Carbon Steel Tubes and Pipes for Pressure Purposes

Mechanical Properties of Carbon Steel Tubes and Pipes for Pressure Purposes

Standard Designation	Grade, Class, Type, Symbol or Name	Steel Number	UNS Number	Product Form/ Heat Treatment	Thickness		Yield Strength, min		Tensile Strength, min		Elongation, min, %	Other
					t, mm	t, in.	N/mm² or MPa	ksi	N/mm² or MPa	ksi		
EN 10216-1:2002	P195TR1	1.0107	---	HF: AF, N or NF; HFCF: N	≤ 16	---	195	---	320-440	---	27 L; 25 T	---
					16 < t ≤ 40	---	185	---				
					40 < t ≤ 60	---	175	---				
	P195TR2	1.0108	---	HF: N or NF; HFCF: N	≤ 16	---	195	---	320-440	---	27 L; 25 T	see standard
					16 < t ≤ 40	---	185	---				
					40 < t ≤ 60	---	175	---				
EN 10217-1:2002	P195TR1	1.0107	---	see standard	≤ 16	---	195	---	320-440	---	27 L; 25 T	---
					16 < t ≤ 40	---	185	---				
	P195TR2	1.0108	---	see standard	≤ 16	---	195	---	320-440	---	27 L; 25 T	see standard
					16 < t ≤ 40	---	185	---				
ASTM A 53/A 53M-02	Type E Grade A	---	K02504	AM	---	---	205	30	330	48	see standard	---
	Type F Grade A	---	---	AM	---	---	205	30	330	48	see standard	---
	Type S Grade A	---	K02504	AM	---	---	205	30	330	48	see standard	---
ASTM A 139-00	A	---	---	---	---	---	205	30	330	48	≥ 7.9 mm (5⁄16 in) 35	---
ASTM A 135-01	A	---	---	AM	---	---	207	30	331	48	≥ 7.9 mm (5⁄16 in) 35	---
EN 10216-1:2002	P235TR1	1.0254	---	HF: AF, N or NF; HFCF: N	≤ 16	---	235	---	360-500	---	25L; 23 T	---
					16 < t ≤ 40	---	225	---				
					40 < t ≤ 60	---	215	---				
	P235TR2	1.0255	---	HF: N or NF; HFCF: N	≤ 16	---	235	---	360-500	---	25 L; 23 T	see standard
					16 < t ≤ 40	---	225	---				
					40 < t ≤ 60	---	215	---				
EN 10217-1:2002	P235TR1	1.0254	---	see standard	≤ 16	---	235	---	360-500	---	25 L; 23 T	---
					16 < t ≤ 40	---	225	---				
	P235TR2	1.0255	---	see standard	≤ 16	---	235	---	360-500	---	25 L; 23 T	see standard
					16 < t ≤ 40	---	225	---				
JIS G 3454:1988	STPG 370	---	---	AM or CF+A	---	---	215	---	370	---	30	---

Carbon Steel Tubes and Pipes for Pressure Purposes

Mechanical Properties of Carbon Steel Tubes and Pipes for Pressure Purposes (Continued)

Standard Designation	Grade, Class, Type, Symbol or Name	Steel Number	UNS Number	Product Form/ Heat Treatment	Thickness		Yield Strength, min		Tensile Strength, min		Elongation, min, %	Other
					t, mm	t, in.	N/mm^2 or MPa	ksi	N/mm^2 or MPa	ksi		
JIS G 3457:1988	STPY 400	---	---	AW or ACE	---	---	225	---	400	---	18	---
EN 10216-1:2002	P265TR1	1.0258	---	HF: AF, N or NF; HFCF: N	≤ 16	---	265	---	410-570	---	21 L; 19 T	---
					16 < t ≤ 40	---	255	---				
					40 < t ≤ 60	---	245	---				
	P265TR2	1.0259	---	HF: N or NF; HFCF: N	≤ 16	---	265	---	410-570	---	21 L; 19 T	see standard
					16 < t ≤ 40	---	255	---				
					40 < t ≤ 60	---	245	---				
EN 10217-1:2002	P265TR1	1.0258	---	see standard	≤ 16	---	265	---	410-570	---	21 L; 19 T	---
					16 < t ≤ 40	---	255	---				
	P265TR2	1.0259	---	see standard	≤ 16	---	265	---	410-570	---	21 L; 19 T	see standard
					16 < t ≤ 40	---	255	---				
JIS G 3454:1988	STPG 410	---	---	AM or CF+A	---	---	245	---	410	---	25	---
ASTM A 135-01	B	---	---	Tempered	---	---	241	35	414	60	≥ 7.9mm (5⁄16 in) 30	---
ASTM A 53/A 53M-02	Type E Grade B	---	K03005	Tempered	---	---	240	35	415	60	see standard	---
	Type S Grade B	---	K03005	AM	---	---	240	35	415	60	see standard	---
ASTM A 139-00	B	---	K03003	---	---	---	240	35	415	60	≥ 7.9mm (5⁄16 in) 30	---
	C	---	K03004	---	---	---	290	42	415	60	≥ 7.9mm (5⁄16 in) 25	---
	D	---	K03010	---	---	---	315	46	415	60	≥ 7.9mm (5⁄16 in) 23	---
	E	---	K03012	---	---	---	360	52	455	66	≥ 7.9mm (5⁄16 in) 22	---

