

TOLERANCES FOR BW FITTINGS

对焊管件的公差
TOLERANCES FOR BW FITTINGS

公称尺寸 Nominal Size		所有管件 ¹⁾²⁾ All Fittings		45°、90° 弯头、三通、四通 45° & 90° Elbows & Tees, Crosses	3D弯头 3D Radius Elbows	180°弯头 Returns			管帽 Caps	异径管、翻边短节 Reducers & Lap Joint Stub Ends	翻边短节 Lap Joint Stub Ends		
DN	NPS	OD ³⁾⁴⁾	ID ³⁾	A、B、C、M、	A、B	O	K	U	E、E ₁	H、F	G	R	t
15-65	1/2 -2 1/2	+1.6 -0.8	± 0.8	± 2	± 3	± 6	± 6	± 1	± 3	± 2	0 -1	0 -1	+1.6 0
80-90	3-3 1/2	± 1.6	± 1.6	± 2	± 3	± 6	± 6	± 1	± 3	± 2	0 -1	0 -1	+1.6 0
100	4	± 1.6	± 1.6	± 2	± 3	± 6	± 6	± 1	± 3	± 2	0 -1	0 -2	+1.6 0
125-200	5-8	+2.4 -1.6	± 1.6	± 2	± 3	± 6	± 6	± 1	± 6	± 2	0 -1	0 -2	+1.6 0
250-450	10-18	+4.0 -3.2	± 3.2	± 2	± 3	± 10	± 6	± 2	± 6	± 2	0 -2	0 -2	+3.2 0
500-600	20-24	+6.4 -4.8	± 4.8	± 2	± 3	± 10	± 6	± 2	± 6	± 2	0 -2	0 -2	+3.2 0
650-750	26-30	+6.4 -4.8	± 4.8	± 3	± 6	---	---	---	± 10	± 5	---	---	---
800-1200	32-48	+6.4 -4.8	± 4.8	± 5	± 6	---	---	---	± 10	± 5	---	---	---
1300-1500	52-60	+6.4 -4.8	± 4.8	± 5	---	---	---	---	---	---	---	---	---
1600-1700	64-68	+6.4 -4.8	± 4.8	± 5	---	---	---	---	---	---	---	---	---
1800-2000	72-80	+6.4 -4.8	± 4.8	± 5	---	---	---	---	---	---	---	---	---

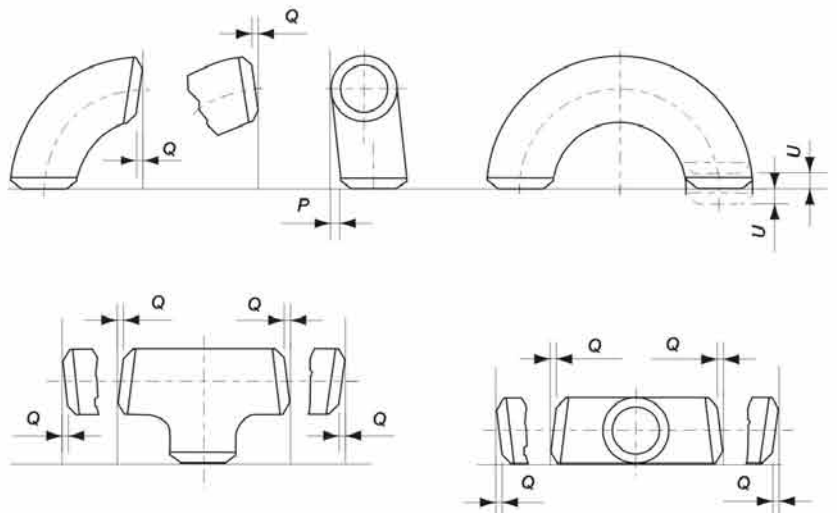
注释:

- 1) 端部内径和公称壁厚由采购方指定。
- 2) 如采购方未规定壁厚公差, 则适用87.5%的最小壁厚。
- 3) 圆度为正负偏差绝对值之和。
- 4) 当需要增加壁厚以满足设计要求时, 该项公差可超过表列值。

