54mm	67 x 54 x 67mm	65	72	66	35	89057
76 x 76 x 28mm	76 x 28 x 76mm	55	66	55	40	89058
76 x 76 x 35mm	76 x 35 x 76mm	46	67	28	52	89000
76 x 76 x 42mm	76 x 42 x 76mm	51	69	34	53	89654
76 x 76 x 54mm	76 x 54 x 76mm	55	69	38	52	89001
108 x 108 x 35mm	108 x 35 x 108mm	160	89	80	56	89059
108 x 108 x 54mm	108 x 54 x 108mm	61	90	39	73	89660
108 x 108 x 76mm	108 x 76 x 108mm	70	85	48	68	89002
133 x 133 x 54mm*	133 x 54 x 133mm*	90	125	56	88	89715
133 x 133 x 108mm*	133 x 108 x 133mm*	105	133	70	99	89716
159 x 159 x 54mm*	159 x 54 x 159mm*	90	145	55	110	89717
159 x 159 x 133mm*	159 x 133 x 159mm*	120	150	87	114	89718

N61

Stop end

For use with copper tube

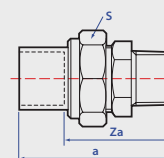


Size	a	Code
67mm	37	89090
76mm	21	89694
108mm	26	89695

N69P

Straight male union connector

Copper x BSP parallel male thread. Cone joint to BS 1010



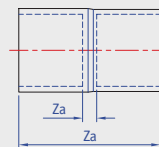
Size	a	Za	S	Code
67mm x 2 1/2"	93	60	96	89253

All sizes for brazing only. *Products may be fabricated.

DEGREASED AND INDIVIDUALLY BAGGED ENDBRAZE FITTINGS FOR USE ON MEDICAL GAS LINES

N1DW Straight coupling

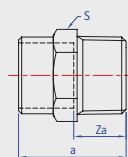
Copper x copper



Size	a	Za	Code
67mm	83	29	88030DW
76mm	49	29	89600DW
108mm	62	23	89601DW
133mm	97	27	89697DW
159mm	99	29	89698DW

N3DW Straight male connector

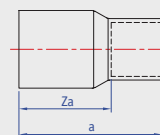
Copper x BSP taper male thread



Size	a	Za	S	Code
67mm x 2 1/2"	64	30	80	88200DW
76mm x 3"	69	51	93	89615DW
108mm x 4"	76	55	119	88616DW

N6DW Reducer

Larger end male copper for insertion into fitting x female copper



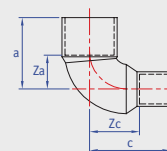
Size	a	Za	Code
67 x 28mm	75	54	88310DW
67 x 35mm	77	51	88311DW
67 x 42mm	77	50	88312DW
67 x 54mm	77	51	88313DW
76 x 35mm	57	41	89624DW
76 x 42mm	53	38	89625DW
76 x 54mm	48	31	89626DW
76 x 67mm	44	26	89627DW
108 x 42mm	79	61	89630DW
108 x 54mm	70	52	89631DW
108 x 67mm	60	44	89632DW
108 x 76mm	58	42	89633DW
133 x 108mm	84	44	89703DW
159 x 76mm	98	69	89706DW
159 x 108mm	97	61	89707DW

DEGREASED AND INDIVIDUALLY BAGGED ENDBRAZE FITTINGS FOR USE ON MEDICAL GAS LINES



N12DW Elbow

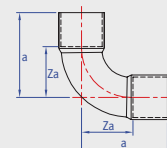
Copper x copper



Size	a	b	Code
67mm	77	43	88456DW

N18DW Slow bend

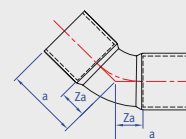
Copper x copper



Size	a	Za	Code
76mm	97	79	89640DW
108mm	135	114	89641DW
133mm	253	218	89709DW

N21DW Obtuse elbow 45°

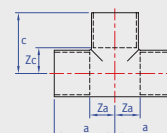
Copper x copper



Size	a	Za	Code
67mm	59	21	88653DW
76mm	43	25	89645DW
108mm	64	44	89646DW

N24DW Equal tee

All ends for copper



Size	a	c	Za	Zc	Code
67mm	73	73	32	32	88719DW
76mm	65	70	47	52	89648DW
108mm	90	96	68	74	89649DW
133mm	130	130	98	98	89713DW
159mm	135	135	100	100	89714DW



