

Specification for

**Steel wedge gate valves
(flanged and
butt-welding ends) for
the petroleum,
petrochemical and
allied industries**

UDC 621.646.5:669.14:[622.313 + 662.753 + 665.6]

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Co-operating organizations

The Petroleum Equipment Industry Standards Committee, under whose supervision this British Standard was prepared, consists of representatives from the following Government departments and scientific and industrial organizations:

- British Gas Corporation
- British Mechanical Engineering Confederation
- British Rubber Manufacturers' Association Ltd.
- British Steel Industry*
- Council of British Manufacturers of Petroleum Equipment*
- Department of Energy (Oil)
- Oil Companies Materials Association*
- Process Plant Association

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:

- Association of Hydraulic Equipment Manufacturers
- British Chemical Engineering Contractors' Association
- British Industrial Measuring and Control Apparatus Manufacturers' Association
- British Plastics Federation
- British Ship Research Association
- British Valve Manufacturers' Association
- Engineering Equipment Users' Association
- Steel Castings Association

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Foreword

This British Standard is one of a series for valves prepared under the authority of the Petroleum Industry Standards Committee. It was first published in 1949 when the materials referred to were described by reference to ASTM specifications. It is a metricated revision except that class designations and body to bonnet bolting sizes have not been converted into metric units. Imperial units are also given for some dimensions in order to comply with established international petroleum practice. The previous sections dealing with face-to-face and end-to-end dimensions, inspection and tests have now been omitted as these subjects have their own separate standards:

BS 2080 "*Face-to-face, centre-to-face, end-to-end and centre-to-end dimensions of flanged and butt-welding end steel valves for the petroleum, petrochemical and allied industries*".

BS 6755 "*Testing of valves*" Part 1 "*Specification for production pressure testing requirements*".

NOTE Requirements for final inspection and supplementary inspection at all stages of manufacture, previously specified in BS 5416-1:1974 (now withdrawn) should be stated by the purchaser in his enquiry or order.

The end flanges for valves of 600 mm (24 in) size and below are required to be in accordance with BS 1560 "*Steel pipe flanges and flanged fittings (nominal sizes $\frac{1}{2}$ in to 24 in) for the petroleum industry*" — Part 2 "*Metric dimensions*" (corresponding to ANSI B 16.5) and butt-welding ends are generally in accordance with ANSI B 16.25. For valves larger than 600 mm (24 in) size, end flanges are required to be in accordance with BS 3293 "*Carbon steel pipe flanges (over 24 in nominal size) for the petroleum industry*" or API Standard 605.

NOTE User requirements for valves generally in accordance with this standard but suitable for use in piping systems with flanges in accordance with BS 4504 "*Flanges and bolting for pipes, valves and fittings. Metric series*" are dealt with in Appendix B.

It is intended that valves complying with the requirements of this standard should be interchangeable as units with those of similar type specified in API 600. The present revision of BS 1414 is generally in accordance with the seventh edition of API 600 (November 1973) except that it has been extended to cover carbon steel valves in sizes up to 1 050 mm (42 in) in Class 150 and Class 300.

Acknowledgment is made to the American Petroleum Institute and to the American National Standards Institute for data used.

The titles of the American standards referred to in this standard and the foreword are as follows:

ANSI	
B 16.5	<i>Steel pipe flanges and flanged fittings</i> (including supplements)
B 16.25	<i>Buttwelding ends</i>
API	
Std 5b	<i>Specification for threading, gaging, and thread inspection of casing, tubing and line pipe threads</i>
Std 600	<i>Steel gate valves</i> (flanged or butt-welding ends)
Std 605	<i>Large-diameter carbon steel flanges</i>
ASTM	
A 182	<i>Forged or rolled alloy-steel pipe flanges, forged fittings and valves and parts for high temperature service</i>
A 276	<i>Stainless and heat resisting steel bars and shapes</i>
A 351	<i>Ferritic and austenitic steel castings for high temperature service</i>
B 124	<i>Copper and copper alloy forging rod, bar and shapes</i>
B 138	<i>Manganese bronze rod, bar and shapes</i>
B 148	<i>Aluminium bronze sand castings</i>
B 150	<i>Aluminium bronze rod, bar and shapes</i>
B 584	<i>Copper alloy sand castings for general applications</i>

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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 20, 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.

