

**Nylon, Polyurethane,
Polyester Reinforced PVC,
Metal Braided Rubber, Copper,
Double Wall Brazed Steel**

- Available in a variety of different types to suit a wide range of applications
- All tubing can be used with specific ranges of tube fittings
- Nylon and polyurethane tube available in several colours for ease of identification

Technical Data

Medium:

Compressed air

(Consult our Technical Service for use with other fluids)

Operating Pressure:

Refer to specific tubing type on the following pages

Operating Temperature:

Refer to specific tubing type on the following pages

Tube Sizes

Nylon: 4, 5, 6, 8, 10, 12, 14, 16, 22, 28 mm O/D

Polyurethane: 4, 5, 6, 8, 10, 12 O/D

Extraflexible Nylon: 8, 10, 12, 15 mm O/D

Polyester reinforced PVC hose: 3, 5, 6.3, 8, 10, 12.5, 19, 25 mm I/D

Polyester reinforced PVC hose assemblies: 4, 5, 6, 8, 10, 12, 16, 22, 28 O/D

Metal Braided: 4, 5, 6, 8, 10, 12, 28 mm

Copper – half hard and annealed: 4, 5, 6, 8, 10, 12, 16, 22, 28 mm O/D

Double Wall Brazed Steel: 4, 6, 8, 10, 12 mm O/D

Materials

Nylon tube: nylon (polyamide) type 11 or 12 fully plasticised

Polyurethane

Polyester reinforced PVC: high quality electrically non-conductive plasticised PVC hose, high tensile polyester fibre braiding, galvanised steel 'O' clips and brass tailpieces on assembled hoses

Metal braided hose: E90 nitrile rubber hose, galvanised steel braiding wire, brass ferrules, copper tailpieces

Copper tube: phosphorous de-oxidised non arsenical copper to BS6017 grade Cu-DHP

Double wall brazed steel: copper coated steel strip with plated



Ordering Information

To order, quote appropriate product number from the tables on the following pages.

When ordering Polyester reinforced PVC hose state the length of hose required.



Metric Tubing and Hose

General Information – Metric Nylon Tubing

To DIN Standards 73378 and 74324

O/D tube (mm)	I/D tube (mm)	Product number									
		Natural	25 m coil	100 m coil	Black	25 m coil	100 m coil	15 m coil	25 m coil	100 m coil	100 m coil
4	2,5	PA0004015*	PA0004025*	PA0004100	PA0704015*	PA0704025*	PA0704100	PA0504015*	PA0504025*	PA0504100	PA0404100
5	3,0	PA0005015*	PA0005025*	PA0005100	PA0705015*	PA0705025*	PA0705100	PA0505015*	PA0505025*	PA0505100	PA0405100
6	4,0	PA0006015*	PA0006025*	PA0006100	PA0706015*	PA0706025*	PA0706100	PA0506015*	PA0506025*	PA0506100	PA0406100
8	6,0	PA0008015*	PA0008025*	PA0008100	PA0708015*	PA0708025*	PA0708100	PA0508015*	PA0508025*	PA0508100	-
10	7,5	PA0010015*	PA0010025*	PA0010100	PA0710015*	PA0710025*	PA0710100	PA0510015*	PA0510025*	PA0510100	-
12	9,0	PA0012015*	PA0012025*	PA0012100	PA0712015*	PA0712025*	PA0712100	PA0512015*	PA0512025*	PA0512100	-
14†	11,0	PA0014015	PA0014025	PA0014100	-	PA0714025	PA0714100	-	PA0514025	PA0514100	-
16	12,0	PA0016015	PA0016025	-	-	-	-	-	-	-	-
18	14	-	PA0018025	-	-	-	-	-	-	-	-
22†	17,0	PA0022015	PA0022025	-	-	-	-	-	-	-	-
28†	22	PA0028015	PA0028025	-	-	-	-	-	-	-	-