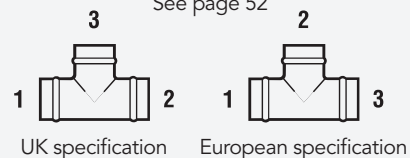
FEATURES

✚ Suitable for medical gas lines

✚ Available in sizes 6mm to 159mm

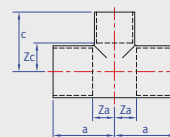
Tee specification

See page 52



N25DW Tee, reduced branch

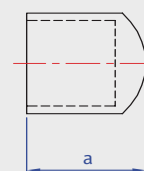
All ends for copper



Size UK	Size European	a	c	Za	Zc	Code
67 x 67 x 28mm	67 x 28 x 67mm	54	66	19	17	88807DW
76 x 76 x 35mm	76 x 35 x 76mm	46	67	28	52	89000DW
76 x 76 x 42mm	76 x 42 x 76mm	51	69	34	53	89654DW
76 x 76 x 54mm	76 x 54 x 76mm	55	69	38	52	89001DW
108 x 108 x 54mm	108 x 54 x 108mm	61	90	39	73	89660DW

N61DW Stop end

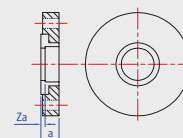
For use with copper tube



Size	a	Code
67mm	37	89090DW

N1FMGIDW Bi-metal flange

Steel outer with gunmetal inserts to BS 4504 part 2, table 16/23

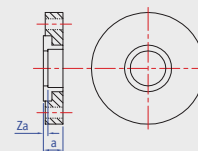
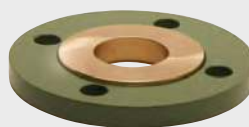


Size	a	Za	Holes	Code
108mm	22	2	8	89604DW



N1FMGI Bi-metal flange

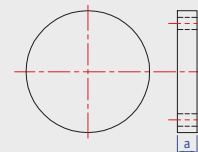
Steel outer with gunmetal inserts to BS 4504 part 2, table 16/23



Size	a	Za	Holes	Code
42mm	19	2	4	88028
54mm	22	3	4	88029
67mm	20	2	4	88114
76mm	22	2	8	89603
108mm	22	2	8	89604
133mm	21	2	8	89602
159mm	25	2	8	89719

N1FMB Gunmetal flange

Blank to BS 4504 part 3.3, type 305



Size	a	Holes	Code
76mm	21	8	89605
108mm	21	8	89606



2.0 PRODUCT DETAILS

ENDEX WASTES

N1W Straight coupling

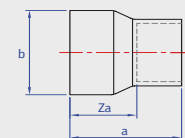
Copper x copper



Size	a	b	Za	Code
35mm	28	38	1	89741
42mm	32	45	1	89742
54mm	35	57	1	89743

N6W Reducer

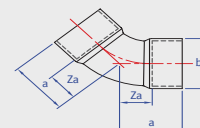
Larger end male copper for insertion into fitting x female copper



Size	a	b	Za	Code
42 x 35mm	36	42	23	89745
54 x 35mm	45	54	33	89746
54 x 42mm	41	54	27	89747

N21W Obtuse elbow 45°

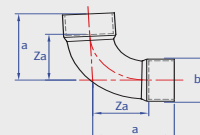
Copper x copper



Size	a	b	Za	Code
35mm	24	38	12	89750
42mm	28	45	14	89751
54mm	41	57	26	89752

N323 Copper bend 91.5°

Copper x copper

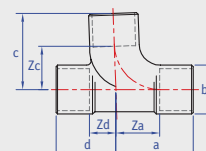


Size	a	b	Za	Code
35mm	58	38	44	89763
42mm	65	46	49	89764
54mm	83	57	64	89765



N359 Pitcher tee 88.5°

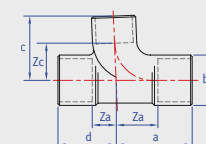
All ends for copper



Size	a	b	c	d	Za	Zc	Zd	Code
35mm	42	40	43	26	29	30	14	89770
42mm	35	47	48	49	20	33	34	89771
54mm	42	60	56	57	26	40	40	89772

N359R Pitcher tee 88.5°

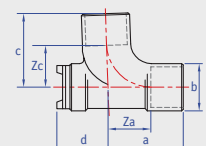
All ends for copper. Branch reduced



Size	a	b	c	d	Za	Zc	Zd	Code
42 x 35mm	30	47	46	45	16	33	31	89773
54 x 35mm	32	60	54	48	15	41	32	89774
54 x 42mm	50	60	46	38	34	40	22	89775

N363 Pitcher tee 88.5°

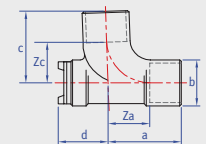
Copper x copper. With cleaning eye



Size	a	b	c	d	Za	Zc	Code
35mm	29	40	43	41	17	30	89776
42mm	34	47	49	48	19	34	89777
54mm	45	60	57	57	29	41	89778

N363R Pitcher tee 88.5°

All ends for copper. Branch reduced. With cleaning eye



Size	a	b	c	d	Za	Zc	Code
42 x 35mm	35	47	48	44	21	35	89779
54 x 35mm	35	60	53	46	19	40	89780
54 x 42mm	35	60	56	38	18	41	89781



