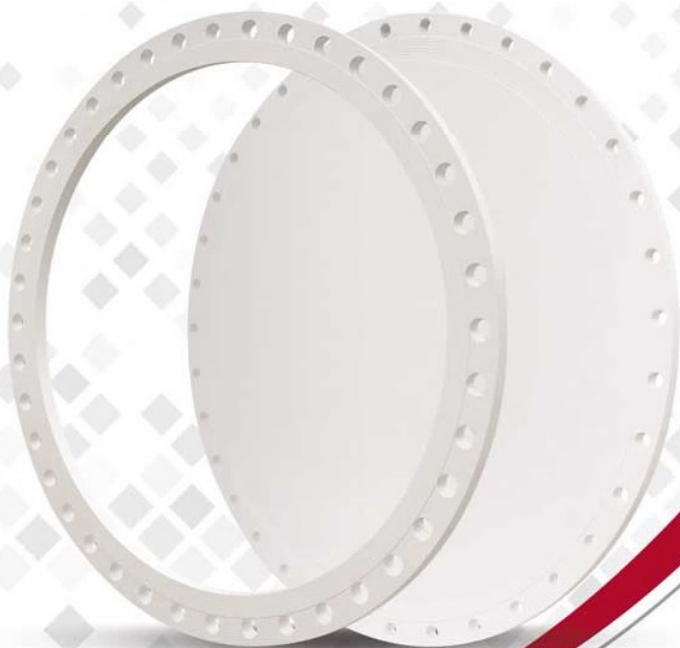


# فورجینگ

شیرآلات صنعتی و اتصالات فولادی

**FORGING**  
VALVES & FITTINGS



## Manufacturing Sequence of Flanges



### Manufacturing Sequence of Flanges

In addition to the main activity of fittings **FORGING Co.** Produces forged steel flanges and custom forged pieces to drawing up to 57kg. Another sequence of flange production is the large diameter flanges from 24" to 120" (600 mm to 3000 mm) made by rotaryforging machine up to 200 mm thickness under its quality control system.

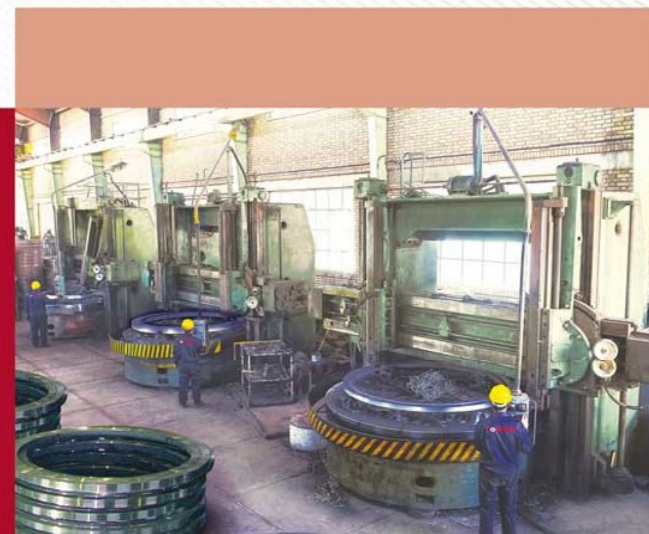


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Raw Material Acceptance

Cutting

Heating

Forging

Heat Treatment

Machining

Visual & Dimensional Examination

Coating & Marking

Delivery

واحد تولیدی و صنعتی **فورجینگ** در بخش مهندسی خود با توجه به امکاناتی که در اختیار دارد کلیه اطلاعات مربوط به قطعات و سازه های مورد نیاز در صنایع و پروژه های خطوط انتقال PIPING را به خدمت می گیرد.

این امر از تجربه وسیع و جامع در خموض طراحی و ساخت اتصالات فولادی جهت ایستگاه های پمپاژ، تصفیه خانه آب و فاضلاب خطوط انتقال و ذخیره سازی، سد، نیروگاه های برق، کارخانجات پتروشیمی و پروژه های دیگر بدست آمده است.

از زمانیکه این واحد به عنوان کاملترین مرکز فرآورده های فوق شناخته شده است کلیه اطلاعات و تجربیات مربوط به اتصالات، قطعات، تجهیزات و نصب آنها در واحد مهندسی گردآوری شده تا با استفاده مطلوب و بهره وری بالا در سفارشات بکار گرفته شود.

