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Spartech, Royalite & Polycast Material Data Sheets



Spartech Plastics Extruded Sheet & Rollstock

			ABS Sheet					
			General Purpose SP-9010	Korad® Cap SP-9011	Premium SP-9020	Economy SP-9030	Low Gloss SP-9050	High Heat SP-9080
Physical Properties	Test Method	Unit						
Specific Gravity	ASTM D-792		1.04	1.04	1.03	1.05	1.04	1.05
Tensile Modulus	ASTM D-638	psi	310,000	310,000	310,000	290,000	280,000	320,000
Tensile Strength @ Yield	ASTM D-638	psi	6,000	6,000	5,400	4,500	4,500	6,200
Tensile Strength, Ultimate	ASTM D-638	psi						
Elongation, Ultimate	ASTM D-638	%						
Flexural Modulus	ASTM D-790	psi	340,000	340,000	300,000	310,000	300,000	360,000
Flexural Strength @ Yield	ASTM D-790	psi	10,000	10,000	9,600	8,000	9,000	11,000
Izod Impact	ASTM D-256							
	(73°F)	ft-lbs/in.	7.5	7.5	8.0	5.0	7.0	6.5
	(-40°F)	ft-lbs/in.	2.5	2.5	4.0	1.4	2.0	
Falling Dart Impact	ASTM D-3029							
	(73°F)	ft-lbs	33	33	35	15	30	15
	(-40°F)	ft-lbs	12	12	23	6	10	3
Heat Deflection Temperature	ASTM D-648							
	(66 psi unannealed) (264 psi unannealed)	°F °F	198 198	198 198	195 195	190 190	195 195	222 222
Coefficient of Thermal Expansion	ASTM D-696	in/in/°F x 10 ⁻⁵	5.0	5.0	5.0	5.0	5.0	5.0
Hardness	ASTM D-785	Rockwell R (L)	105	99	99	105	81	105
	ASTM D-2240	Shore D						
Surface Resistivity	ASTM D-257	ohm/Square						
Gardner Gloss	ASTM D-523	%	90	86	90	90	16	90
Performance Rating								
Impact Strength			High	High	Very High	Average	High	Average
Low Temperature Impact Strength			High	High	Very High	Average	Average	Average
Flexural Modulus (Stiffness)			High	High	High	High	Average	Very High
Tensile Strength			High	High	High	Average	High	Very High
Heat Deflection Temperature			High	High	High	High	High	Very High
Gloss (After Forming)			High	High	High	High	Low	High
Chemical Resistance			High	High	High	High	High	High
UV Resistance			Low	High (Opaque)	Low	Low	Low	Low
Hardness			Very High	High	High	Very High	Average	Very High
Formability			Very Good	Very Good	Very Good	Good	Good	Good
General								
Flammability Ratings†	MVSS 302		Passes	Passes	Passes		Passes	Passes
	UL94 HB		Passes	Passes	Passes	Passes	Passes	Passes
	UL94 V-0							
	UL94 V-1							
	UL94 V-2							
Smoke Rating	FAR 25.853B							
	FAR 25.853A							
	OSU Heat Release							
Toxic Gas Generation	UMTA/DOT/FAA BSS 7229							

Acrylic Sheet				Corrugated Sheet	Flame Retardant Sheet			Packaging Sheet				Polycarbonate Sheet	
Acryloyl 10	Acryloyl 7	Acryloyl F		Plasticor Fluted PP Co/Pol	FR/ABS SP-9013	ABS/PVC SP-9070	Korad® Cap FR/ABS SP-9071	Enviralloy RP	Packalloy Clear Pac	Packalloy CFPP	Packalloy MLB	UltraTuf SP-7010	UltraTuf SG
1.15	1.17	1.17		.90	1.22	1.20	1.22	**	**	**	**	1.20	1.20
220,000	330,000	330,000			310,000	310,000	310,000					350,000	350,000
5,500	7,600	7,600		4,000	6,000	5,500	6,000					9,360	9,360
270,000	380,000	300,000		180,000	310,000	330,000	310,000					340,000	340,000
10,300	14,000				9,800	10,000	9,800					13,500	13,500
1.1	.6	.6		3.0	6.0	12.0	6.0					17.0	17.0
					1.1	1.0	1.1					-	-
10	6.0	6.0			23	41	23					960 (no break)	960 (no break)
					10	20	10					-	-
				194									
170	185	175			180	162	180					270	270
5.6	4.5	5.2			5.6	4.2	5.6					3.8	3.8
106	110	106			99	100	99					118	118
90	90				90	20	86					90	90
High	Average	Average			High	Very High	High					Very High	Very High
Low	Low	Low			Average	Average	Average					Average	Average
Average	High	Average			High	Very High	High					High	High
High	High	High			High	High	High					Very High	Very High
Average	High	Average			High	Average	High					Very High	Very High
Very High	Very High	Low			High	Low	High					Very High	Very High
High	Average	Average			High	High	High					Average	High
Very High	Very High	High			Low	Low	High (Cpaque)					Average	Very High
Very High	Very High	Average			High	Very High	High					Very High	Very High
Very Good	Very Good	Very Good			Good	Very Good	Good					Good	Good
Passes	Passes	Passes			Passes	Passes	Passes						
					Passes	Passes	Passes						

** Physical Property Data will be dependent on the multi-layer structure configuration. This product is custom designed to meet the customer's requirements. 2

