

# Hydraulic & Offshore SUPPLIES

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# **BUTT WELD FITTINGS**

**BS1640 & ANSI B16.9**

**DIMENSIONS & WEIGHTS**

**TOLERANCES**

**BEVEL DETAILS**

**MATERIALS TABLE**

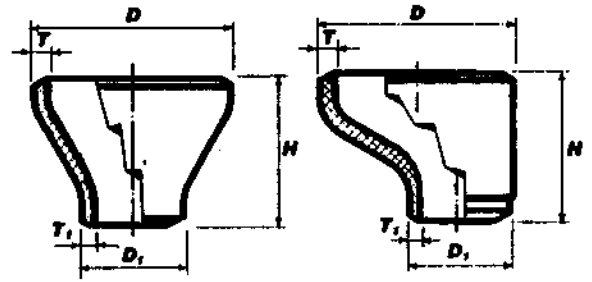




# RIDUZIONI CONCENTRICHE ED ECCENTRICHE

## CONCENTRIC AND ECCENTRIC REDUCERS

O n Nominal Pipe Size in.	O e Outside Diameter m/m		Lunghezza Length m/m	SCH STD		SCH XS		SCH XXS		SCH 10		SCH 20		SCH 30	
				Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg
				T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>
5 x 2	141	x 60	127	6,55	x 3,91	2,10	9,53	x 5,54	2,98	19,05	x 11,07	5,54			
x 2½		x 73	127		x 5,16	2,06		x 7,01	2,92		x 14,02	5,43			
x 3		x 89	127		x 5,49	2,00		x 7,62	2,84		x 15,24	5,27			
x 3½		x 102	127		x 5,74	1,93		x 8,08	2,73						
x 4		x 114	127		x 6,02	1,93		x 8,56	2,73		x 17,12	5,08			
6 x 2	168	x 60	140	7,11	x 3,91	3,17	10,97	x 5,54	4,77	21,95	x 11,07	8,88			
x 2½		x 73	140		x 5,16	3,07		x 7,01	4,62		x 14,02	8,61			
x 3		x 89	140		x 5,49	2,98		x 7,62	4,48		x 15,24	8,34			
x 3½		x 102	140		x 5,74	2,98		x 8,08	4,48						
x 4		x 114	140		x 6,02	2,82		x 8,56	4,25		x 17,12	7,91			
x 5		x 141	140		x 6,55	2,78		x 9,53	4,19		x 19,05	7,90			
8 x 3	219	x 89	152	8,18	x 5,49	5,06	12,70	x 7,62	7,70	22,22	x 15,24	12,83			
x 3½		x 102	152		x 5,74	5,06		x 8,08	7,70						
x 4		x 114	152		x 6,02	4,92		x 8,56	7,47		x 17,12	12,46			
x 5		x 141	152		x 6,55	4,83		x 9,53	7,33		x 19,05	12,23			
x 6		x 168	152		x 7,11	4,68		x 10,97	7,11		x 21,95	11,86			
10 x 4	273	x 114	178	9,27	x 6,02	9,73	12,70	x 8,56	13,15	25,40	x 17,12	25,00			
x 5		x 141	178		x 6,55	9,51		x 9,53	12,84		x 19,05	24,42			
x 6		x 168	178		x 7,11	8,82		x 10,97	11,93		x 21,95	22,68			
x 8		x 219	178		x 8,18	8,46		x 12,70	11,44				6,35 x 6,35	5,85	7,90 x 7,04 7,16
12 x 4	324	x 114	203	9,53	x 6,02	14,12	12,70	x 8,56	18,63	25,40	x 17,12	35,73			
x 5		x 141	203		x 6,55	13,57		x 9,53	17,91		x 19,05	34,32			
x 6		x 168	203		x 7,11	13,02		x 10,97	17,17		x 21,95	32,93			
x 8		x 219	203		x 8,18	12,18		x 12,70	16,08				6,35 x 6,35	8,21	8,38 x 7,04 10,75
x 10		x 273	203		x 9,27	11,63		x 12,70	15,35				x 6,35	7,83	x 7,80 10,26
14 x 6	356	x 168	330	9,53	x 7,11	22,81	12,70	x 10,97	30,14						
x 8		x 219	330		x 8,18	22,49		x 12,70	29,72				7,92 x 6,35	18,83	9,53 x 7,04 22,49
x 10		x 273	330		x 9,27	22,17		x 12,70	29,30				x 6,35	18,56	x 7,80 22,17
x 12		x 324	330		x 9,53	21,86		x 12,70	28,88				x 6,35	18,30	x 8,38 21,86
16 x 6	406	x 168	356	9,53	x 7,11	29,83	12,70	x 10,97	39,43						
x 8		x 219	356		x 8,18	28,34		x 12,70	37,46				7,92 x 6,35	23,69	9,53 x 7,04 29,83
x 10		x 273	356		x 9,27	27,96		x 12,70	36,96				x 6,35	23,38	x 7,80 27,96
x 12		x 324	356		x 9,53	27,60		x 12,70	36,48				x 6,35	27,07	x 8,38 27,60
x 14		x 356	356		x 9,53	27,22		x 12,70	35,98			6,35 x 6,35	18,28	x 7,92	22,76 x 9,53 27,22
18 x 8	457	x 219	381	9,53	x 8,18	37,30	12,70	x 12,70	49,40						
x 10		x 273	381		x 9,27	36,40		x 12,70	48,20				x 6,35	36,40	x 7,80 48,20
x 12		x 324	381		x 9,53	35,60		x 12,70	47,10				x 6,35	35,60	x 8,38 47,10
x 14		x 356	381		x 9,53	34,70		x 12,70	45,90			6,35 x 6,35	34,70	x 7,92	34,70 x 9,53 45,90
x 16		x 406	381		x 9,53	33,80		x 12,70	44,80			x 6,35	33,80	x 7,92	33,80 x 9,53 44,80

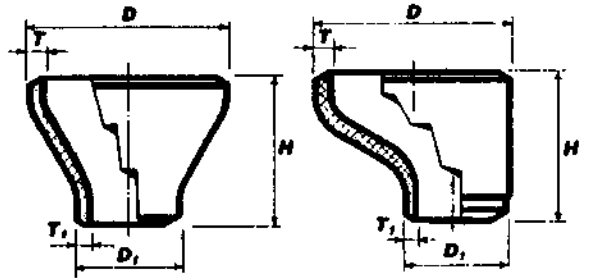


SCH 40			SCH 60			SCH 80			SCH 100			SCH 120			SCH 140			SCH 160			Ø n Nominal Pipe Size in.
Wall thickness Spessore m/m		Weight Peso Kg	Wall thickness Spessore m/m		Weight Peso Kg	Wall thickness Spessore m/m		Weight Peso Kg	Wall thickness Spessore m/m		Weight Peso Kg	Wall thickness Spessore m/m		Weight Peso Kg	Wall thickness Spessore m/m		Weight Peso Kg	Wall thickness Spessore m/m		Weight Peso Kg	
T	T <sub>1</sub>		T	T <sub>1</sub>		T	T <sub>1</sub>		T	T <sub>1</sub>		T	T <sub>1</sub>		T	T <sub>1</sub>		T	T <sub>1</sub>		
6,55	x 3,91	2,10				9,53	x 5,54	2,98										15,88	x 8,74	4,75	5 x 2
	x 5,16	2,06					x 7,01	2,92											x 9,53	4,64	x 2½
	x 5,49	2,00					x 7,62	2,84											x 11,13	4,50	x 3
	x 5,74	1,93					x 8,08	2,73													x 3½
	x 6,02	1,93					x 8,56	2,73				12,70	x 11,13	3,56					x 13,49	4,51	x 4
7,11	x 3,91	3,17				10,97	x 5,54	4,77										18,26	x 8,74	7,57	6 x 2
	x 5,16	3,07					x 7,01	4,62											x 9,53	7,34	x 2½
	x 5,49	2,98					x 7,62	4,48											x 11,13	7,11	x 3
	x 5,74	2,98					x 8,08	4,48													x 3½
	x 6,02	2,82					x 8,56	4,25				14,27	x 11,13	5,42					x 13,49	6,74	x 4
	x 6,55	2,78					x 9,53	4,19					x 12,70	5,34					x 15,88	6,65	x 5
8,18	x 5,49	5,06				12,70	x 7,62	7,70										23,01	x 11,13	13,24	8 x 3
	x 5,74	5,06					x 8,08	7,70													x 3½
	x 6,02	4,92					x 8,56	7,47				18,26	x 11,13	10,43					x 13,49	12,85	x 4
	x 6,55	4,83					x 9,53	7,33				x 12,70	10,25						x 15,88	12,62	x 5
	x 7,11	4,68					x 10,97	7,11				x 14,27	9,93						x 18,26	12,23	x 6
9,27	x 6,02	9,73				15,09	x 8,56	15,10				21,44	x 11,13	21,42				28,58	x 13,49	27,78	10 x 4
	x 6,55	9,51					x 9,53	15,09				x 12,70	20,92						x 15,88	27,13	x 5
	x 7,11	8,82					x 10,97	14,02				x 14,27	19,43						x 19,26	25,19	x 6
	x 8,18	8,46	12,70	x 10,31	12,80		x 12,70	13,44	18,26	x 15,09	16,07		x 18,26	18,63	25,40	x 20,62	21,75		x 23,01	24,16	x 8
9,53	x 6,02	15,25				17,48	x 8,56	25,21				25,40	x 11,13	35,73				33,32	x 13,49	45,64	12 x 4
	x 6,55	14,65					x 9,53	24,23				x 12,70	34,32						x 15,88	43,85	x 5
	x 7,11	14,05					x 10,97	23,24				x 14,27	32,93						x 18,26	42,06	x 6
	x 8,18	13,16	14,27	x 10,31	17,97		x 12,70	21,75	21,44	x 15,09	26,34		x 18,26	30,83	28,58	x 20,62	33,00		x 23,01	39,38	x 8
	x 10,31	12,56		x 12,70	17,16		x 15,09	20,76		x 18,26	25,14		x 21,44	29,43		x 25,40	31,50		x 28,58	37,59	x 10
11,13	x 7,11	26,49				19,05	x 10,97	44,37				27,79	x 14,27	62,99				35,71	x 18,26	79,05	14 x 6
	x 8,18	26,12	15,09	x 10,31	35,00		x 12,70	43,76	23,83	x 15,09	53,90		x 18,26	62,12	31,75	x 20,62	70,17		x 23,01	77,96	x 8
	x 9,27	25,75		x 12,70	34,51		x 15,09	43,14		x 18,26	53,13		x 21,44	61,24		x 25,40	69,18		x 28,58	76,86	x 10
	x 10,31	25,39		x 14,27	34,02		x 17,48	42,52		x 21,44	52,37		x 25,40	60,37		x 28,58	68,20		x 33,32	75,76	x 12
12,70	x 7,11	37,46				21,44	x 10,97	65,00				30,96	x 14,27	91,59				40,49	x 18,26	116,77	16 x 6
	x 8,18	37,46	16,86	x 10,31	48,64		x 12,70	61,75	26,19	x 15,09	74,61		x 18,26	87,00	36,53	x 20,62	101,21		x 23,01	110,94	x 8
	x 9,27	36,96		x 12,70	48,00		x 15,09	60,94		x 18,26	73,63		x 21,44	85,87		x 25,40	99,88		x 28,58	109,48	x 10
	x 10,31	36,48		x 14,27	47,36		x 17,48	60,12		x 21,44	72,64		x 25,40	84,72		x 28,58	98,55		x 33,32	108,10	x 12
	x 11,13	35,98		x 15,09	46,72		x 19,05	59,32		x 23,83	71,66		x 27,79	83,58		x 31,75	97,21		x 35,71	106,56	x 14
14,27	x 8,18	53,60	19,05	x 10,31	74,60	23,83	x 12,70	90,60	29,36	x 15,09	109,80	34,93	x 18,26	128,90	39,67	x 20,62	144,40	45,24	x 23,01	162,90	18 x 8
	x 9,27	52,40		x 12,70	72,90		x 15,09	88,50		x 18,26	107,20		x 21,44	125,90		x 25,40	141,00		x 28,58	159,00	x 10
	x 10,31	51,20		x 14,27	71,10		x 17,48	86,40		x 21,44	104,80		x 25,40	122,90		x 28,58	137,70		x 33,32	155,30	x 12
	x 11,13	49,90		x 15,09	69,40		x 19,05	84,30		x 23,83	102,00		x 27,79	119,90		x 31,75	134,30		x 35,71	151,50	x 14
	x 12,70	48,60		x 16,86	67,70		x 21,44	82,20		x 26,19	99,60		x 30,96	116,90		x 36,53	131,00		x 40,49	147,70	x 16

