

WWW.OCCS.CO.KR



OCCS Co., Ltd.

Flexible Transparent Display Product Introduction

OCCS Inc. Transparent Display Product Introduction





Transparent Display & Printed Electronics Global Leader



Company : OCCS Co., Ltd

C.E.O : Byung Ki Park

Item : Printed electronics, transparent display, LED parts, semiconductors

Date of establishment : Sep. 14th, 2018

E-mail : evergreenbk@naver.com

TEL : +82-42-933-7022

Homepage : <http://occs.co.kr/>

Corporate Registraion Number : 824-88-00990

Main business : Transparent display, LED parts, Flexible circuit board

Head Office/Factory/Laboratory : 2, Sinilseo-ro 18beon-gil, Daedeok-gu, Daejeon, Republic of Korea

Seoul Office : 751, Taejang-ro, Gimpo-si, Gyeonggi-do, Republic of Korea



Contents

02

03

01	Company Introduction	04
02	Technology and Product Introduction	08
03	Product Composition	13
04	Construction Example	15


01 Company Introduction

Greetings

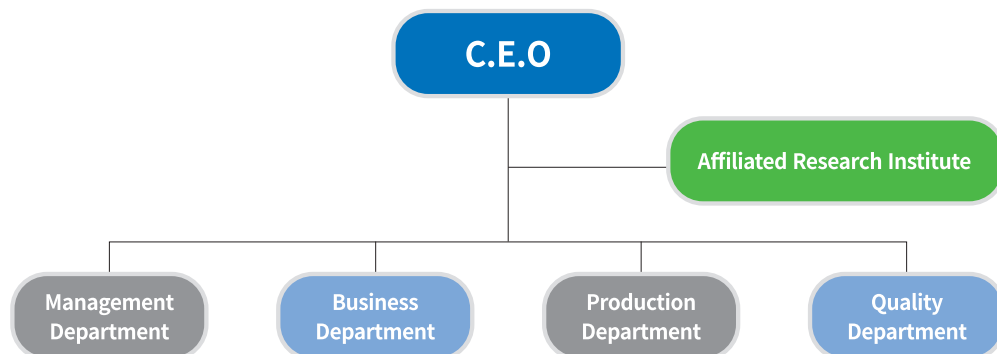
OCCS is a company that conducts transparent digital information display(DID) as its main business. It is an ICT 4th industrial technology convergence LED display that realizes transparency and flexibility at the same time. Since its foundation in 2018, it is growing into a world-class company through continuous investment, continuous technology development, quality and technological innovation.

In the future, OCCS will continue to develop into a company full of vitality, creativity and innovation, and a company that dreams and challenges with a big vision, putting the highest priority on realizing customer satisfaction.

We ask for your continued interest and support.
Thank you.

C.E.O 박병기 

Organization



Vision



We will become a company that produces **creative products** by utilizing possessed original technology and develops through **good communication** with customers.

- O** Original technology (源泉技術)
- C** Creative product (創造적 製品)
- C** Communication with customer (고객과 疏通)
- S** Soaring development (飛躍)

04

05

Corporate History

- 2018. Sep. | **Established of OCCS Co., Ltd.**
- 2018. Oct. | **Attract Angel investment**
- 2019. Feb. | **Technology Guarantee Fund Researcher Startup Excellent Technology Guarantee**
- 2020. Mar. | **Increase of capital through patent technology valuation**
- 2020. Jun. | **Attract investment from Venture Investment Center of Korea Technology Guarantee Fund**
- 2021. Mar. | **Seoul office opened and exhibition room installation**
- 2021. May. | **Completion of construction of production plant and research facilities and production of products**
- 2021. Present | **Commercialization of transparent display, LED, Electronic parts, and cosmetic refrigerator**

