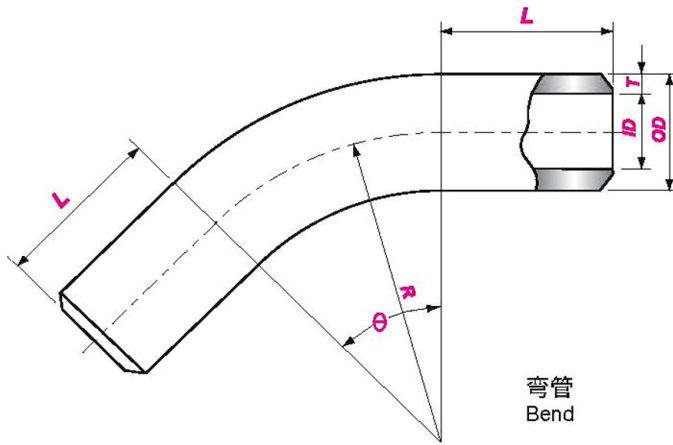


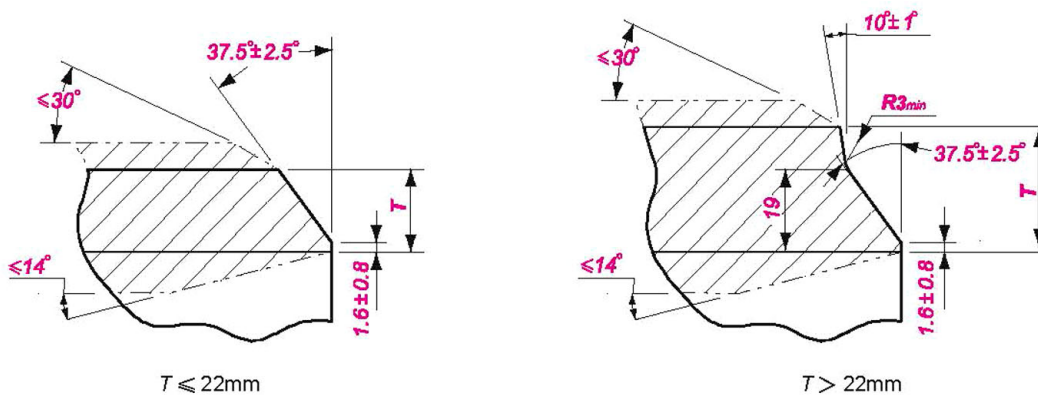
# INDUCTION BEND



项目 Item	内容 Content
标准 Standard	DL/T 515 《电站弯管》、SY/T 5257 《油气输送用钢制弯管》、ASME B16.49 《用于输送和分配的管道系统中的工厂制造的钢制感应弯管》或采购文件规定 DL/T 515 Pipe Bends for Power Station, SY/T 5257 Steel Bend for Oil and Gas Transmission, ASME B16.49 Factory-Made Wrought Steel Induction Bends for Transportation and Distribution Systems and or purchasing specification
材料 Material	碳素钢、合金钢、不锈钢 Carbon Steel, Alloy Steel, Stainless Steel
弯曲半径 $R$ Bend Radius	$R \geq 3OD$ ( $OD$ 为管子外径) $R \geq 3OD$ ( $OD$ is outside diameter of pipe)
弯曲角度 $\theta$ Bend Angle	按设计文件规定 According to the specification of design documentation.
直段长度 $L$ Straight Length	按标准或设计文件规定的长度；或两端直段长度为 500 mm Per standard or specified length in the design documentation, or both straight lengths are 500mm.
外径 $OD$ Outside Diameter	$OD \leq 1220\text{mm}$
壁厚 $T$ Wall Thickness	按设计文件规定 According to 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 per specification of design documentation.

## 对焊管件端部坡口型式

### BEVEL ENDS OF BW FITTINGS



注释:

1) 图示为对焊管件常用的端部焊接坡口型式。当采购文件对端部坡口有另外规定时, 按采购文件规定的型式加工。

Note:

1) The general bevel ends are as the above. If specially required, the purchase specification shall be performed.