# RIDUZIONI CONCENTRICHE ED ECCENTRICHE

## CONCENTRIC AND ECCENTRIC REDUCERS

Ø n Nominal Pipe Size in	Ø e Outside Diameter m/m		Lunghezza Length m/m	SCH STD		SCH XS		SCH XXS		SCH 10		SCH 20		SCH 30				
				Wall thickness Spessore m/m		Weight Peso Kg		Wall thickness Spessore m/m		Weight Peso Kg		Wall thickness Spessore m/m		Weight Peso Kg		Wall thickness Spessore m/m		
				T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	
20 x 8	508	x 219	508	9,53	x 8,18	55,00	12,70	x 12,70	72,90				9,53	x 6,35	55,00	12,70	x 7,04	72,90
x 10		x 273	508	x 9,27	54,00		x 12,70	71,60				x 6,35	54,00	x 7,80	71,60			
x 12		x 324	508	x 9,53	53,10		x 12,70	70,30				x 6,35	53,10	x 8,38	70,30			
x 14		x 356	508	x 9,53	52,20		x 12,70	69,00			6,35	x 6,35	52,20	x 7,92	52,20	x 9,53	69,00	
x 16		x 406	508	x 9,53	51,20		x 12,70	67,80			x 6,35	51,20	x 7,92	51,20	x 9,53	67,80		
x 18		x 457	508	x 9,53	50,20		x 12,70	66,50			x 6,35	50,20	x 7,92	50,20	x 11,13	66,50		
22 x 10	559	x 273	508	9,53	x 9,27	60,70	12,70	x 12,70	80,40				9,53	x 6,35	60,70	12,70	x 7,80	80,40
x 12		x 324	508	x 9,53	59,60		x 12,70	79,00				x 6,35	59,60	x 8,38	79,00			
x 14		x 356	508	x 9,53	58,60		x 12,70	77,60			6,35	x 6,35	58,60	x 7,92	58,60	x 9,53	77,60	
x 16		x 406	508	x 9,53	57,50		x 12,70	76,20			x 6,35	57,50	x 7,92	57,50	x 9,53	76,20		
x 18		x 457	508	x 9,53	56,40		x 12,70	74,70			x 6,35	56,40	x 7,92	56,40	x 11,13	74,70		
x 20		x 508	508	x 9,53	55,30		x 12,70	73,30			x 6,35	55,30	x 9,53	55,30	x 12,70	73,30		
24 x 10	610	x 273	508	9,53	x 9,27	67,50	12,70	x 12,70	89,40				9,53	x 6,35	67,50	14,27	x 7,80	100,20
x 12		x 324	508	x 9,53	66,30		x 12,70	87,90				x 6,35	66,30	x 8,38	98,50			
x 14		x 356	508	x 9,53	65,20		x 12,70	86,30			6,35	x 6,35	65,20	x 7,92	65,20	x 9,53	96,80	
x 16		x 406	508	x 9,53	64,00		x 12,70	84,80			x 6,35	64,00	x 7,92	64,00	x 9,53	95,00		
x 18		x 457	508	x 9,53	62,80		x 12,70	83,30			x 6,35	62,80	x 7,92	62,80	x 11,13	93,30		
x 20		x 508	508	x 9,53	61,60		x 12,70	81,70			x 6,35	61,60	x 9,53	61,60	x 12,70	91,60		
x 22		x 559	508	x 9,53	60,50		x 12,70	80,20			x 6,35	60,50	x 9,53	60,50	x 12,70	89,90		



SCH 40		SCH 60		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		Ø n Nominal Pipe Size in.
Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	
T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	
15,09 x 8,18	81,40	20,62 x 10,31	116,40	26,19 x 12,70	146,20	32,54 x 15,09	179,20	38,10 x 18,26	207,40	44,45 x 20,62	238,70	50,01 x 23,01	265,30	20 x 8
x 9,27	84,70	x 12,70	114,40	x 15,09	138,00	x 18,26	176,00	x 21,44	203,70	x 25,40	234,50	x 28,58	260,60	x 10
x 10,31	83,20	x 14,27	112,30	x 17,48	141,00	x 21,44	172,90	x 25,40	200,00	x 28,58	230,30	x 33,32	256,00	x 12
x 11,13	81,60	x 15,09	110,30	x 19,05	138,50	x 23,83	169,80	x 27,79	196,50	x 31,75	226,00	x 35,71	251,30	x 14
x 12,70	80,00	x 16,66	108,30	x 21,44	135,10	x 26,19	166,60	x 30,96	192,80	x 36,53	221,90	x 40,49	246,70	x 16
x 14,27	78,60	x 19,05	106,20	x 23,83	133,40	x 29,36	163,50	x 34,93	189,20	x 39,67	217,70	x 45,24	242,00	x 18
95,00	22,22 x 12,70	138,20	28,58 x 15,09	175,60	34,92 x 18,26	212,00	41,28 x 21,44	247,50	47,63 x 25,40	282,10	53,98 x 28,58	315,80	22 x 10	
93,40	x 14,27	135,70	x 17,48	172,50	x 21,44	208,30	x 25,40	243,20	x 28,58	291,60	x 33,32	310,20	x 12	
91,80	x 15,09	133,30	x 19,05	169,50	x 23,83	204,60	x 27,79	238,80	x 31,75	272,20	x 35,71	304,50	x 14	
90,00	x 16,66	130,90	x 21,44	166,40	x 26,19	200,10	x 30,96	234,50	x 36,53	267,30	x 40,49	299,00	x 16	
88,40	x 19,05	128,40	x 23,83	163,30	x 29,36	197,00	x 34,93	230,20	x 39,67	262,30	x 45,24	293,60	x 18	
86,70	x 20,62	126,00	x 26,19	160,20	x 32,54	193,40	x 38,10	225,80	x 44,45	257,40	x 50,01	288,00	x 20	
17,48 x 9,27	118,00	24,61 x 12,70	169,80	30,96 x 15,09	211,30	38,89 x 18,26	261,80	46,02 x 21,44	305,90	52,37 x 25,40	344,20	59,54 x 28,58	366,30	24 x 10
x 10,31	116,00	x 14,27	166,90	x 17,48	207,70	x 21,44	257,30	x 25,40	300,60	x 28,58	338,30	x 33,32	379,60	x 12
x 11,13	114,00	x 15,09	164,00	x 19,05	204,00	x 23,83	252,80	x 27,79	295,40	x 31,75	332,30	x 35,71	373,00	x 14
x 12,70	112,00	x 16,66	161,00	x 21,44	200,40	x 26,19	248,20	x 30,96	290,00	x 36,53	326,40	x 40,49	366,30	x 16
x 14,27	109,80	x 19,05	158,00	x 23,83	197,70	x 29,36	243,70	x 34,93	284,80	x 39,67	320,40	x 45,24	359,60	x 18
x 15,09	107,90	x 20,62	155,20	x 26,19	193,00	x 32,54	239,20	x 38,10	279,50	x 44,45	314,50	x 50,01	353,00	x 20
x 15,88	105,80	x 22,22	152,30	x 28,58	189,40	x 34,92	234,70	x 41,28	274,30	x 47,63	308,60	x 53,98	346,30	x 22