Transparent Display
Product Introduction

Core Competencies



C.E.O **Byung Ki Park**

Chungnam National University - **Material engineering, Doctor of Engineering**

Dissertation : Physiochemical Control and Ozone Decomposition Characteristics of Iron Oxide Supported γ -alumina Catalyst Prepared by Hydrothermal Method

❖ Representative History

- **2018.09.14 - Present** CEO of OCCS Co., Ltd.
- **2018.05.05 - Present** Korea Research Institute of Chemical Technology - Honorary Responsible Researcher
- **2008.06.30 - 2016.12.31** University of Science and Technology - Professor of Nanomaterials Engineering
- **1985.03.01 - 2018.05.04** Korea Research Institute of Chemical Technology - Responsible Researcher
- **1985.03.01 - 2018.05.04** 140 journal papers, 30 patent applications, 30 patent registrations, 12 technology transfer/commercialization cases

❖ Awards

- **2013** University of Science and Technology President's Award - Outstanding Professor
- **2006** The Korea Ceramic Society Yangsong Paper Award - Best Paper
- **2004** Prime Minister's Commendation - Outstanding Researcher in Enterprise

A large-area flexible transparent display can be manufactured by simply forming a display electrode through the catalytic ink printing electronic process and the metal mesh micro-patterning process. By combining high-cost performance transparent display that can overcome the disadvantages of existing transparent display products with ICT technology, it can be used as a media facade, smart content, store advertisement, public information delivery, self-assembly product, etc. in various spaces. It is a venture company that manufactures and sells products that can realize interactive communication digital information display (DID) in the non-face-to-face era. In addition, manufacturing and sales of component materials such as catalyst ink and surface treatment substrates and industrial LED modules are in progress. In the future, we are promoting R&D with the goal of commercializing flexible transparent displays using Mini, Micro LED and products in the field of flexible electronics such as FPCB and RFID.



Status of Patents & Certificates



Certificate of patent Certificate of patent Certificate of design registration Certificate of patent Certificate of patent Certificate of patent in China



Certificate of patent in China Venture company confirmation Corporate research institute recognition Certificate ISO 9001 Certificate ISO 14001 Certificate

❖ Technology transfer to Chemical Research Institute/Mechanical Research Institute

Patent name	Main inventor	Owner
Catalyst ink composition, metal pattern formation using the same, and Substrate surface treatment method (South Korea, Patent registration number : 1220327)	Byung Ki Park	OCCS Co., Ltd

❖ Technology transfer to Material Research Institute

Patent name	Main inventor	Owner
Manufacturing method of thermoelectric nanocomposite powder (South Korea, Patent registration number : 1142917)	Kuk Hyun Ha	OCCS Co., Ltd