O/D tube (mm)	I/D tube (mm)	Product number								Corporate Red	Corporate Grey
		Red	25 m coil	100 m coil	Yellow	15 m coil	25 m coil	100 m coil	15 m coil	25 m coil	100 m coil
4	2,5	PA0104015*	PA0104025*	PA0104100	PA0304015*	PA0304025*	PA0304100	PA0204015*	PA0204025*	PA0204100	PA0804025
5	3,0	PA0105015*	PA0105025*	PA0105100	PA0305015*	PA0305025*	PA0305100	PA0205015*	PA0205025*	PA0205100	-
6	4,0	PA0106015*	PA0106025*	PA0106100	PA0306015*	PA0306025*	PA0306100	PA0206015*	PA0206025*	PA0206100	PA0806025
8	6,0	PA0108015*	PA0108025*	PA0108100	PA0308015*	PA0308025*	PA0308100	PA0208015*	PA0208025*	PA0208100	PA0808025
10	7,5	PA0110015*	PA0110025*	PA0110100	PA0310015*	PA0310025*	PA0310100	PA0210015*	PA0210025*	PA0210100	-
12	9,0	PA0112015*	PA0112025*	PA0112100	PA0312015*	PA0312025*	PA0312100	PA0212015*	PA0212025*	PA0212100	-
14†	11,0	-	PA0114025	PA0114100	-	PA0314025	PA0314100	-	PA0214025	PA0214100	-

Coils are supplied in polythene bags. Those coils marked * can also be supplied in boxes at nominal extra cost, add 'C' to end of product number.

†Do not conform to above standards. 22 mm and 28 mm O/D tubing conforms to BS 5409 Part 1, Table 2.

Other colours can be supplied for orders of sufficient quantity.

This standard range of nylon tubing can be supplied in longer lengths to order, provided that a minimum economic production quantity is ordered.

Maximum working pressures

O/D tube (mm)	I/D tube (mm)	Maximum working pressure (bar) at -40°C to +20°C	Minimum bend radius (mm)
4	2,5	28	25
5	3,0	31	25
6	4,0	25	30
8	6	19	50
10	7,5	24	60
12	9,0	18	75
14	11,0	15	80
16	12,0	18	95
22	17,0	15	125
28	22,0	15	160

Working pressure/temperature conversion factors

Working temperature °C	Factor
-40°C to +20°C	1,00
+30°C	0,83
+40°C	0,75
+50°C	0,64
+60°C	0,57
+80°C	0,47

To calculate working pressures at various temperatures, multiply working pressure at -40°C to +20°C by factor given in table.

Maximum continuous working temperature +80°C.

Extraflexible Nylon Tubing

O/D tube (mm)	I/D tube (mm)	Maximum working Pressure (bar) at 20°C	Bend radius (mm)	Natural 25m coil
8	6	10	30	PS0008025
10	8	8	40	PS0010025
12	10	6	60	PS0012025
15	12,5	6	110	PS0015025

Working pressure/temperature conversion factors

Working temperature °C	Factor
-40°C to +20°C	1,00
+30°C	0,83
+40°C	0,75
+50°C	0,64
+60°C	0,57

To calculate working pressures at various temperatures, multiply working pressure at -40°C to +20°C by factor given in table.

Maximum continuous working temperature +60°C.

Polyurethane Tubing

O/D tube (mm)	I/D tube (mm)	Product number									
		Natural		Black		Blue		Red		Yellow	
25 m coil	100 m coil	25 m coil	100 m coil	25 m coil	100 m coil	25 m coil	100 m coil	25 m coil	100 m coil	100 m coil	Green
4	2,5	PU0004025C	PU0004100C	PU0704025C	PU0704100C	PU0504025C	PU0504100C	PU0104025C	PU0104100C	PU0304025C	PU0304100C
5	3,0	PU0005025C	PU0005100C	PU0705025C	PU0705100C	PU0505025C	PU0505100C	PU0105025C	PU0105100C	PU0305025C	PU0305100C
6	4,0	PU0006025C	PU0006100C	PU0706025C	PU0706100C	PU0506025C	PU0506100C	PU0106025C	PU0106100C	PU0306025C	PU0306100C
8	5,5	PU0008025C	PU0008100D	PU0708025C	PU0708100D	PU0508025C	PU0508100D	PU0108025C	PU0108100D	PU0308025C	PU0308100D
10	7,0	PU0010025C	PU0010100D	PU0710025C	PU0710100D	PU0510025C	PU0510100D	PU0110025C	PU0110100D	PU0310025C	PU0310100D
12	8,0	PU0012025C	PU0012100D	PU0712025C	PU0712100D	PU0512025C	PU0512100D	PU0112025C	PU0112100D	PU0312025C	PU0312100D

All of these coils are supplied in boxes or on drums.