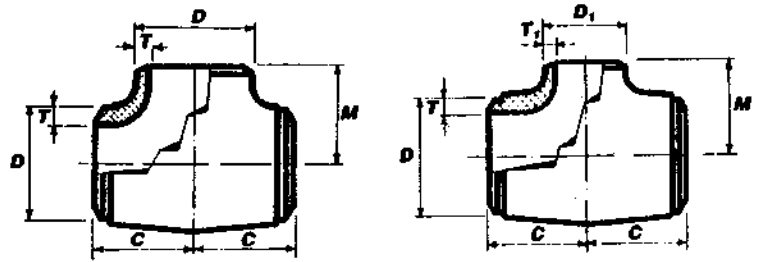












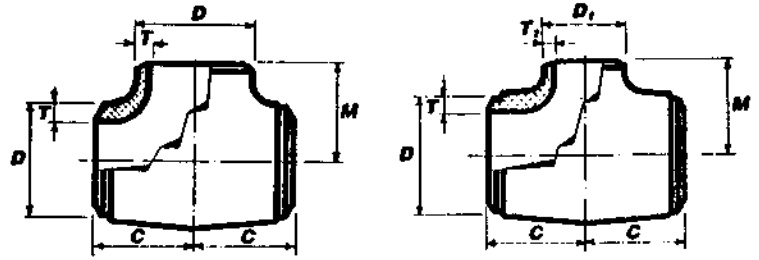
SCH 40		SCH 60		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		Nominal Pipe Size in.
Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	
T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	
6,02 x 3,38	4,67			8,56 x 4,55	6,86							13,49 x 6,35	6,11	4 x 1
x 3,56	4,89			x 4,85	6,96							x 6,35	6,40	x 1 1/4
x 3,68	4,96			x 5,08	7,06							x 7,14	7,05	x 1 1/2
x 3,91	4,96			x 5,54	7,06							x 8,74	7,71	x 2
x 5,16	4,96			x 7,01	7,16							x 9,53	8,28	x 2 1/2
x 5,49	5,17			x 7,62	7,36							x 11,13	8,65	x 3
x 5,74	5,17			x 8,08	7,36									x 3 1/2
x 6,02	5,17			x 8,56	7,36			11,13 x 11,13	8,94			x 13,49	9,40	x 4
6,55 x 3,91	7,39			9,53 x 5,54	10,75							15,88 x 8,74	12,57	5 x 2
x 5,16	7,59			x 7,01	11,02							x 9,53	13,74	x 2 1/2
x 5,49	7,77			x 7,62	11,29							x 11,13	14,74	x 3
x 5,74	7,85			x 8,08	11,40									x 3 1/2
x 6,02	7,97			x 8,56	11,57			12,70 x 11,13	13,80			x 13,49	15,75	x 4
x 6,55	8,36			x 9,53	12,12			x 12,7	14,68			x 15,88	16,75	x 5
7,11 x 3,91	10,80			10,97 x 5,54	16,30							18,26 x 8,74	17,82	6 x 2
x 5,16	10,94			x 7,01	16,48							x 9,53	19,65	x 2 1/2
x 5,49	11,18			x 7,62	17,46							x 11,13	21,49	x 3
x 5,74	11,31			x 8,08	17,60									x 3 1/2
x 6,02	11,31			x 8,56	17,80			14,27 x 11,13	19,60			x 13,49	24,11	x 4
x 6,55	12,32			x 9,53	18,86			x 12,70	20,03			x 15,88	24,63	x 5
x 7,11	12,32			x 10,97	18,86			x 14,27	21,30			x 18,26	26,20	x 6
8,18 x 5,49	19,35			12,70 x 7,62	23,18							23,01 x 11,13	38,40	8 x 3
x 5,74	19,75			x 8,08	25,34									x 3 1/2
x 6,02	20,10			x 8,56	27,20			18,26 x 11,13	37,36			x 13,49	45,06	x 4
x 6,55	20,49			x 9,53	28,43			x 12,70	39,06			x 15,88	47,11	x 5
x 7,11	21,05			x 10,97	29,05			x 14,27	39,91			x 18,26	48,13	x 6
x 8,18	22,87	10,31 x 10,31	26,30	x 12,70	30,90			x 18,26	42,45	20,62 x 20,62	44,30	x 23,01	51,20	x 8
9,27 x 5,49	27,34			15,09 x 7,62	45,27							28,58 x 11,13	70,92	10 x 3
x 6,02	29,89			x 8,56	49,49			21,44 x 11,13	60,15			x 13,49	77,54	x 4
x 6,55	32,08			x 9,53	53,11			x 12,70	66,31			x 15,88	83,21	x 5
x 7,11	33,54			x 10,97	55,53			x 14,27	69,33			x 18,26	86,99	x 6
x 8,18	34,27	12,70 x 10,31	45,41	x 12,70	56,73	18,26 x 15,09	61,43	x 18,26	70,83	25,40 x 20,62	80,00	x 23,01	88,88	x 8
x 9,27	36,45	x 12,70	48,30	x 15,09	60,35	x 18,26	65,35	x 21,44	75,35	x 25,40	85,10	x 28,58	94,55	x 10
10,31 x 6,02	41,93			17,48 x 8,56	68,33			82,60	25,40 x 11,13	84,64		33,32 x 13,49	115,43	12 x 4
x 6,55	45,84			x 9,53	74,71			90,20	x 12,70	92,54		x 15,88	126,20	x 5
x 7,11	49,20			x 10,97	80,17			96,80	x 14,27	99,31		x 18,26	135,44	x 6
x 8,18	51,43	14,27 x 10,31	66,01	x 12,70	83,82	21,44 x 15,09	101,20	x 18,26	103,83	28,58 x 20,62	130,00	x 23,01	141,59	x 8
x 9,27	52,55	x 12,70	67,45	x 15,09	85,64	x 18,26	103,40	x 21,44	106,08	x 25,40	132,83	x 28,58	144,67	x 10
x 10,31	55,90	x 14,27	71,75	x 17,48	91,10	x 21,44	110,00	x 25,40	118,85	x 28,58	141,30	x 33,32	153,90	x 12

# T UGUALI E T RIDOTTI

## EQUAL TEES AND REDUCING TEES

Ø n Nominal Pipe Size in.	Ø e Outside Diameter m/m		Lun- ghezza Center to End Run m/m	Lun- ghezza Center to End Branch m/m	SCH STD		SCH XS		SCH XXS		SCH 10		SCH 20		SCH 30			
	D	D <sub>1</sub>			C	M	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg
	T	T <sub>1</sub>			T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>
14 x 6	356	x 168	279	238	9,53	x 7,11	57,49	12,70	x 10,97	64,46								
x 8		x 219	279	248	x 8,18	61,69		x 12,70	69,17				7,92	x 6,35	54,21	9,53	x 7,04	
x 10		x 273	279	257	x 9,27	64,50		x 12,70	72,32				x 6,35	56,68		x 7,80		
x 12		x 324	279	270	x 9,53	65,90		x 12,70	73,89				x 6,35	57,91		x 8,38		
x 14		x 356	279	279	x 9,53	70,10		x 12,70	76,80				x 6,35	61,60		x 8,38		
16 x 6	406	x 168	305	264	9,53	x 7,11	65,44	12,70	x 10,97	72,20					65,44			
x 8		x 219	305	273	x 8,18	71,55		x 12,70	86,60				7,92	x 6,35	71,55	9,53	x 7,04	
x 10		x 273	305	283	x 9,27	76,78		x 12,70	92,93				x 6,35	76,78		x 7,80		
x 12		x 324	305	295	x 9,53	80,27		x 12,70	97,16				x 6,35	80,27		x 8,38		
x 14		x 356	305	305	x 9,53	82,02		x 12,70	99,27			6,35	x 6,35	82,02	x 7,92	82,02	x 9,53	
x 16		x 406	305	305	x 9,53	87,25		x 12,70	105,60			6,35	x 6,35	87,25	x 7,92	87,25	x 9,53	
18 x 8	457	x 219	343	298	9,53	x 8,18	105,45	12,70	x 12,70	124,70				7,92	x 6,35	105,45	11,13	x 7,04
x 10		x 273	343	308	x 9,27	105,45		x 12,70	124,70				x 6,35	105,45		x 7,80		
x 12		x 324	343	321	x 9,53	107,05		x 12,70	184,00				x 6,35	107,05		x 8,38		
x 14		x 356	343	330	x 9,53	107,05		x 12,70	184,00			6,35	x 6,35	107,05	x 7,92	107,05	x 9,53	
x 16		x 406	343	330	x 9,53	107,05		x 12,70	184,00			x 6,35	107,05	x 7,92	107,05	x 9,53	107,05	
x 18		x 457	343	343	x 9,53	107,05		x 12,70	184,00			x 6,35	107,05	x 7,92	107,05	x 9,53	107,05	
20 x 8	508	x 219	381	324	9,53	x 8,18	128,70	12,70	x 12,70	160,00				9,53	x 6,35	128,70	12,70	x 7,04
x 10		x 273	381	333	x 9,27	128,70		x 12,70	160,00				x 6,35	128,70		x 7,80		
x 12		x 324	381	346	x 9,53	128,70		x 12,70	160,00				x 6,35	128,70		x 8,38		
x 14		x 356	381	356	x 9,53	129,60		x 12,70	176,00			6,35	x 6,35	129,60	x 7,92	129,60	x 9,53	
x 16		x 406	381	356	x 9,53	129,60		x 12,70	176,00			x 6,35	129,60	x 7,92	129,60	x 9,53	129,60	
x 18		x 457	381	368	x 9,53	129,60		x 12,70	176,00			x 6,35	129,60	x 7,92	129,60	x 11,13	129,60	
x 20		x 508	381	381	x 9,53	129,60		x 12,70	176,00			x 6,35	129,60	x 9,53	129,60	x 11,13	171,00	
22 x 10	559	x 273	419	359	9,53	x 9,27	154,30	12,70	x 12,70	203,70				9,53	x 6,35	154,30	12,70	x 7,80
x 12		x 324	419	371	x 9,53	154,30		x 12,70	203,70				x 6,35	154,30		x 8,38		
x 14		x 356	419	381	x 9,53	154,30		x 12,70	203,70			6,35	x 6,35	154,30	x 7,92	154,30	x 9,53	
x 16		x 406	419	381	x 9,53	163,90		x 12,70	203,70			x 6,35	163,90	x 7,92	163,90	x 9,53	167,20	
x 18		x 457	419	394	x 9,53	163,90		x 12,70	203,70			x 6,35	163,90	x 7,92	163,90	x 11,13	196,00	
x 20		x 508	419	406	x 9,53	163,90		x 12,70	203,70			x 6,35	163,90	x 9,53	163,90	x 12,70	196,00	
x 22		x 559	419	419	x 9,53	163,90		x 12,70	203,70			x 6,35	163,90	x 9,53	163,90	x 12,70	196,00	
24 x 10	610	x 273	432	384	9,53	x 9,27	172,80	12,70	x 12,70	204,50				9,53	x 6,35	172,80	14,27	x 7,80
x 12		x 324	432	397	x 9,53	172,80		x 12,70	204,50				x 6,35	172,80		x 8,38		
x 14		x 356	432	406	x 9,53	172,80		x 12,70	204,50			6,35	x 6,35	172,80	x 7,92	172,80	x 9,53	
x 16		x 406	432	406	x 9,53	172,80		x 12,70	204,50			x 6,35	172,80	x 7,92	172,80	x 9,53	204,50	
x 18		x 457	432	419	x 9,53	186,30		x 12,70	232,00			x 6,35	186,30	x 7,92	186,30	x 11,13	236,80	
x 20		x 508	432	432	x 9,53	186,30		x 12,70	232,00			x 6,35	186,30	x 9,53	186,30	x 12,70	236,80	
x 22		x 559	432	432	x 9,53	186,30		x 12,70	232,00			x 6,35	186,30	x 9,53	186,30	x 12,70	236,80	
x 24		x 610	432	432	x 9,53	186,30		x 12,70	232,00			x 6,35	186,30	x 9,53	186,30	x 12,70	236,80	





