

LONGSHENG INTRODUCTION

Global market leader for PDLC

Oct. 2025



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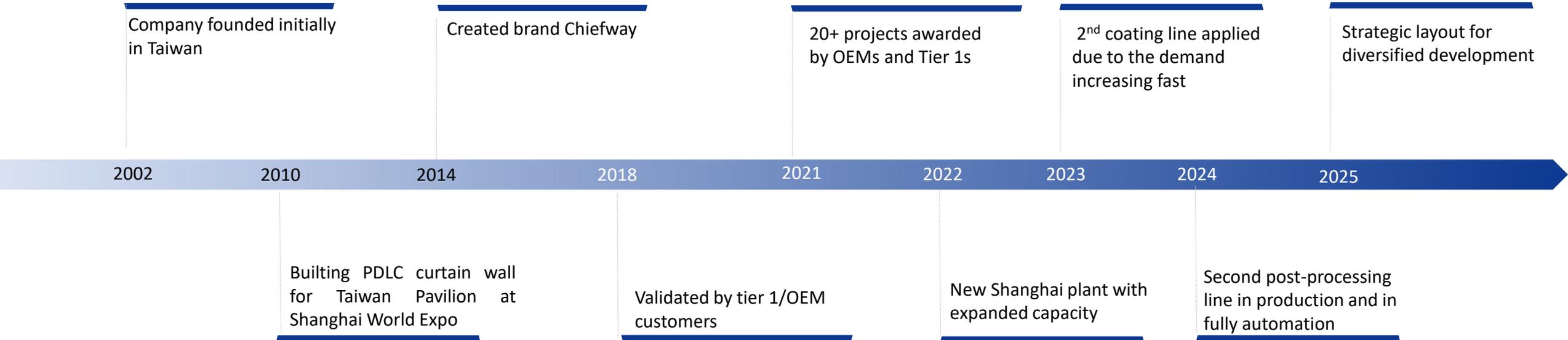
Application in
Architecture Area

04

Application in
Multimedia

01 Company Introduction

Company Milestones



Company Profile

Shanghai Longsheng Optronics New Material Co., Ltd. is a high-tech enterprise focusing on research, development, production and sales of new materials for PDLC film, with the corporate values of “innovation-driven, quality-oriented, and customer first”, and we’re committed to provide customers with the full solutions of PDLC film product development and manufacturing.



Building Area: 20,988m²
Plant Area: 17,532m²



Capacity:
5M m²/Y by Rolls
1.8M pc/Y by Panel



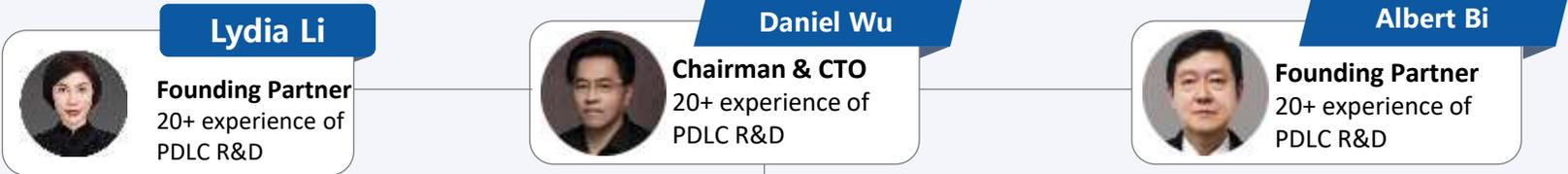
Employee: 200+



Four PDLC products



Organizational Chart



Awards

高新技术企业
—2022年—

创新发展50强
—2025年—

专精特新中小企业
—2023年—

高新技术成果转化
—2023年—

量产·新材料·金奖
—2024—

科技型中小企业
—2023年—

创新产品推荐
—2023年—



Patents & Certificates



The patents cover countries including China, United States, Japan and South Korea, forming a global patent strategy layout. Additional 20+ patents are currently under application.