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Spartech Plastics

Extruded Sheet & Rollstock

			Polyolefin Sheet						
			HDPE SP-1010	LDPE SP-1310	HMWPE SP-1510	Polypro Co/Pol SP-1710	TPO/TPE SP-3810	Glossy HIPS SP-2050	
Physical Properties	Test Method	Unit							
Specific Gravity	ASTM D-792		.96	.918	.95	.900	1.11	1.05	
Tensile Modulus	ASTM D-638	psi	95,000	22,500	120,000			270,000	
Tensile Strength @ Yield	ASTM D-638	psi	4,500	1,800	3,600	3,900		3,500	
Tensile Strength, Ultimate	ASTM D-638	psi					2,300		
Elongation, Ultimate	ASTM D-638	%	800	650	>600	11	375		
Flexural Modulus	ASTM D-790	psi	225,000		165,000	130,000	200,000	310,000	
Flexural Strength @ Yield	ASTM D-790	psi						7,000	
Izod Impact	ASTM D-256								
	(73°F)	ft-lbs/in.	4.0			No Break		1.5	
	(-40°F)	ft-lbs/in.							
Falling Dart Impact	ASTM D-3029								
	(73°F)	ft-lbs		160 (g/mil)			320 (g/mil)	80 (in.-lbs.)	
	(-40°F)	ft-lbs							
Heat Deflection Temperature	ASTM D-648								
	(66 psi unannealed)	°F	176		160	190	127		
	(264 psi unannealed)	°F						185	
Coefficient of Thermal Expansion	ASTM D-696	in/in/°F x 10 ⁻⁵	6.0	4.2	7.0	6.0	3.1	4.5	
Hardness	ASTM D-785	Rockwell R (L)						(55)	
	ASTM D-2240	Shore D	66	45	68	80	69		
Surface Resistivity	ASTM D-257	ohm/Square							
Gardner Gloss	ASTM D-523	%						90	
Performance Rating									
Impact Strength			High	Very High	High	High	Very High	High	
Low Temperature Impact Strength			High	High	High	Average	Very High	Low	
Flexural Modulus (Stiffness)			High	Low	Average	Average	High	High	
Tensile Strength			Average	High	Average	Average	Average	Average	
Heat Deflection Temperature			Average	Low	Average	High	Average	Average	
Gloss (After Forming)			Average	Average	Average	Average	Average	Very High	
Chemical Resistance			Very High	Very High	Very High	Very High	Very High	Average	
UV Resistance			Average	Average	Average	Average	High	Low	
Hardness			Low	Low	Low	Average	Low	High	
Formability			Good	Good	Good	Average	Good	Good	
General									
Flammability Ratings†	MVSS 302								
	UL94 HB		Passes		Passes	Passes		Passes	
	UL94 V-0								
	UL94-5V								
	FAR 25.853B								
	FAR 25.853A								
Smoke Rating	OSU Heat Release								
Toxic Gas Generation	UMTA/DOT/FAA BSS 7239								

Polystyrene Sheet				Weatherable Sheet								
HIPS SP-2010	Korad® Cap/HIPS SP-2011	Litho SP-2090	CastAlloy***	Weather-Pro G	Weather-Pro	SolarKote®/ABS	Geloy®/ABS SP-6730	Luran®/ABS SP-6720	Centrex®/ABS SP-6710	Plexiglas® DR®/ABS	CamAlloy/ABS	
1.04	1.04	1.03	1.10	1.05	1.04	1.11	1.05	1.05	1.05	1.11	1.04	
270,000	270,000	240,000	339,000	360,000	280,000	260,000	280,000	290,000	280,000	260,000	310,000	
3,500	3,500	3,300	6,850	5,800	5,000	5,000	4,700	4,900	4,600	5,000	6,000	
310,000	310,000	225,000	359,000	10,600	280,000	300,000	280,000	280,000	280,000	300,000	340,000	
7,000	7,000	5,800	10,300	7,500	7,500	10,300	7,500	7,500	7,500	10,300	10,000	
2.0	2.0	1.5		3.6	7.0	4.5	7.0	7.0	7.0	4.5	7.5	
					1.6	1.0	1.6	1.6	1.6	1.0	2.5	
80 (in.-lbs)	85 (in.-lbs)	NBS PS-31-70 460			22	20	22	22	23	20	33	
					14	8	14	14	15	8	12	
185	185	185	193	198	180	175	180	175	175	180	198	
4.5	4.5	4.5	8.2	5.0	5.0	5.0	5.0	5.0	5.0	5.0	5.0	
(68)	99	(63)	119	(85)	88	99	88	84	89	99	99	
75	86	15	90	90	85+	90	90	85	86	90		
High	High	High	High	High	Very High	Average	Very High	Very High	Very High	Average	High	
Average	Average	Low	Average	Average	High	Average	High	High	High	Average	High	
High	High	High	Very High	Very High	High	Average	High	High	High	Average	High	
Average	Average	Average	Very High	Very High	Average	High	Average	Average	Average	High	High	
Average	Average	Average	Very High	Very High	Average	Average	Average	Average	Average	Average	High	
Average	High	Very Low	High	Average	High	Very High	High	High	High	Very High	Low	
Average	Average	Average	High	High	High	High	High	High	High	High	High	
Low	High (Opaque)	Low	Very High	Very High	Very High	Very High (Opaque)	Very High	Very High	Very High	Very High (Opaque)	High	
High	High	Average	Very High	Very High	High	Very High	High	High	High	Very High	High	
Good	Good	Good	Very Good	Very Good	Very Good	Good	Very Good	Very Good	Very Good	Good	Very Good	
Passes	Passes	Passes	Passes	Passes	Passes	Passes	Passes	Passes	Passes	Passes	Passes	