SCH 40		SCH 60		SCH 80		SCH 100		SCH 120		SCH 140		SCH 160		Nominal Pipe Size in.
Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	Wall thickness Spessore m/m	Weight Peso Kg	
T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	T	T <sub>1</sub>	
11,13 x 7,11	60,03			19,05 x 10,97	103,82			27,79 x 14,27	130,63			35,71 x 18,26	164,99	14 x 6
x 8,18	64,42	15,09 x 10,31	90,12	x 12,70	111,41	23,83 x 15,09	130,77	x 18,26	140,19	31,75 x 20,62	157,44	x 23,01	177,06	x 8
x 9,27	67,35	x 12,70	94,21	x 15,09	116,48	x 18,26	136,72	x 21,44	146,76	x 25,40	164,59	x 28,58	185,11	x 10
x 10,31	68,81	x 14,27	96,26	x 17,48	119,00	x 21,44	139,69	x 25,40	149,75	x 28,58	168,17	x 33,32	189,13	x 12
x 11,13	73,20	x 15,09	102,40	x 19,05	126,60	x 23,83	148,60	x 27,79	159,30	x 31,75	178,90	x 35,71	201,20	x 14
12,70 x 7,11	79,20			21,44 x 10,97	132,83			30,96 x 14,27	161,85			40,49 x 18,26	214,35	16 x 6
x 8,18	86,60	16,66 x 10,31	115,71	x 12,70	145,23	26,19 x 15,09	163,43	x 18,26	176,96	36,53 x 20,62	203,73	x 23,01	234,36	x 8
x 9,27	92,93	x 12,70	124,17	x 15,09	155,85	x 18,26	175,39	x 21,44	189,91	x 25,40	218,64	x 28,58	251,50	x 10
x 10,31	97,19	x 14,27	129,82	x 17,48	162,94	x 21,44	183,36	x 25,40	198,54	x 28,58	228,58	x 33,32	262,94	x 12
x 11,13	99,27	x 15,09	132,64	x 19,05	166,48	x 23,83	187,35	x 27,79	202,86	x 31,75	233,55	x 35,71	243,30	x 14
x 12,70	105,60	x 16,66	141,10	x 21,44	177,10	x 26,19	199,30	x 30,96	215,80	x 36,53	248,45	x 40,49	285,80	x 16
14,27 x 8,18	124,70	19,05 x 10,31	168,50	23,83 x 12,70	211,60	29,36 x 15,09	259,40	34,93 x 18,26	306,80	39,67 x 20,62	358,30	45,24 x 23,01	408,30	18 x 8
x 9,27	124,70	x 12,70	166,50	x 15,09	211,60	x 18,26	259,40	x 21,44	306,80	x 25,40	358,30	x 28,58	408,30	x 10
x 10,31	167,84	x 14,27	184,04	x 17,48	233,92	x 21,44	306,80	x 25,40	306,80	x 28,58	358,30	x 33,32	408,30	x 12
x 11,13	167,84	x 15,09	184,04	x 19,05	233,92	x 23,83	306,80	x 27,79	306,80	x 31,75	358,30	x 35,71	408,30	x 14
x 12,70	167,84	x 16,66	184,04	x 21,44	233,92	x 26,19	306,80	x 30,96	306,80	x 36,53	358,30	x 40,49	408,30	x 16
x 14,27	167,84	x 19,05	184,04	x 23,83	233,92	x 29,36	306,80	x 34,93	338,60	x 39,67	385,90	x 45,24	431,90	x 18
15,09 x 8,18	160,00	20,62 x 10,31	221,40	26,19 x 12,70	281,30	32,54 x 15,09	339,50	38,10 x 18,26	339,50	44,45 x 20,62	396,50	50,01 x 23,01	465,60	20 x 8
x 9,27	160,00	x 12,70	221,40	x 15,09	281,30	x 18,26	339,50	x 21,44	339,50	x 25,40	396,50	x 28,58	465,60	x 10
x 10,31	160,00	x 14,27	221,40	x 17,48	306,20	x 21,44	339,50	x 25,40	339,50	x 28,58	443,20	x 33,32	498,70	x 12
x 11,13	180,00	x 15,09	246,00	x 19,05	306,20	x 23,83	379,30	x 27,79	379,30	x 31,75	443,20	x 35,71	498,70	x 14
x 12,70	218,00	x 16,66	246,00	x 21,44	306,20	x 26,19	379,30	x 30,96	379,30	x 36,53	443,20	x 40,49	498,70	x 16
x 14,27	224,30	x 19,05	246,00	x 23,83	306,20	x 29,36	379,30	x 34,93	379,30	x 39,67	443,20	x 45,24	498,70	x 18
x 15,09	224,30	x 20,62	246,00	x 26,19	306,20	x 32,54	379,30	x 38,10	453,90	x 44,45	510,70	x 50,01	573,20	x 20
		22,22 x 12,70	343,50	28,58 x 15,09	442,70	34,92 x 18,26	539,00	41,28 x 21,44	640,30	47,63 x 25,40	740,40	53,98 x 28,58	743,80	22 x 10
		x 14,27	343,50	x 17,48	442,70	x 21,44	539,00	x 25,40	640,30	x 28,58	740,40	x 33,32	743,80	x 12
		x 15,09	343,50	x 19,05	442,70	x 23,83	539,00	x 27,79	640,30	x 31,75	740,40	x 35,71	743,80	x 14
		x 16,66	357,00	x 21,44	468,00	x 26,19	580,00	x 30,96	683,00	x 36,53	795,00	x 40,49	912,00	x 16
		x 19,05	357,00	x 23,83	468,00	x 29,36	580,00	x 34,93	683,00	x 39,67	795,00	x 45,24	912,00	x 18
		x 20,62	357,00	x 26,19	468,00	x 32,54	580,00	x 38,10	683,00	x 44,45	795,00	x 50,01	912,00	x 20
		x 22,02	357,00	x 28,58	468,00	x 34,92	580,00	x 41,28	683,00	x 47,63	795,00	x 53,98	912,00	x 22
17,48 x 9,27	218,60	24,61 x 12,70	278,00	30,96 x 15,09	323,30	38,89 x 18,26	455,00	46,02 x 21,44	660,00	52,37 x 25,40	681,50	59,54 x 28,58	745,00	24 x 10
x 10,31	218,60	x 14,27	278,00	x 17,48	323,30	x 21,44	502,00	x 25,40	681,50	x 28,58	702,00	x 33,32	781,50	x 12
x 11,13	220,30	x 15,09	305,20	x 19,05	350,60	x 23,83	532,30	x 27,79	716,80	x 31,75	745,00	x 35,71	817,30	x 14
x 12,70	220,30	x 16,66	305,20	x 21,44	350,60	x 26,19	584,00	x 30,96	725,20	x 36,53	752,00	x 40,49	845,00	x 16
x 14,27	277,40	x 19,05	336,60	x 23,83	380,50	x 29,36	584,00	x 34,93	745,30	x 39,67	781,50	x 45,24	870,00	x 18
x 15,09	280,00	x 20,62	390,00	x 26,19	434,40	x 32,54	653,00	x 38,10	760,00	x 44,45	817,30	x 50,01	913,00	x 20
		x 22,22	467,70	x 28,58	535,00	x 34,92	653,00	x 41,28	790,00	x 47,63	845,00	x 53,98	940,50	x 22
x 17,48	409,00	x 24,61	478,00	x 30,96	545,00	x 38,89	665,00	x 46,02	813,90	x 52,37	852,50	x 59,54	980,70	x 24

# TABELLE VARIE OTHER TABLES

## TOLLERANZE IN MM TOLERANCES / MM

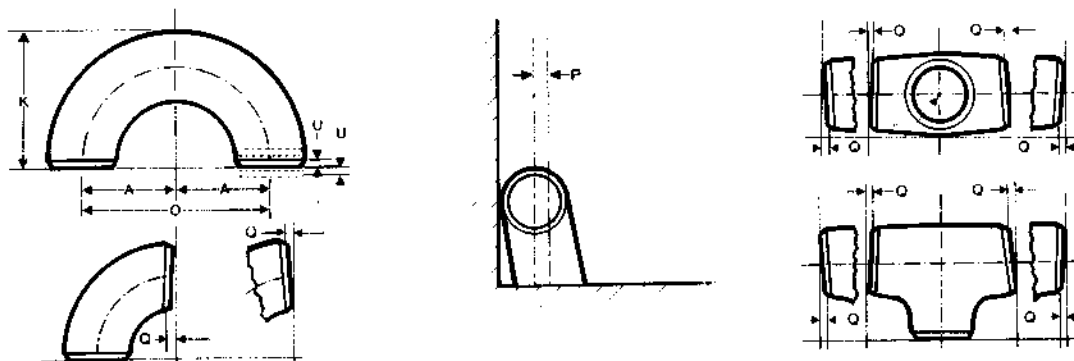
All Fittings				90 Deg. and 45 Deg. Elbows and Tees	Reducers	Caps	180 Deg. Returns			Nominal Pipe Size	Angularity Tol.	
Nominal Pipe Size (NPS)	Outside <sup>(1)</sup> Diameter at Bevel O	Inside <sup>(2)</sup> Diameter at End	Wall <sup>(2)</sup> Thickness T	Center to End Dimension A,B,C,M	Overall Length H	Overall Length E	Center-to-Center Dimension O	Back-to-Face Dimension K	Alignment of Ends U		Off Angle Q	Off Plane P
1/2" to 2 1/2"	± 1	± 0.8	Not less than 87.5% of nominal thickness	± 2	± 2	± 4	± 7	± 7	± 1	1/2" to 4"	± 1	± 2
3" to 3 1/2"	± 1	± 1.6		± 2	± 2	± 4	± 7	± 7	± 1	5" to 8"	± 2	± 4
4"	+2-1	± 1.6		± 2	± 2	± 4	± 7	± 7	± 1	10" to 12"	± 3	± 5
5" to 8"	+3-1	± 1.6		± 2	± 2	± 7	± 7	± 7	± 1	14" to 16"	± 3	± 7
8"	± 2	± 1.6		± 2	± 2	± 7	± 7	± 7	± 1	18" to 24"	± 4	± 10
10"	+4-3	± 3.2		± 2	± 2	± 7	± 10	± 7	± 2	26" to 30"	± 5	± 10
12" to 18"	+4-3	± 3.2		± 3	± 3	± 7	± 10	± 7	± 2	32" to 42"	± 5	± 13
20" to 24"	+6-5	± 4.8		± 3	± 3	± 7	± 10	± 7	± 2	44" to 48"	± 5	± 20
26" to 30"	+7-5	± 4.8		± 3	± 3	± 10	—	—	—	—	—	—
32" to 48"	+7-5	± 4.8		± 5	± 5	± 10	—	—	—	—	—	—

Tutte le tolleranze sono in mm

<sup>(1)</sup> L'ovalizzazione e la somma dei valori assoluti delle tolleranze in più e in meno. — <sup>(2)</sup> Il diametro interno agli imbocchi e gli spessori nominali devono essere specificati dal compratore.