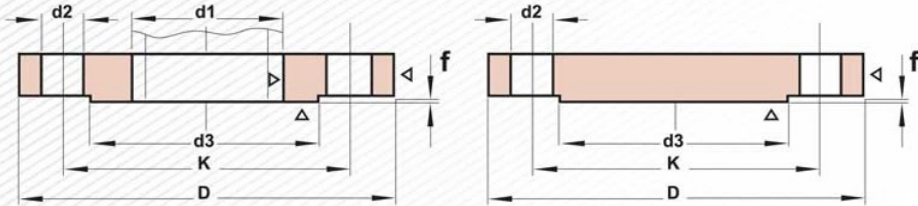
Since **FORGING** Co. Operates as comprehensive piping center, all the data and experience gathered during fittings production, which make full use of them in the broad variety of projects **FORGING** Co. undertakes.

When it comes to designing piping and piping systems, our engineering department work hand in hand with our customers. In this way all of our knowledge is at the service of our customers. This is the way we have always done business and this policy will continue into the future as well.



## Carbon Steel Flanges

DN 80 - 3000  
PN 6 - 10  
DIN 2501-2631-2632 / DIN EN 1092-1



Plain Flange

Blank Flange

unit: mm

Pipe		PN6						PN10					
Size	outside diameter of pipe	Flange diameter	Pitch circle diameter	Holes	Diameter of bolt hole	Raised face diameter	Raised face	Flange diameter	Pitch circle diameter	Holes	Diameter of bolt hole	Raised face diameter	Raised face
DN	d1	D	K	no.	d2	d3	f	D	K	no.	d2	d3	f
80	89	190	150	4	18	128	2	200	160	4/8	18	138	2
100	114.3	210	170	4	18	148	2	220	180	8	18	162	2
125	140	240	200	8	18	178	2	250	210	8	18	188	2
150	168	265	225	8	18	202	2	285	240	8	22	218	2
200	219	320	280	8	18	258	2	340	295	8	22	268	2
250	273	375	335	12	18	312	2	395	350	12	22	320	2
300	324	440	395	12	22	365	2	445	400	12	22	370	2
350	355	490	445	12	22	415	2	505	460	16	22	430	2
400	406	540	495	16	22	465	2	565	515	16	26	482	2
450	457	595	550	20	22	520	2	615	565	20	26	530	2
500	508	645	600	20	22	570	2	670	620	20	26	585	2
550	559							730	675	20	30	630	2
600	610	755	705	20	26	670	2	780	725	20	30	685	2
650	660			24	26		3	835	780	24	30	740	3
700	711	860	810	24	26	775	3	895	840	24	30	800	3
750	762							965	900	24	33	850	3
800	813	975	920	24	30	880	3	1015	950	24	33	905	3
900	914	1075	1020	24	30	980	4	1115	1050	28	33	1005	4
1000	1016	1175	1120	28	30	1080	4	1230	1160	28	36	1110	4
1100	1118							1340	1270	32	36	1221	4
1200	1220	1405	1340	32	33	1295	4	1455	1380	32	39	1330	4
1400	1422	1630	1560	36	36	1510	4	1675	1590	36	42	1535	4
1600	1626	1830	1760	40	36	1710	5	1915	1820	40	48	1760	5
1800	1829	2045	1970	44	39	1920	5	2115	2020	44	48	1960	5
2000	2032	2265	2180	48	42	2125	5	2325	2230	48	48	2170	5
2200	2235	2475	2390	52	42	2335	5	2550	2440	52	56	2370	5
2400	2438	2685	2600	56	42	2545	5	2760	2650	56	56	2570	5
2600	2641	2905	2810	60	48	2750	5	2960	2850	60	56	2780	5
2800	2845	3115	3020	64	48	2960	5	3180	3070	64	56	3000	5
3000	3048	3315	3220	68	48	3160	5	3405	3290	68	62	3210	5

FORGING reserve the right to introduce modification in the interests of technical progress.

