



SentryGlas® Interlayer Elastic Properties (SGP 5000)

DuPont Glass Laminating Solutions

*The preferred supplier and innovator
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Polymer Interlayer Behavior

All interlayers are viscoelastic

- Stiffness (modulus) and Poisson ratio vary as a function of temperature and load duration (creep)
- Evaluate properties over a range of test temperature and time using dynamic mechanical analysis and creep tests (ASTM D 4065)
- “Small” strain values (< 20 % engineering strain)

Young’s modulus, E , shear modulus, G , & Poisson ratio, ν .

- Extract E , G and ν for specified temperature and load duration
- Choose appropriate elastic property values for design case and assign to an effective elastic interlayer
- Important to assess the likelihood of achieving full design load at the design temperature and load duration

Young's Modulus: SentryGlas[®] Interlayer

Young's Modulus E (MPa)		Load Duration						
		1 s	3 s	1 min	1 hr	1 day	1 mo	10 yrs
Temperature	10 °C	692.	681.	651.	597.	553.	499.	448.
	20 °C	628.	612.	567.	493.	428.	330.	256.
	24 °C	581.	561.	505.	416.	327.	217.	129.
	30 °C	442.	413.	324.	178.	148.	34.7	15.9
	40 °C	228.	187.	91.6	27.8	13.6	9.86	8.84
	50 °C	108.	78.8	33.8	12.6	8.45	6.54	6.00
	60 °C	35.3	24.5	10.9	5.10	3.87	3.24	2.91
	70 °C	11.3	8.78	5.64	2.52	1.77	1.44	1.35
	80 °C	4.65	3.96	2.49	0.96	0.75	0.63	0.54

Shear Modulus: SentryGlas® Interlayer

Shear Modulus G (MPa)		Load Duration						
		1 s	3 s	1 min	1 hr	1 day	1 mo	10 yrs
Temperature	10 °C	240.	236.	225.	206.	190.	171.	153.
	20 °C	217.	211.	195.	169.	146.	112.	86.6
	24 °C	200.	193.	173.	142.	111.	73.2	43.3
	30 °C	151.	141.	110.	59.9	49.7	11.6	5.31
	40 °C	77.0	63.0	30.7	9.28	4.54	3.29	2.95
	50 °C	36.2	26.4	11.3	4.20	2.82	2.18	2.00
	60 °C	11.8	8.18	3.64	1.70	1.29	1.08	0.97
	70 °C	3.77	2.93	1.88	0.84	0.59	0.48	0.45
	80 °C	1.55	1.32	0.83	0.32	0.25	0.21	0.18

Poisson Ratio: SentryGlas® Interlayer

		Load Duration						
		1 s	3 s	1 min	1 hr	1 day	1 mo	10 yrs
Temperature	Poisson Ratio, ν	1 s	3 s	1 min	1 hr	1 day	1 mo	10 yrs
	10 °C	0.442	0.443	0.446	0.450	0.454	0.458	0.463
	20 °C	0.448	0.449	0.453	0.459	0.464	0.473	0.479
	24 °C	0.452	0.453	0.458	0.465	0.473	0.482	0.489
	30 °C	0.463	0.466	0.473	0.485	0.488	0.497	0.499
	40 °C	0.481	0.484	0.492	0.498	0.499	0.499	0.499
	50 °C	0.491	0.493	0.497	0.499	0.499	0.500	0.500
	60 °C	0.497	0.498	0.499	0.500	0.500	0.500	0.500
	70 °C	0.499	0.499	0.500	0.500	0.500	0.500	0.500
	80 °C	0.500	0.500	0.500	0.500	0.500	0.500	0.500

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