❖ Holding Patent

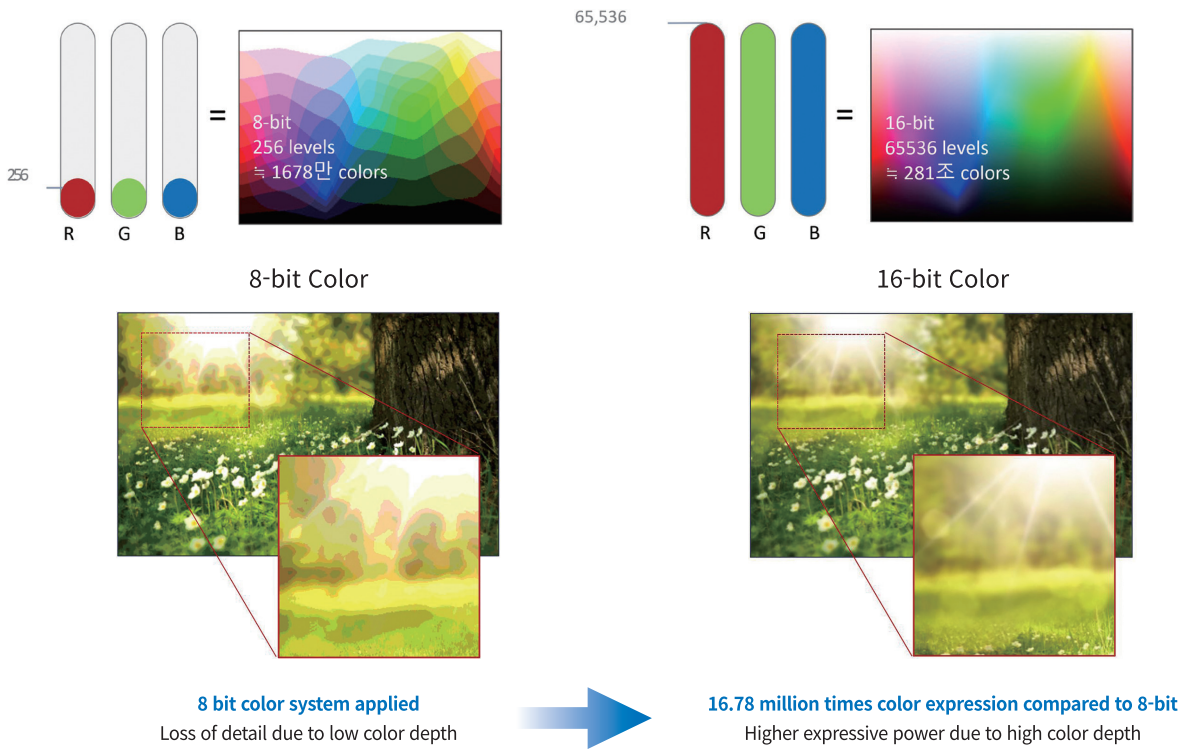
Patent name	Main inventor	Owner
Cosmetic refrigerator (South Korea Design registration : 30-100300)	OCCS Co., Ltd	OCCS Co., Ltd
Transparent display panel and manufacturing method thereof (South Korea, Patent registration : 10-1820403)	Byung Ki Park	OCCS Co., Ltd
Transparent display panel (South Korea, Patent registration : 10-1950665)	Byung Ki Park	OCCS Co., Ltd
Light emitting panel and light emitting panel manufacturing method (China application : 2017-217989, 2017111051335)	OCCS Co., Ltd	OCCS Co., Ltd
Wireless Controlled Transparent Lighting Device (China application : 2017-217987, 2017111034594)	OCCS Co., Ltd	OCCS Co., Ltd