40+



VDA6.3



IATF 16949



ISO9001



ISO45001



ISO14001

Products Comparison

	PDLC	Dye PDLC	EC	SPD	LC
Technical characters	<p>Most cost-effective</p> <p>No contrast ratio & high haze</p>	<p>Best overall performance & most comprehensive functions</p> <p>No significant weakness</p>	<p>High intelligibility</p> <p>Cannot be segmented, slow response, high cost, low yield.</p>	<p>High intelligibility, can be segmented</p> <p>High cost, high driving voltage, low yield rate</p>	<p>Best sensory effect</p> <p>Cannot be segmented, highest processing difficulty, highest cost</p>
	Color	White, black	Blue-black, grey-black	Blue, gray	Blue, black, grey
Partition control	Partitioning thickness maximum 50um	Partitioning thickness maximum 50um	Very difficult for partition	Difficult for partition	Difficult for partition
Transparency	ON	80-90% (Transparent)	20-30% (Transparent)	40-60% (Transparent)	15-30% (Transparent)
	OFF	70-80% (Hidden)	2-4% (Hidden)	0.5-2% (Hidden)	1-5% (Hidden)
Response time	ms	ms	1-20min	s	ms
Working temperature	-30-100°C	-30-100°C	-20-85°C	-40-85°C	-20-85°C
Cost	★	★★	★★	★★★	★★★★
Field of application	Automotive glass, Building glass, 3C, and media applications	Automotive glass, Building glass	Automotive glass, Building glass	Automotive glass, Building glass	Automotive glass, Building glass
Glass Lamination Yield	■■■■■■■	■■■■■■■	■■■■■■■	■■■■■■■	■■■■■■■
Mass production efficiency	■■■■■■■	■■■■■■■	■■■■■■■	■■■■■■■	■■■■■■■

Products

01 White PDLC



02 Insulation PDLC film



03 Wide-view PDLC



04 Dye PDLC



Functions

-  Smart dimming  Shade and heat insulation
-  Energy saving  Privacy
-  High contrast ratio  Smart display

Fields

-  Car market  Building
-  Consumer electronics  Transportation and others

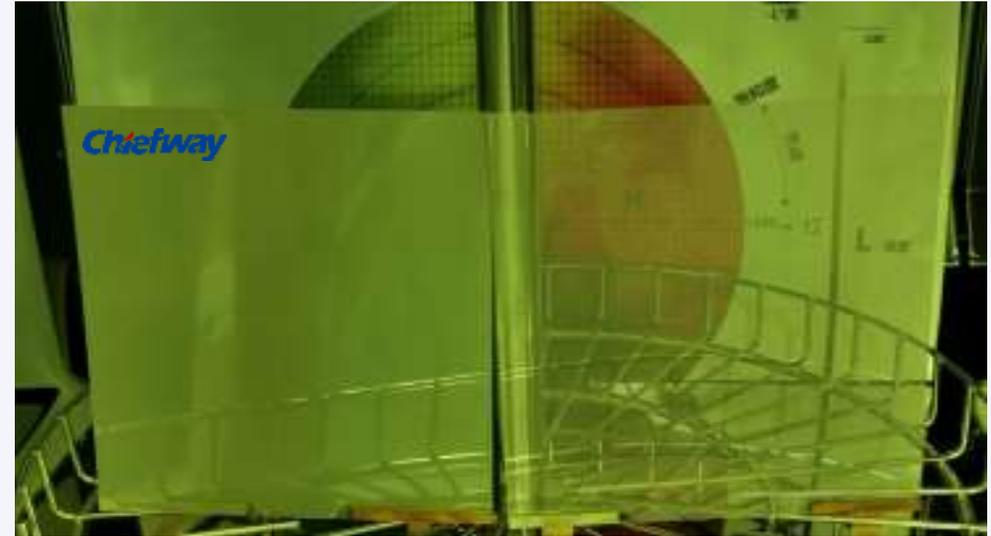
Wide-Temp. LC Formular

Scarce wide-temperature liquid crystal formula,
fulfil the requirements of automotive.

【Double 95】 95% haze at 95°.

【Aging Resistance】 1000H of heat resistance; 3000H of UV resistance.

【Lamination Support】 Up to 150° 2H, high temperature lamination available.