This standard range of polyurethane tubing can be supplied in longer lengths to order, provided that a minimum economic production quantity is ordered.



Maximum working pressures

O/D tube (mm)	I/D tube (mm)	Maximum working pressure (bar) at -40°C to +20°C	Minimum bend radius (mm)
4	2,5	10	6
5	3,0	11	7
6	4,0	9	9
8	5,5	9	16
10	7,0	9	17
12	8,0	9	25

Working pressure/temperature conversion factors

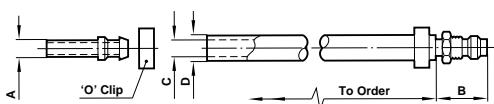
Working temperature °C	Factor
-40°C to +20°C	1,00
+30°C	0,85
+40°C	0,70
+50°C	0,60
+60°C	0,50

To calculate working pressures at various temperatures, multiply working pressure at -40°C to +20°C by factor given in table.

Maximum continuous working temperature +60°C.

Polyester reinforced PVC hose

Flexible hose assemblies



Product Number*	A O/D tailpiece	B	Max (bar) working pressure	Min bend radius	C hose I/D	D hose O/D
42 0200 00 000	4	19,0	10	28	3	8
42 0210 00 000	5	21,5	10	28	3	8
42 0220 00 000	6	23,0	10	31,5	6,3	12
42 0230 00 000	8	26,0	10	31,5	6,3	12
42 0240 00 000	10	28,0	10	48,5	10	16
42 0250 00 000	12	30,0	10	48,5	10	16
42 0260 00 000	16	34,8	9	50,5	12,5	19
42 0270 00 000	22	42,0	7	70	19	27
42 0280 00 000	28	51,0	6	225	25	33

Operating temperature: -20°C to +70°C.

For use at temperatures above +70°C consult our Technical Service.

*State the length of hose required when ordering. Maximum length 30m.

Polyester reinforced PVC hose

30m coils

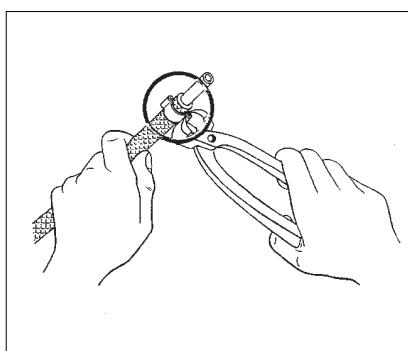
Product Number	Hose bore	Min. bend radius	Hose Ø O/D	Max (bar) working pressure	'O' clip product number
PV2008030	3	25,0	8	10	48 0168 02
PV2010030	5	28,0	10	10	48 0168 03
PV2012030	6,3	31,5	12	10	48 0168 04
PV2014030	8	38,0	13,5	10	48 0168 05
PV2016030	10	48,5	16	10	48 0168 06
PV2019030	12,5	50,5	18,5	9	48 0168 07
PV2027030	20	70,0	27	7	48 0168 11
PV2033030	25	225	33	6	48 0168 15

Pincers

A special pair of pincers, product number **39 0014 00**, is available for crimping 'O' clips to hose.

Instructions

1. Cut off the desired length of hose
2. Insert reusable tailpieces
3. Slip on the 'O' clips
4. Clamp tightly with pincers





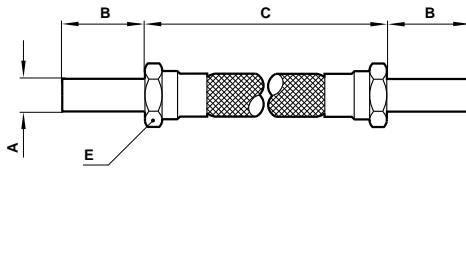
Metal Braided Rubber Hose

Flexible hose assemblies

Metal braided rubber hoses are suitable for use with petrol, diesel fuel, paraffin and other liquids to pressures stated in the tables below. They are also suitable for use with compressed air up to a maximum working pressure of 10 bar.

