

ASME B16.5 Long Weld Neck Flange – Dimensions & Specification

ASME B16.5 Long Weld Neck Flanges (LWN) are special-purpose forged flanges designed for high-pressure, high-temperature, and critical piping systems. Unlike standard weld neck flanges, LWN flanges feature an extended hub or neck, which acts as a nozzle for pressure vessels, columns, tanks, and heat exchangers.

Dimensions – ASME B16.5 Long Weld Neck Flanges

Long weld neck flange dimensions generally follow ASME B16.5 (½ " to 24 ") standards for pressure classes:

Class Ratings: 150, 300, 400, 600, 900, 1500, and 2500 LB

Nominal Pipe Sizes (NPS): ½ " to 24 " (larger sizes available in ASME B16.47)

Facing Types: Raised Face (RF), Ring Type Joint (RTJ), Flat Face (FF on request)

Hub Lengths: Extended neck lengths per design or project requirement

Long weld neck flanges Material Grades

Long weld neck flanges can be manufactured in a wide range of materials according to ASME, ASTM, and API standards:

Carbon Steel: ASTM A105, A350 LF2, A694 F52 / F60 / F65

Alloy Steel: ASTM A182 F11, F22, F5, F9, F91

Stainless Steel: ASTM A182 F304 / 304L, F316 / 316L, F321, F347

Duplex / Super Duplex: ASTM A182 F51, F53, F55

Nickel Alloys: Inconel, Monel, Hastelloy, Alloy 20, etc.

LONG WELD NECK FLANGE DIMENSIONS

FLANGE TOLERANCES

GENERAL NOTE: Dimensions are in inches.

-½ deg.

*Outside Diameter of Flange (dimension O)

OD ≤12	-0.060
OD >12, ≤24	-0.120
OD >24	-0.190

Thickness of Flange (dimension C)

All Sizes

NPS 18 and smaller	+0.120, -zero
NPS 20 and larger	+0.190, -zero

Hub (dimension X)

All Sizes	+0.120, -zero
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Length Through Hub (dimension Y)

NPS 4 and smaller	-0.060
NPS 5 to 10, inclusive	+0.060, -0.120
NPS 12 and larger	+0.120, -0.180

Bore (dimension J)

NPS 10 and smaller	-0.030
NPS 12 to 18, inclusive	-0.060
NPS 20 and larger	+0.120, -0.060

Facings

*Facing Height

-0.010

Diameter of raised face (dimension R & K)

Class 150, 300 (0.06 in. raised face) -0.030

Class 400 + (0.25 in. raised face) -0.020

Ring Type Joint +0.020, -zero

Facings (continued)

Inside and outside diameter of large and small tongue, groove, male and female

R, S, T, U, W, X, Y & Z -0.020

K & L +0.020, -zero

Ring Joint Facing

Depth (dimension E)

+0.016, -zero

Width (dimension F)

-0.008

Pitch diameter (dimension P)

-0.005

Radius at bottom (dimension R)

R ≤ 0.060 +0.030, -zero

R > 0.060 -0.030

23 degree angle

Drilling and Facing

Diameter of bolt circle

-0.060

Center-to-center of adjacent bolt holes

-0.030

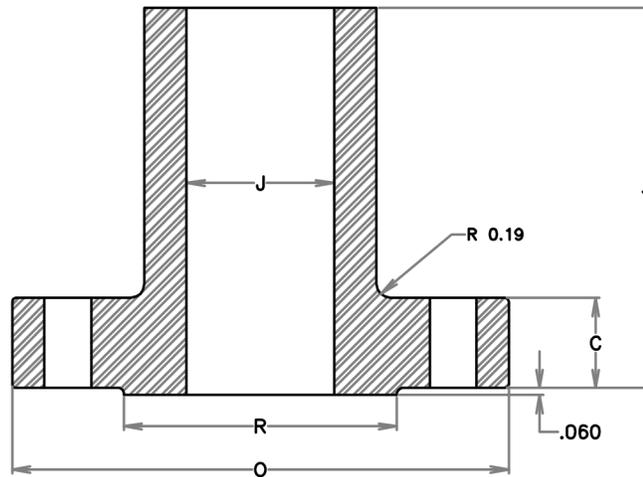
Eccentricity between bolt circle and diameter and machined facing diameters

