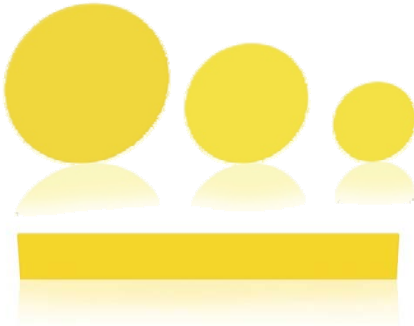


# RELIABILITY DATASHEET

## Intematix ChromaLit™ Round, Square, Linear, Panel



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## Intematix ChromaLit Qualification Reliability Testing

This document summarizes the reliability qualification of Intematix ChromaLit™ Round, Square, Linear and Panel products. Please refer to product datasheet as well as application notes for recommended and maximum operating conditions.

Item	Stress Test	Stress Conditions	Stress Duration	Failure Criteria	Result
1	High Temperature Operating Life (HTOL)	$T_{\max}^1 = 100^\circ\text{C}$	500 hours	>5% variation in conversion efficacy >0.007 variation in CIE ( $\Delta u'$ , $\Delta v'$ ) chromaticity	PASS
2	Wet High Temperature Operating Life (WHTOL)	60°C/90%RH	500 hours	>5% variation in conversion efficacy >0.007 variation in CIE ( $\Delta u'$ , $\Delta v'$ ) chromaticity	PASS
3	Non-Operating Thermal Shock (TMSK)	-40°C to 125°C	500 cycles	>5% variation in conversion efficacy >0.007 variation in CIE ( $\Delta u'$ , $\Delta v'$ ) chromaticity	PASS

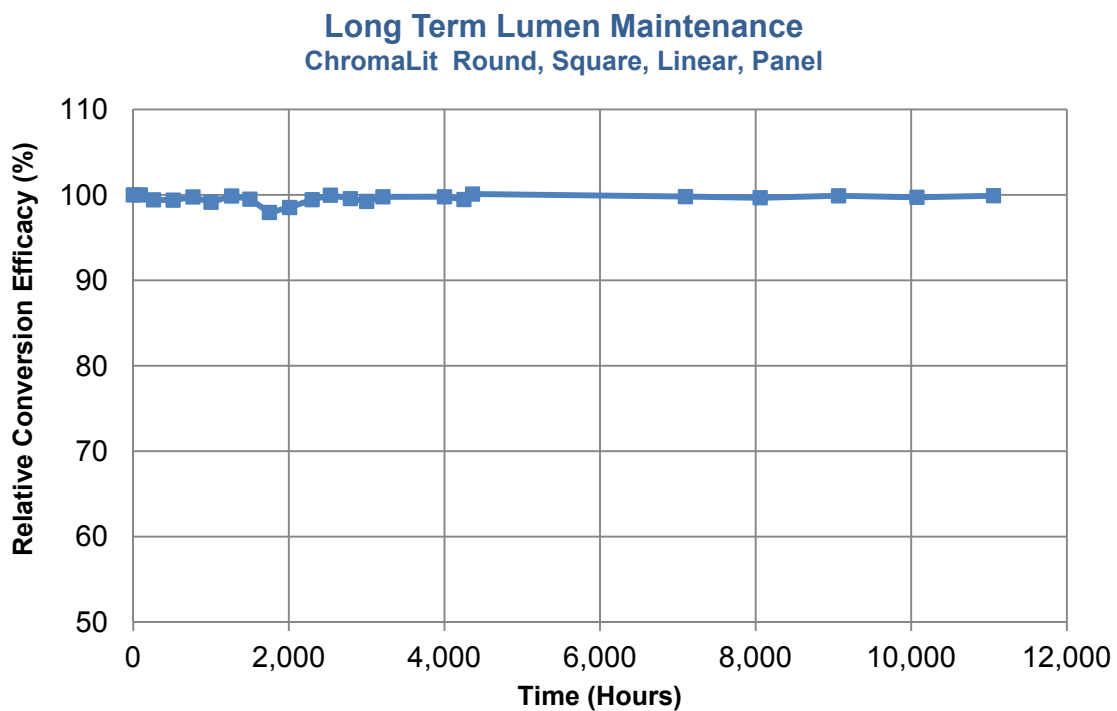
<sup>1</sup> $T_{\max}$  = ChromaLit max temperature at inner surface

