

English

Technical data

Elastic properties

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kuraray

Trosifol® SentryGlas®

Introduction

Interlayer strength, depth and capabilities

Delivering your window into the world of advanced interlayers for laminated safety glass, Kuraray's Advanced Interlayer Solutions Division (AIS) is underpinned by decades of innovation, application knowledge, domain experience and market success.

OUR ADVANCED INTERLAYER PORTFOLIO – comprising Trosifol® PVB and SentryGlas® ionoplast interlayers – has continually revolutionized aesthetic, structural and functional glass design, fabrication and installation in the architectural and automotive/transportation segments.

Designed to benefit consumers, society and industry, our products are advancing the functionality of glass, while our engineers and consultants are setting new application benchmarks by collaborating on solutions that both sustain and inspire.

We are committed to helping you transform your mindset and take your applications to the next level – aesthetically, functionally and structurally. Enjoy greater design freedom and give your glazing strength, clarity, character and purpose with solutions that cover safety, security, sound insulation, UV/solar/energy management, color and print.





Steve Jobs Theater Pavilion - Photo: © Eckerstley O'Callaghan

Steve Jobs Theater Pavilion, Cupertino, USA

OUR DIVERSE PRODUCT RANGE, the broadest on the global market and our domain expertise create strength; and we channel this strength into helping you succeed. We strive to be your strongest ally and supporter and will help you navigate and conquer the ever-changing demands of the global glass industry. Worldwide production, R&D and support, means we are always by your side... no matter where you are.



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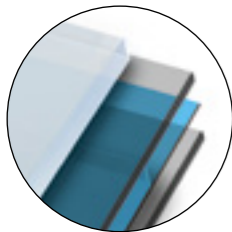
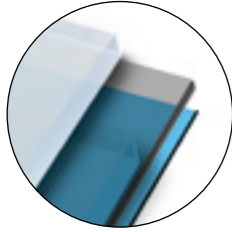

