

# Long Weld Neck Flange — ASME B16.5 Class 300

ANSI / ASME B16.5 Class 300 long welding neck (LWN) raised face flanges · NPS ½" to 24" · standard, heavy barrel and equal barrel necks · Carbon steel ASTM A105, stainless steel ASTM A182 F304 / F316, alloy steel

## ASME B16.5 CLASS 300 LONG WELD NECK FLANGE

A long weld neck flange (LWN) is a weld neck flange with an extended straight neck that acts as the nozzle itself: the flange bolts to the piping and the neck end is welded directly into a vessel, column, drum or exchanger shell. One forging and one weld replace a pipe stub plus weld neck flange — a stronger, more fatigue-resistant nozzle with full traceability.

The flange ring (OD, thickness, facing, drilling) is per ASME B16.5 Class 300; neck OD, bore and length are not standardised and follow industry practice or the vessel drawing. TESCO Steel & Engineering manufactures LWN flanges in Mumbai, ½" to 24", in any length and bore.

## KEY FEATURES

- **Flange per ASME B16.5** — ring dimensions, tolerances, facing and marking to B16.5-2020; rated as a B16.5 flange.
- **Three neck styles** — standard LWN, heavy barrel (HB, thicker neck for reinforcement) and equal barrel (E, pipe-size bore).
- **Made to order** — any length (std. 229 / 305 / 406 mm), bore to schedule, bevel or plain end, RF / FF / RTJ, nut stops.
- **Materials and certification** — A105, A350 LF2, A182 F304/F316, F11/F22, duplex; EN 10204 3.1.

## SPECIFYING AN LWN FLANGE

- State length H (face to neck end), barrel type (standard / HB / E) and bore D — or send the nozzle drawing; standard lengths are 229, 305 and 406 mm.
- Heavy barrel necks give nozzle reinforcement per ASME VIII UG-37 without a repad; equal barrel necks suit butt welding to pipe.
- Specify the neck-end preparation (plain for shell welds, bevelled for butt welds) and any nut stop or relief.

## SPECIFICATION SUMMARY

|                       |                                                                                              |
|-----------------------|----------------------------------------------------------------------------------------------|
| <b>Product</b>        | Long weld neck flange (LWN / nozzle flange), one-piece forged                                |
| <b>Standard</b>       | Flange per ASME B16.5; neck per industry standard / drawing                                  |
| <b>Pressure class</b> | Class 300 (300 lb / #300)                                                                    |
| <b>Size range</b>     | NPS ½" – 24" (DN 15 – DN 600)                                                                |
| <b>Facing</b>         | Raised face (RF) 2 mm standard; FF or RTJ on request                                         |
| <b>Face finish</b>    | Serrated, 125 – 250 µin Ra (3.2 – 6.3 µm) per ASME B16.5                                     |
| <b>Neck / bore</b>    | Standard: neck OD per table, bore = nominal size; HB / E barrels or schedule bore on request |
| <b>Neck end</b>       | Plain (square cut) for nozzle welds; 37.5° bevel on request                                  |
| <b>Materials</b>      | ASTM A105 / A105N; A350 LF2; A182 F304/L, F316/L, F321; F11, F22, F91; duplex                |

## APPLICATIONS

Pressure-vessel, column and drum nozzles · heat-exchanger shell and channel nozzles · boiler and HRSG drums · instrument, level-gauge and thermowell nozzles · reactor and separator inlets · tank and sphere connections · refinery, petrochemical, fertiliser, power and offshore equipment.

## LWN NECK STYLES

|                     |                                             |
|---------------------|---------------------------------------------|
| <b>Standard</b>     | Neck OD per table, bore = nominal size      |
| <b>Heavy barrel</b> | Thicker neck; integral vessel reinforcement |
| <b>Equal barrel</b> | Pipe-schedule bore; butt-weld to pipe       |

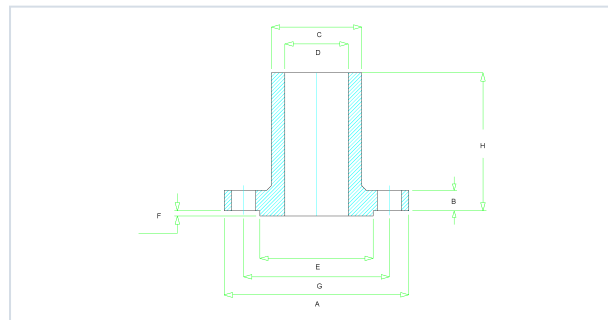
## Long Weld Neck Flange ASME B16.5 Class 300 (LWN)