For dimensional tolerances and bevel details see pages 11 and 12

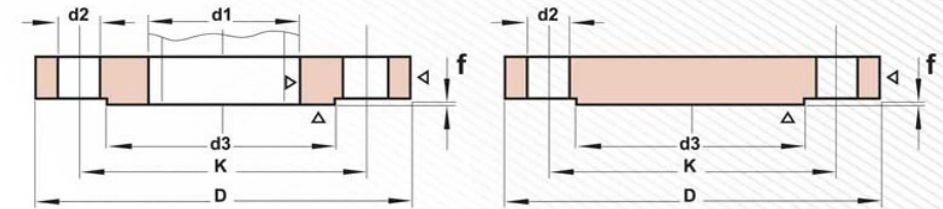
All FORGING flanges are manufactured to applicable DIN

ASTM, MSS, ANSI & AWWA specification in carbon steel

from size 80mm up to 3000mm.

## Carbon Steel Flanges

DN 80 - 2200  
PN 16 - 25  
DIN 2501-2633-2634 / DIN EN 1092-1



Plain Flange

Blank Flange

unit: mm

Pipe		PN16						PN25					
Size	outside diameter of pipe	Flange diameter	Pitch circle diameter	Holes	Diameter of bolt hole	Raised face diameter	Raised face	Flange diameter	Pitch circle diameter	Holes	Diameter of bolt hole	Raised face diameter	Raised face
DN	d1	D	K	no.	d2	d3	f	D	K	no.	d2	d3	f
80	89	200	160	8	18	138	2	200	160	8	18	138	2
100	114.3	220	180	8	18	158	2	235	190	8	22	162	2
125	140	250	210	8	18	188	2	270	220	8	26	188	2
150	168	285	240	8	22	212	2	300	250	8	26	218	2
200	219	340	295	12	22	268	2	360	310	12	26	278	2
250	273	405	355	12	26	320	2	425	370	12	30	335	2
300	324	460	410	12	26	378	2	485	430	16	30	395	2
350	355	520	470	16	26	438	3	555	490	16	33	450	3
400	406	580	525	16	30	490	3	620	550	16	36	505	3
450	457	640	585	20	30	490	3	670	600	16	36	505	3
500	508	715	650	20	33	610	3	730	660	20	36	615	3
550	559	775	710	20	33	665	3	785	710	20	39	660	3
600	610	840	770	20	36	725	3	845	770	20	39	720	3
650	660	860	790	24	36	740	3	895	820	24	39	770	3
700	711	910	840	24	36	795	3	960	875	24	39	820	3
750	762							1020	935	24	42	880	3
800	812	1025	950	24	39	900	3	1085	990	24	48	930	3
900	914	1125	1050	28	39	1000	4	1185	1090	28	48	1030	4
1000	1016	1255	1170	28	42	1115	4	1320	1210	28	56	1140	4
1100	1118	1355	1270	32	42	1215	4	1420	1310	32	56	1240	4
1200	1220	1485	1390	32	48	1330	4	1530	1420	32	56	1350	4
1400	1422	1685	1590	36	48	1530	4	1755	1640	36	62	1560	4
1600	1626	1930	1820	40	56	1750	5	1975	1860	40	62	1780	5
1800	1829	2130	2020	44	56	1950	5	2195	2070	44	70	1985	5
2000	2032	2345	2230	48	62	2150	5	2425	2300	48	70	2210	5
2200	2235	2555	2440	52	62	2360	5						

FORGING reserve the right to introduce modification in the interests of technical progress.

For dimensional tolerances and bevel details see pages 11 and 12

All FORGING flanges are manufactured to applicable DIN

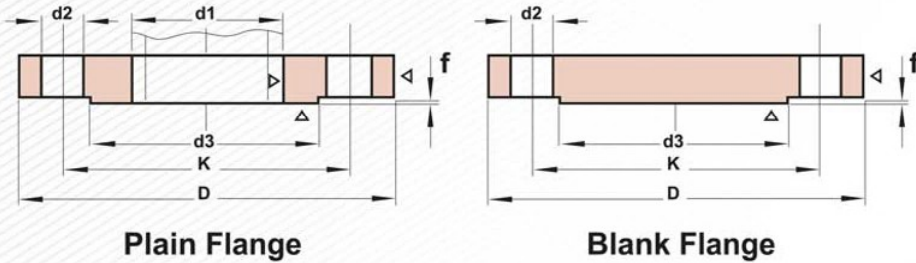
ASTM, MSS, ANSI & AWWA specification in carbon steel

from size 80mm up to 3000mm.



