

Dimensions according to ASME B 36.10M and ASME B 36.19M

Steel type 钢种	International standard 国际标准	Material grade 钢级	C%	Mn%	P% max	S% max	Si%	Cr%	Mo%	Ni%	Cu%	V%	Cb%	N%	Al% max	Ti%	Zr% max	R min tensile strength MPa	S min yield strength Mpa	A% min elongation		Impact test KV sample 10x10 joule		
																				Long.	Trasv.			
Carbon steel 碳钢	A.234	WPB WPC	0.3 max	0.29-1.06	0.05	0.058	0.10 min	0.4 max	0.15 max	0.4 max	0.4 max	0.08 max	-	-	-	-	-	-	415-585	240	30	20	-	
			0.35 max	0.29-1.06	0.05	0.058	0.10 min	0.4 max	0.15 max	0.4 max	0.4 max	0.4 max	0.08 max	-	-	-	-	-	-	485-655	275	30	20	-
Low temperature service 低温钢	A.420	WPL6 WPL3	0.3 max	0.6-1.35	0.035	0.04	0.15-0.30	0.3 max	0.12 max	0.4 max	0.4 max	0.08 max	0.02 max	-	-	-	-	-	415-655	240	30	16.5	-45 deg.C 17.6 / 13.6	
			0.2 max	0.31-064	0.05	0.05	0.13-0.37	-	-	-	-	-	-	-	-	-	-	-	-	450-620	240	30	20	-100 deg.C 17.6 /13.6
Alloy steel 合金钢	A.234	WP1	0.28 max	0.3-0.9	0.045	0.045	0.1-0.5	-	0.44-0.65	-	-	-	-	-	-	-	-	-	380-550	205	30	20	-	
		WP12 Cl. 1	0.05-0.2	0.3-0.8	0.045	0.045	0.6 max	0.8-1.25	0.44-0.65	-	-	-	-	-	-	-	-	-	415-585	220	30	20	-	
		WP12 Cl. 2	0.05-0.2	0.3-0.8	0.045	0.045	0.6 max	0.8-1.25	0.44-0.65	-	-	-	-	-	-	-	-	-	485-655	275	30	20	-	
		WP11 Cl. 1	0.05-0.15	0.3-0.6	0.03	0.03	0.5-1.0	1.0-1.5	0.44-0.65	-	-	-	-	-	-	-	-	-	-	415-585	205	30	20	-
		WP11 Cl. 2	0.05-0.2	0.3-0.8	0.04	0.04	0.5-1.0	1.0-1.5	0.44-0.65	-	-	-	-	-	-	-	-	-	-	485-655	275	30	20	-
		WP11 Cl. 3	0.05-0.2	0.3-0.8	0.04	0.04	0.5-1.0	1.0-1.5	0.44-0.65	-	-	-	-	-	-	-	-	-	-	520-690	310	30	20	-
		WP22 Cl. 1	0.05-0.15	0.3-0.6	0.04	0.04	0.5 max	1.9-2.6	0.87-1.13	-	-	-	-	-	-	-	-	-	-	415-585	205	30	20	-
		WP22 Cl. 3	0.05-0.15	0.3-0.6	0.04	0.04	0.5 max	1.9-2.6	0.87-1.13	-	-	-	-	-	-	-	-	-	-	520-690	310	30	20	-
		WP5	0.15 max	0.3-0.6	0.04	0.3	0.5 max	4.0-6.0	0.44-0.65	-	-	-	-	-	-	-	-	-	-	415-585	205	30	20	-
		WP9	0.15 max	0.3-0.6	0.03	0.03	1.0 max	8.0-10.0	0.9-1.10	-	-	-	-	-	-	-	-	-	-	415-585	205	30	20	-
WP91	0.08-0.12	0.3-0.6	0.02	0.01	0.2-0.5	8.0-9.5	0.85-1.05	0.4 max	-	0.18-0.25	0.06-0.1	0.03-0.07	0.02	-	-	-	0.01	620-840	415	20	-	-		
Stainless steel 不锈钢	A.403	WP304	0.08 max	2.0 max	0.045	0.03	1.0 max	18.0-20.0	-	8.0-11.0	-	-	-	-	-	-	-	-	515	205	28	20	-	
		WP304L	0.03 max	2.0 max	0.045	0.03	1.0 max	18.0-20.0	-	8.0-12.0	-	-	-	-	-	-	-	-	485	170	28	20	-	
		WP304H	0.04-0.10	2.0 max	0.045	0.03	1.0 max	18.0-20.0	-	8.0-11.0	-	-	-	-	-	-	-	-	515	205	28	20	-	
		WP316	0.08 max	2.0 max	0.045	0.03	1.0 max	16.0-18.0	2.0-3.0	10.0-14.0	-	-	-	-	-	-	-	-	-	515	205	28	20	-
		WP316L	0.03 max	2.0 max	0.045	0.03	1.0 max	16.0-18.0	2.0-3.0	10.0-14.0	-	-	-	-	-	-	-	-	-	485	170	28	20	-
		WP321	0.08 max	2.0 max	0.045	0.03	1.0 max	17.0-19.0	-	9.0-12.0	-	-	-	-	-	-	-	-	-	515	205	28	20	-