Dimension chart in mm · NPS ½ – 24

**ASME B16.5 CLASS 300 LONG WELD NECK FLANGE DIMENSIONS (MM)**

| ASME B16.5 · CLASS 300 LONG WELD NECK FLANGE · RAISED FACE · DIMENSIONS IN MM |     |        |         |       |      |             |             |         |        |        | 20 sizes   |
|-------------------------------------------------------------------------------|-----|--------|---------|-------|------|-------------|-------------|---------|--------|--------|------------|
| NPS                                                                           | A   | B      | C       | D     | E    | G           | H           | Bolting |        |        | Weight     |
| inch                                                                          | OD  | Thick. | Neck OD | Bore  | RF Ø | Bolt circle | Length std. | No.     | Hole Ø | Stud   | kg approx. |
| 1/2"                                                                          | 95  | 14.3   | 38.1    | 12.7  | 35   | 66.7        | 229         | 4       | 15.9   | 1/2"   | 2          |
| 3/4"                                                                          | 115 | 15.9   | 47.8    | 19.0  | 43   | 82.6        | 229         | 4       | 19.1   | 5/8"   | 4          |
| 1"                                                                            | 125 | 17.5   | 53.8    | 25.4  | 51   | 88.9        | 229         | 4       | 19.1   | 5/8"   | 4          |
| 1 1/4"                                                                        | 135 | 19.1   | 63.5    | 31.8  | 64   | 98.4        | 229         | 4       | 19.1   | 5/8"   | 6          |
| 1 1/2"                                                                        | 155 | 20.7   | 69.8    | 38.1  | 73   | 114.3       | 229         | 4       | 22.2   | 3/4"   | 7          |
| 2"                                                                            | 165 | 22.4   | 84.1    | 50.8  | 92   | 127.0       | 229         | 8       | 19.1   | 5/8"   | 9          |
| 2 1/2"                                                                        | 190 | 25.4   | 100.1   | 63.5  | 105  | 149.2       | 229         | 8       | 22.2   | 3/4"   | 11         |
| 3"                                                                            | 210 | 28.6   | 117.3   | 76.2  | 127  | 168.3       | 229         | 8       | 22.2   | 3/4"   | 16         |
| 3 1/2"                                                                        | 230 | 30.2   | 133.3   | 88.9  | 140  | 184.2       | 229         | 8       | 22.2   | 3/4"   | 19         |
| 4"                                                                            | 255 | 31.8   | 146.0   | 101.6 | 157  | 200.0       | 305         | 8       | 22.2   | 3/4"   | 28         |
| 5"                                                                            | 280 | 35.0   | 177.8   | 127.0 | 186  | 235.0       | 305         | 8       | 22.2   | 3/4"   | 38         |
| 6"                                                                            | 320 | 36.6   | 206.2   | 152.4 | 216  | 269.9       | 305         | 12      | 22.2   | 3/4"   | 48         |
| 8"                                                                            | 380 | 41.3   | 260.3   | 203.2 | 270  | 330.2       | 305         | 12      | 25.4   | 7/8"   | 67         |
| 10"                                                                           | 445 | 47.7   | 320.5   | 254.0 | 324  | 387.4       | 305         | 16      | 28.6   | 1"     | 95         |
| 12"                                                                           | 520 | 50.8   | 374.6   | 304.8 | 381  | 450.8       | 305         | 16      | 31.8   | 1 1/8" | 125        |
| 14"                                                                           | 585 | 54.0   | 425.4   | 355.6 | 413  | 514.4       | 305         | 20      | 31.8   | 1 1/8" | 147        |
| 16"                                                                           | 650 | 57.2   | 482.6   | 406.4 | 470  | 571.5       | 305         | 20      | 35.0   | 1 1/4" | 183        |
| 18"                                                                           | 710 | 60.4   | 533.4   | 457.2 | 533  | 628.6       | 305         | 24      | 35.0   | 1 1/4" | 211        |
| 20"                                                                           | 775 | 63.5   | 587.2   | 508.0 | 584  | 685.8       | 305         | 24      | 35.0   | 1 1/4" | 249        |
| 24"                                                                           | 915 | 69.9   | 701.5   | 609.6 | 692  | 812.8       | 305         | 24      | 41.3   | 1 1/2" | 353        |

- All dimensions in millimetres per ASME B16.5-2020 Tables 10 and 11 (metric). Thickness B includes the 2 mm raised face (F); length H is overall, from raised face to neck end.
- Neck OD C, bore D and length H are industry-standard values for the standard LWN (bore = nominal size), not part of ASME B16.5; other lengths, HB / E necks and schedule bores to order. Studs per B16.5 Table B1; hole Ø = stud + 3 mm. Weights approximate, carbon steel, at the length shown.

**LONG WELD NECK FLANGE DIMENSIONAL DRAWING**


|                                     |                                                    |
|-------------------------------------|----------------------------------------------------|
| <b>A</b> Flange outside diameter    | <b>B</b> Flange thickness (incl. 2 mm RF)          |
| <b>C</b> Neck outside diameter      | <b>D</b> Bore (standard = nominal size)            |
| <b>E</b> Raised face diameter       | <b>F</b> Raised face height, 2 mm                  |
| <b>G</b> Bolt circle diameter (PCD) | <b>H</b> Overall length (standard 229 / 305 / 406) |

**Selection:** rated as an ASME B16.5 Class 300 flange; the neck is designed as a nozzle (ASME VIII UG-37 / UG-45). **Also known as:** ANSI B16.5 300 lb LWN flange · 300# long welding neck · nozzle flange · LWNRF Class 300 (≈ PN 50).