# INDUCTION BEND

## Hot Formed Induction Bends

ASTM A105, A182F ASTM A234, WPA, WPB, WPC,

WPI, WP5, WP7, WP11, WP12, WP91 A 4210 WPL3,

WPL6, A403 WP 304/304L/316/316L/321/347

DIN & EN:

Stainless Steel 1.4306, 1.4301, 1.4541, 1.4571, 1.4404, 1.4435

Carbon Steel: S235JR, C20, ST35.0, ST37.0, ST45.8, ST55, CK45.St52

Alloy Steel: 16Mn, Cr5Mo, Cr9Mo, 12Cr1MoV, 15mo3, 10crmo910

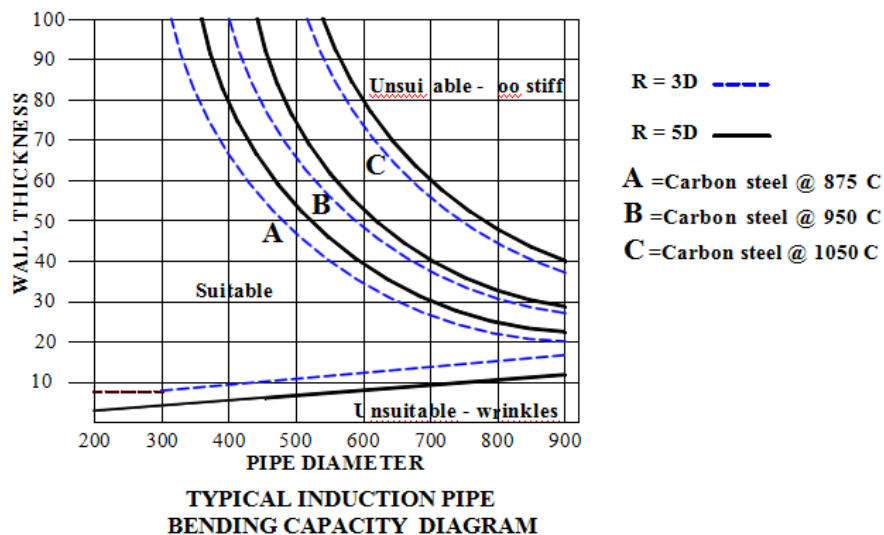
Dimensions:

ANSI B16.11, B16.9, B16.28, B2.1 NPT, MSS-SP-43, MSS SP-48, SP97, B36.10, DIN2605-2619, BS, JIS

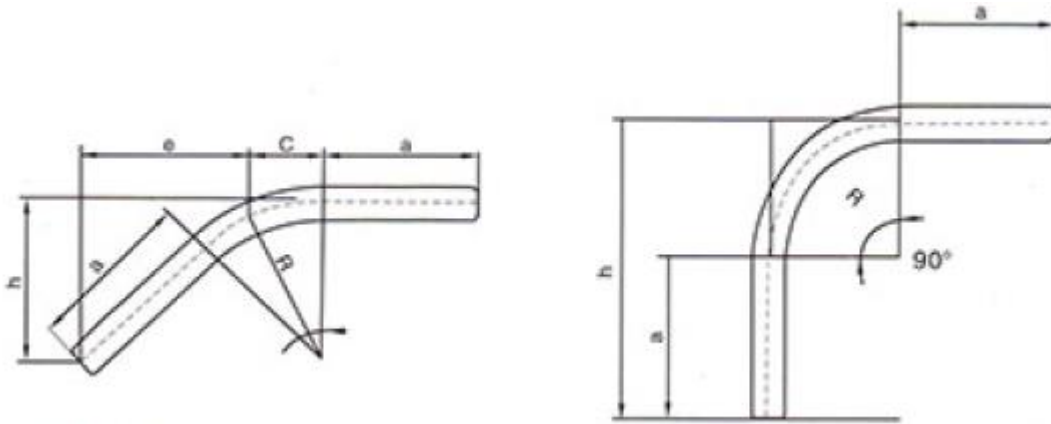


## MATERIAL OF CONSTRUCTIONS FOR HOT INDUCTION BENDS Typical Applicable Materials

Carbon Steel			
SA/A106 Gr.B	SA/A106 Gr. C	SA/A516 70N	SA/A53 Gr.A
SA/A53 Gr.B	SA/A53 Gr.C	STPG 370	API 5L
Alloy Steel			
SA/A335 P92	SA/A335 P91	SA/A335 P22	SA/A335 P12
SA/A335 P11	SM490	SM520	
Stainless Steel			
SA/A312 TP304 (L)	SA/A312 TP316 (L)	SA/A312 TP347	SA/A790 S31803
SA/A790 32750	SA/A358		
TMCP (Thermo Mechanical Control Process) Steel			
API 5L X42	API 5L X46	API 5L X 52	API 5L X 56
API 5LX60	API 5LX65	API 5L X 70	API 5L A
API 5LB	EN 10225 S335G1	EN10225 SA420G1	EN10225 S460G2