The maximum working pressures quoted in these tables have been taken under ideal conditions with non-pulsating pressures when used with compression tube fittings, see Section 9.6.

Working temperature range -20°C to +100°C



Product Number	A O/D tube	B	C	E A/F	Min bend radius	Max (bar) working pressure
42 0020 00 000	4	19	*	13	34	69
42 0020 00 250	4	19	250	13	34	69
42 0020 00 300	4	19	300	13	34	69
42 0020 00 350	4	19	350	13	34	69
42 0020 00 400	4	19	400	13	34	69
42 0020 00 500	4	19	500	13	34	69
42 0020 00 600	4	19	600	13	34	69
42 0020 00 750	4	19	750	13	34	69
42 0020 01 000	4	19	1000	13	34	69
42 0030 00 000	5	21	*	13	34	69
42 0030 00 250	5	21	250	13	34	69
42 0030 00 300	5	21	300	13	34	69
42 0030 00 350	5	21	350	13	34	69
42 0030 00 400	5	21	400	13	34	69
42 0030 00 500	5	21	500	13	34	69
42 0030 00 600	5	21	600	13	34	69
42 0030 00 750	5	21	750	13	34	69
42 0030 01 000	5	21	1000	13	34	69
42 0040 00 000	6	23	*	14	35	69
42 0040 00 250	6	23	250	14	35	69
42 0040 00 300	6	23	300	14	35	69
42 0040 00 350	6	23	350	14	35	69
42 0040 00 400	6	23	400	14	35	69
42 0040 00 500	6	23	500	14	35	69
42 0040 00 600	6	23	600	14	35	69
42 0040 00 750	6	23	750	14	35	69
42 0040 01 000	6	23	1000	14	35	69

*State length of hose required if ordering non-standard lengths.
Minimum length 155mm.

When installing a flexible hose the following simple rules should be noted.

1. Flexible hose is weakened when installed in a twisted position.
2. Ample bend radius should be allowed to avoid collapsing the hose.
3. When hose is installed in a flexing application remember that metal end fittings are not part of the flexible portion.
4. Use elbows or adaptors to eliminate excess hose bends.

Product Number	A O/D tube	B	C	E A/F	Min bend radius	Max (bar) working pressure
42 0050 00 000	8	26	*	17	39	69
42 0050 00 250	8	26	250	17	39	69
42 0050 00 300	8	26	300	17	39	69
42 0050 00 350	8	26	350	17	39	69
42 0050 00 400	8	26	400	17	39	69
42 0050 00 500	8	26	500	17	39	69
42 0050 00 600	8	26	600	17	39	69
42 0050 00 750	8	26	750	17	39	69
42 0050 01 000	8	26	1000	17	39	69
42 0060 00 000	10	28	*	19	39	69
42 0060 00 250	10	28	250	19	39	69
42 0060 00 300	10	28	300	19	39	69
42 0060 00 350	10	28	350	19	39	69
42 0060 00 400	10	28	400	19	39	69
42 0060 00 500	10	28	500	19	39	69
42 0060 00 600	10	28	600	19	39	69
42 0060 00 750	10	28	750	19	39	69
42 0060 01 000	10	28	1000	19	39	69
42 0070 00 000	12	30	*	22	51	47
42 0070 00 250	12	30	250	22	51	47
42 0070 00 300	12	30	300	22	51	47
42 0070 00 350	12	30	350	22	51	47
42 0070 00 400	12	30	400	22	51	47
42 0070 00 500	12	30	500	22	51	47
42 0070 00 600	12	30	600	22	51	47
42 0070 00 750	12	30	750	22	51	47
42 0070 01 000	12	30	1000	22	51	47

Double Wall Brazed Steel Tube

Double wall brazed steel tubing is constructed from copper coated steel strip which is rolled twice around laterally, then furnace brazed to produce a tube of double wall structure, with a clear, scale free coppered bore, a plated external surface and a consistently uniform wall thickness.

Product Number 3m straight (10ft)	O/D tube size	Inside diameter	Min bend radius (min)	Max working pressure (bar) at 20°C*
BU6304003	4	2,6	10	380
BU6306003	6	4,6	13	300
BU6308003	8	6,6	19	250
BU6310003	10	8,6	22	195
BU6312003	12	10,6	44	160

Tolerance on outside diameters is -0,07 mm to +0,05 mm.