Shear Relaxation Modulus G(t)/MPa

Temperature	Product type	Load duration																				
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
-20°C (-4°F)	Trosifol® Clear/UltraClear	250	230	220	210	180	170	140	120	99	85	53	42	33	25	16	14	7	6	1.5	0.7	0.5
	Trosifol® SC Monolayer	210	180	160	150	120	100	71	58	41	31	14	9.9	6.8	4.9	3.2	2.7	1.7	1.5	0.66	0.47	0.41
	Trosifol® SC Multilayer	65	40	31	21	11	7.4	3.4	2.7	2.1	1.8	1.5	1.4	1.3	1.2	1.1	1.0	0.84	0.79	0.45	0.35	0.30
	Trosifol® Extra Stiff	460	440	420	400	370	350	290	270	220	200	120	100	81	61	38	32	16	13	2.1	1.0	0.78
	* Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	291 245	290 243	290 243	289 242	289 240	288 238	285 236	284 233	283 227	281 226	280 221	279 213	278 209	277 192	276 187	276 186	275 184	273 176	268 159	260 139	250 131
0°C (32°F)	Trosifol® Clear/UltraClear	180	150	140	120	100	94	67	55	40	32	14	10	7.0	4.7	2.7	2.3	1.3	1.2	0.62	0.48	0.42
	Trosifol® SC Monolayer	48	32	26	19	12	7.8	3.5	2.6	1.7	1.2	0.7	0.6	0.5	0.5	0.5	0.4	0.4	0.4	0.30	0.21	0.14
	Trosifol® SC Multilayer	2.6	2.0	1.9	1.7	1.5	1.4	1.2	1.1	0.92	0.79	0.50	0.45	0.42	0.39	0.36	0.35	0.31	0.30	0.19	0.090	0.044
	Trosifol® Extra Stiff	420	390	370	350	310	290	230	200	150	130	70	51	36	24	13	10	4.4	3.5	1.1	0.78	0.69
	* Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	260 203	258 199	257 196	256 193	254 186	252 182	249 172	248 169	246 160	244 144	236 124	232 107	231 101	227 95.3	225 85.1	224 83.8	222 75.0	221 70.6	210 54.7	201 42.9	194 38.9
10°C (50°F)	Trosifol® Clear/UltraClear	86	66	57	46	31	23	10	6.9	3.5	2.4	0.81	0.69	0.61	0.53	0.52	0.47	0.46	0.37	0.28	0.21	
	Trosifol® SC Monolayer	5.1	3.1	2.5	1.9	1.1	0.90	0.61	0.55	0.48	0.45	0.36	0.34	0.34	0.32	0.28	0.27	0.22	0.21	0.11	0.042	
	Trosifol® SC Multilayer	1.5	1.3	1.3	1.2	1.1	0.94	0.65	0.54	0.45	0.41	0.35	0.32	0.30	0.27	0.23	0.22	0.17	0.16	0.060		
	Trosifol® Extra Stiff	380	350	330	310	270	240	170	150	110	85	36	24	16	9.5	4.7	3.6	1.9	1.6	0.86	0.70	0.62
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	420 240 181	390 236 179	370 235 178	350 230 176	320 228 172	300 225 170	250 220 161	220 214 143	180 217 126	160 206 120	92 199 91.6	70 194 85.1	52 190 67.2	35 188 57.4	20 178 46.6	15 180 42.6	5.9 172 36.8	4.7 171 34.1	1.1 161 22.6	0.74 153 16.5	0.65 146 13.2
20°C (68°F)	Trosifol® Clear/UltraClear	12	6.6	4.8	3.2	1.7	1.2	0.74	0.64	0.54	0.50	0.43	0.41	0.39	0.36	0.33	0.32	0.27	0.26	0.14	0.063	
	Trosifol® SC Monolayer	0.86	0.66	0.60	0.54	0.47	0.45	0.39	0.37	0.33	0.30	0.23	0.20	0.17	0.14	0.11	0.10	0.063	0.056			
	Trosifol® SC Multilayer	1.2	1.0	0.91	0.78	0.58	0.50	0.40	0.38	0.34	0.32	0.24	0.21	0.18	0.15	0.11	0.10	0.065	0.057			