* ASTM D-882 TEST

***For Solid Color



Spartech Plastics

Extruded Sheet & Rollstock

			Specialty Sheet		Structural Sheet		
			Rigid PVC SP-3010	Noryl® SP-5210	Millennium IV Glass Filled ABS	Millennium III Glass Filled PC	Noryl® GTX SP-52Z1
Physical Properties	Test Method	Unit					
Specific Gravity	ASTM D-792		1.40	1.06	1.10	1.39	1.09
Tensile Modulus	ASTM D-638	psi	400,000	320,000		586,600	
Tensile Strength @ Yield	ASTM D-638	psi	6,600	6,500	5,440	10,600	9,000
Tensile Strength, Ultimate	ASTM D-638	psi					
Elongation, Ultimate	ASTM D-638	%					83
Flexural Modulus	ASTM D-790	psi	480,000	340,000	289,000	367,000	330,000
Flexural Strength @ Yield	ASTM D-790	psi	12,000	8,300	9,100	13,500	13,900
Izod Impact	ASTM D-256						
	(73°F)	ft-lbs/in.	14.0	7.0			6.3
	(-40°F)	ft-lbs/in.	0.5	3.0			2.3 @ -20
Falling Dart Impact	ASTM D-3029						
	(73°F)	ft-lbs	31	220 (in.-lbs)	20.5	20.3	
	(-40°F)	ft-lbs	8	120 (in.-lbs)			
Heat Deflection Temperature	ASTM D-648						
	(66 psi unannealed)	°F			201	280	355
	(264 psi unannealed)	°F	155	185			
Coefficient of Thermal Expansion	ASTM D-696	in/in/°F x 10 ⁻⁵	4.0	4.1	3.3	1.8	
Hardness	ASTM D-785	Rockwell R (L)	112	113	95	118	
	ASTM D-2240	Shore D					
Surface Resistivity	ASTM D-257	ohm/Square					
Gardner Gloss	ASTM D-523	%	90		90	90	
Performance Rating							
Impact Strength			High	High	High	High	High
Low Temperature Impact Strength			Low	High	Average	Average	High
Flexural Modulus (Stiffness)			Very High	High	Very High	Very High	High
Tensile Strength			High	High	Very High	Very High	Very High
Heat Deflection Temperature			Low	High	Very High	Very High	Very High
Gloss (After Forming)			High	Medium	Very High	Very High	Low
Chemical Resistance			High	High	Average	Average	High
UV Resistance			Average	Low	Average	Average	Low
Hardness			High	Very High	High	Very High	Very High
Formability			Good	Good	Good	Good	Good
General							
Flammability Ratings†	MVSS 302						
	UL94 HB						
	UL94 V-0		Passes				
	UL94-5V						
	FAR 25.853B						
	FAR 25.853A						
Smoke Rating	OSU Heat Release						
	UMTA/DOT/FAA						
Toxic Gas Generation	BSS 7239						

Copolyester Sheet					Static Control Sheet							
	APET SP-4110	Spectar®	Spectar® UV	Solorex® SV	Static Dissipative 513	Static Dissipative 617	Static Conductive 829	Royalstat ABS/PVC R63	Royalstat HDPE R64	Royalstat ABS/PVC R632	Royalstat ABS/Polyolefin R635	Royalstat PS Alloy R675
	1.33	1.27	1.27	1.32	1.27	1.27	1.27	1.22	1.06	1.28	1.09	1.07
	320,000*	320,000	320,000	336,000	320,000	320,000	320,000					
	8,500*	7,700	7,700	7,078	7,700	7,700	7,700	4,500	4,400	4,500	2,900	3,000
	8,400*											
	300*											
	320,000	310,000	310,000	380,000	310,000	310,000	310,000	280,000	180,000	290,000	150,000	200,000
	12,200	11,200	11,200	12,473	11,200	11,200	11,200	7,100	5,500	7,000	4,500	
	0.93	1.7	1.7	0.98	1.7	1.7	1.7				3.0	5.0
	0.52	0.7	0.7	0.55	0.7	0.7	0.7					
	ASTM D-1709A 500 400							ASTM D-5420 160	ASTM D-5420 200	ASTM D-5420 145	ASTM D-5420 200	ASTM D-5420 200
	ASTM E-540 162	165 158	165 158	162 153	165 158	165 158	165 158	165 165	180 180	155 155	160 160	183 183
	3.2	4.0	4.0	4.2	4.0	4.0	4.0					
	106	115	115	112	115	115	115	87	66	85	60	75
					10 ¹⁰	10 ¹⁰	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵	10 ⁵
	90											
	Very High	Very High	Very High	Very High	Very High	Very High	Very High	Average	Very High	High	Average	High
	Average	High	High	High	High	Average	High	Average	Average	Average	Average	Average
	High	High	High	High	High	High	High	High	Average	High	Average	Average
	High	High	High	High	High	High	High	Average	Average	High	Average	Average
	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	Average	High
	Very High	Very High	Very High	Very High	High	High	High	Medium	Medium	Medium	Medium	Medium
	High	Very High	Very High	High	High	High	High	High	Very High	High	High	Average
	Average	Average	Very High	Average	Average	Average	Average	Average	Average	Average	Average	Average
	High	High	High	High	High	High	High	High	Average	High	Average	Average
	Good	Very Good	Very Good	Very Good	Very Good	Very Good	Very Good	Good	Good	Good	Good	Good
	Passes	Passes						Passes Listed V-1	Passes	Passes Listed Listed	Passes	

* ASTM D-882 TEST

Specialty Sheet

			PolyLite	Formalloy HG	Formalloy LG	Formalloy TPR	Lenticular PETG 3D	Marballoy	
			Foamed Polyolefin	High-Gloss TPO Alloy	Low-Gloss TPO Alloy	Thermo-plastic Rubber Alloy	3-D Sheet	Marbleized Thermo-plastic Alloy	
Physical Properties	Test Method	Unit							
Specific Gravity	ASTM D-792		.74	1.07	1.09	.97	1.33	.95	
Tensile Modulus	ASTM D-638	psi					320,000*	120,000	
Tensile Strength @ Yield	ASTM D-638	psi	2,810	3,400			8,500*	3,600	
Tensile Strength, Ultimate	ASTM D-638	psi		4,400	3,200	1,127	8,400*		
Elongation, Ultimate	ASTM D-638	%		400	200	627	300*	1,000	
Flexural Modulus	ASTM D-790	psi	127,200	160,000	220,000	17,260	320,000	165,000	
Flexural Strength @ Yield	ASTM D-790	psi					12,200		
Izod Impact	ASTM D-256 (73°F) (-40°F)	ft-lbs/in. ft-lbs/in.	No Break			No Break	0.93 0.52		
Falling Dart Impact	ASTM D-3029 (73°F) (-40°F)	ft-lbs ft-lbs			>350 in. lbs. @ -30°C		ASTM D-1709A 500 400		
Heat Deflection Temperature	ASTM D-648 (66 psi unannealed) (264 psi unannealed)	°F °F	160	180	180	24	ASTM D-540 162	160	
Coefficient of Thermal Expansion	ASTM D-696	in/in/°F x 10 ⁻⁵		6.0	6.0	7.0	3.2	7.0	
Hardness	ASTM D-785 ASTM D-2240	Rockwell R (L) Shore D			65	(88)	106	68	
Surface Resistivity	ASTM D-257	ohm/Square							
Gardner Gloss	ASTM D-523	%		80-85	35-40	20-25	90		
Performance Rating									
Impact Strength			High	High	High	High	Very High	High	
Low Temperature Impact Strength			Average	High	High	High	Average	High	
Flexural Modulus (Stiffness)			Average	Average	High	Low	High	Average	
Tensile Strength			Average	Average	Average	Low	High	Average	
Heat Deflection Temperature			Average	High	High	Low	Average	Average	
Gloss (After Forming)			Average	High	Low	Low	Very High	Medium	
Chemical Resistance			Very High	High	High	High	High	Very High	
UV Resistance			Average	Very High	Average	Average	Average	Average	
Hardness			Low	Low	Low	Low	High	Low	
Formability			Low	Good	Good	Good	Good	Good	
General									
Flammability Ratings†	MVSS 302 UL94 HB UL94 V-0 UL94-5V FAR 25.853B FAR 25.853A OSU Heat Release UMTA/DOT/FAA BSS 7239								
Smoke Rating									
Toxic Gas Generation									

