

美国压力管道管件常用材料
The General Material for American Pressure Piping Fittings

型 Variety	标准号 Standard and Code	级别 Grade	化学成份 Chemical Composition%,max										力学性能 Mechanical requirements				
			C	Mn	P	S	Si	Cr	Mo	Ni	Cu	Other	σb	σ0.2	δ5 % min	HB	Other
													MPa	MPa		max	
												min	min				
管件 FITTING	ASTM A420/A420M	WPL6	0.3	0.60-1.35	0.035	0.04	0.15-0.30	0.3	0.12	0.4	0.4	Cb:0.02;V:0.08	415-585	240	22	---	---
		WPL9	0.2	0.40-1.06	0.03	0.03	---	---	---	1.60-2.24	0.75-1.25	---	435-610	315	20	---	---
		WPL3	0.2	0.31-0.64	0.05	0.05	0.13-0.37	---	---	3.2-3.8	---	---	450-620	240	22	---	---
		WPL8	0.13	0.9	0.03	0.03	0.13-0.37	---	---	8.4-9.6	---	---	690-865	515	16	---	---
	ASTM A815/A815M	UNS S31803	0.03	2	0.03	0.02	0.1	21.0-23.0	2.50-3.50	4.5-6.5	---	N:0.08-0.20	620-795	450	25	290	---
锻件 FORGING	ASTM A105/A105M	A105	0.35	0.60-1.05	0.035	0.04	0.10-0.35	0.3	0.12	0.4	0.4	V:0.05;Nb:0.02	485	250	22	187	ψ%:30
	ASTM A182/A182M	F11 CL1	0.05-0.15	0.30-0.60	0.03	0.03	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	415	205	20	121-174	ψ%:45
		F11 CL2	0.10-0.20	0.30-0.80	0.04	0.04	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	485	275	20	143-207	ψ%:30
		F11 CL3	0.10-0.20	0.30-0.80	0.04	0.04	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	515	310	20	156-207	ψ%:45
		F12 CL1	0.05-0.15	0.30-0.60	0.045	0.045	0.5	0.80-1.25	0.44-0.65	---	---	---	415	205	20	121-174	ψ%:30
		F12 CL2	0.10-0.20	0.30-0.80	0.04	0.04	0.10-0.60	0.80-1.25	0.44-0.65	---	---	---	485	275	20	143-207	ψ%:50
		F304	0.08	2	0.045	0.03	1	18.0-20.0	---	8.0-11.0	---	N:0.10	515	205	30	---	ψ%:50
		F304H	0.04-0.10	2	0.045	0.03	1	18.0-20.0	---	8.0-11.0	---	---	515	205	30	---	ψ%:50
		F304L	0.035	2	0.045	0.03	1	18.0-20.0	---	8.0-13.0	---	N:0.10	485	170	30	---	ψ%:50
		F316L	0.035	2	0.045	0.03	1	16.0-18.0	2.00-3.00	10.0-15.0	---	N:0.10	485	170	30	---	ψ%:50
		F317	0.08	2	0.045	0.03	1	18.0-20.0	3.00-4.00	11.0-15.0	---	---	515	205	30	---	ψ%:50