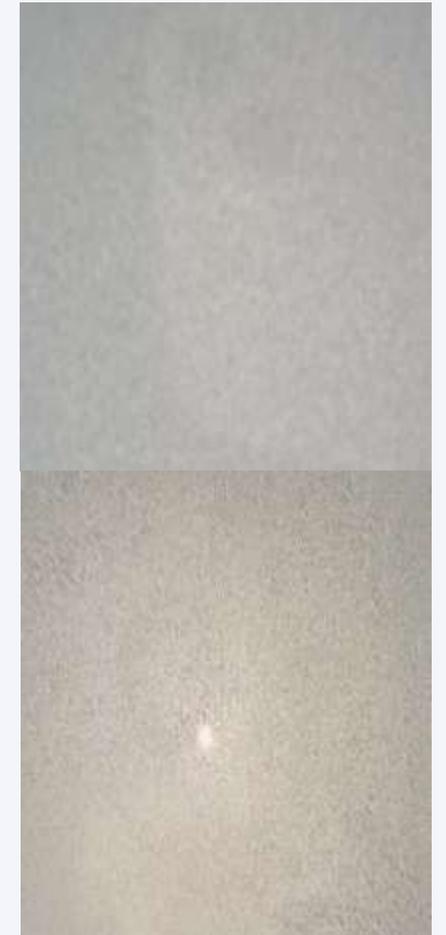
Spacer Free Coating Process

Unique coating process of Spacer free technology

【Aspect】 Uniform color, without transparent points, without agglomeration.

【Quality】 High Yield Rate, high quality performance.

【Anti-wrinkle】 28mm of Transverse Rise , 46mm of Vertical Rise.



Segmentation

Laser carving on the ITO layer, ensure the stable performance.

【Solution】 Pattern design, and industrialization solution.

【Segment Line】 Invisible at OFF, almost invisible at ON.

【Segment Production】 Most complicated design and production capacity.



Stability, Reliability of Production

Over 20 years accumulation of R&D, technology, and customer supports.

【Responsibility】 Be responsible for promises, and results.

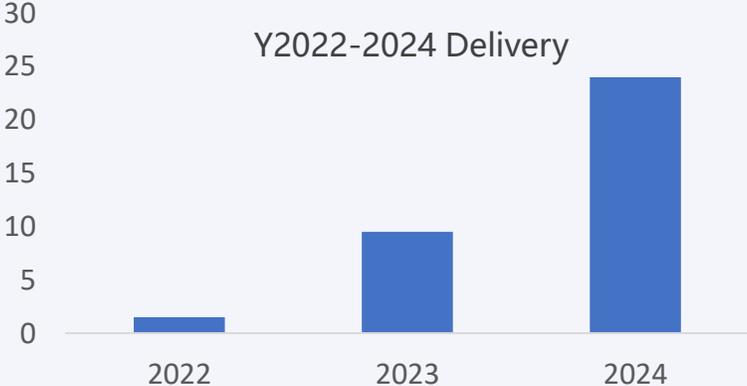
【Aftermarket】 Rely on the rich experience, to provide complete aftermarket service.

【Delivery & Supply】 Delivery on time is the promise to our customer.

Customer Service Assessment



Y2022-2024 Delivery



Advanced Engineering



9 - Segments



10 - segments

01

Dev. Matrix

3 Dr. team for material researching.
10+ Master team for formular application.
30+Eng. Team drives the development and innovation.

02

Product Design

500+ /Year solutions delivery.
10+ patent for invention.

03

Equipment

20+ advanced equipment.
Completed precise measurement ad testing.

04

Digital System

AI data analysis system under developing, facilitating developing progress.

Manufacturing



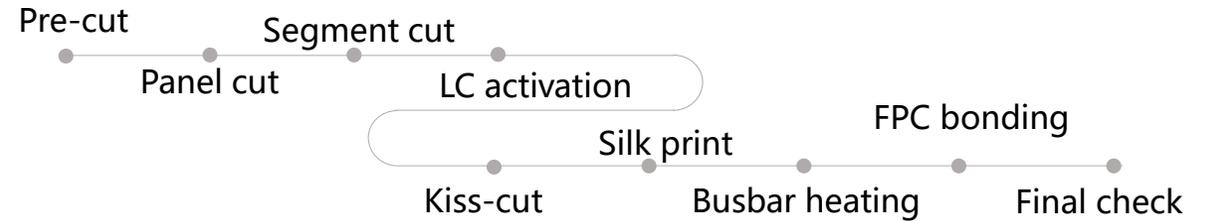
Coating

- Self-designed.
- 3-5times faster coating speed.
- Unique spacer-free process



Roll Capacity

- 2025: 2M m² by Rolls
- 2027: 5M m² by Rolls



Equipment

- First automated production line globally.
- 35µm segment line, almost invisible.



