

# Material Performance Sheet



ASTM Code	Chemical analyze											Mechanical property				硬度	冲击值
	C	Mn	P	S	Si	Cr	Mo	Ni	Cu	V	Nb	Tensile MPa, ≥	Yield MPa, ≥	Elongation %, ≥	Reduce %, ≥	Brinell HB, ≤	J, ≥
A105	0.35	0.60~1.05	0.035	0.040	0.10~0.35	0.30	0.12	0.4	0.40	0.08	0.02	485	250	30	30	187	
A182F11	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	205	20	45	121~174	
A182F22	0.05~0.15	0.30~0.60	0.040	0.040	0.50	2.00~2.50	0.87~1.13					415	205	20	35	170	
A182F304	0.08	2.00	0.045	0.030	1.00	18.0~20.0		8.0~11.0				515	205	30	50		
A182F304L	0.030	2.00	0.045	0.030	1.00	18.0~20.0		8.0~13.0				485	170	30	50		
A182F316	0.08	2.00	0.045	0.030	1.00	16.0~18.0	2.00~3.00	10.0~14.0				515	205	30	50		
A182F316L	0.030	2.00	0.045	0.030	1.00	16.0~18.0	2.00~3.00	10.0~15.0				485	170	30	50		
A182F51	0.030	2.00	0.030	0.020	1.00	21.0~23.0	2.5~3.5	4.5~6.5				620	450	25	45		
A182F6a	0.15	1.00	0.040	0.030	1.00	11.5~13.5		0.50				585	380	18	35	167~229	
A193B7	0.37~0.49	0.65~1.10	0.035	0.040	0.15~0.35	0.75~1.20	0.15~0.25					860	720	16	50	321	
A193B7M	0.37~0.49	0.65~1.10	0.035	0.040	0.15~0.35	0.75~1.20	0.15~0.25	8.0~11.0				690	550	18	50	235	
A193B8	0.08	2.00	0.045	0.030	1.00	18.0~20.0		10.0~14.0		0.25~0.35		515	205	30	50	223	
A193B8M	0.08	2.00	0.045	0.030	1.00	16.0~18.0	2.00~3.00					515	205	30	50	223	
A193B16	0.36~0.47	0.45~0.70	0.035	0.040	0.15~0.35	0.80~1.15	0.50~0.65					860	720	18	50	321	
A1942H	≥0.40	1.00	0.040	0.050	0.04											248~352	
A1942HM	≥0.40	1.00	0.040	0.050	0.04			8.0~11.0								159~237	
A1948	0.08	2.00	0.045	0.030	1.00	18.0~20.0		10.0~14.0								126~300	
A1948M	0.08	2.00	0.045	0.030	1.00	16.0~18.0	2.00~3.00									126~300	
A216WCB	0.30	1.00	0.04	0.045	0.60	0.50	0.20	0.50	0.30	0.03		485~655	250	22	35		
A216WCC	0.25	1.20	0.04	0.045	0.60	0.50	0.2	0.50	0.30	0.03		485~655	275	22	35		
A217C5	0.20	0.40~0.70	0.04	0.045	0.75	4.00~6.50	0.45~0.65	0.50	0.50			620~795	415	18	35		
A217CA15	0.15	1.00	0.040	0.040	1.50	11.5~14.0	0.50	1.00				620~795	450	18	30		
A217WC6	0.05~0.20	0.50~0.80	0.04	0.045	0.60	1.00~1.50	0.45~0.65	0.50	0.50			485~655	275	20	35		
A217WC9	0.05~0.18	0.40~0.70	0.04	0.045	0.60	2.00~2.75	0.90~1.20		0.50			485~655	275	20	35		
A276410	0.08~0.15	1.00	0.040	0.030	1.00	11.5~13.5						480	275	20	45		
A276420	≥0.15	1.00	0.040	0.030	1.00	12.0~14.0											
A320L7	0.38~0.048	0.75~1.00	0.035	0.040	0.15~0.35	0.80~1.10	0.15~0.25					860	725	16	50	241	Avg:27; min:20
A320L7M	0.38~0.048	0.75~1.00	0.035	0.040	0.15~0.35	0.80~1.10	0.15~0.25					690	550	18	50	235	Avg:27; min:20
A336F22	0.05~0.15	0.30~0.60	0.025	0.025	0.50	2.00~2.50	0.90~1.10					515~690	310	19	40		
A350LF1	0.30	0.60~1.35	0.035	0.040	0.15~0.30	0.30	0.12	0.40	0.40	0.08		415~585	205	28	38		Avg:18; min:14
A350LF2	0.30	0.60~1.35	0.035	0.040	0.15~0.30	0.30	0.12	0.40	0.40	0.08	0.02	485~655	250	30	30		Avg:20; min:16
A351CF3	0.03	1.50	0.040	0.040	2.00	17.0~21.0	0.50	8.0~12.0				485	205	35.0			
A351CF3M	0.03	1.50	0.040	0.040	1.50	17.0~21.0	2.0~3.00	9.0~13.0				485	205	30.0			
A351CF8	0.08	1.50	0.040	0.040	2.00	18.0~21.0	0.50	8.0~11.0				485	205	35.0			
A351CF8M	0.08	1.50	0.040	0.040	1.50	18.0~21.0	2.0~3.00	9.0~12.0				485	205	30.0			
A351CF8C	0.08	1.50	0.040	0.040	2.00	18.0~21.0	0.50	9.0~12.0	3.0~4.0			485	205	30.0			
A351CN7M	0.07	1.50	0.040	0.040	1.50	19.0~22.0	2.0~3.00	27.5~30.5				425	170	35			
A352LC1	0.25	0.50~0.80	0.04	0.045	0.60		0.45~0.65					450~620	240	24	35		
A352LC2	0.25	0.50~0.80	0.04	0.045	0.60			2.00~3.00				485~655	275	24	35		Avg:18; min:14
A352LC3	0.15	0.50~0.80	0.04	0.045	0.60			3.00~4.00				485~655	275	24	35		Avg:20; min:16
A352LCB	0.30	1.00	0.04	0.045	0.60	0.50	0.20	0.50	0.30	0.03		450~620	240	24	35		Avg:20; min:16
A352LCC	0.25	1.20	0.04	0.045	0.60	0.50	0.20	0.50		0.03		485~655	275	22	35	139~202	Avg:18; min:14
A439D2	3.00	0.70~1.25	0.08		1.50~3.00	1.75~2.75		18.00~22.00				400	207	8.0			Avg:20; min:16