## Long Term Lumen Maintenance and Chromaticity Shift

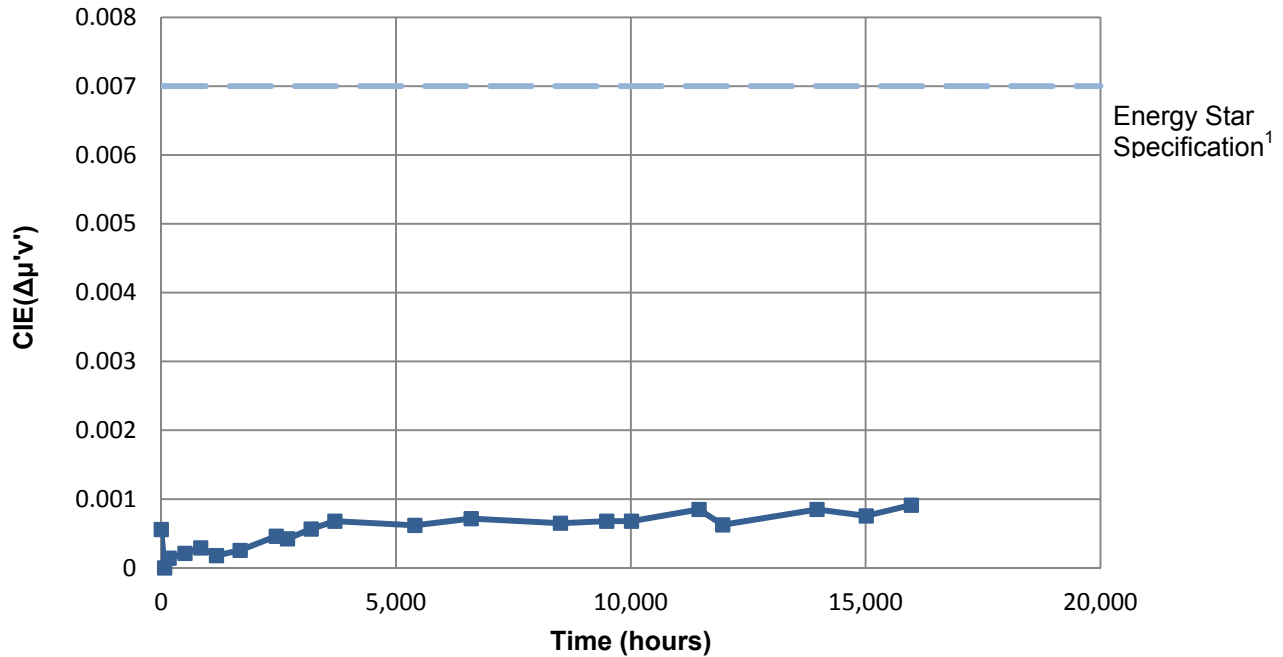
ChromaLit offers excellent long term lumen maintenance and chromaticity shift compared to standard white LEDs. ChromaLit remote phosphor light source is typically driven at a lower operating temperature compared to conventional phosphor enclosed in a white LED. This results in lower total system degradation over time.

Below figure demonstrates the lumen maintenance of the ChromaLit 2D product family at inner surface temperature of 95°C. Inner surface temperature is measured at the center of ChromaLit surface facing Blue LEDs. Operation at lower surface temperature is expected to further improve the long term lumen maintenance.

ChromaLit was operating in a remote phosphor light engine powered by commercially available blue LEDs. Conversion efficacy was measured in the integrating sphere at each data point. Data collected are independent of blue LED performances.



## Long Term Chromaticity Shift ChromaLit Round, Square, Linear, Panel



<sup>1</sup> **Energy Star® Color Maintenance Specification:** The change of chromaticity over the lifetime of the product shall be within 0.007 on the CIE 1976 (u',v') diagram.

### Summary of Results

ChromaLit Inner Surface Temperature	Average Lumen Maintenance at 6,000 hours	Average Chromaticity Shift (Δu'v') at 6,000hours
95°C	99.79%	0.0007



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