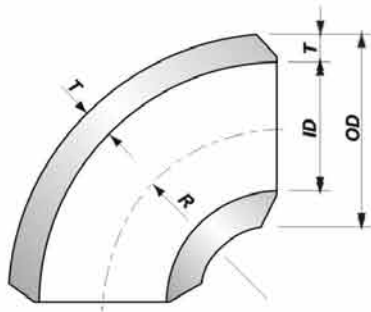
Note:

- 1) The inside diameter and the nominal wall thickness shall be specified by purchaser.
- 2) If purchaser doesn't specify the thickness tolerance, 87.5% of the nominal thickness shall be the min. thickness.
- 3) Out of-roundness is the sum of absolute values of plus and minus tolerance.
- 4) When the wall thickness needs increasing to meet the design requirement, the tolerance may exceed the ones indicated in the above list.

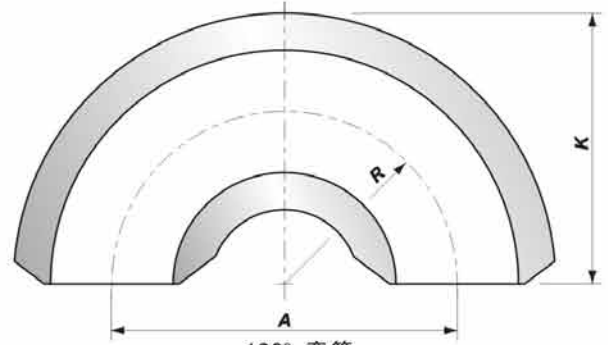
公称尺寸 Nominal Size		Q	P
DN	NPS		
15-100	1/2 - 4	1	2
125-200	5-8	2	4
250-300	10-12	3	5
350-400	14-16	3	6
450-600	18-24	4	10
650-750	26-30	5	10
800-1050	32-42	5	13
1100-1200	44-48	5	19
1300-2000	50-80	5	19



RETURN BENDS & ELBOWS



90° 弯头
90° Elbow



180° 弯管
Return Bend

SH/T 3065 石油化工管式炉急弯弯管

SH/T 3065 RETURN BENDS & ELBOWS OF TUBULAR HEATER IN PETROCHEMICAL INDUSTRY

项目 Item	内容 Content
材料 Material	碳素钢、合金钢、不锈钢 Carbon steel, Alloy steel, Stainless steel
90° 弯头弯曲半径R Bending radius(90° Elbow)	按设计文件规定 Specified according to the design documentation.
180° 弯管中心距离A Center to center(Return Bend)	按设计文件规定 Specified according to the design documentation.
壁厚 T Wall thickness	按设计文件规定 Specified according to the design documentation.
端部坡口 Bevel at ends	按对焊管件端部坡口型式；或按设计文件规定 According to the bevel ends of BW fittings or the specification of design documentation.

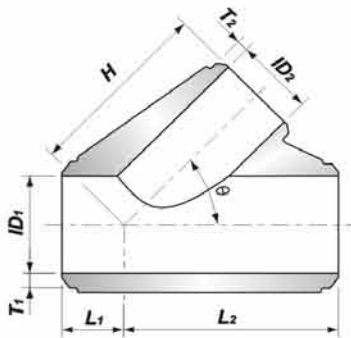
急弯弯头的公差

TOLERANCES FOR RETURN BENDS & ELBOWS

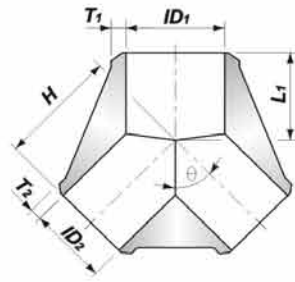
项目 Item	OD ≤ 76		OD=89 ~ 127		OD=141 ~ 193		OD=219 ~ 237	
	90°	180°	90°	180°	90°	180°	90°	180°
OD	+1.50 -0.75	+1.50 -0.75	±1.50	±1.50	+2.00 -0.75	+2.00 -1.50	+2.00 -1.50	+2.00 -1.50
ID	±0.75	±0.75	±1.50	±1.50	±1.50	±1.50	±1.50	±1.50
R	±1.00	-	±1.50	-	±2.00	-	±2.00	-
A	-	±2.00	-	±2.50	-	±2.50	-	±3.00
K	-	+6.00	-	+6.00	-	+6.00	-	+6.00
U	-	±1.00	-	±1.00	-	±1.00	-	±2.00
P	1.50	2.00	1.50	2.00	3.00	4.00	3.00	4.00
Q		0.75				1.50		