*Maximum working pressures stated are for tubes of straight length, with non-pulsating pressures when used with Enots compression tube fittings.



Copper Tubing

The following technical information is valid for copper tube when used with compression fittings, see Section 9.5. For further information please consult our Technical Service.

Standard Duty: Annealed

Product Number 10m coils	O/D tube size	I/D tube size	Wall thickness	Min bend radius	Recommended safe working pressure (bar) -200°C to +50°C
CS6004010	4	2,8	0,6	12	128
CS6005010	5	3,4	0,8	15	138
CS6006010	6	4,4	0,8	19	112
CS6008010	8	6,4	0,8	24	81
CS6010010	10	8,4	0,8	30	64
3m straight					
CS6012003	12	9,6	1,2	40	81
CS6016003	16	13,6	1,2	48	59
CS6022003	22	19,0	1,5	67	53
CS6028003	28	25,0	1,5	86	41

Manufactured to BS 2871: Part 2 with dimensions generally to Table 4.
Tolerances on O/D are +0,00mm to -0,08mm.

The recommended safe working pressures are calculated in accordance with BS1306 with a stress value of 41N/mm² and minimum tube wall thickness. For safe working pressures at temperatures other than -200°C to +50°C refer to Pressure De-rating Factor table below.

Standard Duty: Half Hard

Product Number 3m straight	O/D tube size	I/D tube size	Wall thickness	Min bend radius	Recommended safe working pressure (bar) -200°C to +50°C
CS7004003	4	2,8	0,6	12	193
CS7005003	5	3,4	0,8	15	208
CS7006003	6	4,0	1,0	19	218
CS7008003	8	6,0	1,0	24	157
CS7010003	10	7,6	1,2	30	150
CS7012003	12	9,6	1,2	40	122
CS7016003	16	13,6	1,2	48	89
CS7022003	22	19,0	1,5	67	81
CS7028003	28	25,0	1,5	86	62

Manufactured to BS 2871: Part 2 with dimensions generally to Table 4.
Tolerances on O/D are +0,00mm to -0,08mm.

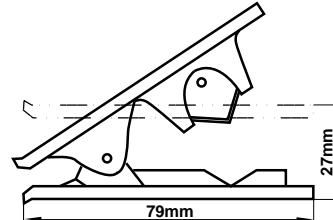
The recommended safe working pressures are calculated in accordance with BS1306 with a stress value of 62N/mm² and minimum tube wall thickness. For safe working pressures at temperatures other than -200°C to +50°C refer to Pressure De-rating Factor table below.

Copper Tubing Pressure De-rating Factor For temperatures other than -200°C to +50°C

Tube	-200°C to +50°C	+50°C to +100°C	+100°C to +150°C	+150°C to +175°C	+175°C to +200°C
Annealed	1,0	0,97	0,82	0,63	0,43
Half-hard	1,0	0,95	0,88	0,54	0,29

To calculate the working pressure at temperatures other than -200°C to +50°C multiply the working pressure given in the appropriate table by the factor given in this table e.g. Safe working pressure of standard duty half-hard copper tube,
8 mm O/D at +120°C = 157 x 0,88 = 138 bar.

Tube Cutter - Plastic Tubing



Product Number	Description
M/3314	Tube cutter
39012061	Replacement blades

Suitable for providing clean square cuts through 3mm to 19mm plastic tubing.
Cutter is provided with Norgren branding in corporate red colour.

Warning

These products are intended for use in industrial compressed air systems only. Do not use these products where pressures and temperatures can exceed those listed under 'Technical Data'.

Before using these products with fluids other than those specified, for non-industrial applications, life-support systems, or other applications not within published specifications, consult Norgren.

Through misuse, age, or malfunction, components used in fluid power systems can fail in various modes. The system designer is warned to consider the failure modes of all component parts used in fluid power systems and to provide adequate safeguards to prevent personal injury or damage to equipment in the event of such failure.

System designers must provide a warning to end users in the system instructional manual if protection against a failure mode cannot be adequately provided.

System designers and end users are cautioned to review specific warnings found in instruction sheets packed and shipped with these products where applicable.