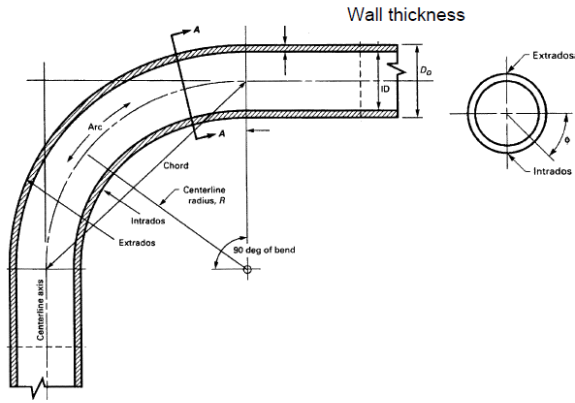


# INDUCTION BEND



弯管 (内径控制管) Pipe bend (inner dia-meter control pipe) $R = 1.5 \cdot OD$ 技术指标 technical specification B-1/1														
公称外径 (上限) Nominal outer diameter (upper limit)	Straight section length a	Bending radius R	15°			30°			45°		60°			90°
			c	e	h	c	e	h	c	e=h	c	e	h	h
194	500	290	38	520	139	78	500	408	120	438	167	334	578	790
219	500	330	43	525	141	88	510	416	137	450	191	345	598	830
245	500	370	49	530	142	99	519	424	153	462	214	357	618	870
273	500	410	54	535	143	110	528	431	170	474	237	368	638	910
325	800	490	65	835	224	131	807	659	203	709	283	541	938	1290
377	800	570	75	845	226	153	825	674	236	733	329	565	978	1370
406	800	610	80	850	228	163	834	681	253	744	352	576	998	1410
426	800	640	84	854	229	171	841	687	265	753	370	585	1013	1440
457	1200	690	91	1247	334	185	1199	979	286	1051	398	799	1384	1890
480	1200	720	95	1251	335	193	1206	985	298	1059	416	808	1399	1920
508	1200	760	100	1256	336	204	1216	993	315	1071	439	819	1419	1960
530	1200	800	105	1261	338	214	1225	1000	331	1083	462	831	1439	2000
610	1500	920	121	1566	420	247	1513	1235	381	1330	531	1016	1759	2420
630	1500	950	125	1570	421	255	1519	1241	394	1339	548	1024	1774	2450

# INDUCTION BEND



弯管（内径控制管） Pipe bend (inner dia-meter control pipe) $R = 2 * OD$ 技术指标 technical specification B-1/1														
公称外径 (上限) Nominal outer diameter (upper limit)	Straight section length a	Bending radius R	15°			30°			45°		60°			90°
			c	e	h	c	e	h	c	e=h	c	e	h	h
194	500	390	51	533	143	105	524	427	162	468	225	363	628	890
219	500	440	58	539	144	118	535	437	182	482	254	377	653	940
245	500	390	65	545	146	131	547	446	203	497	283	391	678	990
273	500	550	72	553	148	147	561	458	228	515	318	409	708	1050
325	800	650	86	855	229	174	844	689	269	756	375	588	1018	1450
377	800	750	99	868	233	201	867	708	311	785	433	617	1068	1550
406	800	810	107	876	235	217	881	719	336	803	468	634	1098	1610
426	800	850	112	881	236	228	890	727	352	815	491	645	1118	1650
457	1200	910	120	1275	342	244	1250	1021	377	1115	525	863	1494	2110
480	1200	960	126	1281	343	257	1262	1030	398	1130	554	877	1519	2160
508	1200	1020	134	1289	345	273	1276	1042	422	1147	589	894	1549	2220
530	1200	1060	140	1294	347	284	1285	1049	439	1159	612	906	1569	2260
610	1500	1220	161	1604	430	327	1582	1292	505	1418	704	1102	1909	2720
630	1500	1260	166	1609	431	338	1591	1299	522	1430	727	1114	1929	2760