T -12.5% T;对于设计文件规定T为最小壁厚的急弯弯管, T的负偏差为零。
-12.5% T ;if T is the min.one,the minus tolerance shall be zero.

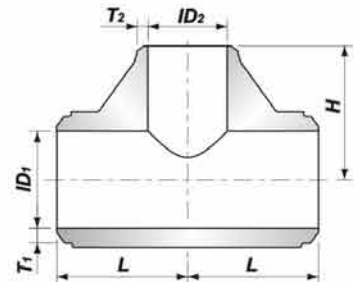
FORGED LARGE SIZE TEES



锻制45°三通
Forged Lateral 45° Tee



锻制Y型三通
Forged WYE



锻制T型三通
Forged Tee

大直径锻制三通
FORGED LARGE SIZE TEES

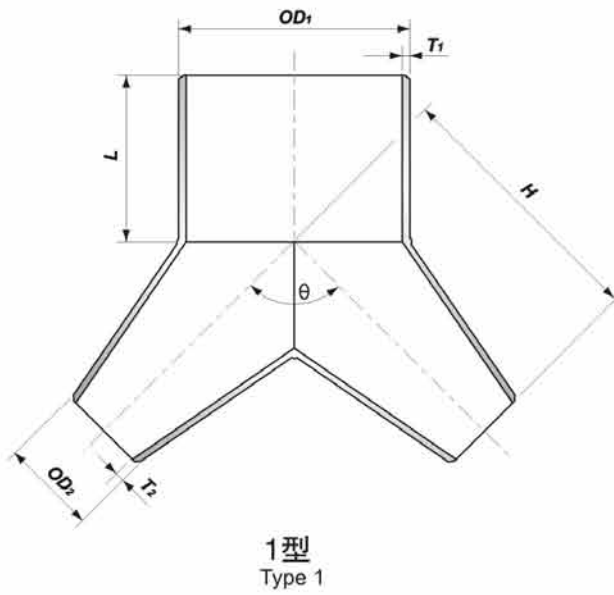
项目 Item	内容 Content
标准 Standard	JB 4726~ 4728压力容器用钢锻件 JB 4726~ 4728 Steel forgings for pressure vessels DL 473 大直径三通锻件技术条件 DL 473 Standard specification for large size tees. ASTM A105 管道元件用碳钢锻件 ASTM A105 Standard Specification for Carbon Steel Forgings for Piping Applications ASTM A182 高温用锻件或轧制合金钢和不锈钢管法兰、锻制管件、阀门和零件 ASTM A182 Standard Specification for Forged or Rolled Alloy and Stainless Steel Pipe Flanges, Forged Fittings, and Valves and Parts for High-Temperature Service ASTM A336 高温承压件用合金钢锻件 ASTM A336 Standard Specification for Alloy Steel Forgings for Pressure and High-Temperature Parts ASTM A965 高温承压件用奥氏体钢锻件 ASTM A965 Standard Specification for Austenitic Steel Forgings for Pressure and High Temperature Parts
制造工艺 Fabrication Process	采用锻件镗孔、热处理、超声波检测和精加工成形的工艺制造 Using the processes of forging boring, heat treatment, ultrasonic examination and finishing.
材料 Material	碳素钢、合金钢、不锈钢 Carbon steel, Alloy steel, Stainless steel
尺寸 Size	按设计文件规定；或制造商与采购方协商确定 Per the specification of design documentation or the agreement between manufacturer and purchaser.
公差 Tolerance	按对焊管件公差执行；或按设计文件规定 Per the tolerance of BW fittings or the specification of design documentation.
端部坡口 Bevelends	按对焊管件端部坡口型式；或按设计文件规定 Per the bevel ends of BW fittings or specification of design documentation.