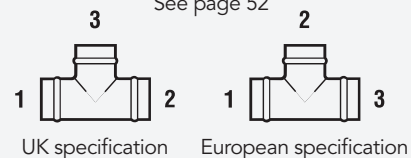
FEATURES

✚ Endex waste fittings are designed for connecting to basin, baths, sinks and other sanitary appliances in domestic and commercial properties

✚ Available in sizes from 35mm to 54mm
✚ The range includes bends, tee and crosses and fittings with rodding eyes to enable inspection and maintenance of the pipework

Tee specification

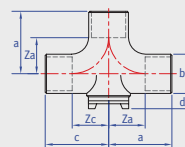
See page 52



N376

Sweep cross, 88.5°

All ends for copper. Upper end tapped 1¼" and 1½" BSP respectively with cleaning eye

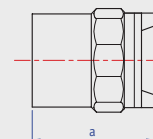


Size	a	b	c	d	Za	Zc	Code
54mm	63	59	63	49	47	47	89783

N377

Cleaning eye adaptor

Male copper for insertion into fitting

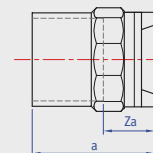


Size	A	Code
35mm x 1"	36	89784
42mm x 1 1/4"	41	89785
54mm x 1 1/2"	44	89786

N378

Cleaning eye coupling

Copper x screwed cleaning plug



Size	A	Za	Code
35mm x 1"	36	24	89787
42mm x 1 1/4"	42	26	89788
54mm x 1 1/2"	44	27	89789



FW1

Tap connector washers

Also Yorkshire and Kuterlite tap connectors (pack of 100)



Size	Code
1/2"*	73050
3/4"*	73051

N161

Endex lead free solder wire

99/1 tin copper. BS EN 29453. Alloy number 23



Size	Code
1/2" kilo reel	71159

*Supplied and priced from the Yorkshire range. ▲ COSHH sheets for these products are available at www.pegler.yorkshire.co.uk/SHE



N164

Brazing rods

Copper Phosphorous alloy to BS EN 1044 CP2 (Formerly BS 1845)



Size	Code
3mm x 600mm	71176

130GHD

Degussa H[▲]

High duty flux. Ready mix paste



Size	Code
500g tub	21068

*Supplied and priced from the Yorkshire range. ▲ COSHH sheets for these products are available at www.pegler.yorkshire.co.uk/SHE



3.0 TECHNICAL DATA

TUBE COMPATIBILITY AND APPLICATIONS

Endex end feed fittings are suitable for jointing copper tube, which must meet the requirements of BS EN 1057.

BS EN 1057 Specification for copper and copper alloy - seamless round copper tubes for water (and gas) in sanitary and heating applications. BS EN 1057 includes specified temper conditions (material strength) expressed as an "R" number. Quite simply, the higher the number, the harder the material. As a result, tube diameter, wall thickness, length and the material temper must all be specified for full product designation.

R220 Annealed condition with a tensile strength of 220N/mm² supplied in coils and suitable for connection by push-fit, capillary and compression fittings. Can be bent with suitable bending tools.

R250 Half hard condition with a tensile strength of 250N/mm² supplied in straight lengths and suitable for connection by push-fit, press-fit, capillary and compression fittings. Can be bent with suitable bending tools.

R290 Hard condition with a tensile strength of 290N/mm² supplied in straight lengths suitable for connection by push-fit, press-fit, capillary and non-manipulative compression fittings. Not suitable for bending.

IMPERIAL COPPER TUBE

Endex end feed fittings with metric or BSP ends are not compatible with imperial copper tube. However, the Endex range includes a number of imperial x metric adaptors, which are specifically designed for the purpose of connecting to imperial copper tube found in an existing installation.

STAINLESS STEEL TUBE

The use of Endex fittings with stainless steel tube is not recommended.

BS EN 1057 COPPER TUBE SPECIFICATIONS COMPATIBLE WITH ENDEX END FEED FITTINGS

Outside	Wall thickness								
diameter	0.6mm	0.7mm	0.8mm	0.9mm	1.0mm	1.2mm	1.5mm	2.0mm	2.5mm
6mm	R220/R250		R220/R250						
8mm	R220/R250		R220/R250						
10mm	R250	R220	R220/R250						
12mm	R250		R220/R250						
14mm									
15mm		R250			R220/R250				
16mm									
18mm									
22mm				R250		R220/R250			
28mm				R250		R220/R250			
35mm					R290	R250/R290	R250		
42mm					R290	R250/R290	R250		
54mm					R290	R250/R290		R250	
64mm									
67mm						R250/R290		R250	
76mm							R290	R250	
89mm									
108mm							R290		R250
133mm							R290		
159mm								R290	
219mm									



3.0 TECHNICAL DATA

WORKING TEMPERATURES AND PRESSURES

CONNECT + CONTROL

Working temperatures and pressure

ENDEX GENERAL RANGE FITTINGS

Endex general range end feed fittings can be assembled using a variety of soft or hard solders (brazing alloy). Their working temperatures and pressures vary according to which solder has been used. When correctly assembled with copper tube to BS EN 1057, the applicable temperatures and pressures are indicated in Table 1 opposite.

