Weld Neck Flange — ASME B16.47 Series A Class 600

ANSI / ASME B16.47 Series A (MSS SP-44) Class 600 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 600 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 600 the two series converge: from NPS 38 upward B16.47 Series A Class 600 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 600 weld neck flanges in Mumbai, 26" to 60", RF or RTJ, bored to the customer's pipe wall.

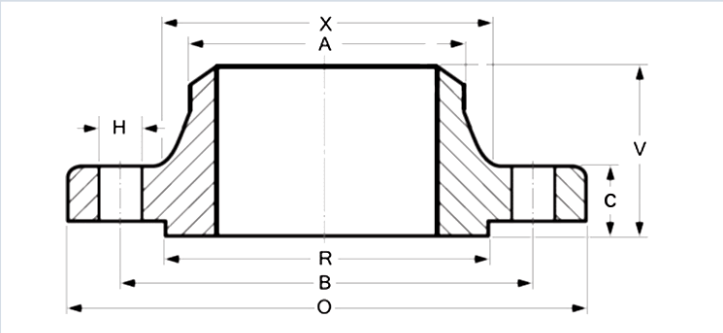
KEY FEATURES

- **Full ASME B16.47 compliance** — Series A dimensions, tolerances, facing and marking to ASME B16.47-2020.
- **Series A drilling** — 28 to 32 studs, 1⅞" – 3½"; matches MSS SP-44 Class 600.
- **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 600 (600 lb / #600)
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 600 WELD NECK FLANGE DIMENSIONS (MM)

ASME B16.47 SERIES A · CLASS 600 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"	1015	108.0	748	660.4	749	228.4	914.4	28	50.8	1 7/8"	426
28"	1075	111.2	803	711.2	800	241.4	965.2	28	54.0	2"	481
30"	1130	114.3	862	762.0	857	254.4	1022.4	28	54.0	2"	549
32"	1195	117.5	918	812.8	914	266.4	1079.5	28	60.3	2 1/4"	624
34"	1245	120.7	973	863.6	965	276.4	1130.3	28	60.3	2 1/4"	699
36"	1315	123.9	1032	914.4	1022	289.4	1193.8	28	66.7	2 1/2"	773
38"†	1270	152.4	1022	965.2	1054	260.4	1162.0	28	60.3	2 1/4"	667
40"†	1320	158.8	1073	1016.0	1111	270.4	1212.8	32	60.3	2 1/4"	739
42"†	1405	168.3	1127	1066.8	1168	285.4	1282.7	28	66.7	2 1/2"	921
44"†	1455	173.1	1181	1117.6	1226	295.4	1333.5	32	66.7	2 1/2"	980
46"†	1510	179.4	1235	1168.4	1276	306.4	1390.6	32	66.7	2 1/2"	1093
48"†	1595	189.0	1289	1219.2	1334	322.4	1460.5	32	73.0	2 3/4"	1295
50"†	1670	196.9	1343	1270.0	1384	335.4	1524.0	28	79.4	3"	1510
52"†	1720	203.2	1394	1320.8	1435	343.4	1574.8	32	79.4	3"	1615
54"†	1780	209.6	1448	1371.6	1492	355.4	1632.0	32	79.4	3"	1778
56"†	1855	217.4	1502	1422.4	1543	368.4	1695.4	32	85.7	3 1/4"	1941
58"†	1905	222.3	1553	1473.2	1600	376.4	1746.2	32	85.7	3 1/4"	2105
60"†	1995	233.4	1610	1524.0	1657	395.4	1822.4	28	92.1	3 1/2"	2268

- All dimensions in millimetres per ASME B16.47-2020 Series A, Class 600 (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 600 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 600) 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, compressor and metering stations · pig launchers and receivers · large block valves and manifolds · refinery hydroprocessing and gas-processing headers · boiler feedwater and HP steam · separator, scrubber and heat-exchanger nozzles.

Also known as: ANSI B16.47 Series A 600 lb WNRF flange · MSS SP-44 Class 600 weld neck flange · large diameter 600# welding neck flange · 26" – 60" WN flange (≈ PN 100).

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 600** 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	102.1	99.3	99.3
100	93.2	84.4	86.3
150	90.2	77.0	79.0
200	87.6	71.3	73.3
250	83.9	66.8	68.9
300	79.6	63.2	65.2
350	75.1	60.7	62.6
400	69.4	58.9	60.9
450	57.5	57.5	58.8

Working pressure in bar (gauge); ASME B16.47 adopts the ASME B16.5 Table 2 ratings for Class 600 (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 600 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 600 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).