注释:

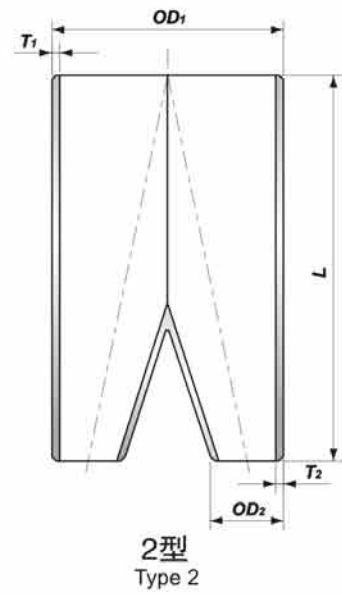
- 1) 除图示形状外，还可以按采购文件规定的形状制造。
- 2) 确定产品形状和尺寸的通常作法如下：
 - a) 由采购方提供制造图纸，制造商按提供的图纸制造。
 - b) 由采购方提出需要的形状、外径、壁厚和夹角等技术要求，由制造商提供制造图纸，经采购方批准后制造。

Note:

- 1) Besides the above figures, others can also be manufactured per the purchase specification..
- 2) Generally, the figures and the sizes will be specified per the following:
 - a) Purchaser provides the drawings and manufacturer will fabricate them accordingly.
 - b) Per the provided specifications by purchasers such as figures, outside diameters, wall thicknesses, angels and etc, manufacturer provides the drawings for purchaser' s review, then manufacture after approval.



1型
Type 1



2型
Type 2

钢板制Y型三通 WYE MADE UP OF STEEL PLATES

项目 Item	内容 Content
成形工艺 Forming Process	采用钢板下料、卷制和焊接的成形工艺制造 Using the processes of cutting steel plate, rolling and welding.
材料 Material	碳素钢、合金钢、不锈钢 Carbon steel, Alloy steel, Stainless steel
结构长度L Structure length	按设计文件规定；或制造商与采购方协商确定 According to the specification of design documentation or the agreement between manufacturer and purchaser.
外径OD Outside Diameter	按设计文件规定 According to the specification of design documentation.
夹角θ Included Angle	按设计文件规定 According to the specification of design documentation.
壁厚T Thickness	按设计文件规定 According to the specification of design documentation.
公差 Tolerance	按对焊管件公差执行；或按设计文件规定 According to the tolerance of BW fittings or the specification of design documentation.
端部坡口 Bevel at ends	按对焊管件端部坡口型式；或按设计文件规定 According to the bevel ends of BW fittings or specification of design documentation.

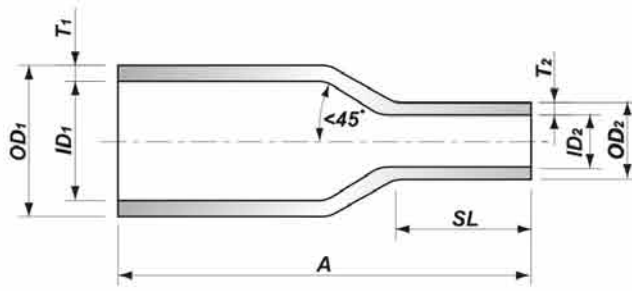
注释：

- 1) 除图示形状外，还可按采购文件规定的形状制造。
- 2) 确定产品形状和尺寸的通常作法如下：
 - a) 由采购方提供制造图纸，制造商按提供的图纸制造。
 - b) 由采购方提出需要的形状、外径、壁厚和夹角等技术要求，由制造商提供制造图纸，经采购方批准后制造。