02 Technology & Product Introduction

Technology Overview

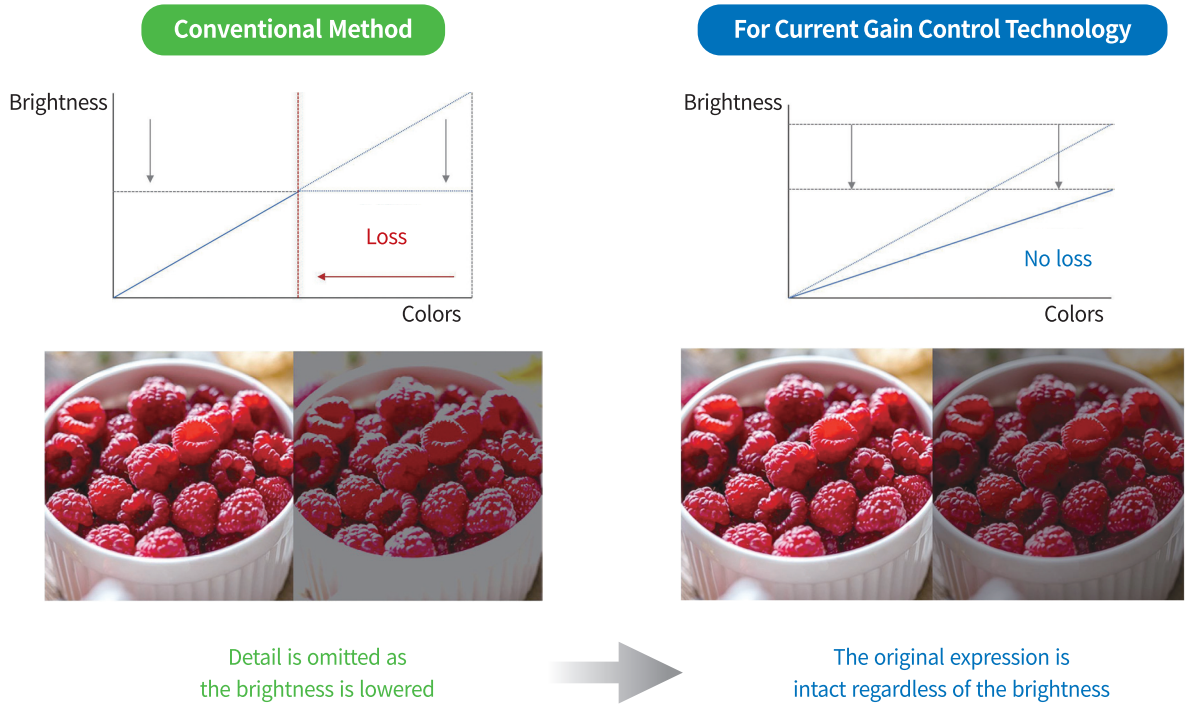
It is a DID that realizes transparency and flexibility at the same time, and it forms a micro pattern on a transparent film and is manufactured through LED SMT and transparent resin coating process. C-P-N-D linkage, short-distance wireless communication/motion recognition/voice recognition/face recognition/Internet of Things(IoT)/Big data convergence Smart Contents DID, which enables remote management through network. It is a flexible and transparent DID capable of non-face-to-face two-way communication that provides various information and advertisements in public and commercial spaces. It is a product that can increase usability and expandability in various information delivery spaces by overcoming the limitations of technology, performance, and cost-effectiveness of existing products.

COLOR EXPRESSION



In the conventional display implementation method, since the 8-bit color system was used, the maximum color expression was about 16.78 million. The display produced by our company is the 16-bit color system, so 281 trillion different color expressions are possible. A clearer picture quality can be realized due to various color expressions.

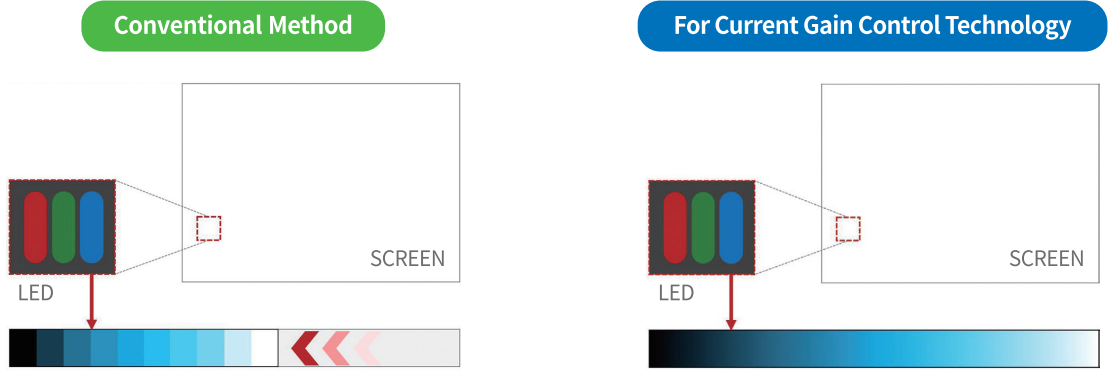
Color and Contrast



In the existing method, as the brightness is increased, the expressive power is lost, so the delicacy of color decreases. On the other hand, if 16-bit IC is used and Current Gain Control technology is applied, sufficient color expression and contrast expression are excellent even at low brightness.