Panel Capacity

- 2025: 600K completed piece
- 2027: 2M completed piece

Applications & Customers

Application



45+ nominated projects
20+ projects in SOP



Building doors and windows,
partitions, curtain walls and
cultural media



Switchable anti-peeping
screens, railway transportation
and consumer electronics

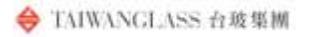
Automotive



Consumer Electronics



Architecture



Application in
Automobile Industry

02

隆昇PDL C车型应用

Mass Production Cases

Applied in 45+ nominated car types, 20 of them are already in mass-production



奥迪A5L



RS 5 Sportback



*Longsheng is the specified PDLC supplier for 10+ Audi models worldwide, including Audi Germany, FAW Audi, SAIC Audi, and other global models.

Mass Production Cases

Applied in 45+ nominated car types, 20 of them are already in mass-production



PDLC Applications



Sky roof

Reading lamp



Side window

Switchable anti-peeking



Partition

P-HUD



Smart dimmable Skyroof



Common Advantages

- Automotive-grade certification, reliable quality
- Wide temperature formulation, strong weather resistance
- Fast response, millisecond-level dimming
- Uniform appearance, no graininess
- Customizable complex segmentation



Products	White PDLC	Dye PDLC	Insolation PDLC
Unique advantages	Mature application Cost-effective High lamination yield Stable mass production	Next-generation dimming material Black color High contrast No side-view white haze Invisible segmentation line	Heat-insolation Cost-effective No side-view white haze Customizable color Customizable insulation performance
SOP Time	2018/11	2025/10	2022/5

Privacy Side Window

Common Advantages

- Automotive-grade certification, reliable quality
- Wide temperature formulation, strong weather resistance
- Fast response, millisecond-level dimming
- Uniform appearance, no graininess
- Customizable complex segmentation



Products	Wide-view PDLC	Dye PDLC
Unique advantages	New-generation dimming material Advanced gray No side-view white haze 180° clear view	Next-generation dimming material Black color High contrast No side-view white haze Invisible segmentation line
SOP Time	2022/8	2025/10

P-HUD

- PDLC-based full size P-HUD
- Release more vision area, segment-screen.
- Quick-response



Product

DYE PDLC



SOP

2025/10

Anti-peeking film

- Brand new technology of Anti-peek solution.
- No loss on color and brightness.
- 80% thinner, 90% lighter than ECB solution.
- 50% lower costing than ECB



White PDLC



105μm、50g



Stable Process

Customers

合作Tier1



OEM 用户



VOLVO



RIVIAN



HYUNDAI



03 Applications in Consumer Electronics

PDLC is an application solution for privacy protection to the new generation of laptops

Demand Background



Rigid demand driven by business security

Users need a narrow viewing angle for privacy to protect sensitive data, as well as a wide viewing angle for sharing, such as meeting collaboration;



Extended requirements for user experience upgrades

At night in an airplane cabin, the bright light from a laptop can disturb passengers sitting nearby; when driving at night, the light from the passenger's screen can distract



Active privacy protection has become a strategic-level technology for high-end devices, integrating privacy compliance, enhanced user experience, and brand premium.

PDLC Switchable Anti-peeking Solution

The world's first PDLC switchable privacy protection solution, empowering a new experience in the 3C sector.