## Carbon Steel Flanges

DN 80 - 1600  
PN 40 - 64 - 100  
DIN 2501-2635-2636-2637 / DIN EN 1092-1

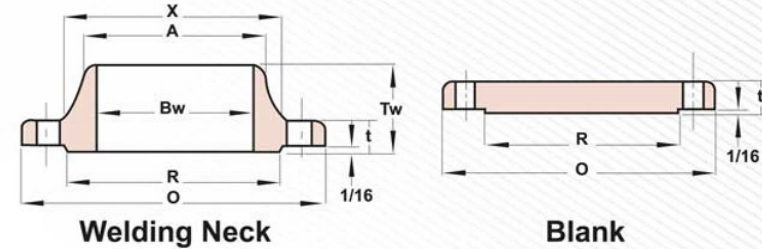


Pipe		PN40				PN64				PN100			
Size	outside diameter of pipe	Flange diameter	Pitch circle diameter	Holes	Diameter of bolt hole	Raised face diameter	Raised face	Holes	Pitch circle diameter	Flange diameter	Pitch circle diameter	Holes	Diameter of bolt hole
DN	d1	D	K	no.	d2	D	K	no.	d2	D	K	no.	d2
80	89	200	160	8	18	215	170	8	22	230	180	8	26
100	114	235	190	8	22	250	200	8	26	265	210	8	30
125	140	270	220	8	26	295	240	8	30	315	250	8	33
150	168	300	250	8	26	345	280	8	33	355	290	12	33
200	219	375	320	12	30	415	345	12	36	430	360	12	36
250	273	450	385	12	33	470	400	12	36	505	430	12	39
300	324	515	450	16	33	530	460	16	36	585	500	16	42
350	355	580	510	16	36	600	525	16	39	655	560	16	48
400	406	660	585	16	39	670	585	16	42	715	620	16	48
450	406	685	610	20	39	670	585	16	42	715	620	16	48
500	508	755	670	20	42	800	705	20	48	870	760	20	56
600	610	890	795	20	48	930	820	20	56	990	875	20	62
700	711	995	900	24	48	1045	935	24	56	1145	1020	24	70
800	812	1140	1030	24	56	1165	1050	24	62				
900	914	1250	1140	28	56	1285	1170	28	62				
1000	1016	1360	1250	28	56	1415	1290	28	70				
1200	1220	1575	1460	32	62	1665	1530	32	78				
1400	1422	1795	1680	36	62								
1600	1626	2025	1900	40	70								

FORGING reserve the right to introduce modification in the interests of technical progress.  
For dimensional tolerances and bevel details see pages 11 and 12  
All FORGING flanges are manufactured to applicable DIN  
ASTM, MSS, ANSI & AWWA specification in carbon steel  
from size 80mm up to 1600mm.

## Carbon Steel Welding Neck & Blank Flanges

According to ANSI B 16.5/ASTM A105



Class 150

unit: inch

Nominal Pipe Size	Common Dimensions				Dia. of Hub at Bevel A	Length Thru Hub	
	Outside Dia. of Flange O	Thick. of Flange t	Dia. of Hub at Base x	Dia. of Raised Face R		Welding Neck Tw	Welding Neck Bw
1/2	3 1/2	7/16	1 3/16	1 3/8	0.84	1 7/8	0.62
3/4	3 7/8	1/2	1 1/2	1 11/16	1.05	2 1/16	0.82
1	4 1/4	9/16	1 15/16	2	1.32	2 3/16	1.05
1 1/4	4 5/8	5/8	2 15/16	2 1/2	1.66	2 1/4	1.38
1 1/2	5	11/16	2 9/16	2 7/8	1.90	2 7/16	1.61
2	6	3/4	3 1/16	3 5/8	2.38	2 1/2	2.07
2 1/2	7	7/8	3 1/4	4 1/8	2.88	2 3/4	2.47
3	7 1/2	15/16	4 1/4	5	3.50	2 3/4	3.07
4	9	15/16	5 5/16	6 3/16	4.50	3	4.03
5	10	15/16	6 7/16	7 5/16	5.56	3 1/2	5.05
6	11	1	7 9/16	8 1/2	6.63	3 1/2	6.07
8	13 1/2	1 1/8	9 11/16	10 5/8	8.63	4	7.98
10	16	1 3/16	12	12 3/4	10.75	4	10.02
12	19	1 1/4	14 3/8	15	12.75	4 1/2	12.00
14	21	1 3/8	15 3/8	16 1/4	14.00	5	13.25
16	23 1/2	1 7/16	18	18 1/2	16.00	5	15.25