	Trosifol® Extra Stiff	280	240	210	190	140	120	67	49	26	17	4.2	2.6	1.8	1.3	1.0	1.0	0.84	0.81	0.66	0.56	0.47
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	340 217 162	290 211 155	290 209 144	270 205 135	230 206 131	205 192 125	150 188 120	120 181 115	83 175 100	63 169 80.1	23 158 55.1	14 151 50.0	7.5 146 39.9	4.3 140 36.8	2.2 130 29.5	1.8 127 26.9	1.1 115 21.2	1.0 112 18.4	0.71 96.5 11.1	0.60 86.6 6.69	0.52 77.1 5.03
25°C (77°F)	Trosifol® Clear/UltraClear	2.7	1.5	1.2	0.92	0.69	0.61	0.50	0.47	0.43	0.41	0.34	0.31	0.29	0.26	0.22	0.20	0.15	0.14	0.056		
	Trosifol® SC Monolayer	0.58	0.50	0.47	0.44	0.41	0.38	0.33	0.30	0.26	0.23	0.15	0.12	0.10	0.078	0.054	0.046	0.027	0.024			
	Trosifol® SC Multilayer	1.0	0.75	0.66	0.55	0.45	0.42	0.36	0.33	0.29	0.27	0.18	0.15	0.13	0.10	0.068	0.058	0.034	0.029			
	Trosifol® Extra Stiff	190	150	130	100	70	51	20	13	5.4	3.3	1.3	1.1	0.94	0.85	0.78	0.75	0.69	0.68	0.56	0.43	0.33
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	250 176 141	210 167 136	190 163 126	160 157 117	120 149 115	95 142 97.9	49 117 80.4	32 115 63.3	16 106 45.8	8.7 101 37.2	2.1 90.6 27.0	1.5 86.2 21.0	1.1 80.5 18.6	0.95 70.8 17.9	0.82 60.8 15.4	0.79 55.1 14.2	0.70 45.1 11.1	0.69 42.4 10.5	0.56 32.1 5.61	0.45 24.3 3.31	0.34 18.1 2.44
30°C (86°F)	Trosifol® Clear/UltraClear	0.93	0.69	0.63	0.56	0.50	0.47	0.41	0.39	0.35	0.33	0.22	0.19	0.16	0.12	0.11	0.070	0.062				
	Trosifol® SC Monolayer	0.47	0.43	0.41	0.39	0.35	0.33	0.26	0.23	0.19	0.16	0.091	0.070	0.054	0.038	0.025	0.021	0.016	0.012			
	Trosifol® SC Multilayer	0.71	0.54	0.49	0.44	0.39	0.37	0.31	0.29	0.24	0.21	0.13	0.10	0.078	0.057	0.036	0.031	0.024	0.019			
	Trosifol® Extra Stiff	73	44	33	21	10	5.8	2.0	1.4	1.0	0.92	0.75	0.71	0.68	0.65	0.61	0.59	0.54	0.53	0.37	0.21	0.12
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	120 151 106	82 141 101	67 138 95.6	49 130 91.2	25 119 84.8	16 110 80.1	4.1 83 55.1	2.4 75.2 50.0	1.3 66 38.2	1.0 60 26.0	0.78 55.3 16.2	0.73 52.3 10.6	0.69 50 8.97	0.65 35.9 8.35	0.61 24.7 7.13	0.60 22.5 6.18	0.54 12.9 5.54	0.53 11.6 5.17	0.38 6.8 3.07	0.22 5.31 1.98	0.12 4.05 1.51
35°C (95°F)	Trosifol® Clear/UltraClear	0.59	0.51	0.49	0.46	0.42	0.40	0.35	0.32	0.27	0.24	0.16	0.13	0.10	0.081	0.057	0.049					
	Trosifol® SC Monolayer	0.42	0.38	0.36	0.34	0.30	0.27	0.20	0.17	0.13	0.11	0.052	0.037	0.027	0.021	0.016	0.012	0.009	0.007			
	Trosifol® SC Multilayer	0.51	0.43	0.41	0.38	0.34	0.32	0.26	0.23	0.18	0.15	0.076	0.056	0.041	0.029							
	Trosifol® Extra Stiff	13	5.7	3.9	2.4	1.4	1.1	0.85	0.79	0.72	0.69	0.60	0.57	0.54	0.50	0.45	0.43	0.36	0.34	0.17		