Section 1. General

1 Scope

This British Standard specifies requirements for cast or forged carbon and alloy steel outside screw and yoke, solid wedge (plain or flexible) rising stem gate valves, with or without soft seals, with flanged or butt-welding ends, in nominal sizes within the range of 25 mm to 600 mm (1 in to 24 in) and Class 150 to Class 2 500. It also covers carbon steel valves in nominal sizes 650 mm to 1 050 mm (26 in to 42 in) in Class 150 and Class 300 only. This standard can also be used as a general guide where valves of material composition outside the scope of section three of this standard are required as, for example, for use in highly corrosive services or environments or for low temperatures (see clause 36).

2 References

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

3 Nomenclature

For the purposes of this British Standard the nomenclature for valve parts shall be as shown in Figure 1 which is also illustrative of some acceptable designs.

4 Pressure classification

This standard applies to valves of the following pressure class designations:

Class 150, Class 300, Class 400, Class 600,
Class 900, Class 1 500 and Class 2 500.

The numerals in these class designations represent the primary service pressure ratings of the valves in pounds-force per square inch.

5 Pressure/temperature ratings

The pressure/temperature ratings applicable to valves specified in this standard shall be in accordance with Tables PE-1 to PE-12 of Appendix A of BS 1560-2:1970 for the particular shell material specified. There is, however, a temperature restriction on soft seals and on certain trim materials (see 18.3 and 29.5).

Where valves in accordance with this standard are to be used at service temperatures below $-30\text{ }^{\circ}\text{C}$, reference should be made to BS 3351. Service temperature refers to the temperature of the fluid in the line at the valve.