# Pressure Temperature Rate



## Class 150Lb/300Lb/600Lb/900Lb/1500Lb/2500Lb Pressure temperature rate PSI (Psig)

Fahrenheit temperature	A217 C12						A351 CF3(f) A351 CF8					
	150Lb	300Lb	600Lb	900Lb	1500Lb	2500Lb	150Lb	300Lb	600Lb	900Lb	1500Lb	2500Lb
-20 to 100	290	750	1500	2250	3750	6250	275	720	1440	2160	3600	6000
200	260	750	1500	2250	3750	6250	235	600	1200	1800	3000	5000
300	230	730	1455	2185	3640	6070	205	530	1055	1585	2640	4400
400	200	705	1410	2115	3530	5880	180	470	940	1410	2350	3920
500	170	665	1330	1995	3325	5440	170	435	875	1310	2185	3640
600	140	605	1210	1815	3025	5040	140	415	830	1245	2075	3460
650	125	590	1175	1765	2940	4905	125	410	815	1225	2040	3400
700	110	570	1135	1705	2840	4730	110	405	805	1210	2015	3360
750	95	530	1065	1595	2660	4430	95	400	795	1195	1990	3320
800	80	510	1015	1525	2540	4230	80	395	790	1180	1970	3280
850	65	485	975	1460	2435	4060	65	390	780	1165	1945	3240
900	50	450	900	1350	2245	3745	50	385	770	1150	1920	3200
950	35	370	740	1110	1850	6085	35	375	750	1125	1870	3120
1000	20	290	585	875	1460	2430	20	325	645	965	1610	2685
1050	20(1)	190	380	565	945	1570	20(1)	310	620	925	1545	2570
1100	20(1)	115	225	340	565	945	20(1)	260	515	770	1285	2145
1150	20(1)	75	150	225	380	630	20(1)	195	390	585	980	1630
1200	20(1)	50	105	155	260	430	20(1)	155	310	465	770	1285
1250	-	-	-	-	-	-	20(1)	110	220	330	550	915
1300	-	-	-	-	-	-	20(1)	85	165	245	410	685
1350	-	-	-	-	-	-	20(1)	65	125	185	310	515
1400	-	-	-	-	-	-	20(1)	50	95	145	240	400
1450	-	-	-	-	-	-	15(1)	35	70	105	170	285
1500	-	-	-	-	-	-	10(1)	20	50	70	120	200