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	39 114 78.7	19 102 70.3	13 96.9 65.5	7.1 89.9 61.5	3.0 77.7 55.1	1.9 70.5 44.9	1.0 53.4 29.0	0.88 47.7 22.0	0.75 37.9 13.5	0.70 34.7 10.0	0.61 26.4 4.60	0.59 23.1 3.99	0.55 20.3 3.31	0.52 16.5 3.23	0.47 12.4 2.76	0.46 11.4 2.63	0.39 8.31 2.32	0.37 7.45 2.15	0.19 4.95 1.51	0.19 4.11 1.05	0.17 3.05 0.87
40°C (104°F)	Trosifol® Clear/UltraClear	0.48	0.44	0.43	0.40	0.37	0.34	0.28	0.25	0.20	0.16	0.10	0.070	0.054								
	Trosifol® SC Monolayer	0.38	0.34	0.32	0.30	0.25	0.22	0.15	0.13	0.089	0.068	0.029	0.016	0.012	0.009	0.007	0.005	0.004	0.003			
	Trosifol® SC Multilayer	0.40	0.36	0.35	0.32	0.28	0.25	0.18	0.15	0.10	0.079	0.033	0.023	0.017	0.013	0.010	0.008	0.006	0.005			
	Trosifol® Extra Stiff	2.1	1.3	1.1	1.0	0.83	0.77	0.68	0.65	0.60	0.57	0.47	0.43	0.39	0.34	0.28	0.25	0.18	0.17			
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	10 77 50.3	4.1 63 46.3	2.7 56.4 40.5	1.6 48.1 35.5	1.1 37 33.1	0.85 31 27.0	0.69 19 15.0	0.66 15.8 12.0	0.60 11.4 6.99	0.57 9.3 5.20	0.47 5.76 2.64	0.44 5.06 1.99	0.41 4.5 1.86	0.37 4.16 1.84	0.32 3.6 1.57	0.30 3.66 1.39	0.23 3.4 1.19	0.21 3.3 1.11	0.17 3.1 0.70	0.19 2.9 0.47	0.17 2.31 0.37
50°C (122°F)	Trosifol® Clear/UltraClear	0.39	0.36	0.34	0.31	0.26	0.23	0.16	0.13	0.089	0.068	0.021	0.017	0.13	0.10							
	Trosifol® SC Monolayer	0.31	0.27	0.25	0.22	0.17	0.14	0.087	0.067	0.041	0.029	0.016	0.012	0.010	0.008	0.006	0.005	0.004	0.003			
	Trosifol® SC Multilayer	0.32	0.28	0.26	0.23	0.18	0.15	0.084	0.062	0.036	0.025			0.18	0.13							
	Trosifol® Extra Stiff	0.79	0.72	0.69	0.66	0.61	0.58	0.50	0.45	0.38	0.34	0.21	0.17	0.18	0.13							
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	0.93 36.2 22.1	0.78 26.4 12.7	0.69 22.1 8.45	0.66 18.5 5.98	0.61 13.5 4.90	0.54 11.3 3.89	0.54 7.31 2.45	0.50 6.19 2.00	0.44 4.9 1.70	0.40 4.2 1.20	0.34 3.24 1.20	0.27 2.98 1.10	0.21 2.8 1.05	0.17 2.67 1.00	0.17 2.4 0.92	0.17 2.42 0.74	0.16 2.2 0.61	0.15 2.2 0.54	0.14 2 0.43	0.12 2 0.23	0.17 1.82 0.17
60°C (140°F)	Trosifol® Clear/UltraClear	0.32	0.27	0.25	0.22	0.17	0.14	0.081	0.062													
	Trosifol® SC Monolayer	0.26	0.22	0.19	0.16	0.12	0.10	0.052	0.037													
	Trosifol® SC Multilayer	0.25	0.20	0.18	0.15	0.10	0.07	0.036	0.025													
	Trosifol® Extra Stiff	0.64	0.60	0.57	0.54	0.47	0.43	0.33	0.28	0.21	0.16											
	Trosifol® Extra Stiff Pro SentryGlas® SentryGlas® Xtra™	0.66 11.8 4.90	0.60 8.2 3.78	0.58 6.89 3.33	0.55 5.76 2.54	0.49 4.3 2.15	0.45 3.6 1.88	0.35 2.6 1.40	0.30 2.25 1.25	0.22 1.9 1.00	0.18 1.7 0.90	0.18 1.42 0.68	0.18 1.35 0.61	0.13 1.3 0.58	0.126 1.26 0.43	0.12 1.2 0.40	0.118 1.18 0.38	0.11 1.1 0.31	0.1 1.0 0.28	0.097 0.97 0.18	0.074 0.74 0.12	0.09 0.09 0.09
70°C (158°F)	Trosifol® Clear/UltraClear	0.26																				

