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TABLE OF EQUIVALENT STANDARDS

Material No.	ASTM		BS		NF		GOST Standard
	Steel Grade	Standard	Steel Grade	Standard	Steel Grade	Standard	
1.2540	Gr. A	A 53	S 360	3601	TU E 220 A	A 49 - 112	8731 / 10 8733 / 10
1.0256	Gr. B	A 53	S 340	3601	TU E 235 A	A 49 - 112	8731 / 20 8732 / 20
1.0421	Gr. 3	A 252	50 B	4360	TU 52 - b	A 49 - 311	5058 / 1862
1.0581		A 252	HFS 5	6323		A 49 - 212	
1.0305	Gr. FPA	A 369	S 320	3059/1	TU 37 - c	A 49 - 213	TU 14-3-460/10
	Gr. A	A 53 + A 106	HFS 360	3602 / 1		A 49 - 215	
		A 179	CFS 360	3602 / 1		A 49 - 212	
		A 192	360	3059 / 2		A 49 - 213	
1.0405	Gr. B	A 106	HFS 430	3602 / 1	TU 42- c	A 49 - 215	TU 14-3-460/20
	Gr. A - 1	A 210	CFS 430	3602 / 1		A 49 - 213	
	Gr. FPA	A 369	440	3059 / 2		A 49 - 215	
1.0481	Gr. C	A 106	440	3059 / 2	TU 48- c	A 49 - 213	
—	Gr. C	A 210	430	3602 / 1		A 49 - 215	
1.0482	—	—	—	—	TU 52 - c	A 49 - 213	
—	—	—	500 Nb	3602 / 1	—	—	
1.5414	—	—	243	3059 / 2	TU 15 D 3	A 49 - 213	
	—	—	—	3606		A 49 - 215	
1.5432	Gr. T1	A 161 + A 209	245	3606	—	—	
	Gr. P 1/FP 1	A 335 + A 369	—	3606	—	—	
—	Gr. P2	A 335 + A 369	—	—	TU 15 CD 2-05	A 49 - 213	
—	Gr. FP2	A 369	—	—		A 49 - 215	
1.7335	Gr. T 12	A 213	620 - 440	3606	TU 13 CD 4-04	A 49 - 213	
	Gr. P 12	A 335	620 - 460	3606		A 49 - 213	
	Gr. FP 12	A 369	620	3606		A 49 - 213	
		A 369	—	3059 / 2		A 49 - 213	
1.7380	Gr. T 22	A 199 + A 200	622 - 440	3059 / 2	TU 10 CD 9-10	A 49 - 213	
	Gr. T 22	A 213	622 - 490	3059 / 2		A 49 - 213	
	Gr. P 22 / FP 22	A 335 + A 369	622	3604 / 3606		A 49 - 215	