08
09

White Balance



Using 16-bit IC and Current Gain Control technology, it is possible to correct the white color without color loss for each CCT. 16-bit IC is used for the same reason as before, and white balance adjustment is possible without color loss to which Current Gain Control is applied.

Dominant Merit

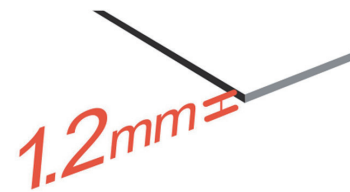


01 Transparent shape / curved surface expression possible

It can be designed in a transparent form and various curved surfaces can be expressed. With these features, it is possible to produce a display with a beautiful design.

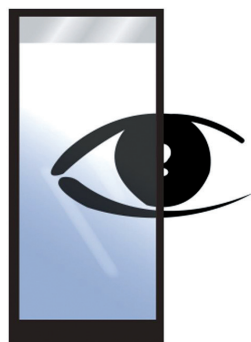
02 Ultra-thin thickness of 1.2 ~ 1.5mm

It is very thin with a thickness of 1.2~1.5mm, so it is advantageous for design production.



03 Attached to the glass window to maintain transparency and high visibility

It can be attached to glass to maintain transparency, and by applying micro-pattern technology, the visibility inside and outside the window is high.



High visibility
inside/outside window



More than 80%
transparency



04 Full color realization possible using R,G,B LED

By using R, G, B and LED, it is possible to realize a splendid full color, so video and information transmission are excellent.

10

05 Excellent focus and information delivery with high brightness

Captivating viewers' attention with good luminosity, it can deliver excellent information and advertising effects, and as a next-generation transparent display, it has the advantage of realizing high-quality images.

11

06 Easy construction and installation

It is easy to install due to its thin and light weight, and it can also be installed indoors.

In addition, the conventional method has the disadvantage of replacing the glass for installation and maintenance because the display is placed between the glass, while our product is attached to the glass instead of replacing the glass, so installation.



← How to attach it to the actual glass

Advantages of Digital Signage



• Outdoor Advertising •

A generic term for advertisements installed outdoors, such as analog posters, signboards, advertising towers, and neon towers. It consists of a display, and the content is limited to text and images, and the operation and management is done by passive content replacement, and user participation and marketing pursue simple gaze and mass production and batch marketing.



Digital Signage

Composed of comprehensive video, information, and advertisement convergence service system display, platform, and network-contents that can interact with users. Content can be used for video, broadcast content, interactive content, and immersive content. Operation and management utilize a network-based central management system, user participation and marketing are direct participation, user experience and personalized marketing are pursued



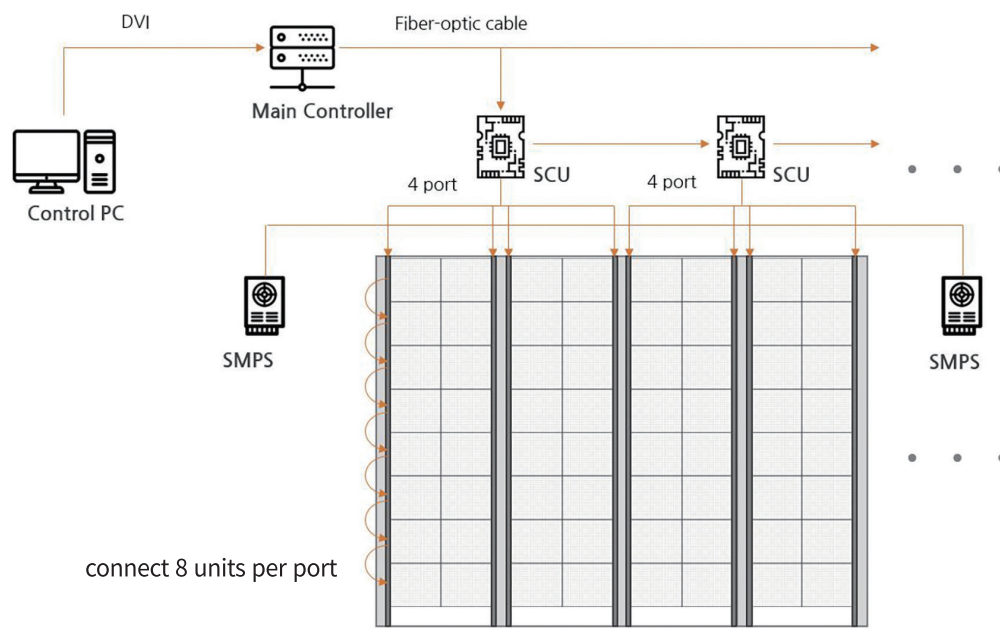
Advantages of Digital Signage Based on Own Technology