Young Relaxation Modulus E(t)/MPa

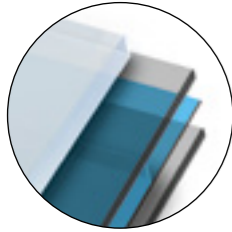


Temperature	Product type	Load duration																				
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
-20°C (-4°F)	Trosifol® Clear/UltraClear	750	680	650	610	550	500	400	360	290	250	160	130	99	75	49	41	22	19	4.3	2.0	1.6
	Trosifol® SC Monolayer	610	520	490	430	350	310	210	170	120	93	43	29	20	15	9.4	8.1	5.2	4.9	2.0	1.4	1.2
	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	1400	1300	1200	1200	1100	1000	860	790	660	570	360	300	240	180	110	93	46	38	6.0	2.8	2.3
	* Trosifol® Extra Stiff Pro																					
0°C (32°F)	SentryGlas®	838	835	835	832	832	829	821	818	815	809	806	804	801	798	795	795	792	786	772	749	720
	SentryGlas® Xtra™	725	719	719	716	710	705	699	670	672	669	654	631	619	568	554	551	544	522	471	411	388
	Trosifol® Clear/UltraClear	530	450	410	370	310	280	200	160	120	95	42	30	21	14	8.2	6.8	4.0	3.5	1.8	1.4	1.3
	Trosifol® SC Monolayer	140	95	77	58	35	23	11	7.7	4.9	3.6	2.1	1.8	1.6	1.5	1.4	1.3	1.2	1.2	0.91	0.63	0.42
	Trosifol® SC Multilayer																					
10°C (50°F)	Trosifol® Extra Stiff	1200	1100	1100	1000	930	850	670	580	450	380	210	150	110	71	38	30	13	10	3.1	2.3	2.0
	* Trosifol® Extra Stiff Pro																					
	SentryGlas®	749	743	740	737	732	726	717	714	708	703	680	668	665	654	648	645	639	636	605	579	559
	SentryGlas® Xtra™	601	589	580	571	551	539	512	500	474	426	367	317	299	282	252	248	222	209	162	127	115
	Trosifol® Clear/UltraClear	260	200	170	140	92	69	31	21	11	7.0	3.0	2.4	2.1	1.8	1.6	1.5	1.4	1.4	1.1	0.83	0.62
20°C (68°F)	Trosifol® SC Monolayer	15	9.1	7.4	5.6	3.4	2.7	1.8	1.6	1.4	1.3	1.1	1.0	0.94	0.83	0.79	0.66	0.62	0.32	0.13	0.13	
	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	1100	1000	970	900	780	700	510	430	310	250	110	70	46	28	14	11	5.5	4.7	2.5	2.1	1.8
	Trosifol® Extra Stiff Pro	1240	1150	1090	1030	940	880	740	650	530	470	270	210	150	100	59	44	17	14	3.2	2.2	1.9
	SentryGlas®	693	681	678	664	661	651	638	618	629	597	574	560	553	543	516	519	498	499	467	448	421
25°C (77°F)	SentryGlas® Xtra™	536	530	527	521	509	503	477	423	373	355	271	252	199	170	138	126	109	101	66.9	48.8	39.1
	Trosifol® Clear/UltraClear	37	20	14	9.4	5.1	3.7	2.2	1.9	1.6	1.5	1.3	1.2	1.2	1.1	0.98	0.94	0.80	0.77	0.42	0.19	
	Trosifol® SC Monolayer	2.6	2.0	1.8	1.6	1.4	1.3	1.2	1.1	0.98	0.90	0.67	0.59	0.50	0.42	0.32	0.28	0.19	0.17			
	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	820	690	630	540	420	350	200	140	77	50	12	7.7	5.4	4.0	3.1	2.9	2.5	2.4	1.9	1.6	1.4
30°C (86°F)	Trosifol® Extra Stiff Pro	1000	910	850	800	680	600	440	350	240	185	68	41	22	13	6.5	5.3	3.2	2.9	2.1	1.8	1.5
	SentryGlas®	629	612	606	594	602	567	549	525	511	493	458	438	428	406	380	368	336	330	282	256	223
	SentryGlas® Xtra™	480	459	426	400	389	370	355	340	296	237	163	148	118	109	87.3	79.6	62.8	54.4	32.9	19.8	14.9
	Trosifol® Clear/UltraClear	7.9	4.4	3.5	2.7	2.1	1.8	1.5	1.4	1.3	1.2	1.0	0.94	0.86	0.77	0.65	0.60	0.46	0.42	0.17		
	Trosifol® SC Monolayer	1.7	1.5	1.4	1.3	1.2	1.1	0.97	0.90	0.76	0.68	0.44	0.37	0.30	0.23	0.16	0.14	0.080	0.072			
35°C (95°F)	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	560	430	370	310	210	150	59	37	16	9.6	3.7	3.1	2.8	2.5	2.3	2.2	2.0	2.0	1.7	1.3	0.96
	Trosifol® Extra Stiff Pro	740	620	560	470	350	280	140	94	47	26	6.2	4.4	3.2	2.8	2.4	2.3	2.1	2.0	1.6	1.3	1.0
	SentryGlas®	511	485	474	456	433	413	340	334	308	294	263	250	234	206	177	160	131	123	93.3	70.6	52.6