F321	0.08	2	0.045	0.03	1	17.0-19.0	---	9.0-12.0	---	Ti:5C%-0.7	515	205	30	---	ψ%:50		
F347	0.08	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	Ti:10C%-1.10	515	205	30	---	ψ%:50		
管 Pipe	ASTM A53/A53M	B	0.3	1.2	0.05	0.045	---	0.4	0.15	0.4	0.4	V:0.08	415	240	--	---	---
	ASTM A106	B	0.3	0.29-1.06	0.035	0.035	0.10min	0.4	0.15	0.4	0.4	V:0.08	415	240	22	---	---
		C	0.35	0.29-1.06	0.035	0.035	0.10min	0.4	0.15	0.4	0.4	V:0.08	485	275	20	---	---
	ASTM A312/A312M	TP304	0.08	2	0.04	0.03	0.75	18.0-20.0	---	8.0-11.0	---	---	515	205	35	---	---
		TP304H	0.04-0.10	2	0.04	0.03	0.75	18.0-20.0	---	8.0-11.0	---	---	515	205	35	---	---
		TP304L	0.035	2	0.04	0.03	0.75	18.0-20.0	---	8.0-13.0	---	---	485	170	35	---	---
		TP316L	0.035	2	0.04	0.03	0.75	16.0-18.0	2.00-3.00	10.0-15.0	---	---	485	170	35	---	---
		TP321	0.08	2	0.04	0.03	0.75	17.0-20.0	---	9.0-13.0	---	Ti:5C%-0.7	515	205	35	---	---
	ASTMA335/A335M	P5	0.15	0.30-0.60	0.025	0.025	0.5	4.00-6.00	0.45-0.65	---	---	---	415	205	22	---	---
		P5B	0.15	0.30-0.60	0.025	0.025	1.00-2.00	4.00-6.00	0.45-0.65	---	---	---	415	205	22	---	---
		P5C	0.12	0.30-0.60	0.025	0.025	0.5	4.00-6.00	0.45-0.65	---	---	Ti:4C%-0.7	415	205	22	---	---
		P9	0.15	0.30-0.60	0.025	0.025	0.50-1.00	8.00-10.00	0.90-1.10	---	---	---	415	205	22	---	---
		P11	0.05-0.15	0.30-0.60	0.025	0.025	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	415	205	22	---	---
P12		0.05-0.15	0.30-0.61	0.025	0.025	0.5	0.80-1.25	0.44-0.65	---	---	---	415	220	22	---	---	
P22		0.05-0.15	0.30-0.60	0.025	0.025	0.5	1.90-2.60	0.87-1.13	---	---	---	415	205	22	---	---	
P91	0.08-0.12	0.30-0.60	0.02	0.01	0.20-0.50	8.00-9.50	0.85-1.05	0.4	---	See standard	585	415	20	---	---		
板 Plate	ASTM A515/A515M	60	0.24	0.98	0.035	0.035	0.13-0.45	---	---	---	---	---	415-550	220	25	---	---
		65	0.28	0.98	0.035	0.035	0.13-0.45	---	---	---	---	---	450-585	240	23	---	---
		70	0.31	1.3	0.035	0.035	0.13-0.45	---	---	---	---	---	485-620	260	21	---	---