NPS 2 ½ and smaller -0.030

NPS 3 and larger -0.060

*Diameter of bolt holes

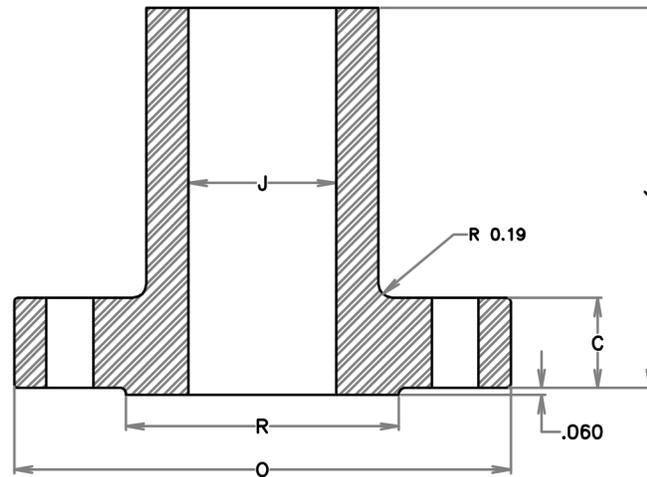
-0.020



ASME B16.5 CLASS 150 LONG WELD NECK FLANGE DIMENSIONS

1	2	3	4	5	6	7	8	9	10
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling			
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle
J	O	C	R	X	Y				
1/2	3.50	0.38	1.38	1.19	S E E N O T E 2	4	0.62	1/2	2.38
3/4	3.88	0.44	1.69	1.50		4	0.62	1/2	2.75
1	4.25	0.50	2.00	1.94		4	0.62	1/2	3.12
1 1/4	4.62	0.56	2.50	2.31		4	0.62	1/2	3.50
1 1/2	5.00	0.62	2.88	2.56		4	0.62	1/2	3.88
2	6.00	0.69	3.62	3.06		4	0.75	5/8	4.75
2 1/2	7.00	0.81	4.12	3.56		4	0.75	5/8	5.50
3	7.50	0.88	5.00	4.25		4	0.75	5/8	6.00
3 1/2	8.50	0.88	5.50	4.81		8	0.75	5/8	7.00
4	9.00	0.88	6.19	5.31		8	0.75	5/8	7.50
5	10.00	0.88	7.31	6.44		8	0.88	3/4	8.50
6	11.00	0.94	8.50	7.56		8	0.88	3/4	9.50
8	13.50	1.06	10.62	9.69		8	0.88	3/4	11.75
10	16.00	1.12	12.75	12.00		12	1.00	7/8	14.25
12	19.00	1.19	15.00	14.38		12	1.00	7/8	17.00
14	21.00	1.31	16.25	15.75		12	1.12	1	18.75
16	23.50	1.38	18.50	18.00		16	1.12	1	21.25
18	25.00	1.50	21.00	19.88		16	1.25	1 1/8	22.75
20	27.50	1.62	23.00	22.00		20	1.25	1 1/8	25.00
24	32.00	1.81	27.25	26.12		20	1.38	1 1/4	29.50

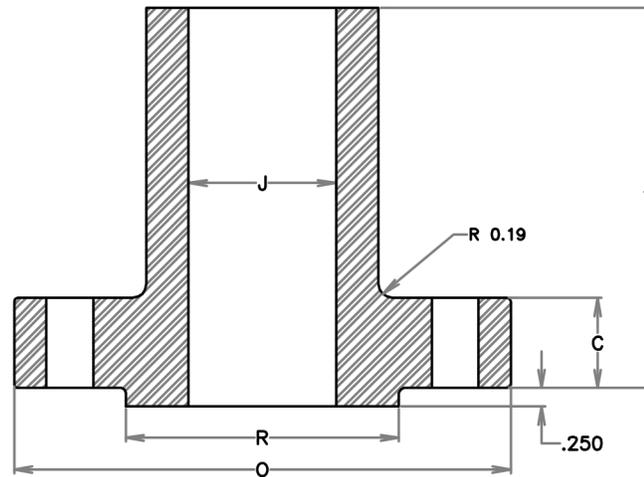
1. All Dimensions shown are in inches.
2. Length through Hub dimensions to be specified by purchaser.
3. Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
4. Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.