	SentryGlas® Xtra™	417	403	373	346	340	289	238	187	136	110	79.9	62.2	55.1	53.0	45.6	42.0	32.9	31.4	16.6	9.80	7.22
40°C (104°F)	Trosifol® Clear/UltraClear	2.8	2.1	1.9	1.7	1.5	1.4	1.2	1.2	1.0	0.97	0.74	0.64	0.56	0.46	0.35	0.31	0.21	0.19			
	Trosifol® SC Monolayer	1.4	1.3	1.2	1.2	1.0	0.97	0.78	0.70	0.56	0.47	0.27	0.21	0.16	0.11	0.075	0.31	0.21	0.19			
	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	210	130	96	63	29	17	5.8	4.2	3.0	2.7	2.2	2.1	2.0	1.9	1.8	1.7	1.6	1.5	1.1	0.62	0.35
	Trosifol® Extra Stiff Pro	350	240	200	140	74	47	12	7.1	3.8	2.9	2.3	2.1	2.0	1.9	1.8	1.8	1.6	1.6	1.1	0.65	0.35
50°C (122°F)	SentryGlas®	443	413	405	381	349	324	243	220	194	178	162	153	146	105	72	66.0	38	35	20.3	15	11.9
	SentryGlas® Xtra™	314	299	283	270	250	237	163	148	113	77.0	48.0	31.4	26.6	24.7	21.1	18.3	16.4	15.3	9.09	5.86	4.47
	Trosifol® Clear/UltraClear	1.8	1.5	1.5	1.4	1.3	1.2	1.0	0.95	0.81	0.72	0.47	0.38	0.31	0.24	0.17	0.15					
	Trosifol® SC Monolayer	1.2	1.1	1.1	1.0	0.89	0.81	0.61	0.52	0.39	0.31	0.15	0.11	0.081								
	Trosifol® SC Multilayer																					
60°C (140°F)	Trosifol® Extra Stiff	39	17	11	7.2	4.1	3.3	2.5	2.3	2.1	2.0	1.7	1.6	1.6	1.5	1.3	1.3	1.0	1.0	0.49		
	Trosifol® Extra Stiff Pro	120	56	38	21	8.8	5.6	2.9	2.6	2.2	2.1	1.8	1.7	1.6	1.5	1.4	1.4	1.1	1.1	0.56		
	SentryGlas®	338	302	287	266	230	209	158	141	122	103	78.2	68.4	60.1	48.9	36.7	33.8	24.6	22.1	14.7	12.2	9.03
	SentryGlas® Xtra™	233	208	194	182	163	133	85.8	65.1	40.0	29.6	13.6	11.8	9.80	9.56	8.17	7.79	6.87	6.35	4.47	3.11	2.58
	Trosifol® Clear/UltraClear	1.4	1.3	1.3	1.2	1.1	1.0	0.82	0.73	0.58	0.49	0.27	0.21	0.16								
70°C (158°F)	Trosifol® SC Monolayer	1.1	1.0	0.96	0.88	0.75	0.66	0.46	0.38	0.26	0.20	0.15	0.11	0.086								
	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	6.1	3.7	3.2	2.8	2.4	2.3	2.0	1.9	1.8	1.7	1.4	1.3	1.1	1.0	0.81	0.75	0.54	0.49			
	Trosifol® Extra Stiff Pro	29	12	7.9	4.7	3.2	2.5	2.0	1.9	1.8	1.7	1.4	1.3	1.2	1.1	0.94	0.88	0.68	0.62			
	SentryGlas®	229	187	167	143	109	91.6	57	46.9	34	27.8	17.1	15.0	13.5	12.3	11	10.9	10	9.9	9.3	8.84	6.86
80°C (176°F)	SentryGlas® Xtra™	149	137	120	105	98.0	79.9	44.4	35.5	20.7	15.4	7.81	5.89	5.51	5.45	4.65	4.11	3.52	3.28	2.07	1.39	1.10
	Trosifol® Clear/UltraClear	1.2	1.1	1.0	0.92	0.78	0.69	0.48	0.39	0.27	0.20	0.15	0.11	0.086								
	Trosifol® SC Monolayer	0.94	0.80	0.74	0.66	0.52	0.43	0.26	0.20	0.12	0.086											
	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	2.3	2.1	2.0	1.9	1.8	1.7	1.5	1.3	1.1	1.0	0.63	0.50	0.4	0.29							
80°C (176°F)	Trosifol® Extra Stiff Pro	2.7	2.3	2.2	2.1	1.9	1.8	1.6	1.5	1.3	1.2	0.79	0.65	0.53	0.38							
	SentryGlas®	108.6	78	66.3	55.1	40	33.8	21.7	18.57	14.6	12.6	9.72	8.94	8.4	8.01	7.2	7.26	6.5	6.5	6.3	6	5.46
	SentryGlas® Xtra™	65.4	37.6	25.0	17.7	14.5	11.5	8.02	7.25	5.92	5.03	3.55	3.26	3.11	2.96	2.72	2.20	1.81	1.59	1.27	0.68	0.50
	Trosifol® Clear/UltraClear	0.95	0.82	0.75	0.66	0.51	0.42	0.24	0.18													
	Trosifol® SC Monolayer	0.78	0.64	0.58	0.49	0.36	0.29	0.15	0.11													
70°C (158°F)	Trosifol® SC Multilayer																					
	Trosifol® Extra Stiff	1.9	1.8	1.7	1.6	1.4	1.3	0.96	0.82	0.60	0.48											
	Trosifol® Extra Stiff Pro	1.9	1.8	1.7	1.6	1.4	1.3	1.0	0.88	0.65	0.53											
	SentryGlas®	35.4	24.5	20.67	17.2	12.8	10.9	7.6	6.75	5.5	5.1	4.26	4.05	3.8	3.78	3.6	3.54	3.3	3.3	3	2.9	2.22
	SentryGlas® Xtra™	14.5	11.2	9.86	7.51	6.36	5.57	4.14	3.70	2.96												

