Liquid Crystal Switchable Mirror

The ***e-TransFlector™***, ***an electrically switchable trans-reflective mirror***, developed by Kent Optronics, represents a unique state-of-the-art of electro-optically switchable mirror. It is a solid state thin film device made from special liquid crystal material, can be ***rapidly switched between pure reflection, half-reflection and total transparent states*** through a push button. *The* ***e-TransFlector™*** series products offer customers a switchable reflective shutter for both visible and infrared applications while providing the flexibility to customize bandwidth, aperture size, and array format, as well as excellent environment stability.

The ***e-TransFlector™*** products can be used either as a component in customer system or a standalone device for designated purposes. Examples include switchable polarizer, achromatic polarizing switchable beam splitter/combiner, light shutter, laser beam director, switchable mirror and half-mirror, seasonal switched energy saving windows, smart spectacles/sun glasses, etc. The envisioned systems and applications include projection displays, helmet mounted displays (HMD), laser protection devices, see-through displays, cameras/camera-phones, vision-aid devices, and high-throughput, spectrally tunable filters, to name a few.

The ***e-TransFlector™*** is superior to current state-of-the-art switchable mirror products: it has ***~87% photopic reflectance*** in reflection state, ***>87% photopic transmittance*** in transparent state, ~43% reflectance/transmittance when in the half-reflection state. Its ***reflection bandwidth can be tailored from 50 to 1,000 nm*** and the ***state-to-state transition time is nominally 10 - 100 milliseconds.***

It comes with a compact power supply that can be either battery or 110/220 V wall-plug powered. Customers have the option to choose the ***e-TransFlector™*** substrate material, shape, and curvature. All products are offered at a competitive price. A demo is available upon request.

In reflection state

In transparent state

In half-reflection/transmission state

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KentOptronics

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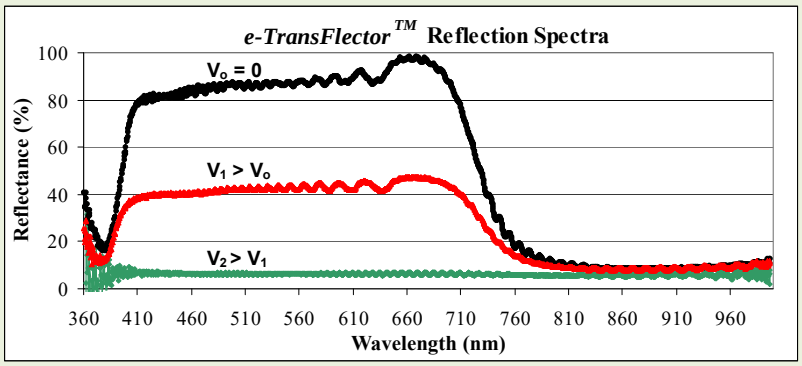
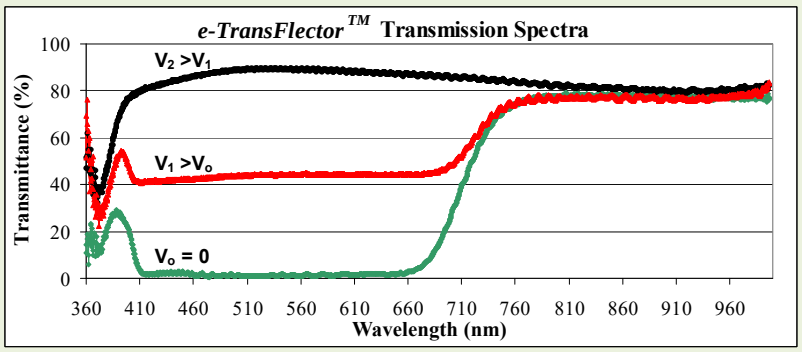
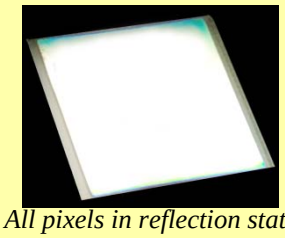
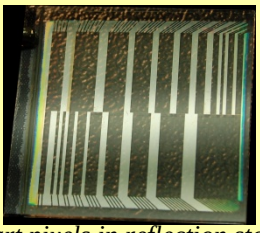




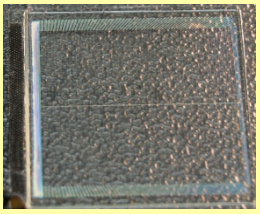
Pixilated e-TransFlector™



All pixels in reflection state



Part pixels in reflection state



All pixels in transparent state

e-TransFlector™ Specifications

Parameter	Current Specification
Spectral range	400 –5,000 nm[(a)]
Reflection spectral bandwidth	50 – 1,000 nm
Photopic reflectance in mirror state (Default state)	>87%
Photopic transmittance in mirror state (Default state)	<1%
Reverse mode default state reflection	Not available
Reverse mode default state transmittance	Not available
Photopic transmittance in clear state	>87% (no AR coating); >95% (AR coating)
Photopic reflectance in clear state	≤10% (no AR coating); ≤3% (AR coating)
Transmittance/reflectance in half-reflection state	43%/43%
Haze	3%
Transmittance/reflection Uniformity	≤ ±0.5%
Viewing angle	0° - 50°[(b)]
Switching time	10 ms – 100 ms (20°C)
Switching voltage	100 - 260 V/20Hz square wave
Power consumption	6.6 mW/cm^2
Operation temperature	-10 – 60°C
Storage temperature	-51 – 100°C
UV stability	Stable under 30W UV-B
Life time	>10 years (in-door)
Active area size (current)	5 mm × 5 mm to 0.58 m (diagonal)
Pixel size (if pixilated)	50 μm or greater
Minimum thickness	0.8 mm
Substrate material (current)	Glass, quartz

Notes:

[(a)] --- Special conductive coating required for wavelength greater than 2,700 nm.

[(b)] --- For reflection bandwidth ≤100 nm, all specs preserve. For reflection bandwidth >100 nm, mirror (reflection) state exhibits increased light leakage.