Chemical Compositions According To Steel Pipe Standards

Standard	Grade	C	Mn	Si	P max	S max	Cu	Ni	Cr	Mo	V
API Spec. 5 ct	H-40				0.03	0.03					
API Spec. 5 ct	J-55				0.03	0.03					
API Spec. 5 ct	K-55				0.03	0.03					
API Spec. 5 ct	N-80				0.03	0.03					
API Spec. 5 L	A	max 0.22	max 0.90		0.03	0.03					
API Spec. 5 L	B	max 0.28	max 1.20		0.03	0.03					
API Spec. 5 L	X 42 - PSL 1	max 0.28	max 1.30		0.03	0.03					
API Spec. 5 L	X 42 - PSL 2	max 0.24	max 1.30		0.025	0.015					
API Spec. 5 L	X 46 - PSL 1	max 0.28	max 1.40		0.03	0.03					
API Spec. 5 L	X 46 - PSL 2	max 0.24	max 1.40		0.025	0.015					
API Spec. 5 L	X 52 - PSL 1	max 0.28	max 1.40		0.03	0.03					
API Spec. 5 L	X 52 - PSL 2	max 0.24	max 1.40		0.025	0.015					
API Spec. 5 L	X 56 - PSL 1	max 0.28	max 1.40		0.03	0.03					
API Spec. 5 L	X 56 - PSL 2	max 0.24	max 1.40		0.025	0.015					
API Spec. 5 L	X 60 - PSL 1	max 0.28	max 1.40		0.03	0.03					
API Spec. 5 L	X 60 - PSL 2	max 0.24	1.4		0.025	0.015					
ASTM A 53	Gr. A	max 0.25	max 0.95		0.05	0.045	max 0.40	max 0.40	max 0.40	max 0.15	max 0.08
ASTM A 53	Gr. B	max 0.30	max 1.20		0.05	0.045	max 0.40	max 0.40	max 0.40	max 0.15	max 0.08
ASTM A 106	Gr. A	max 0.25	0.27-0.93	min 0.10	0.035	0.035	max 0.40	max 0.40	max 0.40	max 0.15	max 0.08
ASTM A 106	Gr. B	max 0.30	0.29-1.06	min 0.10	0.035	0.035	max 0.40	max 0.40	max 0.40	max 0.15	max 0.08
ASTM A 106	Gr. C	max 0.35	0.29-1.06	min 0.10	0.035	0.035	max 0.40	max 0.40	max 0.40	max 0.15	max 0.08
ASTM A 333	Gr. 1	max 0.30	0.40-1.06		0.025	0.025					
ASTM A 333	Gr. 6	max 0.30	0.29-1.06	min 0.10	0.025	0.025					
ASTM A 335	P1	0.10-0.20	0.30-0.80	0.10-0.50	0.025	0.025				0.44-0.65	
ASTM A 335	P11	0.05-0.15	0.30-0.60	0.50-1.00	0.025	0.025			1.00-1.50	0.44-0.65	
ASTM A 335	P12	0.05-0.15	0.30-0.61	max 0.50	0.025	0.025			0.80-1.25	0.44-0.65	
ASTM A 335	P22	0.05-0.15	0.30-0.60	max 0.50	0.025	0.025			1.90-2.60	0.87-1.13	
ASTM A 335	P5	max 0.15	0.30-0.60	max 0.50	0.025	0.025			4.00-6.00	0.45-0.65	
ASTM A 335	P22	0.10-0.20	0.30-0.61	0.10-0.30	0.025	0.025			0.50-0.81	0.44-0.65	

Mechanical Properties According To Steel Pipe Standards

Standard	Grade	Heat Treatment	Re (Mpa)			Rm (Mpa)	A5 min %	KV (J)
			t° up to 16 mm	t°16 - 40 mm	t° 40 - 65 mm			
API Spec. 5 CT	H-40	U	276 - 552	276 - 552		min. 414	viz. API	
API Spec. 5 CT	J-55	U,N	379 - 552	379 - 552		min. 517	viz. API	
API Spec. 5 CT	K-55	U,N	379 - 552	379 - 552		min. 665	viz. API	
API Spec. 5 CT	N-80	Z	552 - 758	552 - 758		min. 689	viz. API	
API Spec. 5 L	A-PSL 1	U,N	207	207	207	min. 331	viz. API	
API Spec. 5 L	B-PSL 1	U,N	241	241	241	min. 414	viz. API	
API Spec. 5 L	B-PSL 2	U,N	241 - 448	241 - 448		414 - 758	viz. API	KV = 27 (0° C)
API Spec. 5 L	X 42-PSL 1	U,N	290	290	290	min. 414	viz. API	
API Spec. 5 L	X 42-PSL 2	U,N	290 - 496	290 - 496		414 - 758	viz. API	KV = 27 (0° C)
API Spec. 5 L	X 46-PSL 1	U,N	317	317	317	min. 434	viz. API	
API Spec. 5 L	X 46-PSL 2	U,N	317 - 524	317 - 524		434 - 758	viz. API	KV = 27 (0° C)
API Spec. 5 L	X 52-PSL 1	U,N	359	359	359	min. 455	viz. API	
API Spec. 5 L	X 52-PSL 2	U,N	359 - 531	359 - 531		455 - 758	viz. API	KV = 27 (0° C)
API Spec. 5 L	X 56-PSL 1	U,N	386	386	386	min. 490	viz. API	
API Spec. 5 L	X 56-PSL 2	U,N	386 - 544	386 - 544		490 - 758	viz. API	KV = 27 (0° C)
API Spec. 5 L	X 60-PSL 1	U,N	414	414	414	min. 517	viz. API	
API Spec. 5 L	X 60-PSL 2	U,N	414 - 565	414 - 565		517 - 758	viz. API	KV = 27 (0° C)
ASTM A53	Gr. A	U,N	205	205	205	min. 330	viz. ASTM	
ASTM A53	Gr. B	U,N	240	240	240	min. 415	viz. ASTM	
ASTM A106	Gr. A	N	205	205	205	min. 330	35	
ASTM A106	Gr. B	N	240	240	240	min. 415	30	
ASTM A106	Gr. C	N	275	275	275	min. 485	30	
ASTM A333	Gr. 1	N	205	205	205	min. 380	25	KV = 18 (-45° C)
ASTM A333	Gr. 6	N	240	240	240	min. 415	30	KV = 18 (-45° C)
ASTM A335	P.1	N	205	205	205	min. 380	30	
ASTM A335	P.11	Z	205	205	205	min. 415	30	
ASTM A335	P.12	Z	220	220	220	min. 415	30	
ASTM A335	P.2	Z	205	205	205	min. 380	30	
ASTM A335	P.22	Z	205	205	205	min. 415	30	
ASTM A335	P.5	Z	205	205	205	min. 415	30	
ASTM A335	P.91	Z	415	415	415	min. 585	20	

