

Toward an era of smart windows!

LC MAGIC, a light control film creating a new space with the magic of light.



Create a new space with the magic of light.

The liquid crystal light control film achieves "to show", "not to show" and "serve as a projection screen".

LC MAGIC is an ultra-thin liquid crystal film developed based on Toppan's liquid crystal technological achievements accumulated through our display-related businesses.

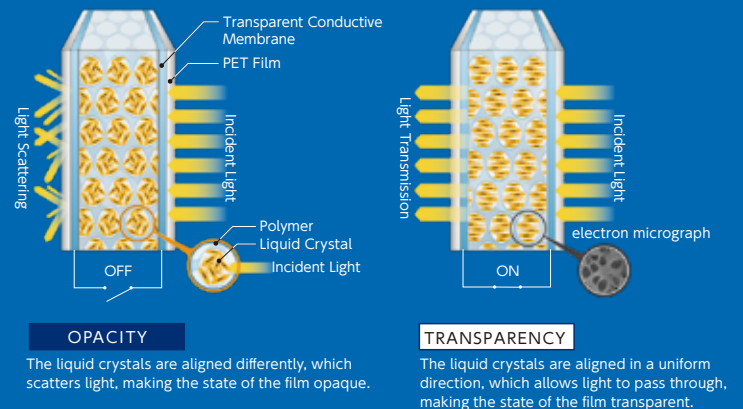
The flip of a switch can transform the film state from transparent to opaque, or vice versa.

This innovative product is used in a wide variety of applications, as an alternative to a blind or curtain, or as a digital signage screen.

Our lineup is: Normal-Mode film that switches to transparent when power is turned on, and Reverse-Mode film that switches to transparent when power is turned off.

Modulation of light transmission by polymer network liquid crystals

Basic Principle (Normal-Mode)



Features of LC MAGIC

1 High Transparency and Full Privacy

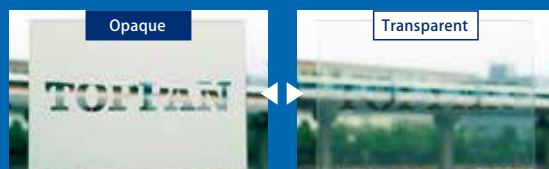
Realized 86% total light transmittance and 98% haze.
For Normal-Mode film, the degree of transparency can be adjusted.

Note: Feasible with Normal-Mode film.

2 Design Flexibility

By making a proper electric design prior to modularization, LC MAGIC can be freely processed into your ideal shape.

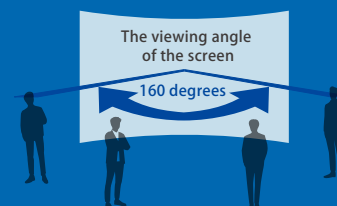
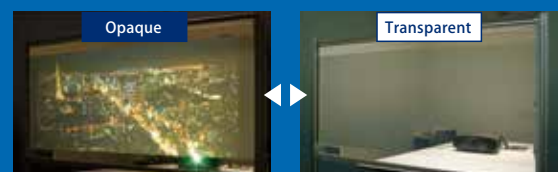
Note: Significant modifications cannot be made after modularization.



4 Projection Screen Usage

As LC MAGIC is optically developed, the opaque state can display images with high quality and high definition, such as 4K.

Note: In addition to the conventional rear projection, front projection is available.



LC MAGIC has a viewing angle of up to 160 degrees in horizontal and vertical directions.

3 Roll-to-Roll Production

The shipment unit per roll is 50m.

Note: The film width is 1,450mm.

5 Production at Toppan's domestic plants

Safe and stable supply system with Japanese quality

Note: Manufactured in a class 100 clean room.



N (transparent when power ON / opaque when power OFF)

NORMAL MODE

For a space where privacy is desired!

For a large window or partition!



Images are for illustrative purpose only.

The degree of transparency can be adjusted gradually.
Flexible adjustment is available in accordance with the application.



Usage example for a sunroof



Privacy Protection

The high haze of 98% at opaque state provides a high level of privacy.



Adjustable Transparency

The degree of transparency can be easily adjusted using a controller.

Note: The optical characteristic of the middle tone is not guaranteed.



Large Width of 1.45m

The film can be applied to a large window or partition without replenishing.

Basic data

Normal-Mode			
Thickness	0.27mm		Response time *3
Maximum dimension	1,450×3,000mm		0.1sec
Total light transmittance (at power ON)*1*2	86%		Power consumption *4
Parallel light transmittance*2	O N	82%	5W/m ²
	OFF	1%	Driving voltage
Haze*1*2	O N	5%	AC40~80V
	OFF	98%	Operating temperature
			-20~90°C
			SWOM (Weathering test) *5
			Passed 2,000 hours testing

Note

*1: The value is measured based on JIS K 7361-1 and JIS K 7136, and is not a guaranteed value.

*2: The value is measured at 23°C.

*3: This is a response speed of the film at 23°C, not including the activation and response time of the power supply equipment.