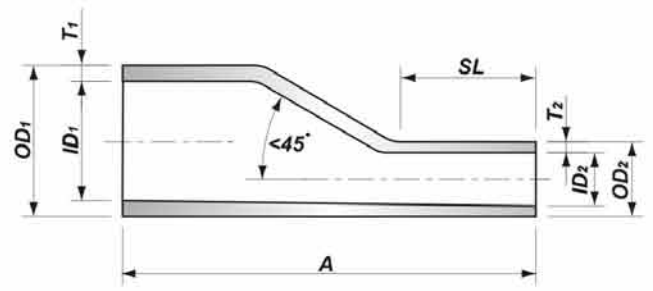
Note:

- 1) Besides the above figures, others can also be manufactured per the purchase specification..
- 2) Generally, the figures and the sizes will be specified per the following:
 - a) Purchaser provides the drawings and manufacturer will fabricate them accordingly.
 - b) Per the provided specifications by purchaser such as figures, outside diameters, wall thicknesses, angles and etc, manufacturer provides the drawings for purchaser's review, then manufacture after approval.

SWAGED NIPPLES



同心异径短节
Concentric Swaged Nipple



偏心异径短节
Eccentric Swaged Nipple

MSS SP-95、SH/T 3419

公称尺寸 Nominal Size		端部外径 OD at End	小端长度 Length of Small End	端面至 端面 End to End
DN	NPS	OD ₁ X OD ₂	SL _{min}	A
8 × 6	1/4 × 1/8	13.7 × 10.3	20	57
10 × 6	3/8 × 1/8	17.1 × 10.3	20	64
10 × 8	3/8 × 1/4	17.1 × 13.7	20	
15 × 6	1/2 × 1/8	21.3 × 10.3	20	70
15 × 8	1/2 × 1/4	21.3 × 13.7	20	
15 × 10	1/2 × 3/8	21.3 × 17.1	20	
20 × 6	3/4 × 1/8	26.7 × 10.3	20	76
20 × 8	3/4 × 1/4	26.7 × 13.7	20	
20 × 10	3/4 × 3/8	26.7 × 17.1	22	
20 × 15	3/4 × 1/2	26.7 × 21.3	22	
25 × 6	1 × 1/8	33.4 × 10.3	20	89
25 × 8	1 × 1/4	33.4 × 13.7	20	
25 × 10	1 × 3/8	33.4 × 17.1	22	
25 × 15	1 × 1/2	33.4 × 21.3	22	
25 × 20	1 × 3/4	33.4 × 26.7	22	
32 × 6	1 1/4 × 1/8	42.2 × 10.3	20	
32 × 8	1 1/4 × 1/4	42.2 × 13.7	20	
32 × 10	1 1/4 × 3/8	42.2 × 17.1	22	
32 × 15	1 1/4 × 1/2	42.2 × 21.3	22	
32 × 20	1 1/4 × 3/4	42.2 × 26.7	25	
32 × 25	1 1/4 × 1	42.2 × 33.4	25	
40 × 6	1 1/2 × 1/8	48.3 × 10.3	20	114
40 × 8	1 1/2 × 1/4	48.3 × 13.7	20	
40 × 10	1 1/2 × 3/8	48.3 × 17.1	22	
40 × 15	1 1/2 × 1/2	48.3 × 21.3	25	
40 × 20	1 1/2 × 3/4	48.3 × 26.7	25	
40 × 25	1 1/2 × 1	48.3 × 33.4	25	
40 × 32	1 1/2 × 1 1/4	48.3 × 42.2	25	
50 × 6	2 × 1/8	60.3 × 10.3	20	
50 × 8	2 × 1/4	60.3 × 13.7	22	
50 × 10	2 × 3/8	60.3 × 17.1	22	
50 × 15	2 × 1/2	60.3 × 21.3	25	
50 × 20	2 × 3/4	60.3 × 26.7	30	
50 × 25	2 × 1	60.3 × 33.4	30	
50 × 32	2 × 1 1/4	60.3 × 42.2	30	
50 × 40	2 × 1 1/2	60.3 × 48.3	30	