Class 300

unit: inch

1/2	3 3/4	9/16	1 1/2	1 3/8	0.84	2 1/16	0.62
3/4	4 5/8	5/8	1 7/8	1 11/16	1.05	2 1/4	0.82
1	4 7/8	11/16	2 1/8	2	10.32	2 7/16	1.05
1 1/4	5 1/4	3/4	2 1/2	2 1/2	1.66	2 9/16	1.38
1 1/2	6 1/8	13/16	2 3/4	2 7/8	1.90	2 11/16	1.61
2	6 1/2	7/8	3 5/16	3 5/8	2.38	2 3/4	2.07
2 1/2	7 1/2	1	3 15/16	4 1/8	2.88	3	2.47
3	8 1/4	1 1/8	4 5/8	5	3.50	3 1/8	3.07
4	10	1 1/4	5 3/4	6 3/16	4.50	3 3/8	4.03
5	11	1 3/8	7	7 5/16	5.56	3 7/8	5.05
6	12 1/2	1 7/16	8 1/8	8 1/2	6.63	3 7/8	6.07
8	15	1 5/8	10 1/4	10 5/8	8.63	4 3/8	7.98
10	17 1/2	1 7/8	12 5/8	12 3/4	10.75	4 5/8	10.02
12	20 1/2	2	14 3/4	15	12.75	5 1/8	12.00

FORGING reserve the right to introduce modification in the interests of technical progress.  
For dimensional tolerances and bevel details see pages 11 and 12  
The 1.16" raised face is included in thickness t and length Tw.



## Hexagon Head Bolts and nuts



### واشر لاستیکی منجیددار

واشرها از نوع لاستیکی، منجیددار و ابعاد و ضخامت بر اساس استاندارد DIN 2690 تولید می‌شود. این نوع واشر مختص خطوط انتقال آب و برای آب بندی بین دو فلنج با مترتال DIN 3771 ساخته می‌شوند. منجید داخل مانع از گسیختگی و خروج واشر از بین دو فلنج می‌گردد.

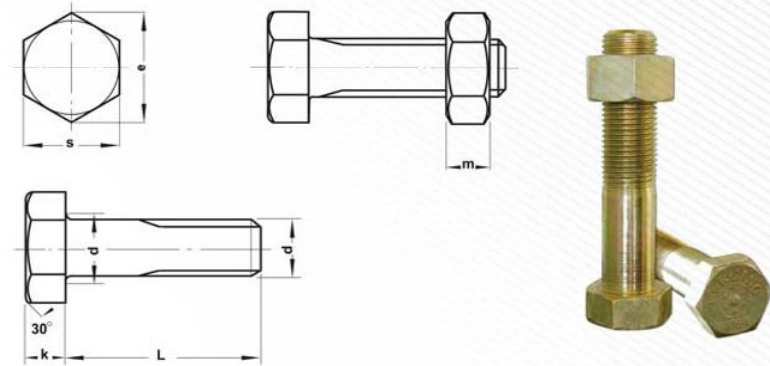
### پیچ و مهره

پیچ و مهره‌ها جهت اتصال کلیه فلنج‌ها و شیرآلات خط لوله، با قطر و طول مناسب، طبق استاندارد از قطر ۱۶ الی ۷۲ میلیمتر تولید می‌گردند. خواص مکانیکی پیچ و مهره متناسب با فشار و دمای خط انتقال انتخاب می‌شود. کلیه پیچ و مهره‌ها پس از تولید طبق استاندارد ISO 4024 گالوانیزه می‌گردند.