All dimensions are inches.

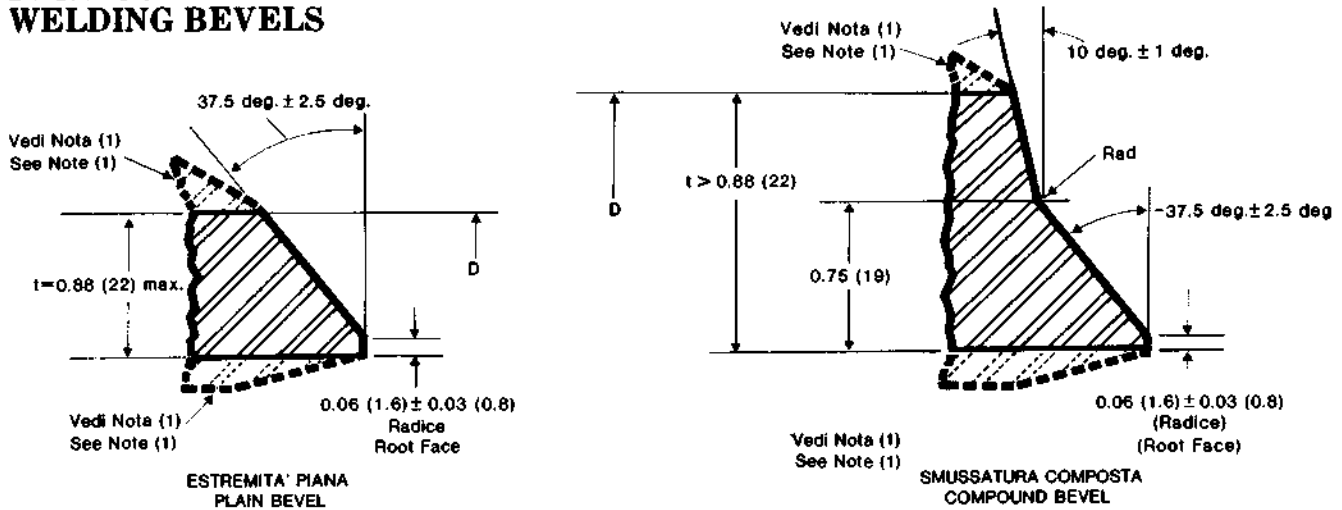
<sup>(1)</sup> Out-of-round is the sum of absolute values of plus and minus tolerance. — <sup>(2)</sup> The inside diameter at ends and the nominal wall thicknesses are to be specified by the purchaser.



## TOLLERANZE IN POLLICI TOLERANCES / INCHES

All Fittings				90 Deg. and 45 Deg. Elbows and Tees	Reducers	Caps	180 Deg. Returns			Nominal Pipe Size	Angularity Tol.	
Nominal Pipe Size (NPS)	Outside <sup>(1)</sup> Diameter at Bevel O	Inside <sup>(2)</sup> Diameter at End	Wall <sup>(2)</sup> Thickness T	Center to End Dimension A,B,C,M	Overall Length H	Overall Length E	Center-to-Center Dimension O	Back-to-Face Dimension K	Alignment of Ends U		Off Angle Q	Off Plane P
1/2 to 2 1/2	+ 0.06 - 0.03	± 0.03	Not less than 87.5% of nominal thickness	± 0.06	± 0.06	± 0.12	± 0.25	± 0.25	± 0.03	1/2 to 4	0.03	0.06
3 to 3 1/2	± 0.06	± 0.06		± 0.06	± 0.06	± 0.12	± 0.25	± 0.25	± 0.03	5 to 8	0.06	0.12
4	± 0.06	± 0.06		± 0.06	± 0.06	± 0.12	± 0.25	± 0.25	± 0.03	10 to 12	0.09	0.19
5 to 8	+ 0.09 - 0.06	± 0.06		± 0.06	± 0.06	+ 0.25	± 0.25	± 0.25	± 0.03	14 to 16	0.09	0.25
10 to 18	+ 0.16 - 0.12	± 0.12		± 0.09	± 0.09	± 0.25	± 0.38	± 0.25	± 0.06	18 to 24	0.12	0.38
20 to 24	+ 0.25 - 0.19	± 0.19		± 0.09	± 0.09	± 0.25	± 0.38	± 0.25	± 0.06	26 to 30	0.19	0.38
26 to 30	+ 0.25 - 0.19	± 0.19		± 0.12	± 0.19	± 0.38	—	—	—	32 to 42	0.19	0.50
32 to 48	+ 0.25 - 0.19	± 0.19		± 0.19	± 0.19	± 0.38	—	—	—	44 to 48	0.19	0.75

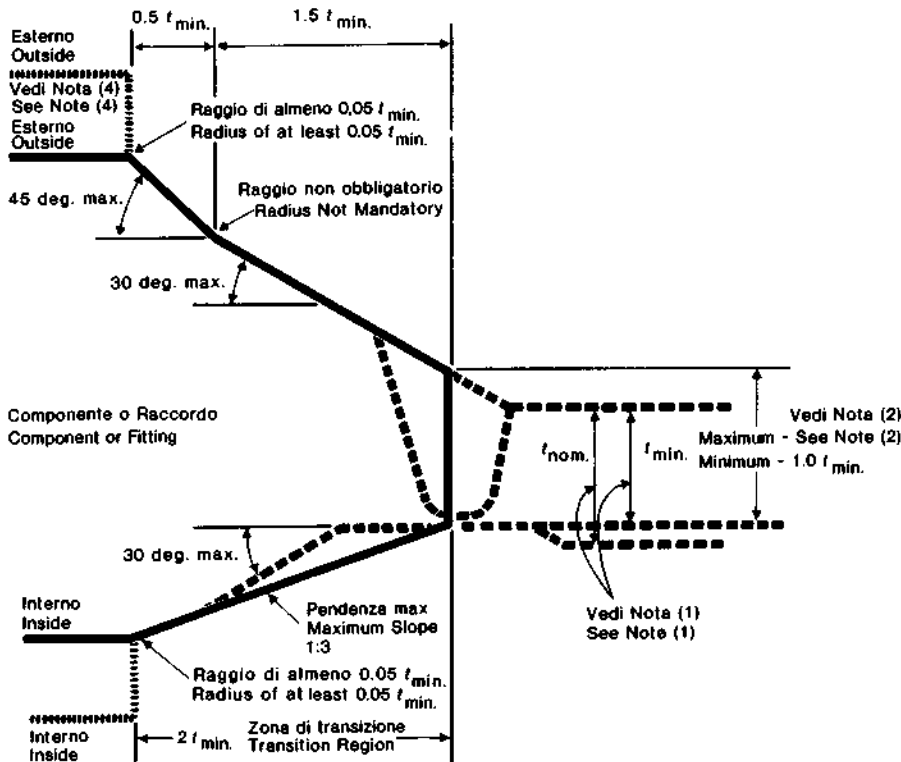
# PARTICOLARI DI SMUSSATURA WELDING BEVELS



Nota (1): Vedi figura successiva per contorni — Note (1): See Figure below for transition contours.

Spessore nominale (t)	Preparazione estremità	Nominal Wall Thickness (t)	End Preparation
$< X^*$	Tagliare a squadra e smussare leggermente ad opzione fabbricante	less than $X^*$	Cut square or slightly chamfer, at mfr's option
$X^*$ fino a 0,88 comprese (22)	Estremità piana come nello schizzo "a" qui sopra	$X^*$ to 0,88 incl. (22)	Plain bevel as in sketch "a" above
$> 0,88$ (22)	Smusso composto come nello schizzo "b" qui sopra	more than 0,88 (22)	Compound bevel as in sketch "b" above
$X^* = 0,18$ (5) per acciaio al carbonio e leghe ferritici e 0,12 (4) per acciai austenitici		$X^* = 0,78$ (5) for carbon steel or ferritic alloy steel and 0,12 (4) for austenitic alloy steel.	

Le dimensioni tra parentesi sono in mm. Le altre sono in pollici. — Dimensions in parentheses are in millimeters. Others are in inches.



(1) Il valore  $t_{min}$  applicabile è uno dei seguenti: (a) lo spessore minimo ordinato del tubo; (b) 0,875 volte lo spessore del tubo ordinato fino a una schedula del tubo che ha una sottotolleranza del 12,5%. — (2) Lo spessore massimo all'estremità del componente è: (a)  $> d_i (t_{min} + 0,15")$  o  $1,15 t_{min}$  se ordinato sulla base di uno spessore minimo; (b)  $> d_i (t_{min} + 0,15")$  o  $1,10 t_{nom}$  se ordinato sulla base di uno spessore nominale. — (3) Lo smusso viene qui indicato solo per illustrazione. — (4) Quando le transizioni usando una pendenza massima non intersecano la superficie esterna, come indicato dal profilo, dovranno essere usate le pendenze massime o i raggi alterni che si vedono nel profilo.

(1) The value  $t_{min}$  is whichever of the following is applicable: (a) the minimum ordered wall thickness of the pipe; (b) 0,875 times the nominal wall thickness of pipe ordered to a pipe schedule wall thickness which has an under tolerance of 12,5%. — (2) The maximum thickness at the end of the component is: (a) the greater of  $(t_{min} + 0,15 \text{ in.})$  or  $1,15 t_{min}$  when ordered on a minimum wall basis; (b) the greater of  $(t_{min} + 0,15 \text{ in.})$  or  $1,10 t_{nom}$  when ordered on a nominal wall basis. — (3) Weld bevel is shown for illustration only. — (4) Where transitions using maximum slope do not intersect outside surface, as shown by phantom outline, maximum slopes shown or alternate radii shown in phantom outlines shall be used.