ASME B16.5 CLASS 300 LONG WELD NECK FLANGE DIMENSIONS

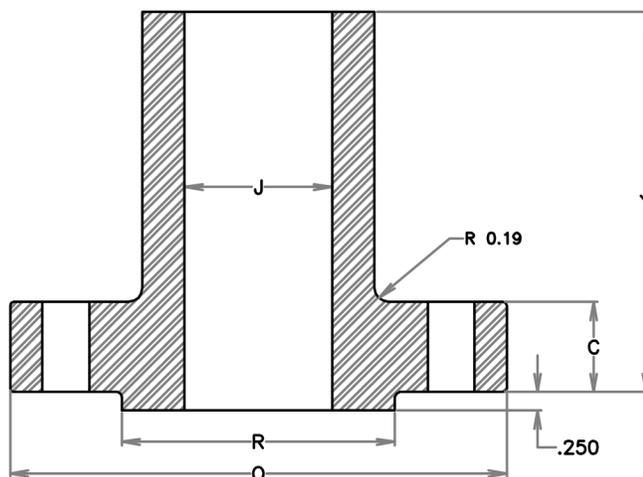
1	2	3	4	5	6	7	8	9	10
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling			
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle
J	O	C	R	X	Y				
1/2	3.75	0.50	1.38	1.50	S E E N O T E 2	4	0.62	1/2	2.62
3/4	4.62	0.56	1.69	1.88		4	0.75	5/8	3.25
1	4.88	0.62	2.00	2.12		4	0.75	5/8	3.50
1 1/4	5.25	0.69	2.50	2.50		4	0.75	5/8	3.88
1 1/2	6.12	0.75	2.88	2.75		4	0.88	3/4	4.50
2	6.50	0.81	3.62	3.31		8	0.75	5/8	5.00
2 1/2	7.50	0.94	4.12	3.94		8	0.88	3/4	5.88
3	8.25	1.06	5.00	4.62		8	0.88	3/4	6.62
3 1/2	9.00	1.12	5.50	5.25		8	0.88	3/4	7.25
4	10.00	1.19	6.19	5.75		8	0.88	3/4	7.88
5	11.00	1.31	7.31	7.00		8	0.88	3/4	9.25
6	12.50	1.38	8.50	8.12		12	0.88	3/4	10.62
8	15.00	1.56	10.62	10.25		12	1.00	7/8	13.00
10	17.50	1.81	12.75	12.62		16	1.12	1	15.25
12	20.50	1.94	15.00	14.75		16	1.25	1 1/8	17.75
14	23.00	2.06	16.25	16.75		20	1.25	1 1/8	20.25
16	25.50	2.19	18.50	19.00		20	1.38	1 1/4	22.50
18	28.00	2.31	21.00	21.00		24	1.38	1 1/4	24.75
20	30.50	2.44	23.00	23.12		24	1.38	1 1/4	27.00
24	36.00	2.69	27.25	27.62		24	1.62	1 1/2	32.00

1. All Dimensions shown are in inches.
2. Length through Hub dimensions to be specified by purchaser.
3. Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
4. Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.

