# Weld Neck Flange — ASME B16.47 Series A Class 400

ANSI / ASME B16.47 Series A (MSS SP-44) Class 400 large diameter welding neck raised face flanges · NPS 26" to 60" · Carbon steel ASTM A105 / A694, stainless steel ASTM A182 F304 / F316, low-temperature A350 LF2

## ASME B16.47 SERIES A CLASS 400 WELD NECK FLANGE

ASME B16.47 covers large diameter steel flanges NPS 26 through 60 in two bolting patterns. **Series A** (formerly MSS SP-44) is the heavier pattern — larger OD, thicker flange and fewer, larger bolts than Series B (formerly API 605) — and is the usual choice for pipelines, valves, pumps and vessel nozzles. For Class 400 the two series converge: from NPS 38 upward B16.47 Series A Class 400 dimensions are identical to Series B.

The weld neck type has a long tapered hub butt-welded to the pipe, giving the best stress distribution and fatigue life. TESCO Steel & Engineering manufactures B16.47 Series A Class 400 weld neck flanges in Mumbai, 26" to 60", RF or RTJ, bored to the customer's pipe wall.

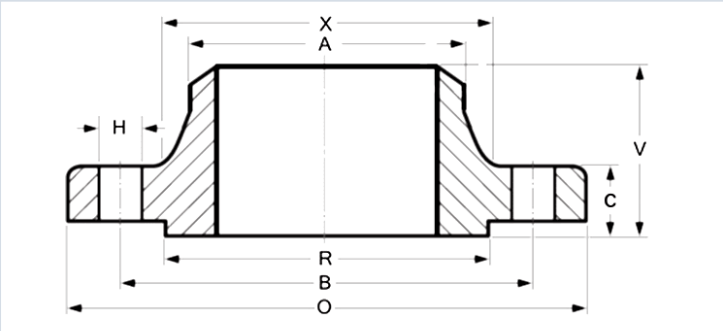
## KEY FEATURES

- **Full ASME B16.47 compliance** — Series A dimensions, tolerances, facing and marking to ASME B16.47-2020.
- **Series A drilling** — 28 to 36 studs, 1¾" – 2¾"; matches MSS SP-44 Class 400.
- **Tapered hub, butt-weld end** — 37.5° bevel, 1.6 mm land; bored to the specified pipe wall.
- **Materials and certification** — A105, A694 F42 – F65, A350 LF2, A182 F304/F316; EN 10204 3.1 / 3.2.

## SPECIFICATION SUMMARY

| | |
|---|---|
| **Product** | Weld neck flange (WN / WNRF), forged or rolled-ring forged |
| **Standard** | ASME B16.47 Series A (formerly MSS SP-44) |
| **Pressure class** | Class 400 (400 lb / #400) |
| **Size range** | NPS 26" – 60" (DN 650 – DN 1500), 18 sizes |
| **Facing** | Raised face (RF) 7 mm (¼") standard; RTJ on request |
| **Face finish** | Serrated, 125 – 250 µin Ra (3.2 – 6.3 µm) |
| **Bore** | To purchaser's pipe OD × wall (not standardised in B16.47) |
| **Weld end** | 37.5° ± 2.5° bevel, 1.6 ± 0.8 mm root face, ASME B16.25 |
| **Materials** | ASTM A105 / A105N; A694 F42 – F65; A350 LF2; A182 F304/L, F316/L; F51 duplex |

## WELD NECK FLANGE DIMENSIONAL DRAWING




| | |
|---|---|
| **O** Flange outside diameter | **C** Flange thickness (excl. 7 mm RF) |
| **X** Hub diameter at base | **A** Hub diameter at bevel (= pipe OD) |
| **R** Raised face Ø, 7 mm high | **V** Length through hub (incl. RF) |
| **B** Bolt circle diameter (PCD) | **H** Bolt hole diameter |
| **Bore** To purchaser's pipe (not dimensioned) | **Bevel** 37.5° ± 2.5°, 1.6 mm land |