**COMPOSIZIONE CHIMICA E CARATTERISTICHE MECCANICHE DEL MATERIALE PER RACCORDI CON ESERCIZIO A MEDIA E ALTA TEMPERATURA IN ACCIAI AL CARBONIO E LEGATI SECONDO NORME ASTM A 234**

**CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF MATERIAL FOR FITTINGS OF WROUGHT CARBON STEEL AND ALLOY-STEEL FOR MODERATE AND ELEVATED TEMPERATURES ACCORDING TO ASTM A-234 Specs.**

Tipo Acciaio Type of the steel	ASTM Grado Grade	Composizione Chimica - Chemical Composition									Caratteristiche Meccaniche Mechanical Properties			
		C %	Mn %	P % max	S % max	Si %	Cr %	Mo %	Ni %	Cu %	R min. - max. Tensile Strength MPa	S min. Yield Strength MPa	A% min. (2 <sup>1</sup> / <sub>4</sub> D) Elongation	
													Long.	Trasv.
	<b>WPB</b>	0,30	0,29 - 1,06	0,050	0,058	0,10					415 - 585	240	30	20
	<b>WPC</b>	0,35	0,29 - 1,06	0,050	0,058	0,10					485 - 655	275	30	20
Acciai Legati  Alloy Steel	<b>WP1</b>	0,28	0,30 - 0,90	0,045	0,045	0,10 - 0,50		0,44 - 0,65			380 - 555	205	30	20
	<b>WP5</b>	0,15	0,30 - 0,60	0,040	0,030	0,050	4,00 - 6,00	0,44 - 0,65			415 - 585	205	30	20
	<b>WP9</b>	0,15	0,30 - 0,60	0,030	0,030	0,25 - 1,00	8,00 - 10,0	0,90 - 1,10			415 - 585	205	30	20
	<b>WP11 CL 1</b>	0,05 - 0,15	0,30 - 0,60	0,030	0,030	0,50 - 1,00	1,00 - 1,50	0,44 - 0,65			415 - 585	205	30	20
	<b>WP11 CL 2</b>	0,05 - 0,20	0,30 - 0,80	0,030	0,040	0,50 - 1,00	1,00 - 1,50	0,44 - 0,65			485 - 655	275	30	20
	<b>WP11 CL 3</b>	0,05 - 0,20	0,30 - 0,80	0,030	0,040	0,50 - 1,00	1,00 - 1,50	0,44 - 0,65			520 - 690	275	30	20
	<b>WP12 CL 1</b>	0,05 - 0,20	0,30 - 0,80	0,045	0,045	0,060	0,80 - 1,25	0,44 - 0,65			415 - 585	220	30	20
	<b>WP12 CL 2</b>	0,05 - 0,20	0,30 - 0,80	0,045	0,045	0,060	0,80 - 1,25	0,44 - 0,65			415 - 655	220	30	20
	<b>WP22 CL 1</b>	0,05 - 0,15	0,30 - 0,60	0,040	0,040	0,050	1,90 - 2,60	0,87 - 1,13			415 - 585	205	30	20
<b>WP22 CL 3</b>	0,05 - 0,15	0,30 - 0,60	0,040	0,040	0,050	1,90 - 2,60	0,87 - 1,13			520 - 690	205	30	20	

**COMPOSIZIONE CHIMICA E CARATTERISTICHE MECCANICHE DEL MATERIALE PER RACCORDI CON ESERCIZIO A BASSA TEMPERATURA IN ACCIAIO AL CARBONIO E LEGATO SECONDO NORME ASTM A 420**

**CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF MATERIAL FOR FITTINGS OF WROUGHT CARBON STEEL AND ALLOY-STEEL FOR LOW TEMPERATURES SERVICE ACCORDING TO ASTM A-234 Specs.**

Tipo Acciaio Type of the steel	ASTM Grado Grade	Composizione Chimica - Chemical Requirements						
		C %	Mn %	P %	S %	Si %	Ni %	Cu %
Acciaio al Carbonio Carbon Steel	<b>WPL6</b>	0,30	0,39 - 1,06	0,048	0,058	0,10 min		
Acciaio al 3 <sup>1</sup> / <sub>2</sub> % Nickel 3 <sup>1</sup> / <sub>2</sub> % Nickel Steel	<b>WPL3</b>	0,20	0,31 - 0,64	0,05	0,05	0,13 - 0,37	3,18 - 3,82	

Tipo Acciaio Type of the steel	ASTM Grado Grade	Caratteristiche Meccaniche Mechanical Properties				Prove di Resilienza - Impact Test				Trattamento Termico dopo formatura	
		R min./ max Tensile Strength MPa	S min. Yield Strength MPa	A % min. su 2" o 50 mm. Elongation in 2" or 50 mm., min. %		Dimensioni provette Size of specimens mm. x mm.	Media minima gruppo 3 provette Minimum average of 3 specimens J	Minimo per una singola provetta Minimum value on one specimen only J	Temperatura di prova Test temperature °C	Post - Forming Heat - Treatment	
				Longitudinale Longitudinal	Trasversale Transverse					Temperatura Temperature °C	Permanenza Min. holding time min.
Acciaio al Carbonio Carbon Steel	<b>WPL6</b>	415/585	240	30	16,5	10x10	17,6	13,6	-45	920	1 h/25,4 mm. 30' min.
						10x 7,5	13,6	10,8			
						10x 5	9,5	7,0			
						10x 2,5	5,4	4,1			
Acciaio al 3 <sup>1</sup> / <sub>2</sub> % Nickel 3 <sup>1</sup> / <sub>2</sub> % Nickel Steel	<b>WPL3</b>	450/620	240	30	20	10x10	17,6	13,6	-100	920	1 h/25,4 mm. 30' min.
						10x 7,5	13,6	10,8			
						10x 5	9,5	7,0			
						10x 2,5	5,4	4,1			

**COMPOSIZIONE CHIMICA E CARATTERISTICHE MECCANICHE DEI MATERIALI PER RACCORDI IN ACCIAIO INOSSIDABILE SECONDO NORME ASTM A 403**

**CHEMICAL COMPOSITION AND MECHANICAL PROPERTIES OF MATERIAL FOR FITTINGS OF WROUGHT STAINLESS STEEL ACCORDING TO ASTM A-403 SPECS.**

ASTM Grado Grade	Materiale Material	Spec. ASTM		Composizione Chimica - Chemical Composition									Caratteristiche Meccaniche Mechanical properties			
		ASTM Spec.		C % max	Mn % max	P % max	S % max	Si % max	Ni %	Cr %	Mo %	Altri Elementi Other Elements	R min Tensile Strength M P a	S min Yield Strength M P a	A% min (2"4 D) Elongation	
		Numero Designation	Grado Grade												Long.	Trasv.
WP 304 H CR 304 H	Tubo Pipe	A 312	TP 304 H	0,04 - 0,10	2,00	0,040	0,030	0,75	8,00 - 11,00	18,0 - 20,0			515	205	35	25
	Lamiere Plate	A 240	304 H	0,04 - 0,10	2,00	0,045	0,030	1,00	8,00 - 10,50	18,0 - 20,0			515	205	40	
WP 304 L CR 304 L	Tubo Pipe	A 312	TP 304 L	0,035	2,00	0,040	0,030	0,75	8,00 - 13,00	18,0 - 20,0			485	170	35	25
	Lamiere Plate	A 240	304 L	0,030	2,00	0,045	0,030	1,00	8,00 - 12,00	18,0 - 20,0	N 0,10% max		485	170	40	
WP 309 CR 309	Tubo Pipe	A 312	TP 309	0,15	2,00	0,040	0,030	0,75	12,0 - 15,0	22,0 - 24,0			515	205	35	25
	Lamiere Plate	A 240	309 S	0,08	2,00	0,045	0,030	1,00	12,0 - 15,0	22,0 - 24,0			515	205	40	
WP 310 CR 310	Tubo Pipe	A 312	TP 310	0,15	2,00	0,040	0,030	0,75	19,0 - 22,0	24,0 - 26,0			515	205	35	25
	Lamiere Plate	A 240	310 S	0,08	2,00	0,045	0,030	1,50	19,0 - 22,0	24,0 - 26,0			515	205	40	
WP 316 H CR 316 H	Tubo Pipe	A 312	TP 316 H	0,04 - 0,10	2,00	0,040	0,030	0,75	11,0 - 14,0	16,0 - 18,0	2,00 - 3,00		515	205	35	25
	Lamiere Plate	A 240	316 H	0,04 - 0,10	2,00	0,045	0,030	1,00	10,0 - 14,0	16,0 - 18,0	2,00 - 3,00		515	205	40	
WP 316 L CR 316 L	Tubo Pipe	A 312	TP 316 L	0,035	2,00	0,040	0,030	0,75	10,0 - 15,0	16,0 - 18,0	2,00 - 3,00		485	170	35	25
	Lamiere Plate	A 240	316 L	0,030	2,00	0,045	0,030	1,00	10,0 - 14,0	16,0 - 18,0	2,00 - 3,00	N 0,10% max	485	170	40	
WP 321 CR 321	Tubo Pipe	A 312	TP 321	0,080	2,00	0,040	0,030	0,75	9,00 - 13,00	17,0 - 20,0		(Ti 5xC min - 0,70% max)	515	205	35	25
	Lamiere Plate	A 240	321	0,080	2,00	0,045	0,030	1,00	9,00 - 12,00	17,0 - 19,0		(Ti 5xC min - 0,70% max)	515	205	40	
WP 321 H CR 321 H	Tubo Pipe	A 312	TP 321 H	0,04 - 0,10	2,00	0,040	0,030	0,75	9,00 - 13,00	17,0 - 20,0		(Ti 4xC min - 0,60% max)	515	205	35	25
	Lamiere Plate	A 240	321 H	0,04 - 0,10	2,00	0,045	0,030	1,00	9,00 - 12,00	17,0 - 19,0		(Ti 4xC min - 0,70% max)	515	205	40	
WP 347 CR 347	Tubo Pipe	A 312	TP 347	0,08	2,00	0,040	0,030	0,75	9,00 - 13,00	17,0 - 20,0		(Cb + Ta 10xC min - 1,00% max)	515	205	35	25
	Lamiere Plate	A 240	347	0,08	2,00	0,045	0,030	1,00	9,00 - 13,00	17,0 - 19,0		(Cb + Ta 10xC min - 1,10% max)	515	205	40	
WP 347 H CR 347 H	Tubo Pipe	A 312	TP 347 H	0,04 - 0,10	2,00	0,040	0,030	0,75	9,00 - 13,00	17,0 - 20,0		(Cb + Ta 8xC min - 1,00% max)	515	205	35	25
	Lamiere Plate	A 240	347 H	0,04 - 0,10	2,00	0,045	0,030	1,00	9,00 - 13,00	17,0 - 19,0		(Cb + Ta 8xC min - 1,00% max)	515	205	40	

**SEAMLESS AND WELDED PIPES**  
**SPECIFICATIONS**  
**DIMENSIONS AND WEIGHTS**

## American & British standards

### AUTHORITIES QUOTED:

American National Standards Institute — ANSI  
American Society for Testing Materials — ASTM  
American Society of Mechanical Engineers — ASME

Manufactures Standardisation Society of the Valve and Fittings Industry — MSS  
Note: SP = Standard Practice

American Petroleum Institute — API

British Standard Institute — BS

## American standards and specifications

### DIMENSIONAL FITTINGS SPECIFICATIONS:

**ANSI B 16.9** — Steel Butt-Welding Fittings. Covers dimensions and tolerances of Welding Fittings 1/2" to 24" with the exception of Short Radius Elbows and Returns.