**ASME B16.5 CLASS 400 LONG WELD NECK FLANGE DIMENSIONS**

1	2	3	4	5	6	7	8	9	10
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling			
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle
J	O	C	R	X	Y				
1/2	3.75	0.56	1.38	1.50	S E E N O T E 2	4	0.62	1/2	2.62
3/4	4.62	0.62	1.69	1.88		4	0.75	5/8	3.25
1	4.88	0.69	2.00	2.12		4	0.75	5/8	3.50
1 1/4	5.25	0.81	2.50	2.50		4	0.75	5/8	3.88
1 1/2	6.12	0.88	2.88	2.75		4	0.88	3/4	4.50
2	6.50	1.00	3.62	3.31		8	0.75	5/8	5.00
2 1/2	7.50	1.12	4.12	3.94		8	0.88	3/4	5.88
3	8.25	1.25	5.00	4.62		8	0.88	3/4	6.62
3 1/2	9.00	1.38	5.50	5.25		8	1.00	7/8	7.25
4	10.00	1.38	6.19	5.75		8	1.00	7/8	7.88
5	11.00	1.50	7.31	7.00		8	1.00	7/8	9.25
6	12.50	1.62	8.50	8.12		12	1.00	7/8	10.62
8	15.00	1.88	10.62	10.25		12	1.12	1	13.00
10	17.50	2.12	12.75	12.62		16	1.25	1 1/8	15.25
12	20.50	2.25	15.00	14.75		16	1.38	1 1/4	17.75
14	23.00	2.38	16.25	16.75		20	1.38	1 1/4	20.25
16	25.50	2.50	18.50	19.00		20	1.50	1 3/8	22.50
18	28.00	2.62	21.00	21.00		24	1.50	1 3/8	24.75
20	30.50	2.75	23.00	23.12		24	1.62	1 1/2	27.00
24	36.00	3.00	27.25	27.62		24	1.88	1 3/4	32.00

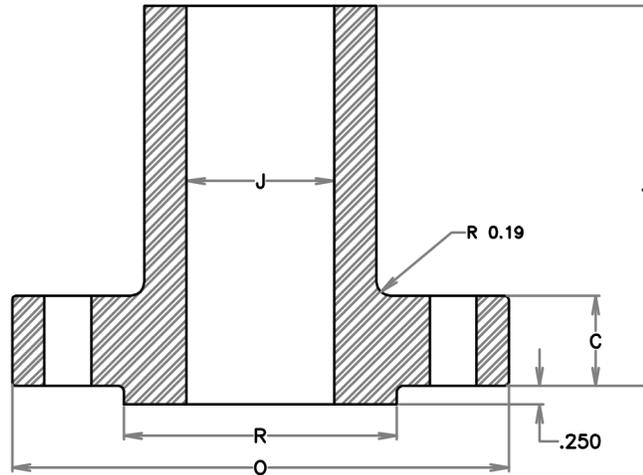
- All Dimensions shown are in inches.
- Length through Hub dimensions to be specified by purchaser.
- Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
- Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.



ASME B16.5 CLASS 600 LONG WELD NECK FLANGE DIMENSIONS

1	2	3	4	5	6	7	8	9	10
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling			
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle
J	O	C	R	X	Y				
1/2	3.75	0.56	1.38	1.50	S E E N O T E 2	4	0.62	1/2	2.62
3/4	4.62	0.62	1.69	1.88		4	0.75	5/8	3.25
1	4.88	0.69	2.00	2.12		4	0.75	5/8	3.50
1 1/4	5.25	0.81	2.50	2.50		4	0.75	5/8	3.88
1 1/2	6.12	0.88	2.88	2.75		4	0.88	3/4	4.50
2	6.50	1.00	3.62	3.31		8	0.75	5/8	5.00
2 1/2	7.50	1.12	4.12	3.94		8	0.88	3/4	5.88
3	8.25	1.25	5.00	4.62		8	0.88	3/4	6.62
3 1/2	9.00	1.38	5.50	5.25		8	1.00	7/8	7.25
4	10.75	1.50	6.19	6.00		8	1.00	7/8	8.50
5	13.00	1.75	7.31	7.44		8	1.12	1	10.50
6	14.00	1.88	8.50	8.75		12	1.12	1	11.50
8	16.50	2.19	10.62	10.75		12	1.25	1 1/8	13.75
10	20.00	2.50	12.75	13.50		16	1.38	1 1/4	17.00
12	22.00	2.62	15.00	15.75		20	1.38	1 1/4	19.25
14	23.75	2.75	16.25	17.00		20	1.50	1 3/8	20.75
16	27.00	3.00	18.50	19.50		20	1.62	1 1/2	23.75
18	29.25	3.25	21.00	21.50		20	1.75	1 5/8	25.75
20	32.00	3.50	23.00	24.00		24	1.75	1 5/8	28.50
24	37.00	4.00	27.25	28.25		24	2.00	1 7/8	33.00

