

## BUTT WELDING FITTINGS



### Material commonly used

Steel type	ASTM	Chemical compositions										Mechanical properties				
		C% max	Mn%	P% max	S% max	Si%	Cr%	Mo%	Ni%	Others	R. min. Tensile strength MPa	S. min. Yield strength MPa	A% min. (2"/40) elongation		Impact test KCV (2) J	
													Long.	Trasv.		
Carbon	A.234	WPD (1)	0.30	0.29-1.06	0.050	0.058	0.10 min	-	-	-	-	415	240	30	20	-
		WPC (1)	0.35	0.29-1.06	0.050	0.058	0.10 min	-	-	-	-	485	275	30	20	-
	A.420	WPLG (1)	0.30	0.39-1.06	0.048	0.058	0.10 min	-	-	-	-	415	240	30	16.5	-46.6°C 17,6/13,6
		WPL3	0.20	0.31-0.64	0.050	0.050	0.13-0.37	-	-	3.18-3.82	-	450	240	30	20	-101.1°C 17,6/13,6
Alloy steel	A.234	WP1	0.28	0.30-0.90	0.045	0.045	0.10-0.50	-	0.44-0.65	-	-	380	205	30	20	-
		WP12	0.20	0.30-0.80	0.045	0.045	0.60 max	0.80-1.25	0.44-0.65	-	-	415	205	30	20	-
		WP11	0.20	0.30-0.80	0.040	0.040	0.50-1.00	1.00-1.25	0.44-0.65	-	-	415	205	30	20	-
		WP22	0.15	0.30-0.60	0.040	0.040	0.50 max	1.90-2.60	0.87-1.13	-	-	415	205	30	20	-
		WP5	0.15	0.30-0.60	0.040	0.030	0.50 max	4.00-6.00	0.44-0.65	-	-	415	205	30	20	-
		WP9	0.15	0.30-0.60	0.030	0.030	0.25-1.00	8.00-10.00	0.90-1.10	-	-	415	205	30	20	-
Stainless steel	A.403	WP304	0.08	2.00	0.040	0.030	0.75 max	18.0-20.0	-	8.0-11.0	-	515	205	35	25	-
		WP304L	0.035	2.00	0.040	0.030	0.75 max	18.0-20.0	-	8.0-13.0	-	485	170	35	25	-
		WP304H	0.04-0.10	2.00	0.040	0.030	0.75 max	18.0-20.0	-	8.0-11.0	-	515	205	35	25	-
		WP321	0.08	2.00	0.040	0.030	0.75 max	17.0-20.0	-	9.0-13.0	Ti=5 x c max 0.70%	515	205	35	25	-
		WP321H	0.04-0.10	2.00	0.040	0.030	0.75 max	17.0-20.0	-	9.0-13.0	Ti=4 x c max 0.60%	515	205	35	25	-
		WP316	0.08	2.00	0.040	0.030	0.75 max	16.0-18.0	2.00-3.00	11.0-14.0	-	515	205	35	25	-
		WP316L	0.035	2.00	0.040	0.030	0.75 max	16.0-18.0	2.00-3.00	10.0-15.0	-	485	170	35	25	-
		WP316H	0.04-0.10	2.00	0.040	0.030	0.75 max	16.0-18.0	2.00-3.00	11.0-14.0	-	515	205	35	25	-

- 1) Per each reduction 0.01% carbon below 0.30% an increase of 0.55% manganese above 1.06% will be permitted to a maximum of 1.35%.
- 2) Relative to 10 x 10 specimen.

