

Glass plant, pipeline and fittings —

Part 3: Specification for pipeline and fittings of nominal bore 15 to 150 mm: compatibility and interchangeability

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Cooperating organizations

The Glass Standards Committee, under whose direction this British Standard was prepared, consisted of representatives from the following Government departments and scientific and industrial organizations:

- British Glass Industry Research Association
- British Lampblown Scientific Glassware Manufacturers' Association Ltd.¹⁾
- British Plastics Federation
- Department of the Environment (Housing and Construction)
- Department of Transport
- Flat Glass Manufacturers' Association
- Glass Manufacturers' Federation¹⁾
- Scientific Instrument Manufacturers' Association
- Society of Glass Technology¹⁾
- The Glass and Glazing Federation

The organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard:

- Chemical Industries Association
- Engineering Equipment Users' Association
- Institution of Chemical Engineers

This British Standard, having been prepared under the direction of the Glass Standards Committee¹⁾, was published under the authority of the Executive Board and comes into effect on 30 April 1980

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¹⁾ On disbandment of the Glass Standards Committee in 1979, responsibility for this work was transferred to the Chemical and Petroleum Engineering Standards Committee.

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Contents

	Page
Cooperating organizations	Inside front cover
National foreword	iii
0 Introduction	1
1 Scope and field of application	1
2 References	1
3 Definitions	1
4 Material and working conditions	2
5 Basic dimensions	3
6 Mating requirements	3
7 Essential dimensions for interchangeability	4
8 Marking	14
9 Testing, handling and use	14
Annex A Measurement of length and angles	15
Annex B Measurement of bow	16
Annex C Examples of the use of adaptor flanges for buttress ends of different shapes	17
Figure 1 — Designation of the components in a flange coupling assembly	2
Figure 2 — Length of pipe section with spherical buttress ends with reference to diameter d_o	3
Figure 3 — Length of pipe section with flat buttress ends and annular zone required for mating flat buttress ends with reference to diameters d' and d''	3
Figure 4 — Pipe section with spherical buttress ends (male/female)	4
Figure 5 — Pipe section with flat buttress ends	4
Figure 6 — Spacer, spherical (female)/spherical (male)	5
Figure 7 — Spacer, flat/flat	5
Figure 8 — Adaptor, spherical (male)/flat	6
Figure 9 — Adaptor, spherical (female)/flat	6
Figure 10 — Reducer, spherical (female)/spherical (male)	6
Figure 11 — Reducer, flat/spherical (male)	6
Figure 12 — Reducer, flat/spherical (female)	7
Figure 13 — Reducer, flat/flat	7
Figure 14 — Elbow with spherical buttress ends, male/female	7
Figure 15 — Elbow with flat buttress ends	8
Figure 16 — 45° bend with spherical buttress ends, male/female	8
Figure 17 — 45° bend with flat buttress ends	8
Figure 18 — 90° bend with spherical buttress ends, male/female	8
Figure 19 — 90° bend with flat buttress ends	9
Figure 20 — Schematic drawing of interchangeability	9
Figure 21 — Equal tee with spherical buttress ends, male/female, side branch female	10
Figure 22 — Equal tee with spherical buttress ends, male/female, side branch male	10
Figure 23 — Equal tee with flat buttress ends, side branch flat	10
Figure 24 — Cross with spherical buttress ends, male/female	11
Figure 25 — Cross with flat buttress ends	11
Figure 26 — Angle valve with spherical buttress ends, male/female	12
Figure 27 — Angle valve with spherical buttress ends, female/male	12
Figure 28 — Angle valve with flat buttress ends	12