## ASME B16.47 SERIES A CLASS 400 WELD NECK FLANGE DIMENSIONS (MM)

ASME B16.47 SERIES A · CLASS 400 WELD NECK FLANGE · RAISED FACE · DIMENSIONS IN MM — 18 sizes

| NPS inch | O | C | X | A | R | V | B | Bolting | | | Weight |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | OD | Thick. | Hub Ø base | Hub Ø bevel | RF Ø | Length thru hub | Bolt circle | No. | H · Hole Ø | Stud | kg approx. |
| **26"** | 970 | 88.9 | 727 | 660.4 | 749 | 200.4 | 876.3 | 28 | 47.6 | 1 3/4" | 295 |
| **28"** | 1035 | 95.3 | 783 | 711.2 | 800 | 212.4 | 939.8 | 28 | 50.8 | 1 7/8" | 356 |
| **30"** | 1090 | 101.6 | 837 | 762.0 | 857 | 225.4 | 997.0 | 28 | 54.0 | 2" | 410 |
| **32"** | 1150 | 108.0 | 889 | 812.8 | 914 | 238.4 | 1054.1 | 28 | 54.0 | 2" | 483 |
| **34"** | 1205 | 111.1 | 945 | 863.6 | 965 | 247.4 | 1104.9 | 28 | 54.0 | 2" | 544 |
| **36"** | 1270 | 114.3 | 1000 | 914.4 | 1022 | 257.4 | 1168.4 | 32 | 54.0 | 2" | 608 |
| **38"†** | 1205 | 123.9 | 1003 | 965.2 | 1035 | 212.4 | 1117.6 | 32 | 47.6 | 1 3/4" | 424 |
| **40"†** | 1270 | 130.2 | 1054 | 1016.0 | 1092 | 222.4 | 1174.8 | 32 | 50.8 | 1 7/8" | 494 |
| **42"†** | 1320 | 133.4 | 1108 | 1066.8 | 1143 | 230.4 | 1225.6 | 32 | 50.8 | 1 7/8" | 540 |
| **44"†** | 1385 | 139.7 | 1159 | 1117.6 | 1200 | 239.4 | 1282.7 | 32 | 54.0 | 2" | 624 |
| **46"†** | 1440 | 146.1 | 1213 | 1168.4 | 1257 | 250.4 | 1339.8 | 36 | 54.0 | 2" | 692 |
| **48"†** | 1510 | 152.4 | 1267 | 1219.2 | 1308 | 263.4 | 1403.4 | 28 | 60.3 | 2 1/4" | 812 |
| **50"†** | 1570 | 157.2 | 1321 | 1270.0 | 1362 | 274.4 | 1460.5 | 32 | 60.3 | 2 1/4" | 885 |
| **52"†** | 1620 | 162.1 | 1372 | 1320.8 | 1413 | 282.4 | 1511.3 | 32 | 60.3 | 2 1/4" | 964 |
| **54"†** | 1700 | 169.9 | 1426 | 1371.6 | 1470 | 295.4 | 1581.2 | 28 | 66.7 | 2 1/2" | 1163 |
| **56"†** | 1755 | 174.6 | 1480 | 1422.4 | 1527 | 304.4 | 1632.0 | 32 | 66.7 | 2 1/2" | 1229 |
| **58"†** | 1805 | 177.8 | 1530 | 1473.2 | 1578 | 312.4 | 1682.8 | 32 | 66.7 | 2 1/2" | 1465 |
| **60"†** | 1885 | 185.7 | 1584 | 1524.0 | 1635 | 325.4 | 1752.6 | 32 | 73.0 | 2 3/4" | 1733 |

- All dimensions in millimetres per ASME B16.47-2020 Series A, Class 400 (metric). Thickness C excludes the 7 mm raised face; length through hub V includes it. Hub Ø at bevel A equals pipe OD (ASME B36.10M).
- † NPS 38 – 60: Series A Class 400 dimensions are identical to Series B (API 605 pattern) — note the step change in OD, bolt circle and bolting between NPS 36 and 38.
- Bore is not standardised in B16.47 — specify pipe OD × wall or schedule. Studs per ASME B16.47; hole Ø is 3.2 mm larger than the stud. Weights approximate, carbon steel, STD (9.53 mm) wall bore.

## SERIES A VS SERIES B

| | |
|---|---|
| **Origin** | Series A = MSS SP-44 · Series B = API 605 |
| **Geometry** | A: larger OD, thicker, fewer / larger bolts · B: compact, more / smaller bolts |
| **Interchange** | Differ at NPS 26 – 36; identical (Class 400) at NPS 38 – 60. Series A mates with MSS SP-44 |
| **Typical use** | A: pipelines, valves, pumps, vessels · B: tanks, low-pressure process |

## APPLICATIONS

High-pressure gas transmission and compressor stations · pig launchers and receivers · large block valves and manifolds · refinery and gas-processing headers · power-plant feedwater and steam · pressure-vessel, separator and heat-exchanger nozzles.