**ANSI B 16.11** — Steel Socket welding Fittings.

**ANSI B 16.25** — Butt-Welding Ends. Covers the preparation and design details of butt-Welding Ends for all components of Butt-Welded Pipe Systems.

**MSS SP-43** — Wrought Stainless Steel Butt-Welding Fittings. Covers dimensions and tolerances of Elbows and returns. Schedule 5S and 10S only in sizes 3/4"—24".

**MSS SP-48** — Steel Butt-Welding Fittings (26" and larger). Covers dimensions and tolerances of Long Radius Elbows, Tees and Reducers in sizes 26" to 36".

**MSS SP-59** — Steel Butt-Welding Short Radius Elbows and Returns. Covers dimensions and tolerances of Short Radius Elbows and Returns only in sizes 1" to 24".

### DIMENSIONAL PIPE SPECIFICATION:

**ANSI B 36.10** — Wrought Steel and Wrought-Iron Pipe. Covers diameters and wall thicknesses of pipe 1/2" to 36" with the exception of Schedules 5S and 10S.

**ANSI B 36.19** — Stainless Steel Pipe. Covers diameters and wall thickness of Stainless Steel Pipe in Schedules 5S, 10S, 40S and 80S in sizes 1/8" to 30".

### MATERIAL SPECIFICATIONS FOR FITTINGS:

**ASTM A 234** — Factory-Made Wrought Carbon Steel and Ferritic Alloy Steel Welding Fittings. Covers materials and physical properties of Carbon, Carbon-Molybdenum and Chromium-Molybdenum Fittings.

**ASTM A 403** — Factory-Made Wrought Austenitic Steel Welding Fittings.

**ASTM A 420** — Factory-Made Wrought Carbon Steel and Alloy Steel Welding Fittings of Seamless or Welded Construction for Low Temperature Service.

**ASTM B 361** — Factory-Made Wrought Aluminium and Aluminium Alloy Welding Fittings.

**MSS SP-63** — High Strength Wrought Welding Fittings. Covers materials for the manufacture of Welding Fittings for High Pressure Transmission Service Piping.

### MATERIAL SPECIFICATIONS FOR PIPES AND TUBES:

**ASTM A 53** — Welded and Seamless Steel Pipe

**ASTM A 106** — Seamless Carbon Steel Pipe for High Temperature Service.

**ASTM A 155** — Electric Fusionwelded Steel Pipe for High Temperature.

**ASTM A 179** — Seamless Cold-Drawn Low Carbon Steel. Heat-Exchanger and Condenser Tubes.

**ASTM A 269** — Seamless and Welded Austenitic Stainless Steel Tubing of General Service.

**ASTM A 312** — Seamless and Welded Austenitic Stainless Steel Pipe.

**ASTM A 333** — Seamless and Welded Steel Pipe for Low Temperature Service.

**ASTM A 335** — Seamless Ferritic Alloy-Steel Pipe for High Temperature Service.

**ASTM A 376** — Seamless Austenitic Steel Pipe for High Temperature Central-Station Services.

**ASTM A 405** — Seamless Ferritic Alloy-Steel pipe specially Heat-Treated for High Temperature Service.

**ASTM A 409** — Welded Large outside diameter Light-Wall Austenitic Chromium-Nickel Alloy Steel Pipe for corrosive or High Temperature Service.

**ASTM B 210** — Aluminium-Alloy Tubes.

**ASTM B 235** — Aluminium-Alloy Extruded Tubes.

### MATERIAL SPECIFICATIONS FOR PLATES:

**ASTM A 20** — General Requirements for delivery of Rolled Steel Plates of Flange and Firebox Qualities.

**ASTM A 129** — Open-Hearth Iron Plates of Flange Quality.

**ASTM A 167** — Specification for corrosion-resisting Chromium Nickel Steel Plate, Sheet or Strip.

**ASTM A 201** — Carbon-Silicon Steel Plates of Intermediate Tensile Ranges for Fusion-Welded Boilers and other Pressure Vessels.

**ASTM A 203** — Nickel-Steel Plates for Boilers and other Pressure Vessels.

**ASTM A 204** — Molybdenum-Steel Plates for Boilers and other Pressure Vessels.

**ASTM A 212** — High Tensile Strength Carbon-Silicon Steel Plates for Boilers and other Pressure Vessels.

**ASTM A 240** — Corrosion-resisting Chromium and Chromium-Nickel Steel Plate, Sheet and Strip for Fusion Welded Unfired Pressure Vessels.

**ASTM A 285** — Low and Intermediate Tensile-Strength Plates of Flange and Firebox Qualities.

**ASTM A 300** — Steel Plates for pressure Vessels for Service at Low Temperatures.

**ASTM A 357** — 5% Chromium, 0.5% Molybdenum Steel Plates for Boilers and other Pressure Vessels.

**ASTM A 387** — Chromium-Molybdenum Steel Plates for Boilers and other Pressure Vessels.

**ASTM A 515** — Carbon Steel Plates of Intermediate Tensile Strength for Intermediate and Higher Temperature Service.

**MATERIAL SPECIFICATIONS FOR BARS:****ASTM A 107** — Hot Rolled Carbon Steel Bars.**ASTM A 182** — Forged or Rolled Alloy-Steel pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service.**ASTM A 276** — Hot Rolled and Cold-Finished Corrosionresisting Steel Bars.**SPECIFICATIONS FOR FLANGES:****ANSI B 16.5** — Steel Pipe Flanges and Flanged Fittings (150-2,500 lbs).**ASTM A 105** — Forged or Rolled Steel Pipe Flanges, Forged Fittings and Valves and parts for High-Temperature Service.**ASTM A 181** — Forged or Rolled Steel Pipe Flanges, Forged Fittings and Valves and Parts for General Services.**ASTM A 182** — Forged or Rolled Alloy-Steel Pipe Flanges, Forged Fittings and Valves and Parts for High-Temperature Service.**ASTM A 350** — Forged or Rolled Carbon and Alloy Steel Flanges, Forged Fittings and Valves and Parts for Low-Temperature Service.**ASTM A 404** — Forged or Rolled Alloy-Steel Pipe Flanges, Flanges Fittings and Valves and Parts specially Heat Treated for High-Temperature Service.**ASTM A 465** — Leaded Carbon Steel Forged Pipe Flanges and Parts for Pressure and General Service.**MISCELLANEOUS AMERICAN SPECIFICATIONS:****ANSI B 31.1** — Code for Pressure Piping.**ANSI B 31.3** — Code for Pressure Piping: Petroleum Refinery Piping.**ANSI B 31.8** — Gas Transmission and Distribution Piping Systems.**ASTM B 210** — Aluminium Alloy Drawn Seamless Tubes.**API STD 5A** — API Specification for casing, Tubing and Drill Pipe.**API STD 5L** — API Specification for Line Pipe.**API STD 5LX** — API Specification for High Test Line Pipe.**ASME** — Boiler and Pressure Vessel Code Specifications.

## British Standards Specifications

**SPECIFICATIONS FOR STEEL PIPE FITTINGS AND FLANGES:****BS 1560** — Steel pipe Flanges and Flanged Fittings (1/2" to 24") for the Petroleum Industry.**BS 1640** — Steel Butt-Welding Pipe Fittings for the Petroleum Industry.  
Part 1: Wrought Carbon and Ferritic Alloy-Steel Fittings.  
Part 2: Wrought and cast Austenitic Chromium-Nickel Steel Fittings.**BS 1965** — Butt-Welding Pipe Fittings for Pressure Purposes.  
Part 1: Carbon Steel.  
Part 2: Austenitic Stainless Steel.**BS 3293** — Carbon Steel Pipe Flanges over 24" for the Petroleum Industry.**BS 3799** — Forged Steel Pipe Fittings, screwed and socket — welding for the petroleum Industry.**SPECIFICATIONS FOR STEELS:****BS 1501-1506** — Steels for use in the Chemical, Petroleum and Allied Industries.**BS 1510** — Low Temperature Supplementary Requirements to BS 1501-1506.**SPECIFICATIONS FOR PIPES AND TUBES:****BS 1600** — Dimensions of Wrought Steel pipe for the Petroleum Industry.**BS 3601** — Steel Pipes and Tubes for Pressure Purposes: Carbon Steel Ordinary Duties.**BS 3602** — Steel Pipes and Tubes for Pressure Purposes: Carbon Steel High Duties.**BS 3603** — Steel Pipes and Tubes for Pressure Purposes: Carbon Steel Low Temperature Duties.**BS 3604** — Steel pipes and Tubes for Pressure Purposes: Low and medium Alloy Steel.**BS 3605** — Steel Pipe and Tubes for Pressure Purposes: Austenitic Stainless Steel.**BS 3351** — Piping Systems for the Petroleum Industry.**MISCELLANEOUS BRITISH SPECIFICATIONS:****BS 806** — Ferrous pipes and piping installations for and in connection with lead boilers.**BS 1500** — Fusion Welded Pressure Vessels for use in the Chemical, Petroleum and Allied Industries.**BS 2041** — Tubular Heat Exchanges for use in the Petroleum Industry.**BS 2910** — General Recommendations for the Radio-graphic Examination of Fusion-Welded Circumferential Butt-Joints.**BS 3274** — Tubular Heat Exchangers for General Purposes.

If you need further information, please contact us.