*4: The value is measured at 23°C using the optimal voltage for an area of 1m². This is the power consumed by the film only, not including the consumption by other devices including the power supply. (Optimal voltage: Normal-Mode...40Vrms 40Hz square wave / Reverse-Mode...40Vrms 60Hz square wave)

*5: SWOM (weathering test) is conducted based on JIS A 5759, and has satisfied the values specified in the Toppan's standard using Toppan-specified adhesive and edge sealing.

R(opaque when power ON / transparent when power OFF)EVERSE MODE

For a room with a sense of openness!
For energy saving and efficiency!



ON Opaque

OFF Transparent

Images are for illustrative purpose only.

An economical type that does not require electricity at transparent state.
Suitable for an environment where transparency is desired.



Usage example for
a rear seat window



Ecology and Energy Efficiency

The transparent state is available without electricity, suitable for using mainly at clear state.



Visible During a Power Failure

The film remains transparent in case of power failure, ensuring visibility.



Higher Transparency

The Reverse-Mode is developed focusing mainly on transparency.

Basic data

Reverse-Mode			
Thickness	0.26mm		Response time *3
Maximum dimension	1,450 × 3,000mm		Power consumption *4
Total light transmittance (at power OFF)*1*2	88%		Driving voltage
Parallel light transmittance*2	O N	7%	Operating temperature
	OFF	80%	SWOM (Weathering test) *5
Haze*1*2	O N	92%	Passed 2,000 hours of testing
	OFF	10%	

Note

*1: The value is measured based on JIS K 7361-1 and JIS K 7136, and is not a guaranteed value.

*2: The value is measured at 23°C.

*3: This is a response speed of the film at 23°C, not including the activation and response time of the power supply equipment.

*4: The value is measured at 23°C using the optimal voltage for an area of 1㎡. This is the power consumed by the film only, not including the consumption by other devices including the power supply. (Optimal voltage: Normal-Mode...40Vrms 40Hz square wave / Reverse-Mode...40Vrms 60Hz square wave)

*5: SWOM (weathering test) is conducted based on JIS A 5759, and has satisfied the values specified in the Toppan's standard using Toppan-specified adhesive and edge sealing.

Option

We offer various options for each application to enhance the functionality.

Color Variation

Black-colored films are available in different tones, and can be chosen according to your preference.



Front Projection

Front projection is available with LC MAGIC, suitable for a room where there is not enough space to put the projection behind the screen.



Electrode

Flexible printed circuits for electronic devices are applied on the electrode area. They are easy to handle, and can be installed in partitions with narrow frames.



Edge Sealing

The edge of LC MAGIC films is protected with Toppan's specified material. Precise and reliable edge sealing is realized with the use of our specialized tools.



Installation

LC MAGIC is available in different styles: film-attached glass, film with wet adhesive, and film with self-adhesive that enables quick installation.



Power Supply

We offer three types of internally designed power supplies for LC MAGIC. Each device is based on safe and secure design, mounted in a fire-resistant housing with earth leakage breaking function.

Note: The LC MAGIC power supplies are certified only in limited areas. Please confirm with our sales whether they are certified in your country.

●LP1

Multi-functional model with transparency adjustment and external control.



〈Dimension〉
W150×D235×H75.5mm
〈Weight〉
about 840g



Dedicated operation panel



Remote controller

Note: Transparency adjustment only supports normal mode

●LP2

Thin model with simple functions for driving large area.



〈Dimension〉
W103×D300×H32mm
〈Weight〉
about 725g

●LP3

Large area compatible model with transparency adjustment and external control.



〈Dimension〉
W200×D345×H75mm
〈Weight〉
about 2,600g



Dedicated operation panel



Remote controller

Note: Transparency adjustment only supports normal mode

LC MAGIC is used in various fields (offices, houses, commercial facilities, etc.).

LC MAGIC can be used differently depending on the intended situation or time, mainly for security solutions, privacy protection, or projecting images.

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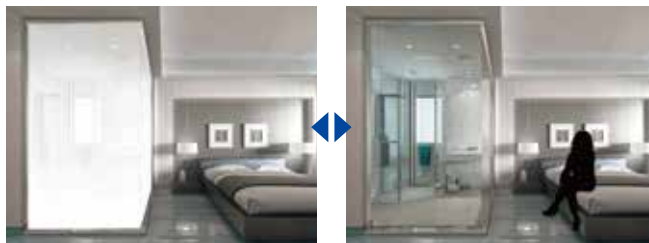
For VIP or reception rooms

Depending on the contents of the meeting, you can easily change the state between transparent and opaque.



For hotel bathrooms

Can create a privacy environment with a sense of openness.



For factory tour routes

Depending on the nature of the manufacturing, you can use the film to keep confidentiality from visitors as a security measure.



For outer windows

You can select the state of film depending on the weather.



For medical facilities

Unlike curtains and blinds, LC MAGIC prevents the accumulation of dust and can be easily cleaned, keeping the room sanitary.



As a digital signage screen

LC MAGIC can be used as a digital signage screen by projecting high resolution image.



■ LC MAGIC website
https://www.toppan.com/en/electronics/device/lc_magic/



■ Introduction of the showroom at the Shibaura Office (Youtube)
<https://www.youtube.com/watch?v=OoPNSxAV3ho>



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