### Carbon steel - high yield - acc. to MSS-SP-75 for gas pipelines

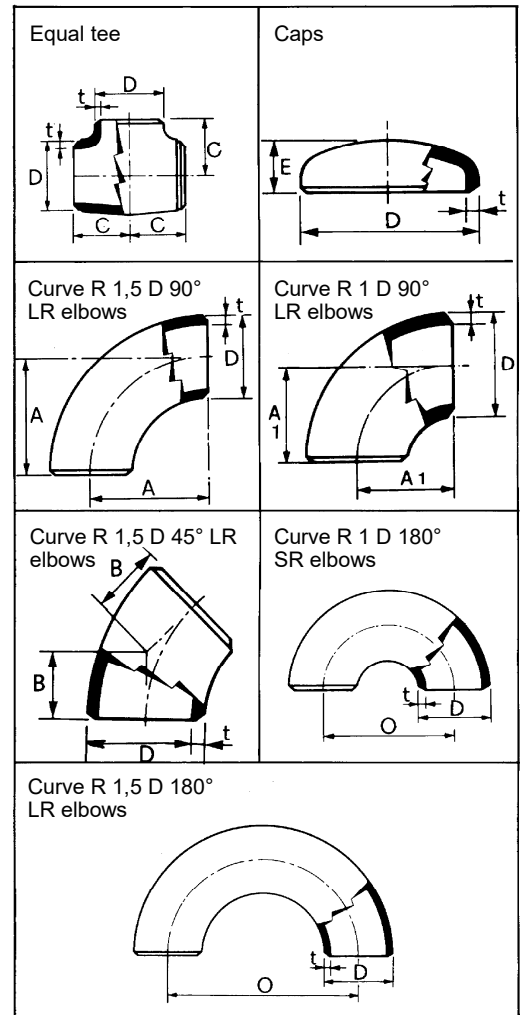
MSS-SP-75 Grade	Chemical compositions											Mechanical properties				
	C%	Mn%	Si%	P%	S%	Cr%	Mo%	Ni%	Cu%	V%	Cb%	R. min. Yield strength MPa	S. min. Yield strength MPa	A% min. (2"/40) Elongation		Impact test KCV (2) J
														Long.	Trasv.	
WPHY42	0.30	1.60	0.35	0.12	0.06	0.25	0.25	1.00	1.50	0.13	0.10	414	289	25	25	KCV -7°C ≥ 50%
WPHY46	0.30	1.60	0.35	0.12	0.06	0.25	0.25	1.00	1.50	0.13	0.10	434	317	25	25	
WPHY52	0.30	1.60	0.35	0.12	0.06	0.25	0.25	1.00	1.50	0.13	0.10	455	358	25	25	
WPHY60	0.30	1.60	0.35	0.12	0.06	0.25	0.25	1.00	1.50	0.13	0.10	517	414	20	20	
WPHY65	0.30	1.60	0.35	0.12	0.06	0.25	0.25	1.00	1.50	0.13	0.10	531	448	20	20	

Fittings on this specification are manufactures and verified in accordance with ANSI B31.1/3/4/8.

### Dimensions according to ANSI B16.9

Nominal pipe Ø	Outside diameter D	Center to face A	Center to face A1	Center to center O	Center to center O1	Center to face B	Height E*		Center to end C-M
							XS ≤	XS >	
1/2"	21	38	19	76	38	16	25	25	25
3/4"	27	29	18	57	36	11	25	25	29
1"	33	38	25	76	51	22	38	38	38
1 1/4"	42	48	32	95	64	25	38	38	48
1 1/2"	48	57	38	114	76	29	38	38	57
2"	60	76	51	152	102	35	38	44	64
2 1/2"	73	95	64	191	127	44	38	51	76
3"	89	114	76	229	152	51	51	64	86
3 1/2"	102	133	89	267	178	57	64	76	95
4"	114	152	102	305	203	64	64	76	105
5"	141	190	127	381	254	79	76	89	124
6"	168	229	152	457	305	95	89	102	143
8"	219	305	203	610	406	127	102	127	178
10"	273	381	254	762	508	159	127	152	216
12"	324	457	305	914	610	190	152	178	254
14"	356	533	356	1067	711	222	165	191	279
16"	406	610	406	1219	813	254	178	203	305
18"	457	686	457	1372	914	286	203	229	343
20"	508	762	508	1524	1016	318	229	254	381
22"	559	838	559	1676	1118	343	254	254	419
24"	610	914	610	1829	1219	381	267	305	432
26"	660	991	660			406	267		495
28"	711	1067	711			438	267		521
30"	762	1143	762			470	267		559
32"	813	1219	813			502	267		597
34"	864	1295	864			533	267		635
36"	914	1372	914			565	267		673
38"	965	1448	965			600	305		711
40"	1016	1524	1016			632	305		749
42"	1067	1600	1067			660	305		762-711
44"	1118	1676	1118			695	343		813-762
46"	1168	1753	1168			727	343		851-800
48"	1219	1829	1219			759	343		889-838