Max. Service Temperatures of Seamless Steel Pipes

Max. Service Temperature	ASTM	DIN 17175	BS 3059-3601 3602-3603 3604-3606	AFNOR NF A 49-213 NF A 49-215	JIS G3456 G3458 G3461 G3462	GOST TY-4-3460-75
	USA	GERMANY	UK	FRANCE	JAPAN	RUSSIA
100 °C	A 334 Gr 3		503 LT	TU10N 14		
45 °C	A 334 Gr 1	No Ni 14	430 LT	TU 42 BT		
475 °C	A 179	St. 35.8	320	TU 37 C	STPT 38	
	A 106 Gr A		360		STB 35	
	A 192					
475 °C	A 106 Gr B	St. 45.8	430	TU 42 C	STPT 42	20
	A 210 Gr A1				STB 42	
475 °C	A 106 Gr C	17 Mn 4	440	TU 48 C	STPT 49	
	A 210 Gr C					
500 °C		15 Mo 3	243	TU 15 D 3		
	A 209 T 1	16 Mo 5	245		STBA 12	
500 °C	A 335 P 1				STPA 12	
					STBA 13	
550 °C	A 213 T 2			TU 15(02.05)	STBA 20	
	A 335 P 12				STPA 20	
560 °C	A 213 T 12	13 Cr Mo 44	620 - 460	TU 13 CD 4.04	STBA 22	15 X M
	A 335 P 12				STPA 22	
575 °C	A 213 T 11		621	TU 10 CD 5.05	STBA 22	
	A 335 P 11				STPA 23	
600 °C						12 X 1 MF
	A 213 T 5	12 Cr Mo 19 S	625	TU Z 10 CD 05.05	STBA 25	
	A 335 P 5		622 - 490	TU Z 12 CD 05.06	STPA 25	
	A 213 T 22	10 Cr Mo 9 10		TU Z 10 C 9.10	STBA 24	
600 °C	A 335 P 22				STPA 24	
		14 Mo V 63				
625 °C						12 X 1 MF
	A 213 T 9	X12CrMo91	629 - 470	TU Z 10 CD 09	STBA 26	
625 °C	A 335 P 9		629 - 490		STPA 26	
625 °C	A 213 T 91	X10CrMoVNb9-1		TU Z 10 CDVNb 09.01		
	A 335 P 91			TU Z 10 CDVNb 09.02		