ENDBRAZE FITTINGS

Endbrazed fittings should be assembled with silver brazing alloys to BS EN 1044 (formerly BS 1845). When correctly assembled with copper tube to BS EN 1057, Endbrazed fittings are designed for the working temperatures and pressures shown in Table 2 opposite. Please contact us for performance information for Endbrazed 219mm fittings.

FLANGES

Endbrazed flanges are designed for assembly with silver brazing alloys to BS EN 1044 (formerly BS 1845). When correctly assembled with copper tube to BS EN 1057, they perform at the temperatures and pressures shown in Table 3 opposite.

ACHIEVING LOW TEMPERATURES

For products used in water systems, working temperatures of less than 4°C can only be achieved if antifreeze is added to the system. Antifreeze must not be added to potable water systems.

HIGH PERFORMANCE

Endex end feed fittings used with copper tube to BS EN 1057 will withstand pressure ratings far exceeding normal service conditions.

TABLE 1

Endex (and Endbrazed 67mm) performance when correctly assembled with copper tube to BS EN 1057 using tin/copper soft solder BS EN 29453 S-Sn99Cu1 or tin/silver soft solder BS EN 29453 L-SnAg5 DIN 1707				
	Service temperature			
	Min			Max
Size	-40°C	30°C	65°C	110°C
6mm to 28mm	25bar	25bar	25bar	16bar
35mm to 54mm	25bar	25bar	16bar	10bar
67mm	16bar	16bar	16bar	10bar

TABLE 2

Endex (and Endbrazed 67mm) performance when correctly assembled with copper tube to BS EN 1057 using tin/lead soft solder BS EN 29453 D-Pb60Sn40 <i>Not suitable for use in potable water systems</i>				
	Service temperature			
	Min			Max
Size	-15°C	30°C	65°C	110°C
6mm to 54mm	16bar	16bar	10bar	6bar
67mm	10bar	10bar	6bar	4bar

TABLE 3

Endbrazed flange performance when correctly assembled with copper tube to BS EN 1057 with silver brazing alloy to BS EN 1044 Ag103 (formerly BS 1845 Ag14)		
	Service temperature	
	Min	Max
Size	180°C	200°C
42mm to 219mm	10bar	8.5bar

THERE ARE THREE GAS FAMILIES

1st Family	Manufactured gas
2nd Family	Natural gas
3rd Family	LPG, compressed propane and butane

PRESSURE EQUIPMENT DIRECTIVE (P.E.D.)

From 30th May 2002 most pressure equipment and assemblies on the market in the United Kingdom must comply with the Pressure Equipment Directive (P.E.D.) 1999. Fittings are exempt from the P.E.D. unless they are incorporated into pressure equipment, falling within its scope.



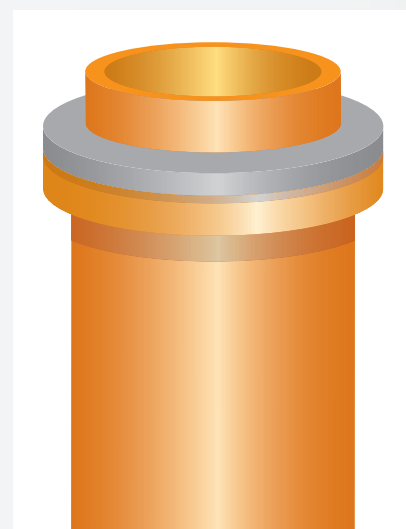
3.0 TECHNICAL DATA

PERFORMANCE AND EQUIPOTENTIAL BONDING



WASHERS

Where tap connectors or other fittings are assembled with washers, service temperatures must not exceed 100°C. Washers are not suitable for use on gas service pipelines.



EQUIPOTENTIAL BONDING

Ensure all metallic pipework systems comply with the equipotential bonding requirements of the current edition of the IEE electrical wiring regulations (BS 7671:2001).

All Endex end feed fittings provide electrical continuity when the joint has been completed with copper tube.

After all plumbing work has been completed, always ensure continuity checks are conducted by a qualified electrician in accordance with regulations.





CONNECT + CONTROL

Maximum hydraulic working pressure for Endex fittings when assembled with copper tube to BS EN 1057 using hard solder (brazing alloy) to BS EN 1044 (formerly BS 1845)*