## Long Weld Neck Flange ASME B16.5 Class 300 (LWN)

Materials · Pressure–temperature ratings · Quality · FAQ

### LONG WELD NECK FLANGE MATERIALS

|                                   |                                                                              |
|-----------------------------------|------------------------------------------------------------------------------|
| <b>Carbon steel</b>               | ASTM A105 / A105N (most common);<br>SA-105 for ASME VIII vessels             |
| <b>Low-temperature CS</b>         | ASTM A350 LF2 Cl.1 / Cl.2, LF3; A266<br>Cl.2 for large necks                 |
| <b>Stainless steel</b>            | ASTM A182 F304 / F304L, F316 /<br>F316L, F321, F347                          |
| <b>Alloy steel</b>                | ASTM A182 F5, F9, F11, F12, F22,<br>F91                                      |
| <b>Duplex / super duplex</b>      | ASTM A182 F51 (UNS S31803 /<br>S32205), F53 (S32750), F55 (S32760)           |
| <b>Nickel &amp; copper alloys</b> | Monel 400, Inconel 600 / 625,<br>Hastelloy C276, Cu-Ni 90/10 — on<br>request |
| <b>Equivalent EN / DIN grades</b> | P250GH (1.0460), 1.4301, 1.4401,<br>1.4404, 1.4571 on request                |

### PRESSURE–TEMPERATURE RATINGS

| PRESSURE–<br>TEMPERATURE<br>RATING | <div> <b>Class</b><br/> <b>300</b> </div> BAR, ASME<br>B16.5 TABLE 2 |                        |                        |
|------------------------------------|----------------------------------------------------------------------|------------------------|------------------------|
|                                    | Group 1.1<br>A105 / A350 LF2                                         | Group 2.1<br>A182 F304 | Group 2.2<br>A182 F316 |
| <b>Temperature °C</b>              |                                                                      |                        |                        |
| <b>–29 to 38</b>                   | 51.1                                                                 | 49.6                   | 49.6                   |
| <b>100</b>                         | 46.6                                                                 | 42.2                   | 43.2                   |
| <b>150</b>                         | 45.1                                                                 | 38.5                   | 39.5                   |
| <b>200</b>                         | 43.8                                                                 | 35.7                   | 36.8                   |
| <b>250</b>                         | 41.9                                                                 | 33.4                   | 34.4                   |
| <b>300</b>                         | 39.8                                                                 | 31.6                   | 32.6                   |
| <b>350</b>                         | 37.6                                                                 | 30.3                   | 31.3                   |
| <b>400</b>                         | 34.7                                                                 | 29.4                   | 30.4                   |
| <b>450</b>                         | 28.8                                                                 | 28.8                   | 29.4                   |

Working pressure in bar (gauge) from ASME B16.5-2020 Table 2-1.1, 2-2.1 / 2-2.2. Ratings apply to the flange; confirm for the specific material group, bolting, gasket and welds.

### QUALITY & DOCUMENTATION

- Forged from certified bars / billets; normalised, quenched-and-tempered or solution-annealed per material specification.
- Manufactured under an ISO 9001:2015 quality management system; marking per ASME B16.5 and MSS SP-25.
- EN 10204 3.1 material test certificates with chemical analysis, mechanical properties and heat-number traceability; 3.2 with third-party endorsement on request.
- Dimensional inspection of flange to ASME B16.5 and of neck to drawing; face finish per MSS SP-6; UT of forgings per ASTM A388 / SA-388 on request.
- MPI / DPT, PMI, Charpy impact tests, HIC / NACE MR0175, IBR, PED and ASME VIII (U-stamp vessel) documentation on request.

### FREQUENTLY ASKED QUESTIONS

#### Does ASME B16.5 cover long weld neck flanges?

Only the flange portion — OD, thickness, facing, drilling and rating. Neck OD, bore and length follow industry convention (this sheet) or the vessel drawing, and the neck is designed as a nozzle under the vessel code.

#### Standard, heavy barrel or equal barrel?

Standard for general nozzles; heavy barrel where the opening needs integral reinforcement; equal barrel where the neck will be butt-welded to pipe of the same size and schedule.

#### What length should I order?

Standard lengths are 229, 305 and 406 mm; any length can be supplied. Specify the overall length H from the raised face to the neck end.

#### Which gasket and bolts are used?

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

### ORDERING INFORMATION

Specify: quantity · size (NPS) · ASME B16.5 Class 300 long weld neck · neck style (standard / HB / E) · length H · bore D or pipe schedule · neck end (plain / bevel) · facing (RF / FF / RTJ) · material grade · certification (3.1 / 3.2, NACE, IBR, PED) · surface protection (anti-rust oil, paint, galvanising).