## Hexagon Head Bolts and nuts

DIN-EN 24018  
DIN-EN 24016  
DIN 601  
Grades: 4.6 - 5.8 - 8.8



unit: mm

Size(d)	K	L	S	e	m
m 12	7.5	60	18	20	10
m 14	8.8	70	21	23.36	12
m 16	10	80	24	26.75	13
m 20	12.5	90	30	33.53	16
m 24	15	110	36	39.98	19
m 27	17	120	40	45.2	22
m 30	18.7	130	46	50.85	24
m 33	21	140	50	55.37	26
m 36	22	150	55	60.79	29
m 39	25	160	60	66.44	31
m 45	28	180	70	76.95	36
m 52	33	210	80	88.25	42
m 56	35	250	85	93.56	48
m 64	40	320	95	104.86	51
m 72	45	360	105	116.16	58

FORGING reserve the right to introduce modification in the interests of technical progress.

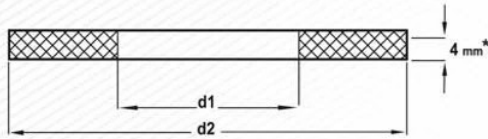


## Sealing for Flanges with Plain Contact Surface

DN 80 - DN 2400  
PN 6 - PN 40

### واشر لاستیکی منجیددار

نوع منجید: ابریشم  
نوع لاستیک: NBR  
مناسب برای فشار کاری ۴۰ تا ۶ پار



Dimensions: DIN 2690 unit: mm

Nominal Width	d1	d2				
		Nominal Pressure (PN)				
		6	10	16	25	40
80	90	132	142	-	-	142
100	115	152	-	162	-	168
125	141	182	-	192	-	195
150	169	207	-	218	-	225
175	195	237	-	248	255	267
200	220	262	273	273	285	292
250	274	318	328	330	342	353
300	325	373	378	385	402	418
350	368	423	438	445	453	475
400	420	473	490	497	515	547
450	470	528	540	557	565	572
500	520	578	595	618	625	628
600	620	680	695	735	730	745
700	720	785	810	805	830	850
800	820	890	915	910	940	970
900	920	990	1015	1010	1040	1060
1000	1020	1090	1120	1125	1150	1190
1200	1220	1305	1340	1340	1360	1395
1400	1420	1520	1545	1540	1575	1615
1600	1620	1720	1770	1760	1795	1830
1800	1820	1930	1970	1960	2000	-
2000	2020	2135	2180	2165	2200	-
2200	2220	2345	2380	2375	-	-
2400	2420	2555	2590	2585	-	-

FORGING reserve the right to introduce modification in the interests of technical progress.  
(\*Smaller thicknesses may be agreed when ordering)

## Dimensional Tolerances

ISO 7005-1  
ANSI B16.5

ISO 7005-1 unit: mm

Plain flang and blind		
Outside diameter	Not specified but the minimum shall provide a sufficient bearing area for the nut-or bolt-head.	
Facing diameter	<DN 250	+2 -1
	>DN 300	+3 -1
Facing height	For all sizes 1 minimum	
Diameter of bolt circle	bolt sizes M 10 to M 24	±1
	bolt sizes M 27 to M 33	±1.25
	bolt sizes M 36 to M 52	±1.5
	bolt sizes M 56 to M 95	±2
Diameter of bolt hole	< 20	+0.5 -0
	> 20	+1 -0
Flange thickness	± (2 + 0.05b)	

ANSI B16.5 unit: inch

Welding Neck and blind		
Outside diameter	When O.D is 24" or Less	±1/16" (1.6mm)
	When O.D is over 24	±1/8" (3.2mm)
Inside diameter	10" and smaller	±1/32" (0.8mm)
	12" thru 18"	±1/16" (1.6mm)
	20" and Larger	+1/8" (3.2mm), -1/16" (3.6mm)
Diameter of contact face	1/16" Raised face	±1/32" (0.8mm)
	1/4" Raised face Tongue & Groove Male, Female	±1/64" (0.4mm)
Diameter of Hub at base	When Hub base is 24" or smaller	±1/16" (1.6mm)
	When Hub base is over 24"	±1/8" (3.2mm)
Diameter of Hub at point of welding	5" and smaller	+3/32" (3.4mm), -1/32" (0.8mm)
	6" and larger	+5/32" (4.0mm), -1/32" (0.8mm)
Drilling	Bolt circle	±1/16" (1.6mm)
	Bolt hole spacing	±1/32" (0.8mm)
	Eccentricity of Bolt circle with respect to facing	2 1/2" & Smaller 1/32" (0.8mm) max 3" & Larger 1/16" (1.6mm) max
	Eccentricity of Bolt circle with respect to Bore	1/32" (0.8mm) max
Thickness	18" and smaller	+1/8" (3.2mm) -0"
	20" and larger	+3/16" (4.8mm) -0"
length thru Hub	10" and smaller	±1/16" (1.6mm)
	12" and larger	±1/8" (3.2mm)