**Also known as:** ANSI B16.47 Series A 400 lb WNRF flange · MSS SP-44 Class 400 weld neck flange · large diameter 400# welding neck flange · 26" – 60" WN flange (≈ PN 64).

## WELD NECK FLANGE MATERIALS

| | |
|---|---|
| **Carbon steel** | ASTM A105 / A105N (most common); A266 Cl.2 / A350 LF2 for large forgings |
| **High-yield pipeline** | ASTM A694 F42, F46, F52, F56, F60, F65 — matched to API 5L X42 – X65 pipe |
| **Low-temperature CS** | ASTM A350 LF2 Cl.1 / Cl.2, LF3 |
| **Stainless steel** | ASTM A182 F304 / F304L, F316 / F316L, F321 |
| **Duplex / super duplex** | ASTM A182 F51 (UNS S31803 / S32205), F53 (S32750) |
| **Clad / weld overlay** | CS flanges with 316L, Inconel 625 or Cu-Ni face overlay — on request |
| **Equivalent EN grades** | P250GH, P355NH / L360NB (1.0582), 1.4404 on request |

## PRESSURE–TEMPERATURE RATINGS

PRESSURE–TEMPERATURE RATING **Class 400** BAR, ASME B16.47 / B16.5 TABLE 2

| Temperature °C | Group 1.1 A105 / A350 LF2 / A694 | Group 2.1 A182 F304 | Group 2.2 A182 F316 |
|---|---|---|---|
| **–29 to 38** | 68.1 | 66.2 | 66.2 |
| **100** | 62.1 | 56.3 | 57.6 |
| **150** | 60.1 | 51.3 | 52.7 |
| **200** | 58.4 | 47.6 | 49.0 |
| **250** | 55.9 | 44.5 | 45.9 |
| **300** | 53.1 | 42.2 | 43.5 |
| **350** | 50.1 | 40.4 | 41.7 |
| **400** | 46.3 | 39.2 | 40.6 |
| **450** | 38.4 | 38.4 | 39.2 |

Working pressure in bar (gauge); ASME B16.47 adopts the ASME B16.5 Table 2 ratings for Class 400 (Table 2-1.1, 2-2.1, 2-2.2). A694 grades rated per Group 1.1 unless otherwise agreed. Confirm for the specific material group, bolting and gasket.

## QUALITY & DOCUMENTATION

- Forged from certified ingots / blooms or rolled-ring forged; normalised, quenched-and-tempered or solution-annealed per material specification.
- Manufactured under an ISO 9001:2015 quality management system; marking per ASME B16.47 and MSS SP-25 including "B16.47 SER. A".
- EN 10204 3.1 material test certificates with chemical analysis, mechanical properties, heat-number traceability; 3.2 with third-party endorsement on request.
- Dimensional inspection to ASME B16.47 tolerances; face finish per MSS SP-6; UT of forgings per ASTM A388 on request.
- MPI / DPT, PMI, Charpy impact testing, NACE MR0175 / ISO 15156, PED and IBR compliance on request.

## FREQUENTLY ASKED QUESTIONS

**Series A or Series B — which do I need?**
Match the mating equipment. Valves, pumps and older MSS SP-44 piping are usually Series A; API 605 / Series B appears on tanks and some process plants. Check the bolt count and bolt circle in the table.

**Why do the dimensions jump at NPS 38?**
B16.47 defines Series A Class 400 for NPS 38 – 60 with the Series B dimensions, so the flanges become smaller and lighter than the 36" size. Always confirm the mating flange's bolt circle and count in this range.

**Why is the bore not in the table?**
B16.47 leaves the bore to the purchaser because large-diameter pipe is ordered by wall thickness, not schedule. State pipe OD × wall on the enquiry.

**Which gasket and bolts are used?**
Spiral wound (ASME B16.20) or non-metallic (B16.21) gaskets with A193 B7 / A194 2H studs and nuts; B8M Cl.2 for stainless flanges.

## ORDERING INFORMATION

Specify: quantity · size (NPS) · ASME B16.47 Series A Class 400 weld neck · facing (RF / RTJ) · pipe OD × wall thickness for bore · material grade · certification (3.1 / 3.2, NACE, PED, IBR) · surface protection (anti-rust oil, paint, galvanising).