Unit Weight Schedule for Seamless Pipes

Diameter		Outer Diameter			STD	1.6	1.8	2	2.3	2.6	2.9	3.2	3.6	4	4.5	5	5.6	6.3	7.1	8	8.8	10		
mm	Inch	Seri 1	Seri 2	Seri 3																				
	1/8"	10			1.6	0.339	0.373	0.404	0.45	0.487														
	1/4"	14			1.8		0.519	0.567	0.64	0.699	0.76	0.813	0.879											
			16		1.8		0.630	0.691	0.78	0.859	0.94	1.01	1.10	1.18										
10	3/8"	17			1.8		0.684	0.750	0.85	0.936	1.02	1.10	1.21	1.30	1.41									
			19		2.0			0.838	0.95	1.05	1.15	1.25	1.37	1.48	1.61	1.73								
			20		2.0			0.888	1.00	1.12	1.22	1.33	1.46	1.58	1.72	1.85								
15	1/2"	21			2.0			0.952	1.08	1.20	1.32	1.43	1.57	1.71	1.86	2.01								
			25		2.0			1.13	1.29	1.44	1.58	1.72	1.90	2.07	2.28	2.47	2.68	2.91						
			25		2.0			1.15	1.31	1.46	1.61	1.75	1.94	2.11	2.32	2.52	2.73	2.97						
20	3/4"	27			2.3			1.23	1.40	1.56	1.72	1.87	2.07	2.26	2.49	2.70	2.94	3.20	3.47					
			30		2.6			1.57	1.76	1.94	2.11	2.34	2.56	2.83	3.08	3.37	3.68	4.01						
			32		2.6			1.67	1.87	2.07	2.26	2.50	2.74	3.03	3.30	3.62	3.96	4.32	4.70					
25	1"	34			2.6			1.78	1.99	2.20	2.41	2.67	2.93	3.24	3.54	3.88	4.26	4.66	5.07					
			38		2.6				2.27	2.51	2.75	3.05	3.35	3.72	4.07	4.47	4.93	5.41	5.92	6.34				
32	1 1/4"	42			2.6				2.55	2.82	3.09	3.44	3.79	4.21	4.61	5.08	5.61	6.18	6.79	7.29	7.99			
			45		2.6				2.69	2.98	3.26	3.63	4.00	4.44	4.87	5.37	5.94	6.55	7.20	7.75	8.51			
40	1 1/2"	48			2.6				2.93	3.25	3.56	3.97	4.37	4.86	5.34	5.90	6.53	7.21	7.95	8.57	9.45			
			51		2.6				3.10	3.44	3.77	4.21	4.64	5.16	5.67	6.27	6.94	7.69	8.48	9.16	10.1			
			54		2.6				3.30	3.65	4.01	4.47	4.93	5.49	6.04	6.68	7.41	8.21	9.08	9.81	10.9			
			57		2.9				3.87	4.25	4.74	5.23	5.83	6.41	7.10	7.88	8.74	9.67	10.5	11.6				
50	2"	60			2.9				4.11	4.51	5.03	5.55	6.19	6.82	7.55	8.39	9.32	10.3	11.2	12.4				
			64		2.9				4.33	4.76	5.32	5.87	6.55	7.21	8.0	8.89	9.88	10.9	11.9	13.2	14.8			
			70		2.9				4.80	5.27	5.90	6.51	7.27	8.01	8.89	9.90	11.0	12.2	13.3	14.8				
			73		2.9				5.01	5.51	6.16	6.81	7.60	8.38	9.31	10.4	11.5	12.8	13.9	15.5				
65	2.5"	76			3.9				5.24	5.75	6.44	7.11	7.95	8.77	9.74	10.8	12.1	13.4	14.6	16.3				
			83		3.2					6.26	7.00	7.74	8.66	9.56	10.6	11.8	13.2	14.7	16.0	17.9				
80	3"	89			3.2					6.76	7.57	8.38	9.37	10.3	11.5	12.8	14.3	16.0	17.4	19.5				
90	3 1/2"		102		3.6							8.70	9.63	10.8	11.9	13.3	14.8	16.5	18.5	20.1	22.6			
			108		3.6							9.27	10.3	11.5	12.7	14.1	15.8	17.7	19.7	21.5	24.2			
100	4"	114			3.6							9.83	10.9	12.2	13.5	15.0	16.8	18.8	21.0	22.9	25.7			
			127		4.0								12.1	13.6	15.0	16.8	18.8	21.0	23.5	25.7	28.9			
			133		4.0								12.7	14.3	15.8	17.6	19.7	22.0	24.7	27.0	30.3			
125	5"	140			4.0								13.4	15.0	16.6	18.5	20.7	23.2	26.0	28.4	32.0			
			152		4.5									16.4	18.2	20.3	22.7	25.4	28.5	31.2	35.1			
			159		4.5									17.1	19.0	21.2	23.7	26.6	29.8	32.6	36.7			
150	6"	168			4.5									18.2	20.1	22.5	25.2	28.2	31.6	34.6	39.0			
	7"		178		5.0										21.3	23.8	26.6	29.9	33.5	36.7	41.4			
			194		5.6											26.0	29.1	32.7	36.6	40.1	45.3			
200	8"	219			6.3												33.1	37.1	41.6	45.6	51.6			
	9"		245		6.3												37.0	41.6	46.7	51.2	57.8			
250	10"	273			6.3												41.4	46.6	52.3	57.3	64.9			
300	12"	324			7.1													55.5	62.3	68.4	77.4			
350	14"	356			8.0														68.6	75.3	85.2			
400	16"	406			8.8															86.3	97.8			
450	18"	457			10																110			
500	20"	508			11																			
550	22"		559		12.5																			
600	24"	610			12.5																			
650	26"		660		14.2																			