* ASTM D-882 TEST

	Panel Pro ABS UV-Resistant Embossed Sheet	PolyTeak Low Stress HDPE	Soft Touch ABS R-104 Laminated Sheet	Soft Touch ASA/ABS Co-Extruded ASA/ABS	Soft Touch PPR Co-Extruded Polyolefin Skin/PPR	Soft Touch HDPE Polyolefin Skin/HDPE	Sound X Noise Abatement Alloy	SparAlloy Rigid Foamed ABS	Ultras SRP Co-Extruded Skid-Resistant PE
	1.04	.96	1.03-1.05	1.05	.90	.955	2.0	.85	.95
	310,000	95,000							120,000
	6,000	4,500	5,000	6,000	4,000	3,600	3,500		3,600
		2,800	190				550		1,000
	340,000	225,000	270,000	340,000	180,000	165,000		300,000	165,000
	10,000		8,300	10,000	9,400	9,500	6,500		
	7.5 2.5	4.0	7.0	7.5					
		176			194	160			160
	198		200	198				198	
	5.0	6.0	5.0	5.0	6.0	7.0		5.0	7.0
	99		96					98	
		66							68
	86								
	High	High	High	High	High	Very High	-	Average	High
	High	High	High	High	Average	High	-	Average	High
	High	High	High	High	High	High	Low	High	Average
	High	Average	High	High	High	High	Average	Average	Average
	High	Average	High	High	Average	Average	-	Average	Average
	High	Average	Average	Low	Low	Low	Low	-	Average
	Good	Very High	High	High	High	High	-	High	Very High
	High	Average	High	Average	High	High	-	Average	Average
	High	Low	High	-	-	-	Low	High	Low
	Good	-	Good	Very Good	Good	Good	Low	-	Good
	Passes		Passes						



Spartech Plastics

Royalite Specialty Products Group

General Purpose Sheet

			ABS R12	ABS R20	ABS R21	ABS R24	ABS R26	
Physical Properties ¹	Test Method	Unit						
Specific Gravity ²	ASTM D-792		1.02-1.08	1.02-1.08	1.02-1.08	1.02-1.08	1.02-1.08	
Tensile Strength @ Yield	ASTM D-638	psi	5,400	4,700	4,800	5,000	5,200	
Flexural Strength @ Yield	ASTM D-790	psi	8,900	7,000	8,000	7,800	8,500	
Flexural Modulus	ASTM D-790	psi	280,000	230,000	270,000	280,000	290,000	
Izod Impact, notched	ASTM D-256	73°F	ft-lbs/in.	4.5	8.0	7.0	7.5	7.5
		-20°F	ft-lbs/in.	1.8	5.0	2.5	3.5	3.5
Impact Strength, Gardner Drop Weight, 73°F	ASTM D-5420 Method GB	in-lbs						
Impact Strength, Dynatup Instrumented Impact, 73°F	ASTM D-3763	ft-lbs	20	26	25	25	26	
Heat Deflection Temperature	ASTM D-648	264 psi annealed	°F	220	205	208	210	210
		66 psi annealed	°F					
Coefficient of Thermal Expansion	ASTM D-696	in/in*°Fx10 ⁻⁵	4.2-5.6	4.2-5.6	4.2-5.6	4.2-5.6	4.2-5.6	
Surface Resistivity	ASTM D-257	ohm/square						
Hardness	ASTM D-785	Rockwell R	96	88	96	98	96	
	ASTM D-2240	Shore D						
Performance Rating								
Impact Strength			High	Very High	Very High	Very High	Very High	
Low Temperature Performance			Average	Very High	High	High	High	
Flexural Modulus (Stiffness)			Very High	High	Very High	Very High	Very High	
Tensile Strength			Very High	High	Very High	Very High	Very High	
Heat Deflection Temperature			Very High	High	High	High	High	
UV Resistance			Low	Low	Low	Low	Low	
Hardness			Very High	High	Very High	Very High	Very High	
Formability			Very Good	Very Good	Very Good	Very Good	Very Good	
Flammability ^{3,4}								
Motor Vehicle Safety Standard	MVSS 302		Passes	Passes	Passes	Passes	Passes	
Underwriter's Laboratories	UL94 HB					Listed		
Underwriter's Laboratories	UL94 V-0							
Underwriter's Laboratories	UL94 5VA							
Underwriter's Laboratories	UL746C							
FAA 12 second vertical burn	FAR Pt 25, App F, Pt I							
FAA 60 second vertical burn	FAR Pt 25, App F, Pt I							
FAA Heat Release	FAR Pt 25, App F, Pt IV							
FAA Smoke Generation	FAR Pt 25, App F, Pt V							
Bus and Rail Smoke Rating	UMTA/DOT/FRA							
Toxic Gas Generation	Boeing/Airbus							