Size	Service temperature					
	Min [†]					Max
	-196°C	65°C	120°C	150°C	175°C	200°C
6mm	81.1bar	81.1bar	76.2bar	60.5bar	46.0bar	30.3bar
8mm	62.5bar	62.5bar	58.8bar	46.7bar	35.5bar	23.3bar
10mm	50.9bar	50.9bar	47.9bar	38.0bar	28.9bar	19.0bar
12mm	42.9bar	42.9bar	40.3bar	32.0bar	24.3bar	16.0bar
14mm	42.4bar	42.4bar	39.9bar	31.7bar	24.0bar	15.8bar
15mm	40.3bar	40.3bar	37.9bar	30.1bar	22.8bar	15.0bar
16mm	37.5bar	37.5bar	35.3bar	28.0bar	21.3bar	14.0bar
18mm	38.6bar	38.6bar	36.3bar	28.8bar	21.9bar	14.4bar
22mm	35.6bar	35.6bar	33.5bar	26.6bar	20.2bar	13.3bar
28mm	28.2bar	28.2bar	26.5bar	21.1bar	16.0bar	10.5bar
35mm	25.2bar	25.2bar	23.7bar	18.8bar	14.3bar	9.4bar
42mm	23.2bar	23.2bar	21.8bar	17.3bar	13.1bar	8.6bar
54mm	19.8bar	19.8bar	18.6bar	14.7bar	11.2bar	7.4bar

Endbrazing performance when correctly assembled with copper tube to BS EN 1057 with silver brazing alloy to BS EN 1044 (formerly BS 1845)

Size	Service temperature				
	Min [†]				Max
	-196°C	65°C	120°C	150°C	200°C
64mm	19.4bar	19.4bar	18.2bar	14.4bar	7.2bar
67mm	18.6bar	18.6bar	17.5bar	14.0bar	6.9bar
76mm	18.6bar	18.6bar	17.5bar	14.0bar	6.9bar
89mm	18.0bar	18.0bar	16.9bar	13.4bar	6.7bar
108mm	17.2bar	17.2bar	16.2bar	12.9bar	6.4bar
133mm	10.5bar	10.5bar	8.5bar	7.7bar	4.1bar
159mm	11.7bar	11.7bar	9.7bar	8.6bar	4.6bar

*Not applicable to products containing non-metallic components. [†]Copper and gunmetal fittings only.



3.0 TECHNICAL DATA

SYSTEM DESIGN CONSIDERATIONS AND TUBE EXPANSION

Here are details of some of the specific design considerations it is important to take account of when designing and installing pipework systems containing Endex fittings.

THERMAL MOVEMENT

Thermal movement is a major consideration when designing and installing plumbing and heating systems and should be taken into account. Pipework systems expand and contract with changes in temperature. If they are fixed too rigidly and their movement restricted the installation will be subject to stress. Stress concentrations between "fixed points" - typically found at radiators, valves and other fittings - should be avoided wherever possible.

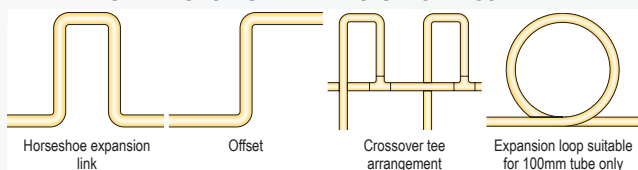
CORRECT ANCHORING

Always ensure the free length of tube between the branch of the tee and the first anchor point (bracket or radiator valve) is long enough to allow normal thermal movement. Not doing this can lead to installation failure.

EXPANSION OF COPPER TUBE

Copper has a coefficient of linear expansion of $17 \times 10^{-6}^{\circ}\text{C}$. For example, a 10 metre length of copper tube carrying hot water at 60°C will increase in length by almost 7mm when heated from 20°C . Assuming that temperature cycling of the system is 20°C , there will be a continuous cycle of expansion and contraction of 3.4mm. Refer to table (below).

TECHNIQUES FOR EXPANSION STRESS RELIEF



PIPELINE SUPPORTS

Pipelines should always be assembled so that the joints are under neutral or compressive stress. Clipping to support the assembled pipeline is essential and tube manufacturer's recommendations should be adhered to. Pegler Yorkshire offers a wide range of pipe clips and brackets to ensure safe and secure installations. Pipe joist clips are also available and are designed to protect pipework against accidental piercing when nailing or screwing down floorboards. For the maximum spacing of supporting brackets refer to the table (below).

Maximum spacing of support brackets for copper tube to BS EN 1057 R250 and R290

Size	Wall thickness	Horizontal pitch	Vertical pitch
6mm	0.6mm	0.40m	0.60m
8mm	0.6mm	0.60m	0.90m
10mm	0.6mm	0.80m	1.20m
12mm	0.6mm	1.00m	1.50m
14mm			
15mm	0.7mm	1.20m	1.80m
16mm			
18mm			
22mm, 28mm	0.9mm	1.80m	2.40m
35mm, 42mm	1.2mm	2.40m	3.00m
54mm	1.2mm	2.70m	3.00m
64mm			
67mm	1.2mm	3.00m	3.60m
76mm, 108mm	1.5mm	3.00m	3.60m
89mm			

