ASME B16.5 — Class 300 Flange Dimensions (NPS 1/2 to NPS 24)

cBallast Technical Sourcing · Class 300 raised-face flange · issued 2026-06-16 · cballast.com/documents/asme-b16-5-class-300-flange-dimensions

ASME B16.5 Class 300 flange dimensions: flange outside diameter O, bolt-circle diameter, number of bolts, bolt-hole size and bolt size for raised-face weld-neck flanges from NPS 1/2 through NPS 24. The higher-pressure companion to the Class 150 reference, completing the inch / NPS flange pair alongside the EN 1092-1 PN references. Includes NPS 2 (6.50 in OD, 8 x 5/8 in), NPS 4 (7.88 in bolt circle, 8 x 3/4 in) and NPS 6 (12 x 3/4 in). Values cross-checked across two independent reference tables.

ASME B16.5 Class 300 flange dimensions (NPS 1/2 to NPS 24)

Class 300 (also written 300 lb or 300#) is the second ASME B16.5 pressure class above Class 150, used where the service pressure or temperature is higher than a Class 150 joint will carry. For a given NPS the class fixes the bolt pattern, so a Class 300 NPS 4 flange from any maker shares the same 10.00 in outside diameter, 7.88 in bolt circle and eight 3/4 in bolts. Class 300 flanges are larger across, sit on a wider bolt circle and often carry more bolts than the Class 150 flange of the same NPS, so the two do not interchange. The values below are the ASME B16.5 nominal dimensions for the raised-face weld-neck flange across the common NPS 1/2 to NPS 24 range, cross-checked across two independent reference tables. Convert to millimetres with 1 in = 25.4 mm.

NPS | Flange OD O (in) | Bolt circle (in) | No. of bolts | Bolt hole (in) | Bolt size (in) |

1/2 | 3.75 | 2.62 | 4 | 5/8 | 1/2 |

3/4 | 4.62 | 3.25 | 4 | 3/4 | 5/8 |

1 | 4.88 | 3.50 | 4 | 3/4 | 5/8 |

1-1/4 | 5.25 | 3.88 | 4 | 3/4 | 5/8 |

1-1/2 | 6.12 | 4.50 | 4 | 7/8 | 3/4 |

2 | 6.50 | 5.00 | 8 | 3/4 | 5/8 |

2-1/2 | 7.50 | 5.88 | 8 | 7/8 | 3/4 |

3 | 8.25 | 6.62 | 8 | 7/8 | 3/4 |

4 | 10.00 | 7.88 | 8 | 7/8 | 3/4 |

5 | 11.00 | 9.25 | 8 | 7/8 | 3/4 |

6 | 12.50 | 10.62 | 12 | 7/8 | 3/4 |

8 | 15.00 | 13.00 | 12 | 1 | 7/8 |

10 | 17.50 | 15.25 | 16 | 1-1/8 | 1 |

12 | 20.50 | 17.75 | 16 | 1-1/4 | 1-1/8 |

14 | 23.00 | 20.25 | 20 | 1-1/4 | 1-1/8 |

16 | 25.50 | 22.50 | 20 | 1-3/8 | 1-1/4 |

18 | 28.00 | 24.75 | 24 | 1-3/8 | 1-1/4 |

20 | 30.50 | 27.00 | 24 | 1-3/8 | 1-1/4 |

24 | 36.00 | 32.00 | 24 | 1-5/8 | 1-1/2 |

Bolt holes are drilled on the bolt circle, straddling the centreline and equally spaced. The bolt hole is the bolt size plus 1/8 in clearance throughout (a 1/2 in bolt in a 5/8 in hole, a 7/8 in bolt in a 1 in hole, and so on). Class 300 keeps four bolts to NPS 1-1/2, steps to eight at NPS 2, to twelve at NPS 6, and to sixteen and then twenty-four at the larger sizes.

Reading the dimensions

O — the flange outside diameter; the overall diameter of the flange disc.

Bolt circle — the bolt-circle diameter (BCD), the circle through the bolt-hole centres. This is the figure to lay out or check drilling against and the single most important number for matching a mating flange.

Number of bolts — always a multiple of four and equally spaced, so the flange turns in quarter steps; both mating flanges share the same count.

Bolt hole — the drilled hole diameter, one eighth inch larger than the bolt so two flanges line up.

Bolt size — the diameter of the through-bolt or stud. Use the full set; do not part-populate a flange.

Selecting and matching

Two flanges bolt together only when the pressure class, NPS, bolt circle and bolt pattern all agree, so confirm all four before ordering. A Class 300 flange will not mate to a Class 150 flange of the same NPS even though the bore is the same — the outside diameter, bolt circle and hole count differ, so the joint cannot be made up. A Class 300 ASME flange and a PN-rated EN 1092-1 flange of a similar size are likewise not interchangeable; the bolt circles and hole counts do not match. ASME B16.5 also defines the facing (the raised face is the common Class 300 facing) and the flange material group, which

set the gasket and bolt grade for the temperature and pressure. The dimensions above are for the raised-face weld-neck flange; blind, slip-on, socket-weld, threaded and lap-joint Class 300 flanges to ASME B16.5 share the same outside diameter, bolt circle, bolt hole, bolt count and bolt size.

Dimensions are nominal ASME B16.5 values and provided for identification and cross-reference. Confirm against the controlling standard and the specific flange maker’s current data sheet before manufacture or procurement.

Frequently asked questions

What are the dimensions of a 2 inch class 300 flange?NPS 2 class 300: 6.50 in outside diameter, 5.00 in bolt circle, eight 3/4 in holes for 5/8 in bolts — twice the bolt count of class 150 at this size.**What are the dimensions of a 4 inch class 300 flange?** NPS 4 class 300: 10.00 in outside diameter, 7.88 in bolt circle, eight 7/8 in holes for 3/4 in bolts.**How do I tell class 150 from class 300 in the field?**Same NPS, different bolting: class 300 flanges are larger in OD and usually carry more or bigger bolts (NPS 2: 8 bolts vs 4). The class is also stamped on the rim.

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