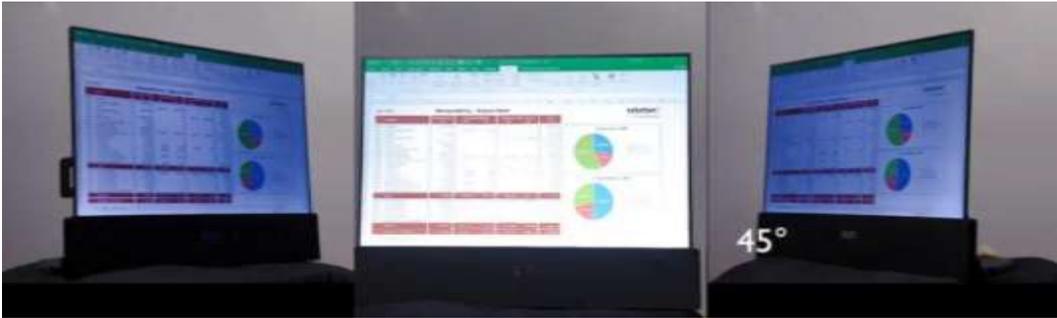
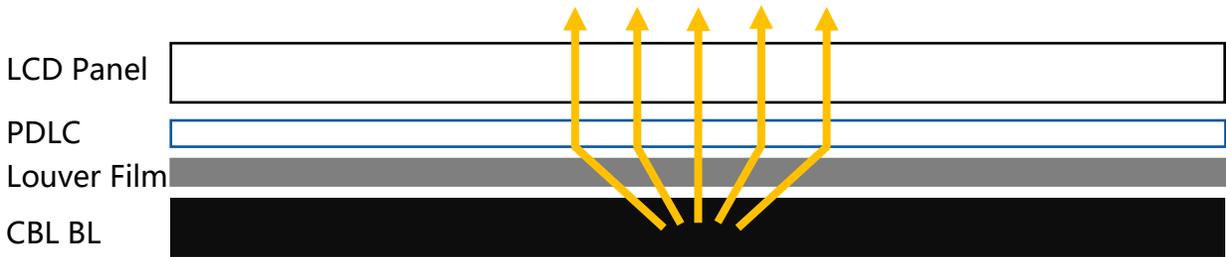
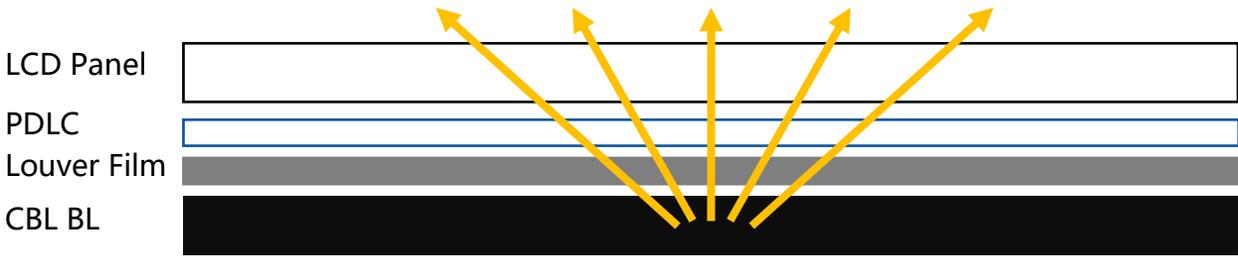


Sharing

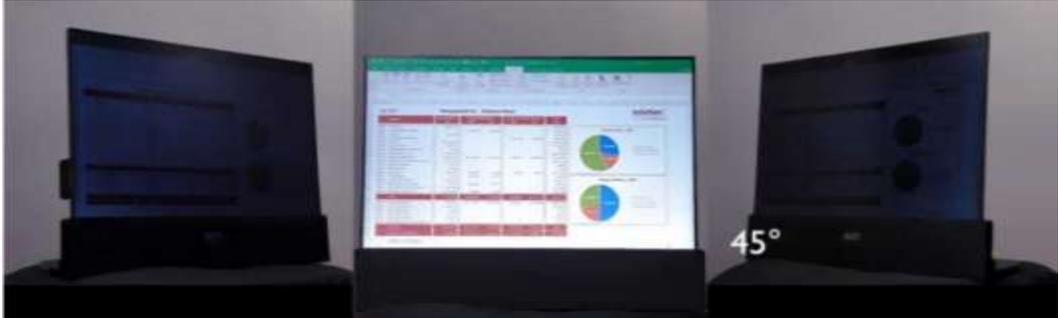


Privacy

Technical Principle



Sharing | PDLC (Off)



Privacy | PDLC (On)

Anti-peeking performance

Fulfilled anti-peeking standards

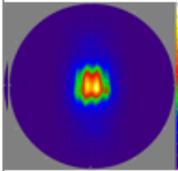
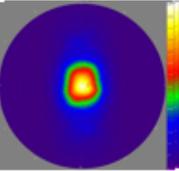
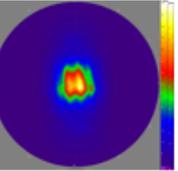
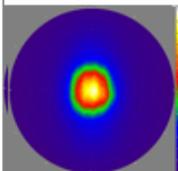
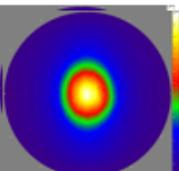
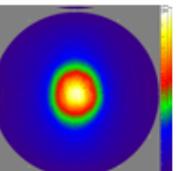
The Ratio between $\theta/\varphi = \pm 40^\circ/0$ the core basis for evaluating the performance of privacy mode/sharing mode.

Privacy mode < 1%

Sharing mode (low voltage) > 12%

Sharing mode (high voltage) > 30%

* Customer' s requirements are fulfilled.