# Dimensions and Weights of ASA standard, Seamless and Welded Steel Pipe (mm & kg/m)

Nominal Bore	Outside diameter	5S	10S	10	20	30	Standard wall & 40S	40	60	Extra strong & 80S	80	100	120	140	160	Double extra strong
in																
$\frac{1}{8}$	10.3		1.24 0.28				1.73 0.36	1.73 0.36		2.41 0.46	2.41 0.46					
$\frac{1}{4}$	13.7		1.65 0.49				2.24 0.63	2.24 0.63		3.02 0.80	3.02 0.80					
$\frac{3}{8}$	17.1		1.65 0.63				2.31 0.85	2.31 0.85		3.2 1.10	3.2 1.10					
$\frac{1}{2}$	21.3	1.65 0.80	2.11 1.00				2.77 1.27	2.77 1.27		3.73 1.62	3.73 1.62				4.78 1.94	7.47 2.55
$\frac{3}{4}$	26.7	1.65 1.03	2.11 1.28				2.87 1.68	2.87 1.68		3.91 2.19	3.91 2.19				5.56 2.90	7.82 3.63
1	33.4	1.65 1.29	2.77 2.08				3.38 2.50	3.38 2.50		4.55 3.23	4.55 3.23				6.35 4.18	9.09 5.45
1 $\frac{1}{4}$	42.2	1.65 1.65	2.77 2.69				3.56 3.38	3.56 3.38		4.85 4.46	4.85 4.46				6.35 5.58	9.70 7.76
1 $\frac{1}{2}$	48.3	1.65 1.90	2.77 3.12				3.68 4.05	3.68 4.05		5.08 5.41	5.08 5.41				7.14 7.22	10.16 9.55
2	60.3	1.65 2.38	2.77 3.94				3.91 5.44	3.91 5.44		5.54 7.49	5.54 7.49				8.74 11.08	11.07 13.45
2 $\frac{1}{2}$	73.0	2.11 3.70	3.05 5.26				5.16 8.68	5.16 8.68		7.01 11.42	7.01 11.42				9.52 14.88	14.02 20.41
3	88.9	2.11 4.50	3.05 6.45				5.49 11.29	5.49 11.29		7.62 15.27	7.62 15.27				11.13 20.98	15.24 27.67
3 $\frac{1}{2}$	101.6	2.11 5.20	3.05 7.40				5.74 13.37	5.74 13.37		8.08 18.63	8.08 18.63					
4	114.3	2.11 5.81	3.05 8.34				6.02 16.07	6.02 16.07		8.56 22.31	8.56 22.31		11.13 28.25		13.49 33.48	17.12 41.02
5	141.3	2.77 9.45	3.40 11.56				6.55 21.78	6.55 21.78		9.52 30.95	9.52 30.95		12.7 40.24		15.88 49.11	19.05 57.42
6	168.3	2.77 11.31	3.40 13.82				7.11 28.26	7.11 28.26		10.97 42.56	10.97 42.56		14.27 54.20		18.26 67.22	21.95 79.18
8	219.1	2.77 14.78	3.76 19.94	6.35 33.03	7.04 36.72		8.18 42.53	8.18 42.53	10.31 52.88	12.7 64.63	12.7 64.63	15.09 75.80	18.26 90.32	20.62 101.04	23.01 111.32	22.22 107.87
10	273	3.40 22.62	4.19 27.83	6.35 41.70	7.8 51.00		9.27 60.29	9.27 60.29	12.7 81.46	12.7 81.46	15.09 95.95	18.26 114.59	21.44 132.74	25.40 154.94	28.58 172.14	25.40 154.94
12	323.9	3.96 33.00	4.57 36.00	6.35 49.81	8.38 65.07		9.52 73.82	10.31 79.67	14.27 108.97	12.7 97.36	17.47 131.70	21.44 159.52	25.40 186.77	28.58 206.96	33.34 238.11	25.40 186.77
14	355.6	3.96 34.23	4.78 41.18	6.35 54.63	7.92 67.95	9.52 81.28	9.52 81.28	11.13 94.31	15.09 126.49	12.7 107.28	19.05 157.94	23.82 194.82	27.79 224.42	31.75 253.14	35.71 281.38	
16	406.4	4.19 41.60	4.78 47.33	6.35 62.58	7.92 77.88	9.52 93.21	9.52 93.21	12.7 123.18	16.64 159.98	12.7 123.18	21.44 203.16	26.19 245.32	30.96 286.44	36.52 332.62	40.49 364.85	
18	457.2	4.19 46.83	4.78 53.18	6.35 70.53	7.92 87.81	11.13 122.12	9.52 105.14	14.27 155.90	19.05 205.62	12.7 139.07	23.82 254.19	29.36 309.44	34.92 363.19	39.69 408.01	45.24 459.18	
20	508	4.78 59.22	5.54 68.50	6.35 78.47	9.52 117.07	12.7 154.97	9.52 117.07	15.09 183.12	20.62 247.79	12.7 154.97	26.19 310.90	32.54 381.04	38.10 440.93	44.45 507.54	50.01 564.14	
24	609.6	5.54 82.60	6.35 94.37	6.35 94.37	9.52 140.94	14.27 209.54	9.52 140.94	17.48 254.74	24.61 354.64	12.7 186.75	30.96 441.10	38.89 546.92	46.02 639.18	52.39 718.94	59.54 806.61	
26	660.4			7.92 127.58	12.7 202.65		9.52 152.87			12.7 202.65						
30	762			7.92 147.33	12.7 234.44	15.88 291.81	9.52 176.73			12.7 234.44						
32	812.8			7.92 156.58	12.7 260.33	15.88 311.67	9.52 188.66	17.48 352.28		12.7 260.33						
34	863.6			7.92 166.82	12.7 266.35	15.88 331.54	9.52 200.59	17.48 363.91		12.7 266.35						
36	914.4			7.92 177.12	12.7 282.12	15.88 351.41	9.52 212.52	19.05 420.17		12.7 282.12						

## Dimensions and Weights of ASA standard Seamless and Welded Steel Pipe (in & lb/ft)

Nominal Bore	Outside diameter	5S	10S	10	20	30	Standard wall & 40S	40	60	Extra strong & 80S	80	100	120	140	160	Double extra strong
in																
1/8	0-405		0-049				0-068	0-068		0-095	0-095					
			0-19				0-24	0-24		0-31	0-31					
1/4	0-540		0-065				0-088	0-088		0-119	0-119					
			0-33				0-42	0-42		0-54	0-54					
3/8	0-675		0-065				0-091	0-091		0-126	0-126					
			0-42				0-57	0-57		0-74	0-74					
1/2	0-840	0-065	0-083				0-109	0-109		0-147	0-147				0-188	0-294
		0-54	0-67				0-85	0-85		1-09	1-09				1-31	1-71
3/4	1-050	0-065	0-083				0-113	0-113		0-154	0-154				0-219	0-308
		0-69	0-86				1-13	1-13		1-47	1-47				1-94	2-44
1	1-315	0-065	0-109				0-133	0-133		0-179	0-179				0-250	0-358
		0-87	1-40				1-68	1-68		2-17	2-17				2-84	3-66
1 1/4	1-660	0-065	0-109				0-140	0-140		0-191	0-191				0-250	0-382
		1-11	1-81				2-27	2-27		3-00	3-00				3-76	5-21
1 1/2	1-900	0-065	0-109				0-145	0-145		0-200	0-200				0-281	0-400
		1-28	2-09				2-72	2-72		3-63	3-63				4-86	6-41
2	2-375	0-065	0-109				0-154	0-154		0-218	0-218				0-344	0-436
		1-61	2-64				3-65	3-65		5-02	5-02				7-46	9-03
2 1/2	2-875	0-083	0-120				0-203	0-203		0-276	0-276				0-375	0-552
		2-48	3-53				5-79	5-79		7-66	7-66				10-01	13-70
3	3-500	0-083	0-120				0-216	0-216		0-300	0-300				0-438	0-600
		3-03	4-33				7-58	7-58		10-25	10-25				14-31	18-58
3 1/2	4-000	0-083	0-120				0-226	0-226		0-318	0-318					
		3-48	4-97				9-11	9-11		12-51	12-51					
4	4-500	0-083	0-120				0-237	0-237		0-337	0-337		0-438		0-531	0-674
		3-92	5-61				10-79	10-79		14-98	14-98		18-98		22-52	27-54
5	5-563	0-109	0-134				0-258	0-258		0-375	0-375		0-500		0-625	0-750
		6-36	7-77				14-62	14-62		20-78	20-78		27-04		32-96	38-56
6	6-625	0-109	0-134				0-280	0-280		0-432	0-432		0-562		0-719	0-864
		7-60	9-29				18-97	18-97		28-57	28-57		36-42		45-34	53-16
8	8-625	0-109	0-148		0-250	0-277	0-322	0-322	0-406	0-500	0-500	0-594	0-719	0-812	0-906	0-875
		9-93	13-40		22-36	24-70	28-55	28-55	35-66	43-39	43-39	50-93	60-89	67-79	74-71	72-42
10	10-750	0-134	0-165		0-250	0-307	0-365	0-365	0-500	0-500	0-594	0-719	0-844	1-000	1-125	1-000
		15-23	18-70		28-04	34-24	40-48	40-48	54-74	54-74	64-40	77-00	89-27	104-13	115-65	104-13
12	12-750	0-156	0-180		0-250	0-330	0-375	0-406	0-562	0-500	0-688	0-844	1-000	1-125	1-312	1-000
		22-22	24-20		33-38	43-77	49-56	53-56	73-22	65-42	88-57	107-29	125-49	139-68	160-33	125-49
14	14-000	0-156	0-188	0-250	0-312	0-375	0-375	0-438	0-594	0-500	0-750	0-938	1-094	1-250	1-406	
		23-07	27-73	36-71	45-68	54-57	54-57	63-37	85-01	72-09	106-13	130-79	150-76	170-22	189-15	
16	16-000	0-165	0-188	0-250	0-312	0-375	0-375	0-500	0-656	0-500	0-844	1-031	1-219	1-438	1-594	
		27-90	31-75	42-05	52-36	62-58	62-58	82-77	107-54	82-77	136-58	164-86	192-40	223-57	245-22	
18	18-000	0-165	0-188	0-250	0-312	0-438	0-375	0-562	0-750	0-500	0-938	1-156	1-375	1-562	1-781	
		31-43	35-77	47-39	59-03	82-06	70-59	104-76	138-17	93-45	170-84	208-08	244-14	274-30	308-55	
20	20-000	0-188	0-218	0-250	0-375	0-500	0-375	0-594	0-812	0-500	1-031	1-281	1-500	1-750	1-969	
		39-78	46-06	52-73	78-60	104-13	78-60	123-06	166-50	104-13	209-92	256-15	296-37	341-10	379-14	
24	24-000	0-218	0-250	0-250	0-375	0-562	0-375	0-688	0-969	0-500	1-219	1-531	1-812	2-062	2-344	
		55-38	63-41	63-41	94-62	140-80	94-62	171-17	238-29	125-49	296-53	367-45	429-50	483-24	542-09	
26	26-000			0-312	0-500		0-375			0-500						
				85-73	136-17		102-63			136-17						
30	30-000			0-312	0-500	0-625	0-375			0-500						
				99-08	157-53	196-08	118-65			157-53						
32	32-000			0-312	0-500	0-625	0-375	0-688		0-500						
				105-76	168-21	209-43	126-66	229-92		168-21						
34	34-000			0-312	0-500	0-625	0-375	0-688		0-500						
				112-43	178-89	222-78	134-67	244-60		178-89						
36	36-000			0-312	0-500	0-625	0-375	0-750		0-500						
				119-11	189-57	236-13	142-68	282-36		189-57						

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