			Fire Rated Sheet							
	PC/ABS R910	Royalex Foam Core Laminate	PVC/Acrylic R52	ABS/PVC R59	FR-ABS R570	PVC/Acrylic R60-LS (R61)	PVC/Acrylic R66	PVC/Acrylic DKE 400	PVC Alloy R47	PC/ABS R71/920
	1.08-1.12	**	1.30-1.38	1.18-1.25	1.21-1.28	1.35-1.40	1.35-1.45	1.30-1.38	1.27-1.30	1.19-1.24
	8,000		5,800	5,200	5,700	5,900	5,900	5,800	6,100	8,000
	13,000		9,500	8,000	9,400	9,700	9,500	9,200	9,400	12,000
	360,000		320,000	290,000	310,000	330,000	320,000	320,000	350,000	330,000
	10.0		12.0	10.0 2.0	4.5 1.5	3.0	3.0	12.0	15.0	8.0 2.0
	31		33	30	20	30	30	33	38	25
	220 250		150	170 190	175	165	170	150	168	240
	4.2-5.6		4.2-5.6	4.6-5.5	4.6-5.5	4.6-5.5	4.6-5.5	4.6-5.5	4.6-5.5	4.6-5.5
	114		100	96	98	103	105	100	100	110
	Very High		Very High	Very High	High	High	High	Very High	Very High	Very High
	Average		Average	High	Average	Average	Average	Average	Average	High
	Very High		Very High	High	Very High	Very High	Very High	Very High	Very High	Very High
	Very High		Very High	High	Very High	Very High	Very High	Very High	Very High	Very High
	Very High		Average	Average	High	High	High	Average	High	Very High
	Low		Good	Low	Low	Good	Good	Good	Good	Low
	Very High		Very High	High	Very High	Very High	Very High	Very High	Very High	Very High
	Good		Good	Very Good	Very Good	Good	Good	Good	Very Good	Very Good
	Passes		Passes	Passes	Passes	Passes	Passes	Passes	Passes	Passes
	Passes									
			Listed	Listed	Listed			Listed	Listed	Listed
			Listed	Listed	Listed			Listed	Listed	Listed
						Passes	Dmax <300			

** Physical Property Data will be dependent on the multi-layer structure configuration. This product is custom designed to meet the customer's requirements.



Spartech Plastics

Royalite Specialty Products Group

Aircraft Grade Sheet

			FR/ABS R57	PVC/Acrylic R60	PVC Alloy R522	PVC Alloy R722	
Physical Properties ¹							
Test Method	Unit						
Specific Gravity ²	ASTM D-792		1.18-1.26	1.30-1.38	1.27-1.30	1.49-1.55	
Tensile Strength @ Yield	ASTM D-638	psi	5,000	5,900	5,900	5,500	
Flexural Strength @ Yield	ASTM D-790	psi	7,800	9,600	9,600	9,000	
Flexural Modulus	ASTM D-790	psi	280,000	330,000	360,000	340,000	
Izod Impact, notched	ASTM D-256	73°F	ft-lbs/in	9.0	14.0	15.0	5.0
		-20°F	ft-lbs/in	1.6			
Impact Strength, Gardner Drop Weight, 73°F	ASTM D-5420 Method GB	in-lbs					
Impact Strength, Dynatup Instrumented Impact, 73°F	ASTM D-3763	ft-lbs	30	36	37	21	
Heat Deflection Temperature	ASTM D-648	264 psi annealed	°F	172	160	167	165
		66 psi annealed	°F				
Coefficient of Thermal Expansion	ASTM D-696	in/in/°F x 10 ⁻⁵	4.6-5.5	4.5	4.5	4.5	
Surface Resistivity	ASTM D-257	ohm/square					
Hardness	ASTM D-785	Rockwell R	93	100	100	95	
	ASTM D-2240	Shore D					
Performance Rating							
Impact Strength			Very High	Very High	Very High	High	
Low Temperature Performance			Average	Average	Average	Average	
Flexural Modulus (Stiffness)			High	Very High	Very High	Very High	
Tensile Strength			High	Very High	Very High	Very High	
Heat Deflection Temperature			Average	Average	High	High	
UV Resistance			Low	Good	Good	Good	
Hardness			High	Very High	Very High	Very High	
Formability			Very Good	Good	Very Good	Good	
Flammability ^{3,4}							
Motor Vehicle Safety Standard	MVSS 302		Passes	Passes	Passes	Passes	
Underwriter's Laboratories	UL94 HB						
Underwriter's Laboratories	UL94 V-0						
Underwriter's Laboratories	UL94 5VA						
Underwriter's Laboratories	UL746C						
FAA 12 second vertical burn	FAR Pt 25, App F, Pt I		Passes	Passes	Passes	Passes	
FAA 60 second vertical burn	FAR Pt 25, App F, Pt I			Passes	Passes	Passes	
FAA Heat Release	FAR Pt 25, App F, Pt IV					Passes	
FAA Smoke Generation	FAR Pt 25, App F, Pt V					Passes	
Bus and Rail Smoke Rating	UMTA/DOT/FRA						
Toxic Gas Generation	Boeing/Airbus						

			Weather Resistant Sheet			
	PC/ABS R922	FR-PC R6000	Proprietary R84	Proprietary R84/21	PVC/Acrylic R86	ABS/PVC R87/59
	1.19-1.24	1.21	1.03-1.08	1.01-1.06	1.33-1.38	1.18-1.25
	7,850	8,900	4,000	4,600	5,700	4,600
	13,200	14,200	6,500	7,500	9,000	6,600
	350,000	340,000	260,000	270,000	320,000	220,000
	9.0	15.0	8.5	7.0	15.0	7.0
	1.5		2.0	2.0		1.5
	25	40	27	26	19	29
	248	270	208	205	155	165
	5.0	3.5	4.2-5.6	4.2-5.6	5.0	4.6-5.5
	115	115	75	91	97	87
	Very High	Very High	Very High	Very High	Very High	Very High
	High	High	High	High	Average	Average
	Very High	Very High	High	High	Very High	High
	Very High	Very High	Average	High	Very High	High
	Very High	Very High	High	High	Average	Average
	Low	Average	Very Good	Very Good	Very Good	Very High
	Very High	Very High	Average	High	Very High	High
	Very Good	Very Good	Very Good	Very Good	Good	Very Good
	Passes	Passes	Passes	Passes	Passes	Passes
			Listed			
					Passes	Listed
					Passes	Listed
			fl			fl
	Passes	Passes				
	Passes	Passes				
		Passes				
	Passes	Passes				