Carbon Steel Tubes and Pipes for Pressure Purposes

Chemical Composition of Carbon Steel Tubes and Pipes for Pressure Purposes

Standard Designation	Grade, Class, Type, Symbol or Name	Steel Number	UNS Number	Weight, %, max, Unless Otherwise Specified								
				C	Mn	Si	P	S	Cr	Ni	Mo	Others
EN 10216-1:2002	P195TR1	1.0107	---	0.13	0.70	0.35	0.025	0.020	0.30	0.30	0.08	Cu 0.30; Nb 0.010; Ti 0.04; V 0.02;Cr+Cu+Mo+Ni 0.70
	P195TR2	1.0108	---	0.13	0.70	0.35	0.025	0.020	0.30	0.30	0.08	Al 0.02 min; Cu 0.30; Nb 0.010; Ti 0.04; V 0.02;Cr+Cu+Mo+Ni 0.70
EN 10217-1:2002	P195TR1	1.0107	---	0.13	0.70	0.35	0.025	0.020	0.30	0.30	0.08	Cu 0.30; Nb 0.01; Ti 0.040; V 0.02; Cr+Cu+Mo+Ni 0.70
	P195TR2	1.0108	---	0.13	0.70	0.35	0.025	0.020	0.30	0.30	0.08	Al 0.020 min; Cu 0.30; Nb 0.01; Ti 0.040; V 0.02; Cr+Cu+Mo+Ni 0.70
ASTM A 53/A 53M-02	Type E Grade A	---	K02504	0.25	0.95	---	0.05	0.045	0.40	0.40	0.15	Cu 0.40; V 0.08; Cu+Ni+Cr+Mo+V 1.00
	Type F Grade A	---	---	0.30	1.20	---	0.05	0.045	0.40	0.40	0.15	Cu 0.40; V 0.08; Cu+Ni+Cr+Mo+V 1.00
	Type S Grade A	---	K02504	0.25	0.95	---	0.05	0.045	0.40	0.40	0.15	Cu 0.40; V 0.08; Cu+Ni+Cr+Mo+V 1.00
ASTM A 139-00	A	---	---	0.25	1.00	---	0.035	0.035	---	---	---	---
ASTM A 135-01	A	---	---	0.25	0.95	---	0.035	0.035	---	---	---	---
EN 10216-1:2002	P235TR1	1.0254	---	0.16	1.20	0.35	0.025	0.020	0.30	0.30	0.08	Cu 0.30; Nb 0.010; Ti 0.04; V 0.02;Cr+Cu+Mo+Ni 0.70
	P235TR2	1.0255	---	0.16	1.20	0.35	0.025	0.020	0.30	0.30	0.08	Al 0.02 min; Cu 0.30; Nb 0.010; Ti 0.04; V 0.02;Cr+Cu+Mo+Ni 0.70
EN 10217-1:2002	P235TR1	1.0254	---	0.16	1.20	0.35	0.025	0.020	0.30	0.30	0.08	Cu 0.30; Nb 0.01; Ti 0.040; V 0.02; Cr+Cu+Mo+Ni 0.70
	P235TR2	1.0255	---	0.16	1.20	0.35	0.025	0.020	0.30	0.30	0.08	Al 0.020 min; Cu 0.30; Nb 0.01; Ti 0.040; V 0.02; Cr+Cu+Mo+Ni 0.70
JIS G 3454:1988	STPG 370	---	---	0.25	0.30-0.90	0.35	0.040	0.040	---	---	---	---

Carbon Steel Tubes and Pipes for Pressure Purposes

Chemical Composition of Carbon Steel Tubes and Pipes for Pressure Purposes (Continued)

Standard Designation	Grade, Class, Type, Symbol or Name	Steel Number	UNS Number	Weight, %, max, Unless Otherwise Specified								
				C	Mn	Si	P	S	Cr	Ni	Mo	Others
JIS G 3457:1988	STPY 400	---	---	0.25	---	---	0.040	0.040	---	---	---	---
EN 10216-1:2002	P265TR1	1.0258	---	0.20	1.40	0.40	0.025	0.020	0.30	0.30	0.08	Cu 0.30; Nb 0.010; Ti 0.04; V 0.02;Cr+Cu+Mo+Ni 0.70
	P265TR2	1.0259	---	0.20	1.40	0.40	0.025	0.020	0.30	0.30	0.08	Al 0.02 min; Cu 0.30; Nb 0.010; Ti 0.04; V 0.02;Cr+Cu+Mo+Ni 0.70
EN 10217-1:2002	P265TR1	1.0258	---	0.20	1.40	0.40	0.025	0.020	0.30	0.30	0.08	Cu 0.30; Nb 0.01; Ti 0.040; V 0.02; Cr+Cu+Mo+Ni 0.70
	P265TR2	1.0259	---	0.20	1.40	0.40	0.025	0.020	0.30	0.30	0.08	Al 0.020 min; Cu 0.30; Nb 0.01; Ti 0.040; V 0.02; Cr+Cu+Mo+Ni 0.70
JIS G 3454:1988	STPG 410	---	---	0.30	0.30-1.00	0.35	0.040	0.040	---	---	---	---
ASTM A 135-01	B	---	---	0.30	1.20	---	0.035	0.035	---	---	---	---
ASTM A 53/A 53M-02	Type E Grade B	---	K03005	0.30	1.20	---	0.05	0.045	0.40	0.40	0.15	Cu 0.40; V 0.08; Cu+Ni+Cr+Mo+V 1.00
	Type S Grade B	---	K03005	0.30	1.20	---	0.05	0.045	0.40	0.40	0.15	Cu 0.40; V 0.08; Cu+Ni+Cr+Mo+V 1.00
ASTM A 139-00	B	---	K03003	0.26	1.00	---	0.035	0.035	---	---	---	---
	C	---	K03004	0.28	1.20	---	0.035	0.035	---	---	---	---
	D	---	K03010	0.30	1.30	---	0.035	0.035	---	---	---	---
	E	---	K03012	0.30	1.40	---	0.035	0.035	---	---	---	---