Unit Weight Schedule for Seamless Pipes

Diameter		Outer Diameter			STD	11	12.5	14.2	16	17.5	20	22.2	25	28	30	32	36	40	45	50	55	60	65		
mm	Inch	Seri 1	Seri 2	Seri 3																					
	1/8"	10.2			1.6																				
	1/4"	13.5			1.8																				
			16		1.8																				
10	3/8"	17.2			1.8																				
			19		2.0																				
			20		2.0																				
15	1/2"	21.3			2.0																				
			25		2.0																				
			25.4		2.0																				
20	3/4"	26.9			2.3																				
			30		2.6																				
			32		2.6																				
25	1"	33.7			2.6																				
			38		2.6																				
32	1 1/4"	42.4			2.6																				
			44.5		2.6	9.09																			
40	1 1/2"	48.3			2.6	10.1	11.0																		
			51		2.6	10.9	11.9	12.9																	
			54		2.6	11.7	12.8	13.9																	
			57		2.9	12.5	13.7	15.0	16.2																
50	2"	60.3			2.9	13.4	14.7	16.1	17.5	18.5															
			64		2.9	14.2	15.7	17.3	18.7	19.9															
			70		2.9	16.0	17.7	19.5	21.3	22.7	24.7														
			73		2.9	16.8	18.7	20.6	22.5	24.0	26.1														
65	2.5"	76			3.9	17.7	19.6	21.7	23.7	25.3	27.7														
			82.5		3.2	19.4	21.6	23.9	26.2	28.1	30.8	33.0													
80	3"	88.9			3.2	21.1	23.6	26.2	28.8	30.8	34.0	36.5	39.4												
90	3 1/2"		102		3.6	24.6	27.5	30.6	33.8	36.3	40.2	43.5	47.2	50.8	53.0	54.9									
			108		3.6	26.3	29.4	32.8	36.3	39.1	43.4	47.0	51.2	55.2	57.7	60.0	63.9								
100	4"	114			3.6	28.0	31.4	35.1	38.8	41.8	46.5	50.4	55.1	59.6	62.4	64.9	69.5								
			127		4.0	31.5	35.3	39.5	43.8	47.3	52.8	57.4	62.9	68.4	71.8	75.0	80.8	85.8							
			133		4.0	33.1	37.1	41.6	46.2	49.8	55.7	60.7	66.6	72.5	76.2	79.7	86.1	91.7							
125	5"	140			4.0	34.9	39.2	43.9	48.8	52.7	59.0	64.3	70.7	77.1	81.2	85.0	92.1	98.4	105						
			152		4.5	38.4	43.1	48.4	53.8	58.1	65.3	71.3	78.5	85.9	90.6	95.0	103	111	119	126					
			159		4.5	40.1	45.2	50.7	56.4	61.1	68.6	74.9	82.6	90.5	95.4	100	109	117	127	134					
150	6"	168			4.5	42.7	48.0	54.0	60.1	65.1	73.1	80.0	88.3	96.9	102	108	117	127	137	146	154				
	7"		178		5.0	45.2	51.0	57.3	63.8	69.2	77.8	85.2	94.2	103	109	115	126	136	147	158	167				
			194		5.6	49.6	55.9	62.9	70.1	76.0	85.7	93.9	104	114	121	128	140	152	165	177	188				
200	8"	219			6.3	56.5	63.7	71.8	80.1	87.0	98.2	108	120	132	140	148	163	177	193	209	223	235	247		
	9"		245		6.3	63.3	71.5	80.6	90.2	98.0	111	122	135	149	159	168	185	202	221	240	257	273	288		
250	10"	273			6.3	71.1	80.3	90.6	101	110	125	137	153	169	180	190	210	230	253	275	296	315	333		
300	12"	324			7.1	84.9	96.0	108	121	132	150	165	184	204	217	230	256	280	310	338	365	390	415		
350	14"	356			8.0	93.5	106	120	134	146	166	183	204	226	241	255	284	331	345	377	408	437	466		
400	16"	406			8.8	107	121	137	154	168	191	210	235	261	278	295	329	361	401	439	477	513	547		
450	18"	457			10	121	137	155	174	190	216	238	266	296	316	335	374	411	457	502	545	587	628		
500	20"	508			11	135	153	173	194	212	241	266	298	331	354	376	419	462	514	565	614	663	710		
550	22"		559		12.5		168	191	214	234	266	294	329	367	391	416	464	512	570	628	684	738	792		
600	24"	610			12.5		184	209	234	256	291	322	361	402	429	456	510	562	627	691	753	814	874		
650	26"		660		14.2			226	254	277	316	349	392	436	466	496	554	612	683	752	821	888	954		