Spartech Polycast

Cell Cast Acrylic

Typical Properties (.250" unless noted)

			Polycast	UF3	UF4	UF96
Mechanical Properties	Test Method	Unit				
Ballistic Protection						
Specific Gravity	ASTM-D-792		1.19	1.19	1.19	1.19
Tensile Strength	ASTM-D-638					
Yield		psi	11,250	11,250	11,250	11,250
Elongation, Rupture		%	6.4	6.4	6.4	6.4
Modulus of Elasticity		psi	450,000	450,000	450,000	450,000
Flexural Strength	ASTM-D-790					
(Rupture)		psi	15,250	15,250	15,250	15,250
Modulus of Elasticity		psi	475,000	475,000	475,000	475,000
Compressive Strength	ASTM-D-695					
(Yield)		psi	18,000	18,000	18,000	18,000
Modulus of Elasticity		psi	440,000	440,000	440,000	440,000
Compressive Deformation (Under Load)	ASTM-D-621					
4000 PSI 122F, 24hr		%	0.75	0.75	0.75	0.75
Shear Strength	ASTM-D-732					
Impact Strength		psi	9,000	9,000	9,000	9,000
Izod Milled Notch	ASTM-D-256	ft. lbs./in. of notch	0.375*	0.375*	0.375*	0.375*
Falling Steel Ball, 0.5lb. (Breakage drop height (ft.))			18	18	18	18
Rockwell Hardness	ASTM-D-785		M96*	M96*	M96*	M96*
Barcol Hardness	ASTM-D-2583		50*	50*	50*	50*
Residual Shrinkage (Internal Strain)	ASTM-D-4802					
Polycast		%	2.2	2.2	2.2	2.2
Polycast Mil Spec		%				
Optical Properties						
Refractive Index	ASTM-D-542		1.49	1.49	1.49	1.49
Luminous Transmittance (As Cast)	ASTM-D-1003					
Total		%	92	92	92	92
Haze			<0.5	<0.5	<0.5	<0.5
Yellowness Index	ASTM-D-1925		0.5	2.1		1.0
After 1000 hrs. Accelerated Weathering	ASTM-D-1449					
Total		%	92			
Haze			<0.5			
Effect Of Accelerated Weathering- On Appearance	ASTM-D-1449					
Crazing / Discoloration / Warping			none			
Ultraviolet Transmission @ 320nm		%	0	0 @ 390nm	0 @ 385nm	0 @ 390nm
Craze Resistance	Mil-P-8184	psi				
DRY						
IPA			2,000			
Lacquer Thinner			1,000			
Sulfuric Acid			0			
WET						
IPA			500			
Lacquer Thinner			0			
Sulfuric Acid			0			
Abrasion Resistance (Reported as increase in % haze)						
Taber Abrasion (500g. ea. wheel, 100 rev.) ANSI Z26.1	ASTM-D-1044		14			
Mar Resistance	ASTM-D-637		29			
Thermal Properties						
Hot Forming Temperature		deg. Fahrenheit	320 **	320 **	320 **	320 **
Deflection Temperature under load	ASTM-D-648					
(Heat Distortion Temp.)						
66 psi		deg. Fahrenheit	230*	230*	230*	230*
264 psi		deg. Fahrenheit	203*	203*	203*	203*
Maximum Recommended Continuous Service Temp.		deg. Fahrenheit	180	180	180	180
Minimum Recommended Continuous Service Temp.						
[lowest temp. tested for bullet-resistance]						
Coefficient of Linear Thermal Expansion	ASTM-D-696	in./in./deg. F	0.000042	0.000042	0.000042	0.000042
Coefficient of Thermal Conductivity	Cento-Fitch	BTU/(Hr.) (Sq.Ft.) (deg. F/in.)	1.3	1.3	1.3	1.3
Thermal Relaxation						
@ 230 deg. F	Mil-P-25690	%				
@ 293 deg. F	Mil-P-25690	%				
Water Absorption						
26 day immersion		%	0.65	0.65	0.65	0.65
24 hour immersion		%	0.2	0.2	0.2	0.2
Flammability (Burning Rate) UL94HB	ASTM-D-635	in./min.	1.2*	1.2*	1.2*	1.2*
Self-ignition Temperature	ASTM-D-1929	deg. Fahrenheit	830*	830*	830*	830*
Specific Heat @ 77°F	DuPont 900 (Therm. An. Cal.)	BTU/(Lb.) (deg. F)	0.35	0.35	0.35	0.35
Smoke Density	ASTM-D-2843	%	27**	27**	27**	27**
Crack Propagation (Received at STD Conditions)	Mil-P-25690	lbs/in 3/2				

(UV) Ultra-Violet Transmitting	Solacryl [tests based on .187"]	SAR (Super Abrasion Resistant)	MP 1.25 (UL 752 Level 1)	SAR HP 1.25 (UL 752 Level 2)	SP 1.25 (UL 752 Level 3)	Poly FR9 (.060")	Poly 900 (DTD-5592-UK)	Poly II (Mil-P-5425)
1.19	1.19	1.19	9mm	.357 Magnum	.44 Magnum	1.19	1.19	1.19
11,250 6.4 450,000	8,600 7 400,000	10,000 4.5 427,000	9,500 400,000	9,500 400,000	9,400 400,000	>10,500 4.5 450,000	11,250 6.2	11,250 6.4
15,250 475,000		16,000 460,000					15,250 475,000	15,250 475,000
18,000 440,000		17,900 427,000	400,000	400,000	400,000		18,000 440,000	18,000 440,000
0.75 9,000		8,900					0.75 9,000	0.75 9,000
0.375* 18 M98*		0.375* 18 M100*						
50*						M96*	M98* 50*	M98* 50*
2.2	2.2	2.2	2.2	2.2		<1	2.2	<1
1.49	1.49	1.43***				1.49	1.49	1.49
92 <0.5	92 <1	93 0.5	>90 <1.0 <0.7	>90 <1.0 <0.7	>85 <1.5 <1.0	92 <0.5	92 <0.5	92 <0.5
							92 <0.5	92 <0.5
							none 0	none 0
>80		0-5	0	0	0	0	0	0
							2,100 1,350 NA 1,460 1,200 NA	2,100 1,100 0 1,000 0 0
		1.5 2.3		1.5 2.3				
320 **	300 **	223 **	320 **	320 **			320 **	320 **
230* 203* 180	200* 155	200 176	170 -26	170 -26	170 -26		230* 180	216* 180
0.000042 1.3	0.000042	0.000042 1.45	0.000042 1.3	0.000042 1.3			0.000042 1.3	0.000042 1.3
0.65 0.2 1.2* 830*	0.2 1.2* 830*	0.2 0.96 870*	0.2 1.2* 870	0.2 1.2* 870	0.2 .23*	0.65 0.2 <0.3	0.65 0.2 1.2*	0.65 0.2 1.2* 830*
0.35 27**	0.35	0.35 13.9	0.35 Max:8%; Rating 5%	0.35 Max:8%; Rating 5%	0.35 Max:65%; Rating 49%	0.35 Max:13%; Rating 23.2%	0.35	0.35 27**