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管件 Fitting	ASTM A234/A234M	WPB	0.3	0.29-1.06	0.05	0.058	0.10min	0.4	0.15	0.4	0.4	V:0.06;Nb:0.02	415-585	240	22	217	---	
		WPC	0.35	0.29-1.06	0.05	0.058	0.10min	0.4	0.15	0.4	0.4	V:0.06;Nb:0.02	485-655	275	22	217	---	
		WP1	0.28	0.30-0.90	0.045	0.045	0.10-0.50	---	0.44-0.65	---	---	---	---	380-550	205	22	217	---
		WP12 CL1	0.05-0.20	0.30-0.80	0.045	0.045	0.6	0.80-1.25	0.44-0.65	---	---	---	---	415-585	220	22	217	---
		WP12 CL2	0.05-0.20	0.30-0.80	0.045	0.045	0.6	0.80-1.25	0.44-0.65	---	---	---	---	485-655	275	22	217	---
		WP11 CL1	0.05-0.15	0.30-0.60	0.03	0.03	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	---	415-585	205	22	217	---
		WP11 CL2	0.05-0.20	0.30-0.80	0.04	0.04	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	---	485-655	275	22	217	---
		WP11 CL3	0.05-0.20	0.30-0.80	0.04	0.04	0.50-1.00	1.00-1.50	0.44-0.65	---	---	---	---	520-690	310	22	217	---
		WP22 CL1	0.05-0.15	0.30-0.60	0.04	0.04	0.5	1.90-2.60	0.87-1.13	---	---	---	---	415-585	205	22	217	---
		WP22 CL3	0.05-0.15	0.30-0.60	0.04	0.04	0.5	1.90-2.60	0.87-1.13	---	---	---	---	520-690	310	22	217	---
		WP5 CL1	0.15	0.30-0.60	0.04	0.03	0.5	4.0-6.0	0.44-0.65	---	---	---	---	415-585	205	22	217	---
		WP5 CL3	0.15	0.30-0.60	0.04	0.03	0.5	4.0-6.0	0.44-0.65	---	---	---	---	520-690	310	22	217	---
		WP9 CL1	0.15	0.30-0.60	0.03	0.03	1	8.0-10.0	0.90-0.10	---	---	---	---	415-585	205	22	217	---
		WP9 CL3	0.15	0.30-0.60	0.03	0.03	1	8.0-10.0	0.90-0.10	---	---	---	---	520-690	310	22	217	---
		WPR	0.2	0.40-1.06	0.045	0.05	---	---	---	1.60-2.24	0.75-1.25	---	---	435-605	315	20/28	217	---
	WP91	0.08-0.12	0.30-0.60	0.02	0.01	0.20-0.50	8.0-9.5	0.85-1.05	0.4	---	---	See standard	585-760	415	20	248	---	
	WP911	0.09-0.13	0.30-0.60	0.02	0.01	0.10-0.50	8.5-10.5	0.90-1.10	0.4	---	---	See standard	620-840	440	20	248	---	
	WP304	0.08	2	0.045	0.03	1	18.0-20.0	---	8.0-11.0	---	---	---	515	205	28	---	---	
	WP304H	0.04-0.10	2	0.045	0.03	1	18.0-20.0	---	8.0-11.0	---	---	---	515	205	28	---	---	
	WP304L	0.035	2	0.045	0.03	1	18.0-20.0	---	8.0-13.0	---	---	---	485	170	28	---	---	
	WP304LN	0.03	2	0.045	0.03	0.75	18.0-20.0	---	8.0-10.5	---	---	N2:0.10-0.16	515	205	28	---	---	
	WP304N	0.08	2	0.045	0.03	0.75	18.0-20.0	---	8.0-11.0	---	---	N2:0.10-0.16	550	240	28	---	---	
	WP309	0.15	2	0.045	0.03	1	22.0-24.0	---	12.0-15.0	---	---	---	515	205	28	---	---	
	WP310	0.15	2	0.045	0.03	1.5	24.0-26.0	---	19.0-22.0	---	---	---	515	205	28	---	---	
	WP316	0.08	2	0.045	0.03	1	16.0-18.0	2.00-3.00	10.0-14.0	---	---	---	515	205	28	---	---	
	WP316H	0.04-0.10	2	0.045	0.03	1	16.0-18.0	2.00-3.00	10.0-14.0	---	---	---	515	205	28	---	---	
	WP316LN	0.03	2	0.045	0.03	0.75	16.0-18.0	2.00-3.00	11.0-14.0	---	---	N2:0.10-0.16	515	205	28	---	---	
	WP316L	0.035	2	0.045	0.03	1	16.0-18.0	2.00-3.00	10.0-16.0	---	---	---	485	170	28	---	---	
	WP316N	0.08	2	0.045	0.03	0.75	16.0-18.0	2.00-3.00	11.0-14.0	---	---	N2:0.10-0.16	550	240	28	---	---	
	WP317	0.08	2	0.045	0.03	1	18.0-20.0	3.0-4.0	11.0-15.0	---	---	---	515	205	28	---	---	
	WP317L	0.03	2	0.045	0.03	1	18.0-20.0	3.0-4.0	11.0-15.0	---	---	---	515	205	28	---	---	
	WP321	0.08	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	---	Ti:5C-0.7	515	205	28	---	---	
	WP321H	0.04-0.10	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	---	Ti:4C-0.7	515	205	28	---	---	
	WP347	0.08	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	---	Nb+Ta:10C-1.10	515	205	28	---	---	
WP347H	0.04-0.10	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	---	Nb+Ta:8C-1.00	515	205	28	---	---		
WP348	0.08	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	---	Ta:0.10	515	205	28	---	---		
WP348H	0.04-0.10	2	0.045	0.03	1	17.0-20.0	---	9.0-13.0	---	---	Ta:0.10	515	205	28	---	---		

·材料的化学成份和力学性指标会因为某项条件的规定而有所改变,使用时请查阅原标准.

·The index of material chemical composition and mechanical properties shall change as to some defined condition,and please refer to the original standard.