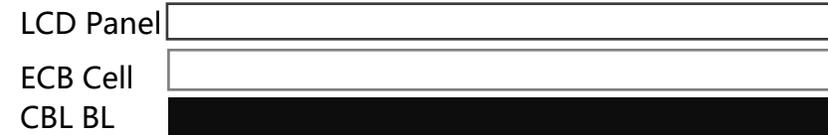
		SPEC	Switch Cell	Panel	Panel	Panel
PDLC Vendor		-	-	Chiefway	Chiefway	Chiefway
Model		-	n/a	M1434	M111	S111
PET (um)		-	-	50	50	50
LC (um)		-	-	12	5	5
V0 T%		-	-	25.26%	10.65%	4.39%
Privacy	Brightness(nits)	595	595	471	477	483
						
	@45° Ratio	-	0.80%	0.70%	0.66%	0.61%
	@40° Ratio	< 1%	1.60%	1.07%	0.94%	0.94%
Sharing	Brightness(nits)	595	595	257	190	127
						
	@45° Ratio	> 12%	4.9%	6.90%	13.31%	27.51%
	@40° Ratio	30% (LCM)	7.6%	8.84%	17.09%	32.37%

Customization

Custom development services are available, with solutions tailored to customer requirements.

Material thickness	100 μ m	250 μ m	376 μ m
Parallel light transmittance	10%	20%	30%
Liquid crystal thickness		5 μ m~20 μ m	
Voltage		10V-48V	

PDLC solution VS ECB solution



	PDLC solution	ECB CELL solution
Voltage	10V~20V	10V
Image quality	Normal	Normal
Color difference	Normal	Normal
Thickness	105um	600um
Weight	50g	500g
Price	¥	¥ ¥ ¥ ¥
Spec	Automotive-grade	Automotive-grade

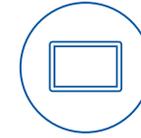
Applications



Car



Laptop / Pad



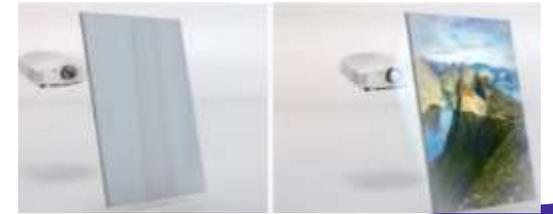
Monitor



Application in Architecture Area **04**

There are many applications for PDLC in the Building

PDLC应用场景



High-end doors and windows

Advantages

- High climate resistance performance
- Dimming speed in millisecond-level
- Homogeneous appearance
- Segmentable
- Privacy protection

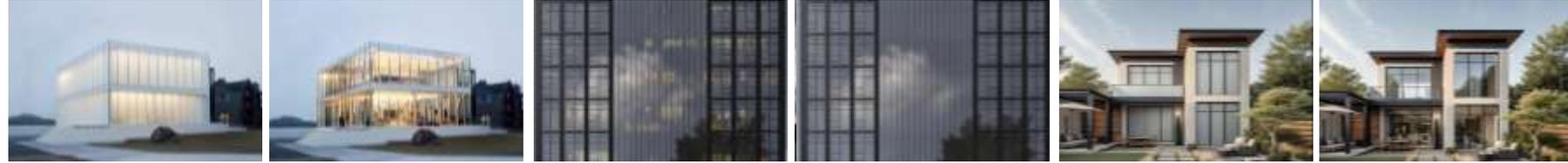


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SOP Time	2018/11	2025/10	2022/5

Glass curtain wall

Advantages

- High climate resistance
- Dimming speed in millisecond-level
- Privacy protection
- Combined with projection



Products	White PDLC	Dye PDLC	Insolation PDLC
Unique advantages	Mature application Cost-effective High lamination yield Stable mass production	Next-generation dimming material Black color High contrast No side-view white haze Invisible segmentation line	Heat-insolation Cost-effective No side-view white haze Customizable color Customizable insulation performance
SOP Time	2018/11	2025/10	2022/5

Partition in the office

Advantage

- Switchable privacy protection
- Flexible space
- Technological aesthetics
- Combined with projection



Products

General PDLC



Unique advantage

Dynamic Privacy Control
Optimized Space Utilization



SOP

2015/10

Projects

已合作2000+项目



2018世博会台湾馆



Door and window



Curtain wall



阳光房遮光顶棚



Curtain wall



Display screen



卡塔尔门窗幕墙



Partition



Global Leader of PDLC Market