弯管（内径控制管） Pipe bend (inner dia-meter control pipe) $R = 2.5 * OD$ 技术指标 technical specification B-1/1														
公称外径 (上限) Nominal outer diameter (upper limit)	Straight section length a	Bending radius R	15°			30°			45°		60°			90°
			c	e	h	c	e	h	c	e=h	C	e	h	h
194	500	490	65	545	146	131	547	446	203	497	283	391	978	990
219	500	550	72	553	148	147	561	458	228	515	318	409	708	1050
245	500	610	80	561	150	163	575	469	253	532	352	426	738	1110
273	500	680	90	569	153	182	591	482	282	553	393	446	773	1180
325	800	810	107	876	235	217	881	719	336	803	468	634	1098	1610
377	800	940	124	892	239	252	911	744	389	841	543	671	1163	1740
406	800	1020	134	902	242	273	930	759	422	864	589	694	1203	1820
426	800	1070	141	909	244	287	941	768	443	879	618	709	1228	2340
457	1200	1140	150	1304	349	305	1304	1065	472	1182	658	929	1609	2400
480	1200	1200	158	1312	351	322	1318	1076	497	1200	693	946	1639	2470
508	1200	1270	167	1321	354	340	1334	1089	626	1221	733	967	1674	2530
530	1200	1330	175	1328	356	356	1348	1101	551	1238	768	984	1704	3030
610	1500	1530	201	1643	440	410	1654	1351	634	1509	883	1192	2064	3080
630	1500	1580	208	1650	442	423	1666	1360	654	1523	912	1206	2089	1610

# INDUCTION BEND

弯管（内径控制管） Pipe bend (inner dia-meter control pipe) $R = 3*OD$ 技术指标 technical specification B-1/1														
公称外径 (上限) Nominal outer diameter (upper limit)	Straight section length a	Bending radius R	15°			30°			45°		60°			90°
			c	e	h	c	e	h	c	e=h	C	e	h	h
194	500	580	76	557	149	155	568	463	240	523	335	417	723	1080
219	500	660	87	567	152	177	586	479	273	547	381	441	763	1160
245	500	740	97	577	155	196	605	494	307	570	427	464	803	1240
273	500	820	108	587	157	220	623	509	340	594	473	487	843	1320
325	800	980	129	897	240	263	920	751	406	853	566	683	1183	1780
377	800	1130	149	916	246	303	955	780	468	897	652	726	1258	1930
406	800	1220	161	926	249	327	976	797	505	923	704	752	1303	2020
426	800	1280	169	936	251	343	990	808	530	941	739	770	1333	2080
457	1200	1370	180	1333	357	367	1357	1108	567	1250	791	995	1724	2570
480	1200	1440	190	1342	360	386	1373	1121	596	1270	831	1016	1759	2640
508	1200	1520	200	1352	362	407	1392	1137	630	1294	878	1039	1799	2720
530	1200	1590	209	1361	365	426	1408	1150	659	1314	918	1059	1834	2790
610	1500	1830	241	1682	451	490	1724	1407	758	1597	1057	1278	2214	3330
630	1500	1370	249	1689	453	506	1738	1419	783	1614	1091	1296	224	3390

弯管（内径控制管） Pipe bend (inner dia-meter control pipe) $R = 4*OD$ 技术指标 technical specification B-1/1														
公称外径 (上限) Nominal outer diameter (upper limit)	Straight section length a	Bending radius R	15°			30°			45°		60°			90°
			c	e	h	c	e	h	c	e=h	C	e	h	h
194	500	780	103	582	156	209	614	501	323	582	450	475	823	1280
219	500	880	116	595	159	236	637	520	365	611	508	504	873	1380
245	500	980	129	606	163	263	660	539	406	641	566	533	923	1480
273	500	1090	144	622	167	292	686	560	451	673	629	565	978	1590
325	800	1300	171	933	251	348	994	812	538	946	751	775	1343	2100
377	800	1510	199	965	259	405	1043	852	625	1008	872	836	1448	2310
406	800	1620	213	979	262	434	1069	873	671	1040	935	868	1503	2420
426	800	1700	224	989	265	456	1087	888	704	1064	981	891	1543	2500
457	1200	1830	241	1392	373	490	1464	1195	758	1385	1057	1128	1954	3030
480	1200	1920	253	1403	376	514	1485	1212	795	1411	1109	1154	1999	3120
508	1200	2030	267	1417	380	544	1510	1233	841	1443	1172	1186	2054	3230
530	1200	2120	279	1429	383	568	1531	1250	878	1469	1224	1212	2099	3320
610	1500	2440	321	1759	471	654	1865	1523	1011	1775	1409	1454	2519	3940
630	1500	2520	332	1759	474	675	1884	1538	1044	1799	1455	1477	2559	4020





# INDUCTION BEND



Outside Diameter & Wall Thickness  
(ANSI)