		WP321H	0.04-0.1	2.0 max	0.045	0.03	1.0 max	17.0-19.0	-	9.0-12.0	-	-	-	-	-	-	-	-	-	515	205	28	20	-
		WP347	0.08 max	2.0 max	0.045	0.03	1.0 max	17.0-19.0	-	9.0-12.0	-	-	-	-	-	-	-	-	-	515	205	28	20	-
		WP347H	0.04-0.1	2.0 max	0.045	0.03	1.0 max	17.0-19.0	-	9.0-12.0	-	-	-	-	-	-	-	-	-	515	205	28	20	-
		8xC= min - 1.10 max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	515	205	28	20	-
5xC(N)= min -0.7 max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	515	205	28	20	-		
4xC(N)= min -0.7 max	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	515	205	28	20	-		
Duplex 双相钢	A.815	WPS31803 WPS32750	0.03 max	2.0 max	0.03	0.02	1.0 max	21.0-23.0	2.5-3.5	4.5-6.5	0.5 max	-	-	0.08-0.2	-	-	-	-	620	450	20	-	-	
			0.03 max	1.2 max	0.035	0.02	0.8 max	24.0-26.0	3.5 max	6.0-8.0	-	-	-	0.24-0.32	-	-	-	-	800-965	550	15	-	-	
High-yield steel for pipeline and offshore 强度钢	ASTM A.860	WPHY 42	0.2 max	1.0-1.45	0.03	0.01	0.15-0.40	0.3 max	0.25 max	0.5 max	0.35 max	0.1 max	0.04 max	-	0.06	0.05 max	-	-	415-585	290	25	25	-46 deg.C 40/34	
		WPHY 46	0.2 max	1.0-1.45	0.03	0.01	0.15-0.40	0.3 max	0.25 max	0.5 max	0.35 max	0.1 max	0.04 max	-	0.06	0.05 max	-	-	435-605	315	25	25	-46 deg.C 40/34	
		WPHY 52	0.2 max	1.0-1.45	0.03	0.01	0.15-0.40	0.3 max	0.25 max	0.5 max	0.35 max	0.1 max	0.04 max	-	0.06	0.05 max	-	-	455-625	360	25	25	-46 deg.C 40/34	
		WPHY 60	0.2 max	1.0-1.45	0.03	0.01	0.15-0.40	0.3 max	0.25 max	0.5 max	0.35 max	0.1 max	0.04 max	-	0.06	0.05 max	-	-	515-690	415	20	20	-46 deg.C 40/34	
		WPHY 65	0.2 max	1.0-1.45	0.03	0.01	0.15-0.40	0.3 max	0.25 max	0.5 max	0.35 max	0.1 max	0.04 max	-	0.06	0.05 max	-	-	530-705	450	20	20	-46 deg.C 40/34	
		WPHY 70	0.2 max	1.0-1.45	0.03	0.01	0.15-0.40	0.3 max	0.25 max	0.5 max	0.35 max	0.1 max	0.04 max	-	0.06	0.05 max	-	-	550-725	485	20	20	-46 deg.C 40/34	
	MSS SP75	WPHY 42	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	413	289	25	25	-7 deg.C 27 average	
		WPHY 46	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	434	317	25	25	-7 deg.C 27 average	
		WPHY 52	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	455	358	25	25	-7 deg.C 27 average	
		WPHY 56	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	489	386	20	20	-7 deg.C 27 average	
		WPHY 60	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	517	413	20	20	-7 deg.C 27 average	
		WPHY 65	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	530	448	20	20	-7 deg.C 27 average	
		WPHY 70	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	565	482	18	18	-7 deg.C 27 average	
		WPHY 80	0.3 max	1.6 max	0.035	0.035	0.5 max	0.25 max	0.25 max	0.5 max	0.5 max	0.13 max	0.1 max	-	-	0.05 max	-	-	620	551	16	16	-7 deg.C 27 average	