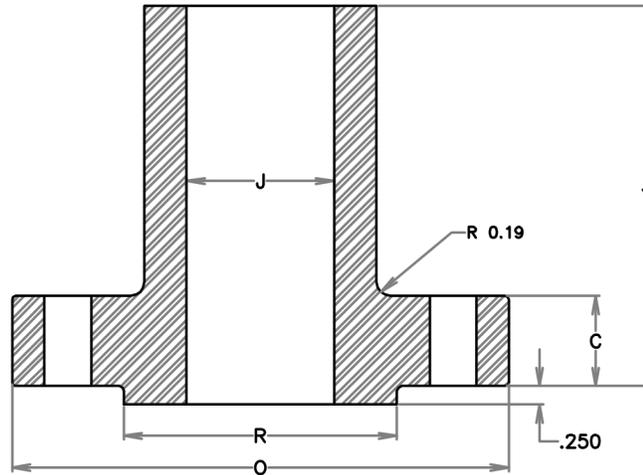
1. All Dimensions shown are in inches.
2. Length through Hub dimensions to be specified by purchaser.
3. Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
4. Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.



ASME B16.5 CLASS 900 LONG WELD NECK FLANGE DIMENSIONS

1	2	3	4	5	6	7	8	9	10	
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling				
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle	
J	O	C	R	X	Y					
1/2	4.75	0.88	1.38	1.50	S E E	4	0.88	3/4	3.25	
3/4	5.12	1.00	1.69	1.75		4	0.88	3/4	3.50	
1	5.88	1.12	2.00	2.06		4	1.00	7/8	4.00	
1 1/4	6.25	1.12	2.50	2.50		4	1.00	7/8	4.38	
1 1/2	7.00	1.25	2.88	2.75		4	1.12	1	4.88	
2	8.50	1.50	3.62	4.12		8	1.00	7/8	6.50	
2 1/2	9.62	1.62	4.12	4.88		8	1.12	1	7.50	
3	9.50	1.50	5.00	5.00		8	1.00	7/8	7.50	
3 1/2	---	---	---	---		---	---	---	---	---
4	11.50	1.75	6.19	6.25		N O T E 2	8	1.25	1 1/8	9.25
5	13.75	2.00	7.31	7.50	8		1.38	1 1/4	11.00	
6	15.00	2.19	8.50	9.25	12		1.25	1 1/8	12.50	
8	18.50	2.50	10.62	11.75	12		1.50	1 3/8	15.50	
10	21.50	2.75	12.75	14.50	16		1.50	1 3/8	18.50	
12	24.00	3.12	15.00	16.50	20		1.50	1 3/8	21.00	
14	25.25	3.38	16.25	17.75	20		1.62	1 1/2	22.00	
16	27.75	3.50	18.50	20.00	20		1.75	1 5/8	24.25	
18	31.00	4.00	21.00	22.25	20		2.00	1 7/8	27.00	
20	33.75	4.25	23.00	24.50	20		2.12	2	29.50	
24	41.00	5.50	27.25	29.50	20	2.62	2 1/2	35.50		

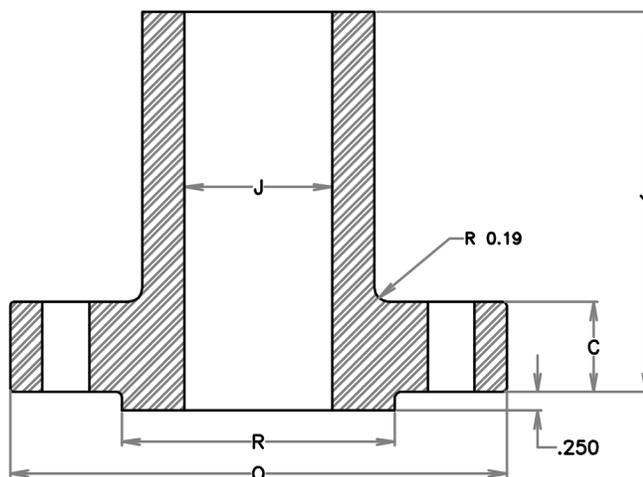
1. All Dimensions shown are in inches.
2. Length through Hub dimensions to be specified by purchaser.
3. Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
4. Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.