公称尺寸 Nominal Size		端部外径 OD at End	小端长度 Length of Small End	端面至 端面 End to End	
DN	NPS	OD ₁ X OD ₂	SL _{min}	A	
65 × 6	2 1/2 × 1/8	73.0 × 10.3	22	178	
65 × 8	2 1/2 × 1/4	73.0 × 13.7	22		
65 × 10	2 1/2 × 3/8	73.0 × 17.1	22		
65 × 15	2 1/2 × 1/2	73.0 × 21.3	25		
65 × 20	2 1/2 × 3/4	73.0 × 26.7	25		
65 × 25	2 1/2 × 1	73.0 × 33.4	30		
65 × 32	2 1/2 × 1 1/4	73.0 × 42.2	30		
65 × 40	2 1/2 × 1 1/2	73.0 × 48.3	40		
65 × 50	2 1/2 × 2	73.0 × 60.3	40		
80 × 6	3 × 1/8	88.9 × 10.3	22		203
80 × 8	3 × 1/4	88.9 × 13.7	22		
80 × 10	3 × 3/8	88.9 × 17.1	22		
80 × 15	3 × 1/2	88.9 × 21.3	25		
80 × 20	3 × 3/4	88.9 × 26.7	25		
80 × 25	3 × 1	88.9 × 33.4	30		
80 × 32	3 × 1 1/4	88.9 × 42.2	30		
80 × 40	3 × 1 1/2	88.9 × 48.3	40		
80 × 50	3 × 2	88.9 × 60.3	40		
80 × 65	3 × 2 1/2	88.9 × 73.0	40		
90 × 6	3 1/2 × 1/8	101.6 × 10.3	22	203	
90 × 8	3 1/2 × 1/4	101.6 × 13.7	22		
90 × 10	3 1/2 × 3/8	101.6 × 17.1	22		
90 × 15	3 1/2 × 1/2	101.6 × 21.3	25		
90 × 20	3 1/2 × 3/4	101.6 × 26.7	25		
90 × 25	3 1/2 × 1	101.6 × 33.4	30		
90 × 32	3 1/2 × 1 1/4	101.6 × 42.2	30		
90 × 40	3 1/2 × 1 1/2	101.6 × 48.3	40		
90 × 50	3 1/2 × 2	101.6 × 60.3	40		
90 × 65	3 1/2 × 2 1/2	101.6 × 73.0	40		
90 × 80	3 1/2 × 3	101.6 × 88.9	40		
100 × 8	4 × 1/4	114.3 × 13.7	25		229
100 × 10	4 × 3/8	114.3 × 17.1	25		
100 × 15	4 × 1/2	114.3 × 21.3	25		
100 × 20	4 × 3/4	114.3 × 26.7	30		
100 × 25	4 × 1	114.3 × 33.4	30		
100 × 32	4 × 1 1/4	114.3 × 42.2	40		