ANSI B36.10 & B36.19 Outside Diameter & Wall Thickness

Nom Pipe	OD	Nominal Wall Thickness														
		Sch 5s	Sch 10s	Sch 10s	Sch 20	Sch 30	STD	Sch 40	XS	Sch 60	Sch 80	Sch 100	Sch 120	Sch 140	Sch 160	XXS
1/8	10.3	-	1.24	-	-	-	1.73	1.73	2.41	-	2.41	-	-	-	-	-
1/4	13.7	-	1.65	-	-	-	2.24	2.24	3.02	-	3.02	-	-	-	-	-
3/8	17.1	1.65	1.65	-	-	-	2.31	2.31	3.20	-	3.20	-	-	-	-	-
1/2	21.3	1.65	2.11	-	-	-	2.77	2.77	3.73	-	3.73	-	-	-	-	7.47
3/4	26.7	1.65	2.11	-	-	-	2.87	2.87	3.91	-	3.91	-	-	-	4.78	7.82
1	33.4	1.65	2.77	-	-	-	3.38	3.38	4.55	-	4.55	-	-	-	5.56	9.09
1.1/4	42.2	1.65	2.77	-	-	-	3.56	3.56	4.85	-	4.85	-	-	-	6.35	9.70
1.1/2	48.3	1.65	2.77	-	-	-	3.68	3.69	5.08	-	5.08	-	-	-	6.35	10.15
2	60.3	2.11	2.77	-	-	-	3.91	3.91	5.54	-	5.54	-	-	-	7.14	11.07
2.1/2	73.0	2.11	3.05	-	-	-	5.16	5.16	7.01	-	7.01	-	-	-	8.74	14.02
3	88.9	2.11	3.05	-	-	-	5.49	5.49	7.62	-	7.62	-	-	-	9.53	15.24
3.1/2	101.6	2.11	3.05	-	-	-	5.74	5.74	8.08	-	8.08	-	-	-	11.13	-
4	114.3	2.11	3.05	-	-	-	6.02	6.02	8.56	-	8.56	-	11.13	-	-	17.12
5	141.3	2.77	3.40	-	-	-	6.88	6.88	10.97	-	9.53	-	12.70	-	13.49	18.05
6	168.3	2.77	3.40	-	-	-	7.11	7.11	12.70	-	10.97	-	14.27	-	15.88	21.95
8	219.1	2.77	3.76	-	6.35	7.04	8.18	8.18	12.70	10.31	12.70	15.09	18.26	20.62	18.26	22.23
10	273.1	3.40	4.19	-	6.35	7.80	9.27	9.27	12.70	12.70	15.09	18.26	21.44	25.40	23.01	25.40
12	323.9	3.96	4.57	-	6.35	8.38	9.53	10.31	12.70	14.27	17.48	21.44	25.40	25.58	28.58	25.40
14	355.6	3.96	4.78	6.35	7.92	9.53	9.53	11.13	12.70	15.09	19.05	23.88	27.79	31.75	33.32	-
16	406.4	4.19	4.78	6.35	7.92	9.53	9.53	12.70	12.70	16.66	21.44	26.19	30.99	36.53	35.71	-
18	457	4.19	4.78	6.35	7.92	11.13	9.53	14.27	12.70	19.05	23.83	29.36	34.93	39.67	40.49	-
20	508	4.78	5.54	6.35	9.53	12.70	9.53	15.09	12.70	20.62	26.19	32.54	38.10	44.45	45.24	-
22	559	4.78	5.54	6.35	9.53	12.70	9.53	-	12.70	22.23	28.58	34.93	41.28	47.63	50.01	-
24	610	5.54	6.35	6.35	9.53	12.27	9.53	17.48	12.70	24.61	30.96	38.89	46.20	52.37	53.98	-
26	660	-	-	7.92	12.70	-	9.53	-	12.70	-	-	-	-	-	-	-
28	771	-	-	7.92	12.70	15.88	9.53	-	12.70	-	-	-	-	-	-	-
30	762	6.35	7.92	7.92	12.70	15.88	9.53	-	12.70	-	-	-	-	-	-	-
32	813	-	-	7.92	12.70	15.88	9.53	17.48	12.70	-	-	-	-	-	-	-
34	864	-	-	7.92	12.70	15.88	9.53	17.48	12.70	-	-	-	-	-	-	-
36	914	-	-	7.92	12.70	15.88	9.53	19.05	12.70	-	-	-	-	-	-	-
38	965	-	-	-	-	-	9.53	-	12.70	-	-	-	-	-	-	-
40	1016	-	-	-	-	-	9.53	-	12.70	-	-	-	-	-	-	-
42	1067	-	-	-	-	-	9.53	-	12.70	-	-	-	-	-	-	-
44	1118	-	-	-	-	-	9.53	-	12.70	-	-	-	-	-	-	-
46	1168	-	-	-	-	-	9.53	-	12.70	-	-	-	-	-	-	-
48	1219	-	-	-	-	-	9.53	-	12.70	-	-	-	-	-	-	-