

## Addison Clear Wave Dual-Cure Epoxy Adhesives for Active Alignment Applications

Adhesive Name	A1851-TX	A1853-TX	A1859-TX	TCL-202***	A1708-TX	A1708-TX2
appearance cured	light yellow/tan	light yellow/tan	yellow/tan	yellow/tan	yellow-amber	yellow-amber
Curing: UV + Heat UV cure (sec at 250 mW/cm <sup>2</sup> ) plus heat step	8-16 sec 60 min, 85 °C	8-16 sec 60 min, 85 °C	8-16 sec 60 min, 90 °C	20 sec 90 min, 90 °C	20 sec 60 min, 150 °C	20 sec 60 min, 150 °C
Curing: Heat Only	1-2 hr, 85 °C 60 min, 90 °C 45 min, 100 °C	1-2 hr, 85 °C 60 min, 90 °C 45 min, 100 °C	90 min, 90 °C 60 min, 100 °C	90 min, 90 °C 60 min, 100 °C 45 min, 110 °C	2-3 hr, 150 °C 1-2 hr, 180 °C	2-3 hr, 150 °C 1-2 hr, 180 °C
Working Life at RT	48 hours	48 hours	48 hours	48 hours	3 months	3 months
Viscosity at 10/s (mPa-s)*	11,000	65,000	90,000	32,000	12,000	50,000
Thixotropic Index**	3	7	5	3.5	2	5
Young Modulus (Mpa)	2,400	2,000	1,640	15,700	3,300	3,300
Tensile Strength (Mpa)	57	150	125	151	540	540
Elongation (%)	4	5	6	3	4	4
Tg by DMA (°C)	164	165	150	183	168	170
CTE below Tg (ppm/°C)	32	35	32	21	33	20
CTE above Tg (ppm/°C)	110	100	100	60	60	60
Shrinkage (vol %)	1	1	1	1	1	1
Hardness Shore D	80-85	75-80	75-80	85-90	80-85	95
Storage Temperature (6 month storage life)	-20 °C	-20 °C	-20 °C	-20 °C	25 °C	25 °C

\* Thixotropic materials; the viscosity reported is the measured value at a shear rate of 10/s at 25 °C

\*\* Thixotropic Index measured as viscosity at 1/s shear rate divided by viscosity at 10/s shear rate at 25 °C.

\*\*\* TLC-202 is thermally conductive and electrically insulating.