

CONFIRMED
DECEMBER 2007

Specification for

Nylon tubing —

**Part 1: Fully plasticized nylon tubing
types 11 and 12 for use primarily in
pneumatic installations**

UDC 621.643.33:678.675 – 462:621.51/.54

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	Water Companies Association
	Water Research Centre

This British Standard, having been prepared under the direction of the Plastics Standards Committee, was published under the authority of the Executive Board on 30 November 1976

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The following BSI references relate to the work on this standard:
Committee references PLC/9, PLC/9/3
Draft for comment 73/53768 and draft for approval 75/52446

ISBN 0 580 09068 X

Amendments issued since publication

Amd. No.	Date of issue	Comments
2284	May 1977	Indicated by a sideline in the margin

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Foreword

This British Standard is published under the authority of the Plastics Standards Committee. It has been prepared to provide a national standard for plasticized nylon tubing for use primarily in pneumatic installations in conjunction with the compression type fittings used. Part 1 is not intended to cover tubing for use in contact with beverages or foodstuffs, nor is it suitable for domestic central heating systems.

Tubing containing reinforcing agents or fillers is not within the scope of this standard.

In the preparation of this Part attention has been paid to standards prepared by Comité Européen des Transmissions Oléo-Hydrauliques et Pneumatiques (CETOP).

It is intended to prepare further Parts of this standard as follows:

- *Part 2: Plasticized and unplasticized nylon tubing types 11 and 12, for use primarily in the automotive industry;*
- *Part 3: Unplasticized nylon tubing types 6 and 66.*

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 5409 specifies requirements for fully plasticized nylon (polyamide) tubing manufactured from nylon of either type 11 or type 12 and of nominal outside diameter from 4 mm to 28 mm, of two grades differentiated by the tubing wall thickness, and for use either in pneumatic installations or in fluid transfer, but excluding both use with beverages or foodstuffs and use in domestic central heating systems.

2 References

The titles of the publications referred to in this standard are listed on the inside back cover.

3 Material

3.1 Material used for the manufacture of the tubing shall be a nylon of either type 11 or type 12.

3.2 The only additives that shall be added are those that are necessary to facilitate the manufacture of the polymer into sound, durable tubing with such qualities of flexibility, stability towards heat and light, and uniformity of colour as are required. None of these additives, either alone or in combination, shall be used in quantities that are sufficient to impair the chemical and physical properties of the tubing as defined in this standard.

3.3 When a moulded sheet of the material is tested for tensile properties using the test specimen illustrated in Figure 301.11 of BS 2782:1970 and a rate of grip separation of 50 mm/min, the tensile strength shall be not less than 24 MPa and the elongation at break not less than 200 %.

4 Designation of tubing

4.1 Grade. Tubing shall be designated light duty grade if its wall thickness complies with the requirements of Table 1 and normal duty grade if its wall thickness complies with the requirements of Table 2.

4.2 Dimensions. Tubing shall be designated by its nominal outside diameter.

5 Dimensions

5.1 Outside diameter. The outside diameter shall comply with the requirements of either Table 1 or Table 2 as appropriate.

5.2 Wall thickness. The wall thickness, when measured at any point on a 300 mm sample of tubing, shall comply with the requirements of either Table 1 or Table 2 as appropriate.

Table 1 — Tubing dimensions: light duty grade

Outside diameter			Wall thickness		Concentricity
Nominal	Min.	Max.	Min.	Max.	Max.
mm	mm	mm	mm	mm	mm
4	3.95	4.05	0.42	0.58	0.08
5	4.95	5.05	0.55	0.71	0.08
6	5.90	6.05	0.67	0.83	0.08
8	7.90	8.05	0.92	1.08	0.08
10	9.90	10.05	1.17	1.33	0.08
12	11.90	12.05	1.17	1.33	0.08
16	15.90	16.05	1.42	1.58	0.08
18	17.85	18.05	1.42	1.58	0.10
22	21.85	22.05	1.72	1.88	0.10
28	27.80	28.05	2.17	2.33	0.10

Table 2 — Tubing dimensions: normal duty grade

Outside diameter			Wall thickness		Concentricity
Nominal	Min.	Max.	Min.	Max.	Max.
mm	mm	mm	mm	mm	mm
4	3.93	4.05	0.67	0.83	0.08
5	4.93	5.05	0.77	0.93	0.08
6	5.90	6.05	0.92	1.08	0.08
8	7.90	8.05	1.17	1.33	0.08
10	9.90	10.05	1.42	1.58	0.08
12	11.90	12.05	1.67	1.83	0.08
16	15.90	16.05	1.92	2.08	0.08
18	17.85	18.05	1.92	2.08	0.10
22	21.85	22.05	2.42	2.58	0.10
28	27.80	28.05	2.92	3.08	0.10

5.3 Concentricity. The concentricity, defined as the maximum difference between any two wall thicknesses measured at the same cross section, shall comply with the requirements of either Table 1 or Table 2 as appropriate.

6 Working pressures and installation radii

Safe working pressures over a range of temperatures are given in Table 3 and Table 4 together with information on the minimum safe installation radii. These pressures are calculated on the basis of an induced stress of 6.7 MPa at 20 °C. Table 5 gives the factors for calculating the relationship between working pressures at other temperatures and that at 20 °C.

NOTE The safe working pressure of the tubing is calculated from the short-time burst pressure at 20 °C divided by a factor of 3.

This takes into account an estimated tubing life of 100 000 h and also allows for the ageing in service.