Trosifol® Extra Stiff and Trosifol® PVB combinations – Shear Relaxation Modulus G(t)/MPa

Combination	Temperature	Load duration																				
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
 Trosifol® Extra Stiff 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil) Trosifol® Extra Stiff 0.76 mm (30 mil)	10°C (50°F)	370	330	310	280	240	210	140	120	81	61	23	15	10	6.4	3.7	3.1	1.7	1.5	0.82	0.66	0.58
	20°C (68°F)	220	180	160	130	92	71	33	22	11	7.0	2.5	1.8	1.4	1.2	0.97	0.92	0.80	0.77	0.63	0.52	0.42
	25°C (77°F)	98	65	51	36	19	12	4.5	3.0	1.8	1.4	0.93	0.84	0.78	0.73	0.68	0.67	0.62	0.60	0.46	0.31	0.19
	30°C (86°F)	23	12	8.4	5.5	2.9	2.1	1.2	1.0	0.86	0.79	0.68	0.64	0.61	0.58	0.53	0.51	0.45	0.43	0.25	0.11	
	35°C (95°F)	4.3	2.4	1.9	1.5	1.1	0.95	0.77	0.73	0.67	0.64	0.55	0.51	0.47	0.43	0.36	0.34	0.26	0.24	0.09		
	40°C (104°F)	1.5	1.1	0.99	0.88	0.77	0.73	0.65	0.61	0.56	0.52	0.41	0.36	0.32	0.27	0.20	0.18	0.12	0.11			
	50°C (122°F)	0.76	0.69	0.67	0.63	0.58	0.55	0.45	0.41	0.33	0.28	0.16	0.12	0.093								
	60°C (140°F)	0.62	0.57	0.54	0.50	0.44	0.39	0.28	0.23	0.16	0.12											
	70°C (158°F)	0.51	0.44	0.41	0.36	0.29	0.24	0.14	0.10													
80°C (176°F)	0.41	0.33	0.29	0.24	0.17	0.13																
 Trosifol® Extra Stiff 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil)	10°C (50°F)	330	290	280	250	210	190	130	100	68	50	17	11	7.0	4.5	2.7	2.3	1.5	1.3	0.78	0.64	0.56
	20°C (68°F)	200	160	140	120	82	62	27	18	8.3	5.2	2.0	1.5	1.2	1.0	0.86	0.82	0.72	0.70	0.58	0.46	0.37
	25°C (77°F)	89	57	45	31	16	10	3.5	2.4	1.5	1.2	0.83	0.76	0.71	0.67	0.63	0.61	0.56	0.55	0.41	0.27	0.17
	30°C (86°F)	21	10	6.9	4.4	2.4	1.8	1.1	0.93	0.78	0.73	0.62	0.59	0.57	0.53	0.49	0.47	0.41	0.39	0.22	0.094	
	35°C (95°F)	3.7	2.1	1.7	1.3	1.0	0.88	0.72	0.68	0.62	0.59	0.50	0.47	0.43	0.39	0.33	0.31	0.24	0.22	0.081		
	40°C (104°F)	1.4	1.0	0.92	0.82	0.72	0.68	0.60	0.57	0.52	0.49	0.38	0.33	0.29	0.25	0.19	0.17	0.11	0.096			
	50°C (122°F)	0.71	0.65	0.62	0.59	0.54	0.51	0.42	0.38	0.31	0.26	0.15	0.11	0.083								
	60°C (140°F)	0.58	0.53	0.51	0.47	0.41	0.36	0.26	0.21	0.15	0.11											
	70°C (158°F)	0.48	0.41	0.38	0.34	0.27	0.22	0.13	0.093													
80°C (176°F)	0.37	0.30	0.27	0.22	0.16	0.12																
 Trosifol® Extra Stiff 0.76 mm (30 mil) Trosifol® PVB 0.76 mm (30 mil)	10°C (50°F)	290	260	240	210	170	150	93	73	45	32	11	6.8	4.6	3.1	2.0	1.8	1.3	1.2	0.74	0.61	0.53
	20°C (68°F)	110	77	63	47	27	17	6.3	4.2	2.3	1.8	1.0	0.91	0.82	0.75	0.68	0.66	0.61	0.60	0.47	0.33	0.22
	25°C (77°F)	35	18	13	8.6	4.4	3.0	1.5	1.2	1.0	0.86	0.68	0.65	0.61	0.58	0.54	0.52	0.47	0.45	0.29	0.14	0.068
	30°C (86°F)	6.7	3.5	2.7	2.0	1.4	1.1	0.83	0.75	0.67	0.64	0.55	0.52	0.49	0.45	0.39	0.37	0.30	0.28	0.12		
	35°C (95°F)	1.9	1.3	1.2	1.0	0.83	0.75	0.64	0.61	0.56	0.53	0.43	0.39	0.35	0.30	0.24	0.22	0.15	0.13			
	40°C (104°F)	1.1	0.86	0.80	0.73	0.66	0.63	0.55	0.52	0.46	0.42	0.30	0.26	0.21	0.17	0.12	0.10					
	50°C (122°F)	0.66	0.61	0.59	0.55	0.50	0.46	0.37	0.32	0.25	0.20	0.098	0.070									
	60°C (140°F)	0.55	0.50	0.47	0.43	0.36	0.32	0.21	0.16	0.10	0.075											
	70°C (158°F)	0.43	0.37	0.33	0.29	0.21	0.17	0.085														
80°C (176°F)	0.32	0.25	0.22	0.17	0.11	0.079																

TAB 3 •

Trosifol® Extra Stiff and Trosifol® PVB combinations – Young Relaxation Modulus E(t)/MPa