## Class 150Lb/300Lb/600Lb/900Lb/1500Lb/2500Lb Pressure temperature rate PSI (Psig)

Fahrenheit temperature	A351 CF3M(g) A351 CF8M						A351 CF8C						A351 CN7M(I)					
	150Lb	300Lb	600Lb	900Lb	1500Lb	2500Lb	150Lb	300Lb	600Lb	900Lb	1500Lb	2500Lb	150Lb	300Lb	600Lb	900Lb	1500Lb	2500Lb
-20 to 100	275	720	1440	2160	3600	6000	275	720	1440	2160	3600	6000	230	600	1200	1800	3000	5000
200	240	620	1240	1860	3095	5160	240	635	1270	1910	3180	5300	215	555	1115	1670	2785	4640
300	215	560	1120	1680	2795	4660	215	590	1175	1765	2940	4900	200	525	1045	1570	2615	4360
400	195	515	1030	1540	2570	4280	195	555	1110	1665	2770	4620	185	480	960	1445	2405	4010
500	170	480	955	1435	2390	3980	170	520	1035	1555	2590	4320	170	470	935	1405	2340	3900
600	140	450	905	1355	2255	3760	140	490	985	1475	2460	4100	140	455	910	1365	2275	3790
650	125	445	890	1330	2220	3700	125	480	960	1440	2400	4000	125	450	900	1350	2250	3750
700	110	430	865	1295	2160	3600	110	470	935	1405	2340	3900	110	445	890	1335	2225	3710
750	95	425	845	1270	2110	3520	95	460	920	1385	2305	3840	95	440	880	1320	2200	3665
800	80	415	830	1245	2075	3460	80	455	910	1370	2280	3800	80	430	865	1295	2160	3600
850	65	405	810	1215	2030	3380	65	445	890	1330	2220	3700	-	-	-	-	-	-
900	50	395	790	1180	1970	3280	50	430	865	1295	2160	3600	-	-	-	-	-	-
950	35	385	775	1160	1930	3220	35	385	775	1160	1930	3220	-	-	-	-	-	-
1000	20	265	725	1090	1820	3030	20	365	725	1090	1820	3030	-	-	-	-	-	-
1050	20(1)	360	720	1080	1800	3000	20(1)	360	720	1080	1800	3000	-	-	-	-	-	-
1100	20(1)	325	645	965	1610	2685	20(1)	325	645	965	1610	2685	-	-	-	-	-	-
1150	20(1)	275	550	825	1370	2285	20(1)	275	550	825	1370	2285	-	-	-	-	-	-
1200	20(1)	205	410	620	1030	1715	20(1)	170	345	515	855	1430	-	-	-	-	-	-
1250	20(1)	180	365	545	910	1515	20(1)	125	245	370	615	1030	-	-	-	-	-	-
1300	20(1)	140	275	410	685	1145	20(1)	95	185	280	465	770	-	-	-	-	-	-
1350	20(1)	105	205	310	515	860	20(1)	70	135	205	345	570	-	-	-	-	-	-
1400	20(1)	75	150	225	380	630	20(1)	50	105	155	255	430	-	-	-	-	-	-
1450	25(1)	62	115	175	290	485	20(1)	40	80	125	205	345	-	-	-	-	-	-
1500	15(1)	40	85	125	205	345	15(1)	35	70	105	170	285	-	-	-	-	-	-