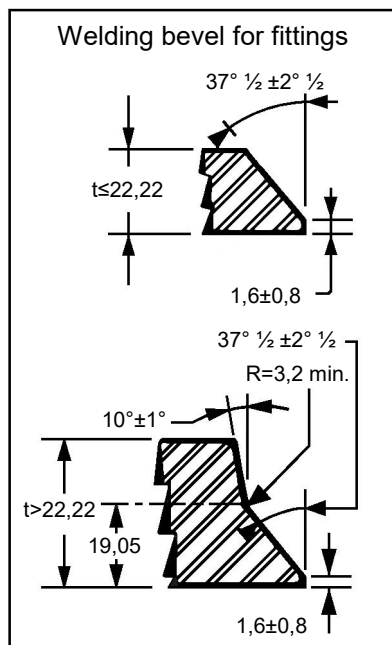
\* The data indicated on the left column is referring to caps with wall thickness = sch. XS. The data indicated on the right column is referring to caps with wall thickness > sch. XS.



Nominal pipe Ø	Outside diameter D	Outside diameter D1	Center to end C	Center to end M	Length H	Nominal pipe Ø	Outside diameter D	Outside diameter D1	Center to end C	Center to end M	Length H	Nominal pipe Ø	Outside diameter D	Outside diameter D1	Center to end C	Center to end M	Length H
3/8x3/8	27	17	29	29	38	5x3	141	89	124	111	127	20x8	508	219	381	324	508
3/8x1/2	27	21	29	29	38	5x3 1/2	141	102	124	114	127	20x10	508	273	381	333	508
1x1/2	33	21	38	38	51	5x4	141	114	124	117	127	20x12	508	324	381	346	508
1x3/4	33	27	38	38	51	6x2 1/2	168	73	143	121	140	20x14	508	356	381	356	508
1 1/4x1	42	21	48	48	51	6x3	168	89	143	124	140	20x16	508	406	381	356	508
1 1/4x3/4	42	27	48	48	51	6x3 1/2	168	102	143	127	140	20x18	508	457	381	368	508
1 1/4x1/2	42	33	48	48	51	6x4	168	114	143	130	140	22x10	559	273	419	359	508
1 1/2x1/2	48	21	57	57	63	6x5	168	141	143	137	140	22x12	559	324	419	371	508
1 1/2x3/4	48	27	57	57	63	8x3 1/2	219	102	178	152	152	22x14	559	356	419	381	508
1 1/2x1	48	33	57	57	63	8x4	219	114	178	156	152	22x16	559	406	419	381	508
1 1/2x1 1/4	48	42	57	57	63	8x5	219	141	178	162	152	22x18	559	457	419	394	508
2x1	60	27	64	44	76	8x6	219	168	178	168	152	22x20	559	508	419	406	508
2x1 1/2	60	33	64	51	76	10x4	273	114	216	184	178	24x10	610	273	432	384	508
2x1 1/4	60	42	64	57	76	10x5	273	141	216	191	178	24x12	610	324	432	397	508
2x1 1/2	60	48	64	60	76	10x6	273	168	216	194	178	24x14	610	356	432	406	508
2 1/4x1	73	33	76	57	89	10x8	273	219	216	203	178	24x16	610	406	432	406	508
2 1/2x1 1/2	73	42	76	64	89	12x5	324	141	254	216	203	24x18	610	457	432	419	508
2 1/2x1 1/4	73	48	76	67	89	12x6	324	168	254	219	203	24x20	610	508	432	432	508
2 1/2x2	73	60	76	70	89	12x8	324	219	254	229	203	24x22	610	559	432	432	508
3x1 1/4	89	42	86	70	89	12x10	324	273	254	241	203	26x18	660	457	495	444	610