Spartech Polycast

Cell Cast Acrylic

Typical Properties (.250" unless noted)

Poly 84 (Mil-P-8184)	Poly 76 (Mil-P-8184)	Poly 2000 (Mil-P-25690; Class 1)	Poly 2000 (Mil-P-25690; Class 2)
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Mechanical Properties	Test Method	Unit	Poly 84 (Mil-P-8184)	Poly 76 (Mil-P-8184)	Poly 2000 (Mil-P-25690; Class 1)	Poly 2000 (Mil-P-25690; Class 2)
Ballistic Protection						
Specific Gravity	ASTM-D-792		1.19	1.19	1.19	1.19
Tensile Strength	ASTM-D-638					
Yield		psi	11,250	11,250	12,100	12,100
Elongation, Rupture		%	4.0	4.0		
Modulus of Elasticity		psi				
Flexural Strength	ASTM-D-790					
(Rupture)		psi	15,250	15,250		
Modulus of Elasticity		psi	475,000	475,000		
Compressive Strength	ASTM-D-695					
(Yield)		psi	18,000	18,000		
Modulus of Elasticity		psi	440,000	440,000		
Compressive Deformation (Under Load)	ASTM-D-621					
4000 PSI 122F, 24hr		%	0.75	0.75		
Shear Strength	ASTM-D-732	psi	9,000	9,000	3,700	3,700
Impact Strength						
Izod Milled Notch	ASTM-D-256	ft. lbs/in. of notch				
Falling Steel Ball, 0.5lb. (Breakage drop height (ft.))						
Rockwell Hardness	ASTM-D-785		M98*	M98*		
Barcol Hardness	ASTM-D-2583		50*	50*		
Residual Shrinkage (Internal Strain)	ASTM-D-4802					
Polycast		%				
Polycast Mil Spec		%	<1	<1		
Optical Properties						
Refractive Index	ASTM-D-542		1.49	1.49	1.49	1.49
Luminous Transmittance (As Cast)	ASTM-D-1003					
Total		%	92	92		
Haze			<0.75	<0.75	91	91
Yellowness Index	ASTM-D-1925				<1.5	<1.5
After 1000 hrs. Accelerated Weathering	ASTM-D-1449					
Total		%	91	91	90	90
Haze			<0.75	<0.75	<3.0	<3.0
Effect Of Accelerated Weathering-On Appearance	ASTM-D-1449					
Crazing / Discoloration / Warping			none	none		
Ultraviolet Transmission @ 320nm		%	0	0		
Craze Resistance	Mil-P-8184	psi				
DRY						
IPA			3,225	3,100	3,700	4,300
Lacquer Thinner			3,030	3,150	3,300	3,600
Sulfuric Acid			1,550	1,285		
WET						
IPA			2,775	2,440	2,750	3,600
Lacquer Thinner			2,700	2,450	2,650	3,000
Sulfuric Acid			1,020	500		
Abrasion Resistance (Reported as increase in % haze)						
Taber Abrasion (500g. ea. wheel, 100 rev.) ANSI Z26.1	ASTM-D-1044					
Mar Resistance	ASTM-D-637					
Thermal Properties						
Hot Forming Temperature		deg. Fahrenheit	320 **	320 **	218**	218**
Deflection Temperature under load	ASTM-D-648					
(Heat Distortion Temp.)						
66 psi		deg. Fahrenheit				
264 psi		deg. Fahrenheit	221*	234*		
Maximum Recommended Continuous Service Temp.		deg. Fahrenheit	180	180		
Minimum Recommended Continuous Service Temp.						
[lowest temp. tested for bullet-resistance]						
Coefficient of Linear Thermal Expansion	ASTM-D-696	in./in./deg. F	0.000042	0.000042	0.000042	0.000042
Coefficient of Thermal Conductivity	Centro-Fitch	BTU/(Hr.) (Sq.Ft.) (deg. F/in.)	1.3	1.3	1.3	1.3
Thermal Relaxation						
@ 230 deg. F	Mil-P-25690	%			3.3	3.3
@ 293 deg. F	Mil-P-25690	%			45	45
Water Absorption						
26 day immersion		%	1.6	2.6	2.6	1.6
24 hour immersion		%	0.2	0.2	0.2	0.2
Flammability (Burning Rate) UL94HB	ASTM-D-635	in./min.	0.8*	0.8*		
Self-Ignition Temperature	ASTM-D-1929	deg. Fahrenheit				
Specific Heat @ 77°F	DuPont 900 (Therm. An. Cal.)	BTU/(Lb.) (deg. F)	0.35	0.35	0.35	0.35
Smoke Density	ASTM-D-2843	%				
Crack Propagation (Received at STD Conditions)	Mil-P-25690	lbs/in 3/2			2,900	2,900



