...making excellence a habit.™

Please be aware that this PDF has been created from the original hardcopy document, which might not be in good condition and so the PDF might reflect this.

BSI Group
389 Chiswick High Road
London, W4 4AL
United Kingdom

T: +44 20 845 086 9001
F: +44 20 8996 7400
cservices@bsigroup.com
bsigroup.com

British Standards Limited
Registered in England no: 07864997
Registered address: 389 Chiswick High Road
London, W4 4AL, United Kingdom

Q

BSI

BS 806 : 1975

UDC 621.181 : 621.186.3 : 621.643.22/.23

Specification for

Ferrous pipes and piping installations for and in connection with land boilers

L'installation des tuyauteries et tuyaux ferreux pour et réliés à les chaudières terrestres

Eisenröhre und Rohrleitungssysteme für und in Verbindung mit Landboilern

Amendments issued since publication

Amd. No.	Date of issue	Text affected
1/2071	28·2·77	AS SHOWN BY 1
2/3201	31. 1·80.	As Shown By 2
3/3545	29.5.81	AS SHOWN BY 3

British Standards Institution · 2 Park Street · London W1A 2BS
Telephone 01-629 9000
Telex 266933

ti A4

E102a 9081

BS 806 : 1975

Contents

Foreword

This British Standard, first published in 1938 and subsequently revised in 1942, 1954 and 1967, forms one of a series for boiler installations.

For information on the materials and the standard sizes of steel pipes applicable to this standard, reference should be made to the following specifications.

BS 1387 Steel tubes and tubulars suitable for screwing to BS 21 pipe threads

BS 3600 Dimensions and masses per unit length of welded and seamless steel pipes and tubes for pressure purposes

BS 3601 Steel pipes and tubes for pressure purposes: carbon steel with specified room temperature properties

BS 3602 Specification for steel pipes and tubes for pressure purposes; carbon and carbon manganese steel with specified elevated temperature properties

Part 1 Seamless, electric resistance welded and induction welded tubes

Part 2 Submerged arc welded tubes'

BS 3604 Specification for steel pipes and tubes for pressure purposes; ferritic alloy steel with specified elevated temperature properties

* $N/mm^2 = 1\ MN/m^2 = 1\ MPa = 10\ bar$.

Integral piping, i.e. 'that piping within the whole of the circulatory system of the boiler between the water inlet valve and the steam stop valve and in the case of a reheater, between the reheater inlet header and the reheater outlet header', is excluded from this standard and is dealt with in BS 1113 'Water-tube steam generating plant (including super-heaters, reheaters and steel tube economizers)'. Also excluded is certain pipework, e.g. water gauge pipes, connected to the boiler pressure parts or to the pipes forming the main circulatory system but not connected to external equipment or to atmosphere.

Information regarding the criteria used for the determination of design stress values is given in clause 7.

NOTE. To facilitate calculations both pressure and stress are expressed in N/mm^2*.

In this standard pressures are expressed as 'gauge' unless otherwise stated.

If any ambiguity be found or doubt arise as to the meaning or effect of any part of this standard or as to whether anything ought to be done or omitted to be done in order that this standard should be complied with in full, the question may be referred to the Technical Committee responsible for this standard for an interpretation of the requirements of this standard upon the matter at issue. This provision is limited to questions of interpretation and does not confer upon the committee any power, duty or authority to adjudicate upon the contractual rights or duties of any person under a contract except in so far as they may necessarily be affected by the interpretation arrived at by the committee.

Findings or rulings of the committee upon all enquiries, including matters of interpretation, which are of sufficient importance that both enquiries and replies be made public as soon as possible will be published in an enquiry-reply form as Enquiry Cases. Their availability will be notified in *BSI News* .

British Standard Specification for

Ferrous pipes and piping installations for and in connection with land boilers

Section one. General

1. Scope

This British Standard applies to the design and construction of the ferrous pipework connecting steam generating plant to engine, turbine, or industrial plant and all auxiliary pipework in connection therewith, together with the pipes and pipe fittings forming parts of such installations for

(a) pipes of any bore where the pressure exceeds 0.35 N/mm²;

(b) pipes over 250 mm bore for steam at pressures up to and including 0.35 N/mm².

NOTE. The term 'pipe fitting' in this standard includes tees, elbows and specials, but excludes everything covered by BS 759.

The standard applies to the use of carbon steel for design temperatures up to 480 °C and to the use of alloy steel for design temperatures up to 600 °C.

It does not apply to the component parts of the boiler unit or to integral piping, which are dealt with in BS 1113 and BS 2790.

Steam receivers and separators are also excluded from this standard.

2. References

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

3. Prime symbols

The prime symbols used in the formulae in this standard are defined as follows:

D is the outside diameter* of the pipe (mm);

d is the inside diameter* of the pipe (mm). This should not be confused with nominal size, which is an accepted designation associated with outside diameters of standard rolling sizes;

t_r is the minimum thickness of pipe calculated by the appropriate formula (mm);

t_b is the minimum thickness of pipe before bending, i.e. t_r + bending allowance (mm);

t_m is the minimum thickness of branch or main at a branch position (mm);

t is the mean thickness based on limiting thickness tolerances of ordered pipe (mm);

T is the design temperature (°C);

p is the design pressure (N/mm²);

f is the maximum permissible design stress (N/mm²);

e is the weld efficiency factor (see clause 8);

p_t is the hydraulic test pressure (N/mm²).

4. Information to be supplied by the purchaser

The purchaser shall state the following in all enquiries and orders:

(a) the design pressure and temperature determined in accordance with clause 5;

NOTE. It is the responsibility of the purchaser to ensure that the requirements of clause 5 are fulfilled.

(b) the name of the Inspecting Authority, if any;

(c) whether or not the purchaser or his representative desires to witness the tests;

(d) whether or not the purchaser desires to receive test certificates;

(e) Design life of piping installations at design temperature, where this is time dependent;

(f) the pipe internal surface condition required before erection, if not in accordance with the requirements of clause 25.

(g) Whether the purchaser intends to institute fitness for continued service reviews at two-thirds of the lifetime specified in (e); see footnote to appendix A;

(h) the category of test to which the tubes are to be subjected where appropriate, e.g. BS 3602 : Part 1, test category 1.

5. Design pressures and temperatures

For the purposes of this British Standard the pressures and temperatures for which pipes and pipe fittings are designed shall be as follows.

5.1 Design pressure for steam piping

5.1.1 The design pressure for piping beyond the steam stop valve shall be the design pressure of the boiler, i.e. not less than the highest pressure at which any safety valve is to be set to lift, except that,

(a) where the design temperature of the piping exceeds 430 °C in the case of carbon steels and 525 °C in the case of alloy steels, and

(b) where the total capacity of the safety valves on the superheater is not less than 20 % of the total evaporative capacity of the boiler,

the design pressure of the steam piping shall be the highest pressure at which any superheater safety valve is to be set to lift, provided that in no case shall the design pressure of the piping be less than 90 % of the design pressure of the boiler.

5.1.2 Where there is no superheater, the design pressure of the piping shall be the design pressure of the boiler.

ti A7

*These diameters are subject to manufacturing tolerances, but these tolerances are not to be used in the evaluation of formulae.