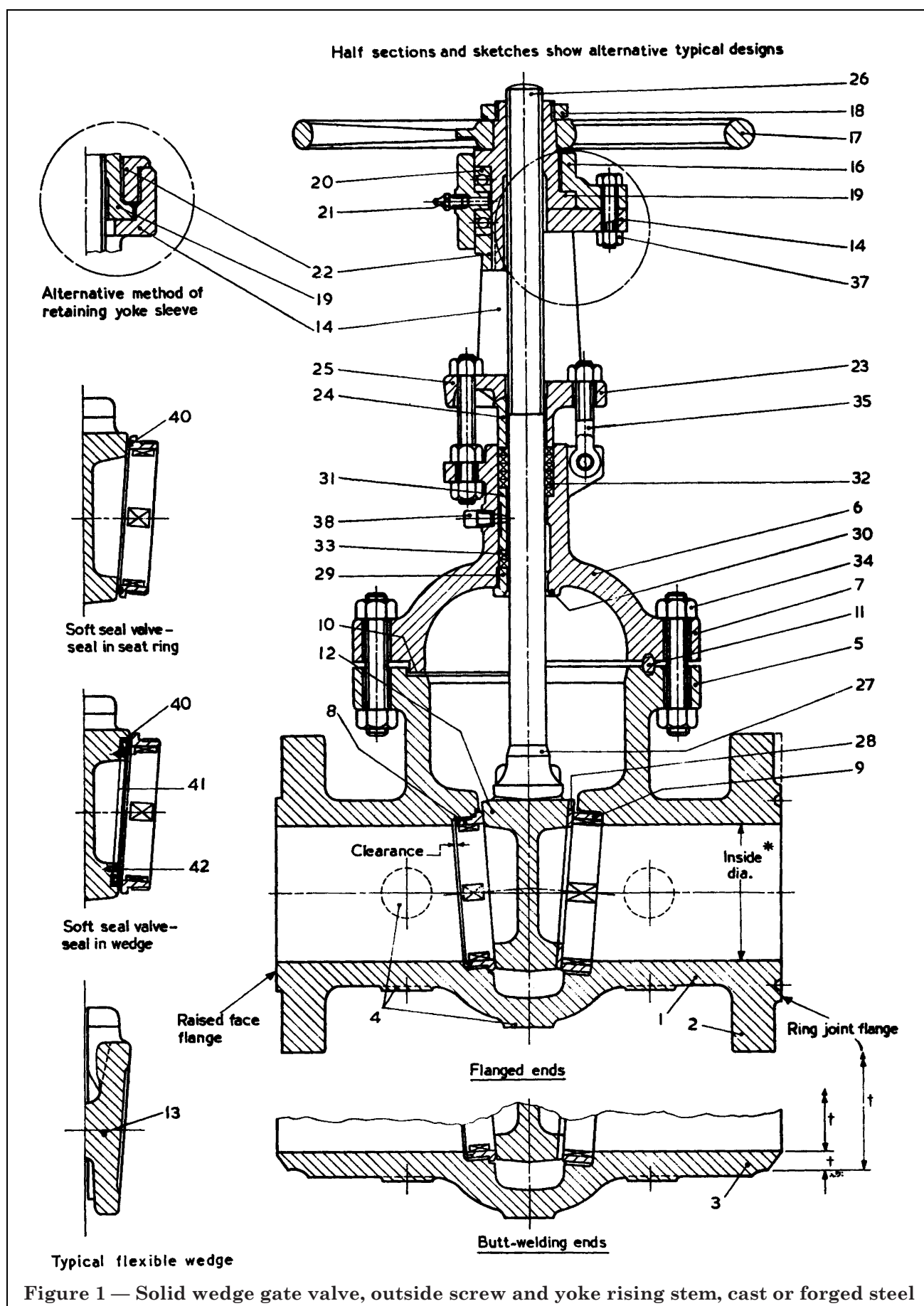
6 Nominal sizes

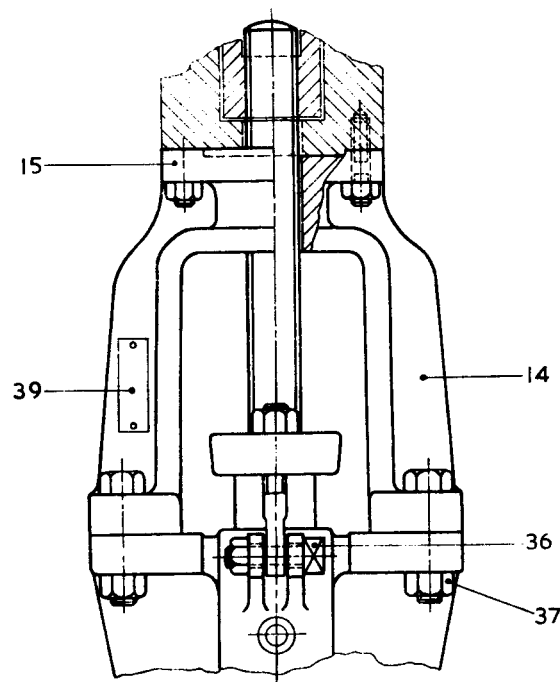
This standard covers valves of the following nominal sizes:

mm	(in)	mm	(in)	mm	(in)
25	(1)	150	(6)	500	(20)
32 ^a	(1 $\frac{1}{4}$) ^a	200	(8)	600	(24)
40	(1 $\frac{1}{2}$)	250	(10)	650	(26)
50	(2)	300	(12)	700	(28)
65 ^a	(2 $\frac{1}{2}$) ^a	350	(14)	750	(30)
80	(3)	400	(16)	900	(36)
100	(4)	450	(18)	1 050	(42)

^a These sizes have been retained only for the purpose of replacing existing valves. Their use for new construction in piping systems using BS 1560-2 end flanges should be avoided.

For each valve class the applicable sizes are shown in Appendix A.





View showing yoke with actuator mounting flange

Reference	Name of part	Material reference clause
1	Body	19
2	End flange	—
3	Butt-welding end	—
4	Body bosses	—
5	Body/bonnet flange	—
6	Bonnet	19
7	Bonnet flange	—
8	Shoulder seated ring	20 and 29
9	Bottom seated ring	20 and 29
10	Bonnet gasket	21
11	Ring joint	21
12	Plain wedge	22 and 29
13	Flexible wedge	22 and 29
14	Yoke	23
15	Actuator mounting flange	—
16	Yoke cap	—
17	Handwheel	24
18	Handwheel nut	25
19	Yoke sleeve	26
20	Yoke sleeve rolling bearing	—
21	Bearing lubricator fitting	—

Reference	Name of part	Material reference clause
22	Yoke sleeve retaining nut	27
23	One piece gland	28
24	Gland follower	28
25	Gland flange	28
26	Stem	29
27	Stem seat	—
28	Wedge facing ring	29
29	Back-seat bushing	29
30	Back seat	29
31	Lantern ring	30
32	Stem packing	31
33	Wiper rings	31
34	Bonnet stud-bolts and nuts	32
35	Gland bolt and nut	32
36	Gland lug bolt and nut	32
37	Yoke bolting	32
38	Stuffing box plug	33
39	Nameplate	34
40	Soft seal ring	35
41	Soft seal retaining ring	35
42	Soft seal retaining ring screws	35

NOTE These sketches are composite for the purpose of showing some typical variations in individual details and part names. A product utilising any combination of these details (except when such combination may be specifically prohibited in the text) or similar construction will be acceptable provided it complies with this standard in all other respects.

* See Appendix A.

† See Figure 2.

Figure 1 — Solid wedge gate valve, outside screw and yoke rising stem, cast or forged steel