ASME B16.5 CLASS 1500 LONG WELD NECK FLANGE DIMENSIONS

1	2	3	4	5	6	7	8	9	10
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling			
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle
J	O	C	R	X	Y				
1/2	4.75	0.88	1.38	1.50	S E E	4	0.875	3/4	3.25
3/4	5.12	1.00	1.69	1.75		4	0.875	3/4	3.50
1	5.88	1.12	2.00	2.06		4	1.000	7/8	4.00
1 1/4	6.25	1.12	2.50	2.50		4	1.000	7/8	4.38
1 1/2	7.00	1.25	2.88	2.75		4	1.125	1	4.88
2	8.50	1.50	3.62	4.12		8	1.000	7/8	6.50
2 1/2	9.62	1.62	4.12	4.88		8	1.125	1	7.50
3	10.50	1.88	5.00	5.25		8	1.250	1 1/8	8.00
3 1/2	---	---	---	---		---	---	---	---
4	12.25	2.12	6.19	6.38		N O T E 2	8	1.375	1 1/4
5	14.75	2.88	7.31	7.75	8		1.625	1 1/2	11.50
6	15.50	3.25	8.50	9.00	12		1.500	1 3/8	12.50
8	19.00	3.62	10.62	11.50	12		1.750	1 5/8	15.50
10	23.00	4.25	12.75	14.50	12		2.000	1 7/8	19.00
12	26.50	4.88	15.00	17.75	16		2.125	2	22.50
14	29.50	5.25	16.25	19.50	16		2.375	2 1/4	25.00
16	32.50	5.75	18.50	21.75	16		2.625	2 1/2	27.75
18	36.00	6.38	21.00	23.50	16		2.875	2 3/4	30.50
20	38.75	7.00	23.00	25.25	16		3.125	3	32.75
24	46.00	8.00	27.25	30.00	16	3.625	3 1/2	39.00	

1. All Dimensions shown are in inches.
2. Length through Hub dimensions to be specified by purchaser.
3. Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
4. Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.



ASME B16.5 CLASS 2500 LONG WELD NECK FLANGE DIMENSIONS

1	2	3	4	5	6	7	8	9	10
Nominal Size and Bore	Outside Diameter	Minimum Flange Thickness	Diameter of Raised Face	Diameter of Hub at Weld End	Length Through Hub	Drilling			
						Number of Bolt Holes	Diameter of Bolt Holes	Diameter of Bolts	Diameter of Bolt Circle
J	O	C	R	X	Y				
1/2	5.25	1.19	1.38	1.69	S E E	4	0.88	3/4	3.50
3/4	5.50	1.25	1.69	2.00		4	0.88	3/4	3.75
1	6.25	1.38	2.00	2.25		4	1.00	7/8	4.25
1 1/4	7.25	1.50	2.50	2.88		4	1.12	1	5.12
1 1/2	8.00	1.75	2.88	3.12		4	1.25	1 1/8	5.75
2	9.25	2.00	3.62	3.75		8	1.12	1	6.75
2 1/2	10.50	2.25	4.12	4.50		8	1.25	1 1/8	7.75
3	12.00	2.62	5.00	5.25		8	1.38	1 1/4	9.00
3 1/2	---	---	---	---		---	---	---	---
4	14.00	3.00	6.19	6.50		N O T E 2	8	1.62	1 1/2
5	16.50	3.62	7.31	8.00	8		1.88	1 3/4	12.75
6	19.00	4.25	8.50	9.25	8		2.12	2	14.50
8	21.75	5.00	10.62	12.00	12		2.12	2	17.25
10	26.50	6.50	12.75	14.75	12		2.62	2 1/2	21.25
12	30.00	7.25	15.00	17.38	12		2.88	2 3/4	24.38
14	---	---	---	---	---		---	---	---
16	---	---	---	---	---		---	---	---
18	---	---	---	---	---		---	---	---
20	---	---	---	---	---		---	---	---
24	---	---	---	---	---	---	---	---	

1. All Dimensions shown are in inches.
2. Length through Hub dimensions to be specified by purchaser.
3. Straight Hub Welding Flanges will be furnished with bore as shown in column 1; other bore sizes may be specified by purchaser.
4. Flange facing shall have a finish of 125 μ in. to 250 μ in. roughness, unless otherwise specified.