	Page
Figure 29 — Straight-through valve with spherical buttress ends, male/female	13
Figure 30 — Straight-through valve with spherical buttress ends, female/male	13
Figure 31 — Straight-through valve, flat/flat	14
Figure 32 — Recommended apparatus for measurement of length of pipe sections and fittings	15
Figure 33 — Example for a method of test for accuracy of 90° bend with flat buttress ends	15
Figure 34 — Example for a method of test for accuracy of 45° bend with flat buttress ends	15
Figure 35 — Method of measurement of bow	16
Figure 36 — Glass pipe to glass pipe	17
Figure 37 — Glass pipe to pipe of any kind of material	18
Table 1 — Maximum working pressures for glass pipeline and fittings	2
Table 2 — Limits of wall thickness	3
Table 3 — Dimensions for compatibility of spherical and flat buttress ends	4
Table 4 — Adaptor flanges, mating and dimensions	4
Table 5 — Minimum possible deviation of alignment	4
Table 6 — Lengths and tolerances of pipe sections	5
Table 7 — Permissible bow of pipe sections	5
Table 8 — Maximum outside diameter of pipe	5
Table 9 — Lengths and tolerances of spacers and adaptors	6
Table 10 — Lengths and tolerances of reducers	7
Table 11 — Lengths and tolerances of elbows	8
Table 12 — Lengths and tolerances of 45° bends	8
Table 13 — Lengths and tolerances of 90° bends	9
Table 14 — Lengths and tolerances of equal tees	10
Table 15 — Lengths and tolerances of crosses	12
Table 16 — Lengths and tolerances of angle valves	13
Publications referred to	Inside back cover

National foreword

This British Standard is published in Parts which are identical with the corresponding ISO standards dealing with glass plant, pipeline and fittings as follows.

- *Part 1: ISO 3585 Properties of borosilicate glass 3.3;*
- *Part 2: ISO 3586 General rules for testing, handling and use;*
- *Part 3: ISO 3587 Pipeline and fittings of nominal bore 15 to 150 mm – Compatibility and interchangeability;*
- *Part 4: ISO 4704 Glass plant components.*

BS 2598 was first published in 1955 to provide for the increasing demand for glass piping in the chemical and allied industries. The standard was revised and extended in 1966 to include spherical buttress ends and metric dimensions. The 1966 edition is now withdrawn.

The preparation of an International Standard was proposed by the United Kingdom and the ISO standards listed above were prepared by Technical Committee 128, Glass plant, pipeline and fittings, of the International Organization for Standardization (ISO). The United Kingdom took an active part in the development of these standards based on experience with the previous editions of BS 2598.

It was not found possible to reach agreement internationally on the design of a single buttress end but the ISO standards provide for compatibility and interchangeability between a wide range of components from the current and future productions of manufacturers in different countries.

ISO 3587 was approved by the ISO Member Bodies of the following countries.

Austria	Italy	Turkey
Bulgaria	Romania	United Kingdom
Czechoslovakia	South Africa, Rep. of	U.S.A.
France	Spain	U.S.S.R
Germany	Switzerland	

No ISO Member Body expressed disapproval of the document.

Terminology and conventions. The text of the International Standard has been approved as suitable for publication, without deviation, as a British Standard. Some terminology and certain conventions are not identical with those used in British Standards; attention is especially drawn to the following.

The comma has been used throughout as a decimal marker. In British Standards it is current practice to use a full point on the base line as the decimal marker.

Wherever the words “International Standard” appear, referring to this standard, they should be read as “British Standard”.

Cross-references

International Standard	Corresponding British Standard
ISO 3585:1976	BS 2598 <i>Specification for glass plant, pipeline and fittings</i> Part 1:1980 <i>Properties of borosilicate glass 3.3</i> (Identical)
ISO 3586:1976	BS 2598 <i>Specification for glass plant, pipeline and fittings</i> Part 2:1980 <i>General rules for testing, handling and use</i> (Identical)
ISO 4704:1977	BS 2598 <i>Specification for glass plant, pipeline and fittings</i> Part 4:1980 <i>Glass plant components</i> (Identical)

There is no British Standard equivalent for ISO 2084. A related British Standard for this ISO standard is BS 4504 "*Flanges and bolting for pipes, valves and fittings. Metric series*" Part 1 "Ferrous".

Additional information. With reference to the use of the term "nominal bore" in conjunction with the symbol "DN", it should be noted that this symbol is being adopted for "nominal size" in conjunction with International Standards for metal pipe and fittings.

With reference to Figure 1, the buttress ends will usually be of the same design but this standard provides for the use of adapter flanges (see 3.7) to allow buttress ends of any design to be used together.