Spartech Plastics

Sign Products

			Sign Grade Sheet					
			Crylex High Impact Acrylic	Tuf-Glas Impact Modified Acrylic	Sungard Ultra-Weatherable Polycarbonate	Sta-Tuf High Impact Thermoplastic Alloy	PC-2000 High Impact Polycarbonate	Solarex °K High Heat Weatherable Copolyester
Physical Properties	Test Method	Unit						
Specific Gravity	ASTM D-792		1.15	1.17	1.20	1.10	1.20	1.22
Tensile Modulus	ASTM D-638	psi	220,000	330,000	350,000	300,000	350,000	290,000
Tensile Strength @ Yield	ASTM D-638	psi	5,500	7,600	9,360	5,500	9,360	8,000
Tensile Strength, Ultimate	ASTM D-638	psi						
Elongation, Ultimate	ASTM D-638	%						
Flexural Modulus	ASTM D-790	psi	270,000	380,000	340,000	330,000	340,000	330,000
Flexural Strength @ Yield	ASTM D-790	psi	10,300	14,000	13,500	8,300	13,500	12,350
Izod Impact	ASTM D-256							
	(73°F)	ft-lbs/in.	1.1	.6	17.0	2.0	17.0	2.0
	(-40°F)	ft-lbs/in.				.7		
Falling Dart Impact	ASTM D-3029							
	(73°F)	ft-lbs	10	6.0	960 (no break)	138	960 (no break)	27
	(-40°F)	ft-lbs						
Heat Deflection Temperature	ASTM D-648							
	(66 psi unannealed)	°F	170	185	270	185	270	180
	(264 psi unannealed)	°F						
Coefficient of Thermal Expansion	ASTM D-696	in/in°F x 10 ⁻⁵	5.6	4.5	3.8	5.5	3.8	4.16
Hardness	ASTM D-785	Rockwell R (L)	106	110	118	110	118	115
	ASTM D-2240	Shore D						
Surface Resistivity	ASTM D-257	ohm/Square						
Gardner Gloss	ASTM D-523	%	90	90	90	90	90	85
Performance Rating								
Impact Strength			High	Average	Very High	High	Very High	High
Low Temperature Impact Strength			Low	Low	Average	Low	Average	Average
Flexural Modulus (Stiffness)			Average	High	High	High	High	High
Tensile Strength			High	High	Very High	Average	Very High	High
Heat Deflection Temperature			Average	High	Very High	Average	Very High	Average
Gloss (After Forming)			Very High	Very High	Very High	Very High	Very High	Very High
Chemical Resistance			High	Average	High	High	Average	Average
UV Resistance			Very High	Very High	Very High	Very High	Average	Very High
Hardness			Very High	Very High	Very High	High	Very High	Very High
Formability			Very Good	Very Good	Good	Very Good	Good	Very Good
General								
Flammability Ratings	MVSS 302							
	UL94 HB		Passes	Passes	Passes	Passes	Passes	Passes
	UL94 V-0							
	UL94-5V							
	FAR 25.853B							
	FAR 25.853A							
	OSU Heat Release							
Smoke Rating	UMTA/DOT/FAA							
Toxic Gas Generation	BSS 7239							



Spartech Plastics

Extruded Sheet & Rollstock

POLYPEDIC™ MATERIALS, APPLICATIONS AND PROPERTIES					
	Polypedic A	Modified LDPE	Polypedic F	Polypedic O	Polypedic C
Material Type	Low-density Polyethylene	Custom Low-density Polyethylene	High-density Polyethylene	Polypropylene Homopolymer	Polypropylene Copolymer
Applications	Anterior shells for AFOs and KAFOs; TLSOs; passive types of HOs, WHOs and EWHO's	Anterior shells for AFOs and KAFOs; TLSOs; passive types of HOs, WHOs and EWHO's; prosthetic flexible sockets	Neck brace; splints	AFOs; MAFOs; KAFOs; CTLSOs; TLSOs; pelvic bands and joints; pelvic girdles; AK and BK sockets	AFOs; MAFOs; KAFOs; AK and BK sockets; CTLSOs; TLSOs; pelvic bands and joints; pelvic girdles
Material Characteristics	Flexible, lower processing temperature, soft	Flexible, wider window for forming, soft	More rigid, tough, able to withstand cold temperature application	Rigid, strong, fatigue-resistant	Resilient in cold weather, durable, slightly less rigid than Polypedic O
Mold & Set Temperature*	180°F	180°F	180°F	190°F	190°F
Lower Process Limit*	260°F	260°F	260°F	290°F	290°F
Normal Forming Temperature*	275°F	275°F	275°F	310-325°F	310-325°F
Upper Limit Temperature*	331°F	331°F	331°F	331°F	331°F
Typical Shrinkage	2-3%	2-3.5%	2-3.5%	1.5-2%	1.5-2%

* Plastic temperatures (not oven temperatures)

Call Professional Plastics at **(888) 995-7767** or
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Notes for Extruded Sheet & Rollstock and Alloy Plastics:

† Spartech sheet is extruded from resins that are HB rated, however each user should conduct his own testing and evaluations to determine the effectiveness, safety, and suitability of the material for its particular use, specifically to include testing of prototype parts in their intended end use.

Notes for Royalite Specialty Products Group:

- 1 Average values based on 0.125" extruded sheet
- 2 Color Dependent
- 3 This term and any corresponding data refer to typical performance in the specific tests indicated and should not be construed to imply this material's behavior under actual fire conditions.
- 4 Fire and Smoke ratings are subject to minimum thickness restrictions. See individual data sheets for more detail.

Notes for Polycast Cell Cast Acrylic:

ADDITIONAL DATA, CODES AND APPROVALS ARE AVAILABLE UPON REQUEST

All values shown are for 0.250" thickness sheet, unless otherwise noted. Asterisked (*) values will change with thickness. Difference in length and width, as measured at room temperature, before and after heating above 300 deg F.

** Varies with thickness.

*** Because the surface of Polycast SAR has a lower refractive index than the substrate, the amount of back reflectance is reduced and the transmittance increased.

- (A) Steel Wool Rotary Test - This severe abrasion uses a 1.25" square pad of commercially available 0000 grade steel wool. The steel wool pad is loaded with appropriate weights to give either 12 or 24 psi pressure and is revolved five times.
- (B) Simulated Cleaning Test - An abrasive water slurry of a commercially available standard test dust is placed on the sample. It is then stroked 360 times with a felt pad under an approximately 2.0 psi load. @ MP 1.25 also available in SAR abrasion resistant coating