COPPER TUBE EXPANSION

Temperature change	Tube length									
	3m	4m	5m	6m	7m	8m	9m	10m	12m	25m
10°C	0.5mm	0.7mm	0.9mm	1.0mm	1.2mm	1.4mm	1.5mm	1.7mm	2.0mm	4.3mm
20°C	1.0mm	1.4mm	1.7mm	2.0mm	2.4mm	2.7mm	3.0mm	3.4mm	4.0mm	8.5mm
30°C	1.5mm	2.0mm	2.6mm	3.1mm	3.6mm	4.1mm	4.6mm	5.1mm	6.1mm	13.0mm
40°C	2.0mm	2.7mm	3.4mm	4.1mm	4.8mm	5.4mm	6.1mm	6.8mm	8.2mm	17.0mm
50°C	2.6mm	3.4mm	4.3mm	5.1mm	6.0mm	6.8mm	7.7mm	8.5mm	10.2mm	21.0mm
60°C	3.1mm	4.1mm	5.1mm	6.1mm	7.1mm	8.2mm	9.2mm	10.2mm	12.2mm	26.0mm
70°C	3.6mm	4.8mm	6.0mm	7.1mm	8.3mm	9.5mm	10.7mm	11.9mm	14.3mm	30.0mm
80°C	4.1mm	5.4mm	6.8mm	8.2mm	9.5mm	10.9mm	12.2mm	13.6mm	16.3mm	34.0mm
90°C	4.6mm	6.1mm	7.7mm	9.2mm	10.7mm	12.2mm	13.8mm	15.3mm	18.4mm	38.0mm
100°C	5.1mm	6.8mm	8.5mm	10.2mm	11.9mm	13.6mm	15.3mm	17.0mm	20.4mm	43.0mm
150°C	7.65mm	10.2mm	12.75mm	15.3mm	17.85mm	20.4mm	22.95mm	25.5mm	30.6mm	63.75mm
200°C	10.2mm	13.6mm	17.0mm	20.4mm	23.8mm	27.2mm	30.6mm	34.0mm	40.8mm	85.0mm



INSULATION

For all Endex installations, we recommend you adhere to the insulation requirements for copper tube as specified by The Water Supply (Water Fittings) Regulations 1999. These can be downloaded from www.hms.gov.uk

PHENOLIC FOAM

When using rigid phenolic foam (or other thermal insulation) to lag pipework, always remember to refer to the lagging manufacturer's fixing instructions. To avoid the risk of external corrosion of pipework, the European Phenolic Foam Association recommends that such insulation products be installed with a moisture barrier, such as Densopaste or a plastic covering applied by the tube manufacturer. If you need to add a barrier product, we recommend that all Endex fittings are fully installed and are completely coated before these are applied.

COVERED PIPEWORK

Making provision for thermal movement is vital where pipe-work is installed under screed or plaster, or passes through brick or blockwork. The preferred practice is to pass tubes and pipes through sleeves or conduits or to lay them in ducts surrounded by loose, non-rigid material such as vermiculite or glass wool. For further information, consult the standard BS 6700.

PIPEWORK ACCESSIBILITY

It's wise to take advice from the local water authority when it comes to pipework accessibility.

CHEMICALS

Some contracts may require the use of proprietary chemicals to cleanse and flush pipework before full commissioning. Endex is compatible with a selection of products - contact us for a list.



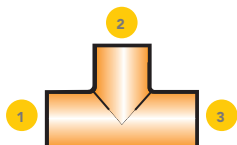
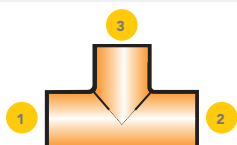
CONNECTORS

MALE CONNECTORS

Endex male connectors have threads to ISO 7/EN 10226-1. Inert jointing compounds or PTFE tape should be applied to taper threads and good quality jointing washers should be used with parallel threaded fittings.

FEMALE CONNECTORS

Endex female threaded connectors have internal parallel threads to ISO 7/EN 10226-1.



TEE SPECIFICATION

UK SPECIFICATION

First quote the ends on the run (larger end first) and then the branch.

EUROPEAN SPECIFICATION

Quote the larger end first, then the branch, followed by the remaining end.



4.0 TECHNICAL DATA

INSTALLATION INSTRUCTIONS FOR SOFT SOLDER

The following instructions illustrate just how easy it is to make an Endex end feed joint. The fittings use the principle of capillary attraction to allow solder to fill the gap between fitting and tube to form a completely reliable joint.

ENDEX GENERAL RANGE FITTINGS

The reliability of soft soldered joints is greatly influenced by the type of flux used. Yorkshire flux and Traditional Craftsman's flux are specially formulated for jointing copper tubes with Endex end feed fittings. All fluxes are to some extent, corrosive, but special care should be taken with so-called self cleaning fluxes.

PRELIMINARIES

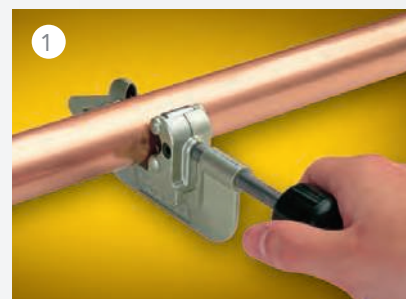
Select the correct size of tube and fitting for the job. Ensure that both are clean, in good condition and free from damage and imperfections. If the tube is oval or damaged, use a re-rounding tool.

