# LUX LABS

Introducing ClearBright™

ClearBright™ transparent display film turns any clear surface into a high-resolution display while maintaining its transparency. Incorporating state of the art nanotechnology developed at MIT, the ClearBright™ polymer film is easily applied to glass and compatible with any off-the-shelf projector, these flexible films offer full color, high brightness and contrast, and a 360° viewing angle.

Black color looks transparent

Image light

Ambient light
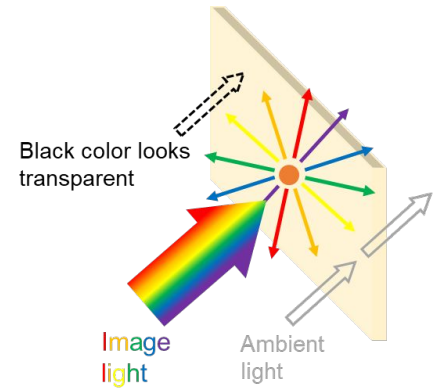
Target Applications

Use Environments

➤ Conference Rooms
➤ Business Offices
➤ Board Rooms
➤ Briefing Centers
➤ Training Centers
➤ Demo Centers
➤ Multimedia Centers

➤ Customer Exp. Centers
➤ Visitor Welcome Centers
➤ Hybrid Retail
➤ Transit Centers
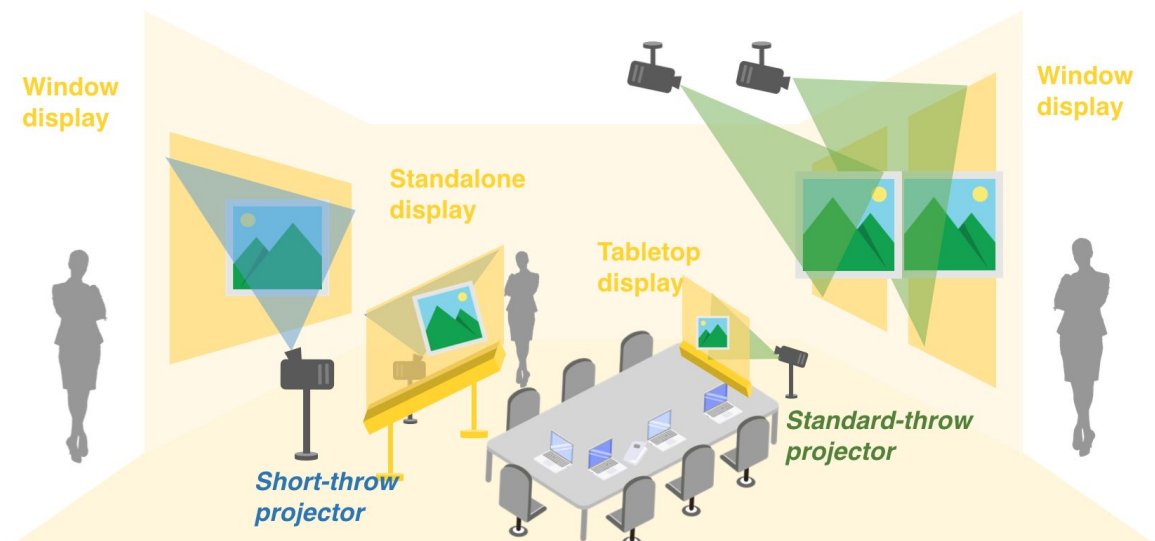➤ Museums
➤ Out of Home Marketing
➤ Live Events

Projector Requirements

➤ Lights on - 160 lumens per square foot (nighttime)
➤ Lights off - 100 lumens per square foot (nighttime)
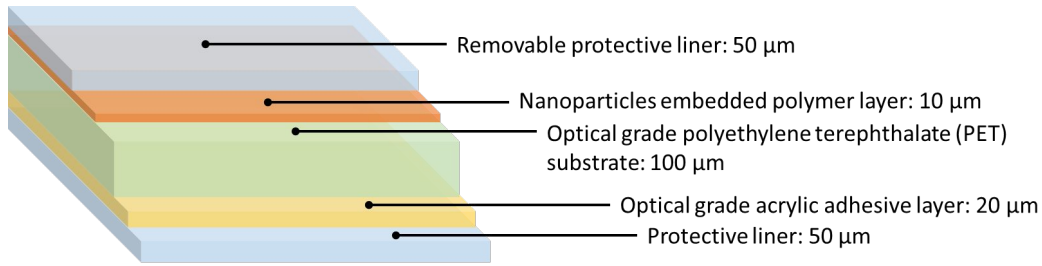➤ Daytime - 325 lumens per square foot

* Daytime performance can vary depending on lighting conditions. All numbers are minimum requirements.