These instructions are prepared in line with the general experience and contain the dimensions for bevel from which in principle satisfy the optimum welding condition. these instruction are applicable to the one-side butt welding with steel tube they are also in prepared on the basis of the general bevel shape of DIN 8551.

In connection with these instructions, refer to the welded sections under the following prerequisites.

**MATERIAL**

Non-alloyed, alloyed or austenite steel.

**WELDING PROCESS**

- Arc weld (E)
- Gas weld (G)
- Gas shielding arc weld (SG)
- Tungsten inert gas weld (TGI)
- Metal insert gas weld (MIG)

**AUXILIARY WORK**

According to din 1913, din 8554 and so on, which should be suitable to the specified materials and welding process.

**WELDING WORK**

One-side, hand welding

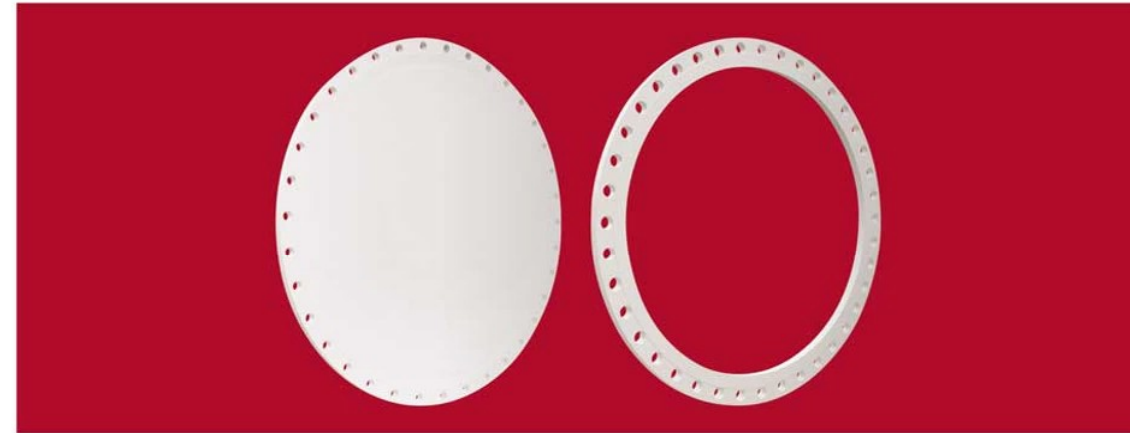
**WELDING POSITION**

All position (W,h,s,f,q,u according to DIN 1912, section 1 Above all, the weld in the fixed position (without rotation of pipe).

unit: mm

No.	Wall thickness	De-Description	Symbol for shape 1)	Welding bevel drawing	$\alpha$ Angle (degree)2)	$\beta$	Space for Weiding b	Longitudinal space for welding c	Pipe wall thickness h	Recommended weld process		Remarks
										Root position for welding	Other position for welding	
1	Up to 16	1-shape weld			-	-	0 to 3	-	-	E, SG, MIG, G for austenite steel	G (up 6mm for welding of class III Conforming to DIN 1912 Section 1)	
2	Up to 16	V-shape weld	V		60	-	0 to 4	-	-			
3	12 and over	U-shape weld	U		-	10	0 to 3	2	-			
4	12 and over	UV-shape weld	UV		30	10	0 to 4	4	-	Only E and MIG		
5	Up to 16	W-shape weld	W		35	6	0 to 2	6	E			

1. For possible additional marks, refer to DIN 1912  
2. The indicated dimensions are applicable to the specified condition



**FORGING**

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