Combination	Temperature	Load duration																				
		1 sec	3 sec	5 sec	10 sec	30 sec	1 min	5 min	10 min	30 min	1 hour	6 hours	12 hours	1 day	2 days	5 days	1 week	3 weeks	1 month	1 year	10 years	50 years
 Trosifol® Extra Stiff 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil) Trosifol® Extra Stiff 0.76 mm (30 mil)	10°C (50°F)	1100	970	910	830	700	610	420	350	240	180	68	44	29	19	11	9.1	4.9	4.3	2.4	1.9	1.7
	20°C (68°F)	660	520	460	390	270	210	96	64	32	21	7.3	5.4	4.2	3.5	2.9	2.7	2.3	2.3	1.9	1.5	1.2
	25°C (77°F)	290	190	150	110	56	36	13	9.0	5.4	4.2	2.7	2.5	2.3	2.2	2.0	2.0	1.8	1.8	1.4	0.90	0.57
	30°C (86°F)	69	34	25	16	8.6	6.2	3.5	3.0	2.5	2.3	2.0	1.9	1.8	1.7	1.6	1.5	1.3	1.3	0.74	0.33	
	35°C (95°F)	13	7.1	5.6	4.3	3.2	2.8	2.3	2.1	2.0	1.9	1.6	1.5	1.4	1.2	1.1	1.00	0.77	0.71	0.28		
	40°C (104°F)	4.4	3.2	2.9	2.6	2.3	2.1	1.9	1.8	1.6	1.5	1.2	1.1	0.93	0.78	0.60	0.54	0.36	0.31			
	50°C (122°F)	2.2	2.0	2.0	1.9	1.7	1.6	1.3	1.2	0.98	0.83	0.47	0.36	0.27								
	60°C (140°F)	1.8	1.7	1.6	1.5	1.3	1.2	0.82	0.68	0.47	0.36											
	70°C (158°F)	1.5	1.3	1.2	1.1	0.84	0.70	0.40	0.30													
80°C (176°F)	1.2	0.97	0.86	0.72	0.51	0.39																
 Trosifol® Extra Stiff 0.76 mm (30 mil) Trosifol® PVB 0.38 mm (15 mil)	10°C (50°F)	970	860	810	740	620	540	370	300	200	150	51	32	21	13	7.8	6.7	4.3	3.9	2.3	1.9	1.7
	20°C (68°F)	590	480	420	350	240	180	79	52	25	15	5.7	4.4	3.6	3.0	2.5	2.4	2.1	2.1	1.7	1.4	1.1
	25°C (77°F)	260	170	130	91	46	29	10	7.1	4.5	3.6	2.4	2.2	2.1	2.0	1.8	1.8	1.7	1.6	1.2	0.78	0.49
	30°C (86°F)	60	29	20	13	7.1	5.3	3.2	2.7	2.3	2.1	1.8	1.7	1.7	1.6	1.4	1.4	1.2	1.1	0.65	0.28	
	35°C (95°F)	11	6.2	5.0	3.9	3.0	2.6	2.1	2.0	1.8	1.7	1.5	1.4	1.3	1.1	0.98	0.91	0.70	0.65	0.24		
	40°C (104°F)	4.0	3.0	2.7	2.4	2.1	2.0	1.8	1.7	1.5	1.4	1.1	0.98	0.86	0.72	0.55	0.49	0.32	0.28			
	50°C (122°F)	2.1	1.9	1.8	1.7	1.6	1.5	1.2	1.1	0.90	0.77	0.43	0.33	0.24								
	60°C (140°F)	1.7	1.6	1.5	1.4	1.2	1.1	0.76	0.63	0.44	0.33											
	70°C (158°F)	1.4	1.2	1.1	0.99	0.78	0.65	0.37	0.27													
80°C (176°F)	1.1	0.89	0.79	0.66	0.46	0.35																
 Trosifol® Extra Stiff 0.76 mm (30 mil) Trosifol® PVB 0.76 mm (30 mil)	10°C (50°F)	860	750	700	620	500	430	270	210	130	95	31	20	14	9.2	5.9	5.2	3.7	3.4	2.2	1.8	1.6
	20°C (68°F)	320	230	190	140	78	51	19	12	6.9	5.2	3.0	2.7	2.4	2.2	2.0	1.9	1.8	1.7	1.4	0.97	0.65
	25°C (77°F)	100	54	39	25	13	8.8	4.5	3.7	2.8	2.5	2.0	1.9	1.8	1.7	1.6	1.5	1.4	1.3	0.85	0.41	0.20
	30°C (86°F)	20	10	7.9	5.8	4.0	3.3	2.4	2.2	2.0	1.9	1.6	1.5	1.4	1.3	1.2	1.1	0.88	0.82	0.35		
	35°C (95°F)	5.7	4.0	3.4	2.9	2.4	2.2	1.9	1.8	1.7	1.6	1.3	1.1	1.0	0.89	0.70	0.64	0.43	0.39			
	40°C (104°F)	3.1	2.5	2.4	2.2	1.9	1.8	1.6	1.5	1.4	1.2	0.89	0.75	0.63	0.49	0.34	0.30					
	50°C (122°F)	1.9	1.8	1.7	1.6	1.5	1.4	1.1	0.95	0.73	0.59	0.29	0.21									
	60°C (140°F)	1.6	1.5	1.4	1.3	1.1	0.93	0.61	0.48	0.31	0.22											
	70°C (158°F)	1.3	1.1	0.98	0.84	0.62	0.49	0.25														
80°C (176°F)	0.95	0.73	0.63	0.50	0.32	0.23																

TAB 4 •



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Contact



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