Ambient Light

➤ Avoid direct sunlight
➤ Improved experience in darker conditions

Window display

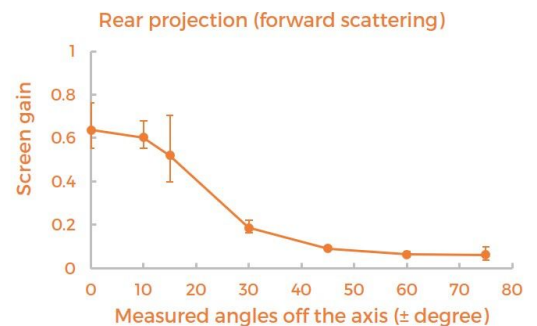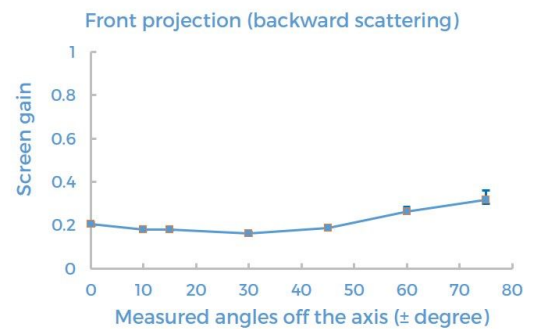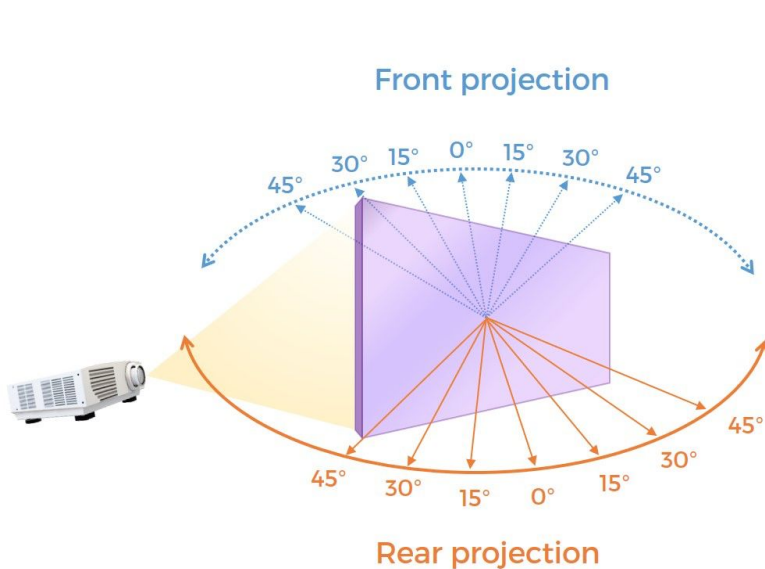Window display

Standalone display

Tabletop display

Standard-throw projector

Short-throw projector

Film Construction

- Removable protective liner: 50 μm
- Nanoparticles embedded polymer layer: 10 μm
- Optical grade polyethylene terephthalate (PET) substrate: 100 μm
- Optical grade acrylic adhesive layer: 20 μm
- Protective liner: 50 μm

Width on full roll	0.91 meters
length on full roll	283 meters

Display Characteristics[1]

Viewing Angle	178° (horizontal or vertical)
Total Transmission	90%
Max incident angle for projector	75°
Viewable area	100%
Ideal Viewing Distance	0.5+ meter (dependent on the lumens of projector)
Projector lumen requirements (dark)	>1000 ANSI lumens
Projector lumen requirements (indoor light)	>3500 ANSI lumens

[1]Other general display characteristics (image area, resolution, etc.) are determined by the specifications of the projector in use.

Front projection

Rear projection

Front projection (backward scattering)

Rear projection (forward scattering)

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Environmental Durability Tests

Test	Conditions	Results

Low Temperature	● -20℃
	● 72 hrs
		● Change of optical properties:
		  ○ Total Transmittance ≤ 0.6%
		  ○ Haze ≤ 2%
		
		● The peeling force maintains in the range of 300-400gf/25mm.
		
		● Exterior side outdoor window applications have shown no signs of degradation or image quality lose across real temperatures from -18℃ to 35℃ and high humidity

High Temperature	● 85℃ ● 72 hrs	
High Temperature / High Humidity	● 85℃ / 85%RH ● 72 hours	
Temperature Cycling	● -20℃ / 85℃ ● Cycling time 2hrs - 2hrs ● 72 hrs	

UV Exposure	● Light
	  ○ UVA 340nm
	  ○ 0.63mW/m^2
	  ○ 60℃
	● Dark
	  ○ 50℃
	● 50%RH
	● Cycling time 4hrs - 4hrs
	● 72 hrs	

Application Methods

● **Wet**: Use on existing windows or to create large screens with multiple panels of ClearBright. Excess liquid evaporates out in about 3 days and continues to improve over time. See *luxlabsdisplays.com/faq*. Any commercial sign installer will be familiar with this method or do it yourself.

● **Dry**: For use on clear substrates that can be passed through a cold lamination machine to create a see-through screen. This service is available through most custom sign and graphics shops. Also available through Lux Labs with the ability to customize requirements. Thinner substrates display slightly better optical properties. We commonly use clear acrylic 1/16 to 1/4 inch thick depending on application.

● **Commercial Glass Lamination**: Use as an interlayer in multi-layer commercial glass. Layering in high quality glass displays the best optical properties and highest level of durability. Contact Lux Labs if interested or would like a proof of concept demo.

www.LuxLabsDisplays.com
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