PREPARATION

1. Cut the tube square using a rotary tube cutter wherever possible. If a hacksaw is used to cut the tube, a fine toothed blade should be used.

2. Remove any burrs from the inside and outside of the tube ends using a fine toothed file or a S120 deburring tool from the XPress accessories range.

3. Clean the inside of the fitting socket and the outside of the tube with a Yorkshire cleaning pad, fine sandpaper or steel wool.





CONNECT + CONTROL



JOINTING - SOFT SOLDER

1. Using a suitable brush, apply adequate - but not excessive - flux to both the outside of the tube and the inside of the fitting socket. Do not use your finger.



2. Insert the tube into the fitting until it reaches the tube stop, then wipe off any excess flux. Heat the assembled joint evenly on all sides.



3. Apply solder to the mouth of the fitting. When the correct temperature has been reached the solder will flow freely and be drawn into the joint. Briefly reapply the blowtorch and wipe off any excess solder.



4. Allow the joint to cool without disturbance. Clean the joint generally, wiping off any external flux residues. This will prevent unsightly stains or (in extreme cases) corrosion of pipework. Flush out the pipework.

FLUXES

Yorkshire Flux, Traditional Craftsman's Flux and Degussa H high duty flux are subject to the requirements of the Control of Substances Hazardous to Health (COSHH) regulations. COSHH sheets are available to download from our website, www.pegleryorkshire.co.uk

HEATING DZR BRASS

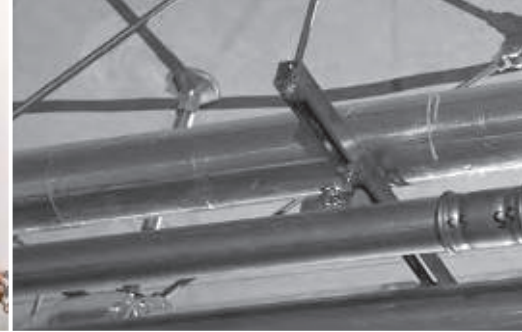
The corrosion resistance of DZR brass can be adversely affected by heating to temperatures in excess of 400°C. Care should be taken when using hard solder to avoid over heating DZR components.

THREADED CONNECTORS

Joining compounds should comply with BS 6956 Part 5 and be WRAS listed. PTFE tape for water and general applications should comply with BS 7786 and satisfy the requirements of BS 6920 Part 1. For gas applications, PTFE tape should comply with BS EN 751-3 (formerly BS 6974).

Female threaded connectors have internal threads to BS EN ISO 228 and should be used for general connections from male threaded fittings to copper pipework.

Male threaded connectors have taper male BSP threads and may require the use of joining materials. Complete the soldering operation, then apply a WRAS listed joining compound or PTFE tape to the threads. When installing fittings with parallel connector threads, a good quality joining washer should be used.



4.0 TECHNICAL DATA

INSTALLATION INSTRUCTIONS FOR BRAZING ALLOYS

PRELIMINARIES

Select the correct size of tube and fitting for the job. Ensure that both are clean, in good condition and free from damage and imperfections. If the tube is oval or damaged, use a re-rounding tool.

UNION FITTINGS UK DESIGNATION

Union fittings have metal-to-metal cone joints to BS 1010. Avoid damaging the mating faces and, if required, apply a WRAS listed jointing compound or PTFE tape. Tighten the joint with a spanner. Where UK designation is given, these are union connections suitable for the UK style markets.

UNION FITTINGS EUROPEAN DESIGNATION

Where European designated unions are listed, these are for use in European markets. These unions are not interchangeable with each other.

UNMADE ENDS

If one or more ends of an Endex fitting are to remain unmade, a short length of correctly sized, uncleaned tube should be inserted into the unjointed end. Keep this section cool by wrapping a wet rag around it while heating the remaining end.

TAKING APART AND REMAKING ENDEX JOINTS

Remaking of Endex general range joints is generally not recommended. However, in some situations, joints can be remade by fluxing the tinned portion of the tube and reinserting this into the fitting. Then, heat the joint and end feed the solder. If a new tube is to be used, clean and flux the tube before assembly.

If it is necessary to break into existing pipes for repairs or to fit new branches, slip couplings or tees which have no tube stops make the job easier and avoid disturbing the rest of the system.

ADAPTING IMPERIAL TO METRIC WITH ENDEX

Endex general range fittings can be easily connected to older imperial sized tube installations through the use of an Endex imperial to metric adaptor coupling. One end of the adaptor fits onto imperial pipe and the other onto metric pipe. Adaptors are available in a variety of size combinations.