NOTE With reference to the footnote to clause 2, ISO 4704 was published during 1977.

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.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 18, 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.

0 Introduction

Standardization of glass plant, pipeline and fittings has as its objective the provision of compatibility and interchangeability of the widest practicable range of current and future production,

This International Standard deals with glass pipeline and fittings from 15 to 150 mm nominal bore (for glass plant components of nominal bore 80 to 1 400 mm, see ISO 4704). The limitations in nominal bore and types of fittings have been made in order to achieve the maximum possible standardization at the earliest possible time so as to obviate proliferation of different commercial and national standards. It avoids the exclusion of any existing buttress end forms and any restriction on the technical development of products.

Requirements of flange couplings have only been included to the extent necessary to ensure compatibility of the glass components.

In deciding the technical content of this International Standard, account has been taken of the existence of the various national and commercial standards which are already established.

The requirements of this International Standard are governed largely by the properties of the “borosilicate glass 3.3” specified in ISO 3585.

The requirements for compatibility and interchangeability specified in this International Standard can also be met by other materials of different physical properties, provided they are satisfactory in other respects.

Drawings in this International Standard are only to be considered as examples.

1 Scope and field of application

This International Standard specifies the essential requirements for compatibility and interchangeability of borosilicate glass pipeline and fittings in sizes from 15 up to 150 mm nominal bore (DN).

2 References

ISO 2084, *Pipeline flanges for general use — Mating dimensions*.

ISO 3585, *Glass plant, pipeline and fittings — Properties of borosilicate glass 3.3*.

ISO 3586, *Glass plant, pipeline and fittings — General rules for testing, handling and use*.

ISO 4704, *Glass plant, pipeline and fittings — Glass plant components²⁾*.

²⁾ In preparation.

3 Definitions

For the purposes of this International Standard the following definitions apply.

3.1

pipeline

a complete assembly consisting of pipe sections and fittings which are connected by flange couplings

3.2

pipe section

a straight length of pipe fitted with buttress ends

3.3

buttress end

the specially shaped end of a pipe section or fitting, the joint face being either flat or spherical, convex (male) or concave (female)

3.4

fittings

items such as spacers, reducers, bends, tees, crosses, and valves used in conjunction with pipe sections within the pipeline

3.5

flange coupling

the complete assembly of backing flanges, inserts, gaskets, and the appropriate nuts and bolts for connecting two buttress ends. (See Figure 1.)

3.6

backing flange

the ring which transfers the clamping pressure of the bolts through an insert to the joint face of the buttress end. (See Figure 1.)

3.7

adaptor flange

a special backing flange for coupling buttress ends of different design. (See 6.2.)

3.8

insert

the sleeve or ring between the buttress end and the backing flange. (See Figure 1.)

3.9

gasket

the jointing material placed between the faces of the buttress ends. (See Figure 1.)

4 Material and working conditions

4.1 Basic properties

The glass parts referred to in this specification shall be manufactured from borosilicate glass 3.3, which is both heat and chemically resistant. Its properties are specified in ISO 3585.

4.2 Working temperatures

The maximum working temperatures of installed systems should not exceed those recommended by the manufacturer. There may be further limits, including temperature differences and rates of heating and cooling, where reference should be made to the manufacturer’s recommendations and to the general rules given in ISO 3586.

Although borosilicate glass 3.3 retains its mechanical strength and will not deform at temperatures approaching the strain point (approximately 510 °C), the practical upper limit of operating temperatures for a pipeline is considerably lower and is controlled by the temperature differentials which can be permitted in the component. Pipeline should not be subjected to rapid temperature changes or to fluid temperature differences exceeding 120 °C (see ISO 3586) except where otherwise recommended by the manufacturer.

4.3 Maximum working pressures

Maximum working pressures for glass pipeline and fittings are given in Table 1.

Table 1 — Maximum working pressures for glass pipeline and fittings

Nominal bore DN	Pipeline without valves	Pipeline including valves
mm	bar ^a	bar ^a
15	4	3
25	4	3
40	4	3
50	4	2
80	3	1,5
100	2	1
150	2	1

^a 1 bar = 10⁵ Pa