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SWAGED NIPPLES

异径短节 SWAGED NIPPLES

公称尺寸 Nominal Size		端部外径 OD at End	小端长度 Length of Small End	端面至 端面 End to End	公称尺寸 Nominal Size		端部外径 OD at End	小端长度 Length of Small End	端面至 端面 End to End	
DN	NPS	OD ₁ × OD ₂	SL _{min}	A	DN	NPS	OD ₁ × OD ₂	SL _{min}	A	
100 × 40	4 × 1 1/2	114.3 × 48.3	40	229	200 × 25	8 × 1	219.1 × 33.4	40	330	
100 × 50	4 × 2	114.3 × 60.3	45		200 × 32	8 × 1 1/4	219.1 × 42.2	40		
100 × 65	4 × 2 1/2	114.3 × 73.0	45		200 × 40	8 × 1 1/2	219.1 × 48.3	45		
100 × 80	4 × 3	114.3 × 88.9	45		200 × 50	8 × 2	219.1 × 60.3	45		
100 × 90	4 × 3 1/2	114.3 × 101.6	45		200 × 65	8 × 2 1/2	219.1 × 73.0	45		
					200 × 80	8 × 3	219.1 × 88.9	50		
				200 × 90	8 × 3 1/2	219.1 × 101.6	50			
				200 × 100	8 × 4	219.1 × 114.3	50			
125 × 8	5 × 1/4	141.3 × 13.7	25	279	200 × 125	8 × 5	219.1 × 141.3	60		
125 × 10	5 × 3/8	141.3 × 17.1	25		200 × 150	8 × 6	219.1 × 168.3	60		
125 × 15	5 × 1/2	141.3 × 21.3	25							
125 × 20	5 × 3/4	141.3 × 26.7	30							
125 × 25	5 × 1	141.3 × 33.4	30							
125 × 32	5 × 1 1/4	141.3 × 42.2	40							
125 × 40	5 × 1 1/2	141.3 × 48.3	40			250 × 50	10 × 2	273.0 × 60.3	45	381
125 × 50	5 × 2	141.3 × 60.3	45			250 × 65	10 × 2 1/2	273.0 × 73.0	45	
125 × 65	5 × 2 1/2	141.3 × 73.0	45			250 × 80	10 × 3	273.0 × 88.9	50	
125 × 80	5 × 3	141.3 × 88.9	45			250 × 90	10 × 3 1/2	273.0 × 101.6	50	
125 × 90	5 × 3 1/2	141.3 × 101.6	45			250 × 100	10 × 4	273.0 × 114.3	60	
125 × 100	5 × 4	141.3 × 114.3	50			250 × 125	10 × 5	273.0 × 141.3	60	
					250 × 150	10 × 6	273.0 × 168.3	65		
					250 × 200	10 × 8	273.0 × 219.1	65		
150 × 15	6 × 1/2	168.3 × 21.3	30	304	300 × 50	12 × 2	323.8 × 60.3	50	406	
150 × 20	6 × 3/4	168.3 × 26.7	30		300 × 65	12 × 2 1/2	323.8 × 73.0	50		
150 × 25	6 × 1	168.3 × 33.4	40		300 × 80	12 × 3	323.8 × 88.9	60		
150 × 32	6 × 1 1/4	168.3 × 42.2	40		300 × 90	12 × 3 1/2	323.8 × 101.6	60		
150 × 40	6 × 1 1/2	168.3 × 48.3	45		300 × 100	12 × 4	323.8 × 114.3	65		
150 × 50	6 × 2	168.3 × 60.3	45		300 × 125	12 × 5	323.8 × 141.3	65		
150 × 65	6 × 2 1/2	168.3 × 73.0	45		300 × 150	12 × 6	323.8 × 168.3	65		
150 × 80	6 × 3	168.3 × 88.9	45		300 × 200	12 × 8	323.8 × 219.1	70		
150 × 90	6 × 3 1/2	168.3 × 101.6	50		300 × 250	12 × 10	323.8 × 273.0	70		
150 × 100	6 × 4	168.3 × 114.3	50							
150 × 125	6 × 5	168.3 × 141.3	60							

注释:

1) 当按SH/T 3419标准订货时, 其外径应使用SH/T 3405 《石油化工企业钢管外径系列》中规定的外径。

Note:

1) If ordering per SH/T 3419, the outside diameter specified in SH/T 3405 《tube outside diameter in petrochemical industry》 shall be applied.

异径短节的公差

TOLERANCES OF SWAGED NIPPLES

公称尺寸 Nominal Size		端部外径 OD at End	端部内径 ID at End	端面至端面 End to End	壁厚 Wall
DN	NPS	OD		A	T
		平口端部 Plain End	其它端部 Other Ends		
6 ~ 10	1/8~ 3/8	+0.4 -0.8	±0.8	±0.8	不小于公称 壁厚的87.5% Not less than 87.5% Nominal Wall Thickness
15 ~ 40	1/2 ~ 1 1/2	+0.4 -0.8	±1.6 -0.8	±0.8	
50 ~ 65	2 ~ 2 1/2	±0.8	±1.6 -0.8	±0.8	
80 ~ 100	3 ~ 4	±0.8	±1.6	±1.6	
125 ~ 150	5 ~ 6	+2.4 -1.6	+2.4 -1.6	±1.6	
200 ~ 300	8 ~ 12	+4.0 -3.2	+4.0 -3.2	±3.2	