BRAZING ALLOY (HARD SOLDER) INSTALLATION - ENDEX GENERAL RANGE AND ENDBRAZE

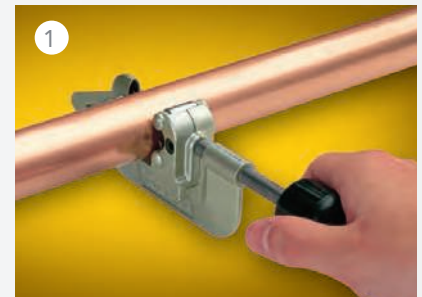
The same preliminaries and preparation guidelines apply as for soft soldering.

BLOWTORCHES AND THEIR USE

For brazing joints, an oxy-propane, oxyacetylene or other torch with a large soft, neutral or slightly reducing flame should be used. This should be kept moving throughout the making of the joint to avoid excessive local heating. It is better to melt the alloy by conduction than by heating it directly with the torch, although a combination of the two techniques can be used to aid the flow of alloy into the joint. The gap between the socket and the tube should be filled with the brazing alloy to leave a small, uniform bead of this alloy around the mouth of the socket.

PREPARATION

1. Cut the tube square using a rotary tube cutter wherever possible. If a hacksaw is used to cut the tube, a fine toothed blade should be used.



2. Remove any burrs from the inside and outside of the tube ends using a fine toothed file or a S120 deburring tool from the XPress accessories range.



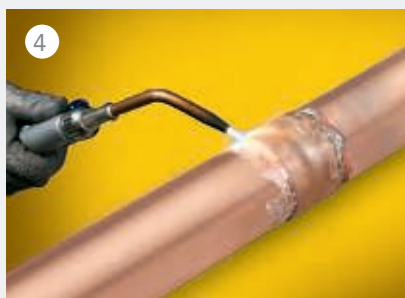
3. Clean the inside of the fitting socket and the outside of the tube with a Yorkshire cleaning pad, fine sandpaper or steel wool.





JOINTING - BRAZING ALLOY

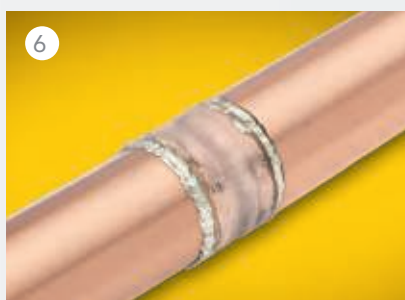
4. Heat the assembled joint evenly on all sides to 700–750°C (red heat in poor daylight).



5. Apply the filler rod to the mouth of the fitting, allowing the brazing alloy to melt and flow into the annular gap.



6. Allow the joint to cool without disturbance. Clean the joint generally and flush out the pipework.



USE OF FLUX WITH BRAZING ALLOYS

Refer to the table below for details of which fittings and brazing alloys require the use of a flux. Where required, Pegler Yorkshire recommends Degussa H ready mixed flux.

SYSTEM TESTING

We recommend all systems are thoroughly tested upon completion. In hydraulic based installations the system may be tested to 1.5 times the working pressure of the system (see tables on pages 51 and 52 for data). If higher test pressures are required advice should be sought from Pegler Yorkshire.

On completion, compressed air pipeline systems must be properly tested. The system designer and installation contractor must ensure safe methods are selected for system testing which will comply with all current Health and Safety regulations.

This may include testing compressed air lines with fluids or compressed air at a limited pressure, or a combination. In any event we do not recommend the maximum working pressure of the product be exceeded during this procedure.

N.B. The maximum temperature and pressure range in any system is dictated by the component with the lowest performance rating.

TYPE OF BRAZING ALLOYS		
Tube to fitting	Copper/phosphorous brazing alloy to BS EN 1044 CP104, CP105 (formerly BS 1845 CP4, CP2)	Silver brazing alloy to BS EN 1044 Ag103 (formerly BS 1845 Ag14)
Copper to copper	No flux	Flux
Copper to gunmetal	Flux	Flux





Follow us on



CONNECT + CONTROL

UK ENQUIRIES

Free Phone: 0800 156 0010

Fax: 01302 560 203

Email: uk.sales@aalberts-ips.com

TECHNICAL HELP

Free Phone: 0800 156 0050

Email: technical@aalberts-ips.com

INTERNATIONAL ENQUIRIES

EXPORT

Tel: +44 (0) 1302 855 656

Email: export@aalberts-ips.com

Tectite

XPress

VSH Shurjoint

Terrier

Ballorex

Pegler

Prestex

Yorkshire

Endex

Kuterlite

HEAD OFFICE

Aalberts Integrated Piping Systems Ltd

St. Catherine's Avenue, Doncaster,
South Yorkshire DN4 8DF, England

Tel: +44 (0) 1302 560 560

Fax: +44 (0) 1302 560 203

Email: info@pegler.co.uk

www.pegler.co.uk

Registered in England Company No. 00401507

All brand names and logo styles are registered trademarks. Maintaining a policy of continual product development, Pegler reserves the right to change specifications, design and materials of products listed in this publication without prior notice.

LIT. REF: 880114