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# High Pressure Butterfly Valves with Offset Design

Standard Practice
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U.S. customary units in this SP are the standard; the metric units are for reference only

Substantive changes in this 1997 edition are "flagged by parallel bars as shown on the margins of this paragraph. The specific detail of the change may be determined by comparing the material flagged with that in the previous edition.

Unless otherwise specifically noted in this MSS SP, any standard referred to herein is identified by the date of issue that was applicable to the referenced standard(s) at the date of issue of this MSS SP. (See Annex A.)



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## CONTENTS

# HIGH PRESSURE BUTTERFLY VALVES WITH OFFSET DESIGN

## 1. SCOPE

1.1 This standard practice covers design requirements, test performance, marking requirements, and nomenclature for butterfly valves designed for high pressure performance, having a seat plane offset from the plane of the stem centerline.

1.2 This standard practice covers flangeless (wafer type) and single flanged (lug type) body designs, compatible with ASME/ANSI B16.5 flanges for sizes NPS 3 (DN 80) through NPS 24 (DN 600) and ASME/ANSI B16.47 Series A flanges for sizes NPS 30 (DN 750) through NPS 48 (DN 1200). Reference Tables 1 and 2.

1.3 This standard practice covers valves having body pressure temperature ratings in accordance with ASME/ANSI B16.34.

1.4 Definitions may be found in MSS SP-96.

## 2. DESIGN REQUIREMENTS

2.1 Valve Flange Gasket Surfaces. The flange gasket surfaces of the valve body (against the mating flanges) shall be flush with or raised from other body surfaces within the outside diameters of the mating flanges.

2.2 Flange Bolting

2.2.1 Threaded holes used for flange bolting shall provide for full thread engagement to a depth of not less than 1.0 times the nominal bolt diameter.

2.2.2 Unless otherwise specified by the customer, threaded holes for flange bolting shall be tapped in accordance with ASME B1.1 Coarse Thread Series Class 2B for bolts 1 inch and smaller and shall be tapped to the 8-Thread Series Class 2B for bolts 1 1/8" and larger.

2.3. Minimum Disc-Pipe Clearance

2.3.1 The valve disc will upon rotation project beyond the body flange gasket surfaces and therefore requires care on the part of the user to insure that, when installed, there is no interference between the valve disc and adjacent components such as piping, strainers, check valves and other valving. Also mating pipe flanges should be carefully aligned prior to tightening of the companion flange bolts.

2.3.2 The valves shall be designed to be compatible with Schedule 40 pipe for all sizes of Class 150 (PN 20); with Schedule 80 pipe for all sizes of Class 300 (PN 50) and with Schedule 80 pipe for the NPS 3 (DN 80) through NPS 6 (DN 150) sizes and Schedule 100 for sizes NPS 8 (DN 200) through NPS 24 (DN 600) of Class 600 (PN 100).

2.3.3. All valves shall be designed for disc-pipe clearance according to the requirements of Annex A.

2.3.4 When the user elects to use a heavier schedule pipe than listed in 2.3.2, it shall be his responsibility to insure disc/pipe clearance.

2.4. Minimum Wall Sections. All valves shall have a minimum wall thickness as required by ASME/ANSI B16.34 for the rating marked on the identification plate.

2.5 Special Requirements for Single Flange (Lug Type) Valves. Single flange (lug type) valves may be designed for closure in dead-end piping when installed against a single flange. Such condition may also occur after removing the companion flange and piping from one side of the valve. Single flange (lug type) valves which have every flange bolt hole threaded shall be designed such that all parts which are necessary to support pressure loads acting across the seating element safely support the maximum differential pressure rating of the valve. Examples of such parts are seat seal retaining plates and their bolting or retaining means. In the event that the valve design cannot accommodate these