3x1 1/2	89	48	86	73	89	14x6	356	168	279	238	330	26x20	660	508	495	457	610
3x2	89	60	86	76	89	14x8	356	219	279	248	330	26x22	660	559	495	470	610
3x2 1/2	89	73	86	83	89	14x10	356	273	279	257	330	26x24	660	610	495	473	610
3 1/2x1 1/2	102	48	95	79	102	14x12	356	324	279	270	330	28x18	711	457	521	470	610
3 1/2x2	102	60	95	83	102	16x6	406	168	305	264	356	28x20	711	508	521	483	610
3 1/2x2 1/2	102	73	95	89	101	16x8	406	219	305	273	356	28x22	711	559	521	495	610
3 1/2x3	102	89	95	92	101	16x10	406	273	305	283	356	28x24	711	610	521	508	610
4x1 1/2	114	48	105	86	102	16x12	406	324	305	295	356	28x26	711	660	521	521	610
4x2	114	60	105	89	102	16x14	406	356	305	305	356	30x18	762	457	559	495	610
4x2 1/2	114	73	105	95	102	18x8	457	219	343	298	381	30x20	762	508	559	508	610
4x3	114	89	105	98	102	18x10	457	273	343	308	381	30x22	762	559	559	521	610
4x3 1/2	114	102	105	102	102	18x12	457	324	343	321	381	30x24	762	610	559	533	610
5x2	141	60	124	105	127	18x14	457	356	343	330	381	30x26	762	660	559	546	610
5x2 1/2	141	73	124	108	127	18x16	457	406	343	330	381	30x28	762	711	559	456	610

### Tolerancer ved ANSI B 16.9

Nominel pipe Ø	All fittings			Elbows tees	Reducers	Caps	180° bøjninger		
	Outside (1) diameter at bevel	Inside (2) diameter at end	Wall thickness	Center to end A-B-C-M	Overall length H	Overall length E	Center to center O	Back to face	Alignment of ends
½"-2 ½"	± 1	± 0.8	Not less than 87.5% of nominel thickness	± 2	± 2	± 4	± 7	± 7	± 1
3"-3 ½"	± 1	± 1.6		± 2	± 2	± 4	± 7	± 7	± 1
4"	± 2-1	± 1.6		± 2	± 2	± 4	± 7	± 7	± 1
5"-6"	± 3-1	± 1.6		± 2	± 2	± 7	± 7	± 7	± 1
8"	± 2	± 1.6		± 2	± 2	± 7	± 7	± 7	± 1
10"	± 4-3	± 3.2		± 2	± 2	± 7	± 10	± 7	± 2
12"-18"	± 4-3	± 3.2		± 3	± 3	± 7	± 10	± 7	± 2
20"-24"	± 6-5	± 4.8		± 3	± 3	± 7	± 10	± 7	± 2
26"-30"	± 7-5	± 4.8		± 3	± 5	± 10			
32"-48"	± 7-5	± 4.8		± 5	± 5	± 10			



### Angularity tolerances

Nominel pipe Ø	Off angle Q	Off plane P
½"-4"	± 1	± 2
5"-8"	± 2	± 4
10"-12"	± 3	± 5
14"-16"	± 3	± 7
18"-24"	± 4	± 10
26"-30"	± 5	± 10
32"-42"	± 5	± 13
44"-48"	± 5	± 20