- 01 | Based on transparent LED display, applicable to all fields of digital signage
- 02 | Reduced facility investment by 60% and improved productivity through process reduction
- 03 | Installation and A/S are easy, and maintenance cost can be reduced by 50%
- 04 | 50% or less lower price, 1/6 electricity bill
- 05 | C-P-N-D linked ICT (IoT, BIG DATA, AI) convergence interactive content possible

03 Product Composition

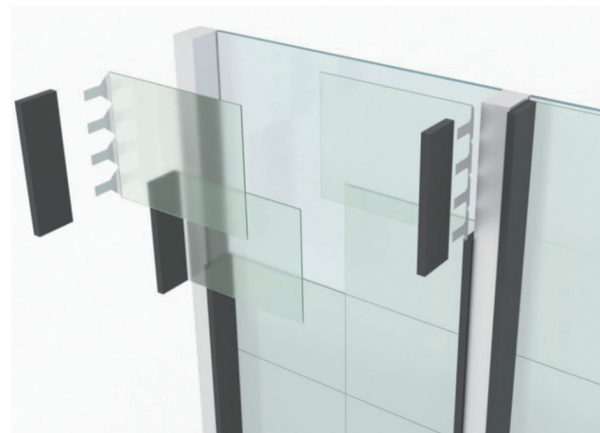
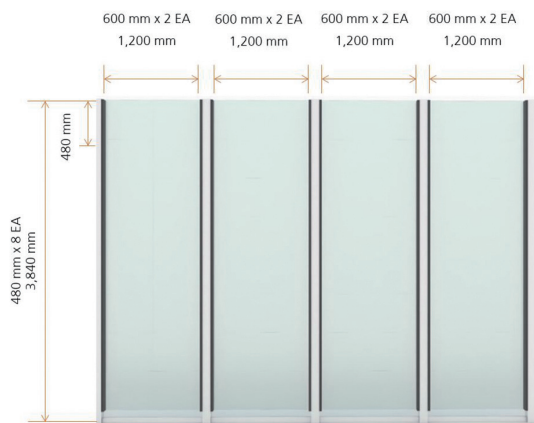
Product Diagram



12

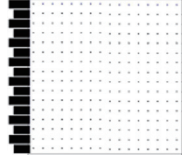
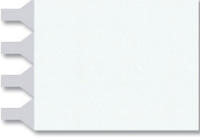
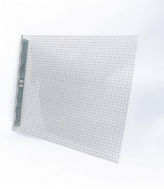
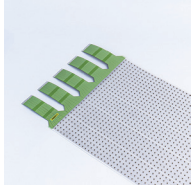
13

Product Understanding








Product Specifications and Applications

❖ Product Specifications

List	Specification			
Model No	GVD-4848-30	GVD-4860-19	GVD-4860-12	GVD-4860-08
Product Size	482mm X 482mm (H,V)	480mm X 600mm (H,V)	480mm X 600mm (H,V)	240mm X 600mm (H,V)
LED Pitch	30mm / 30mm	18.75mm / 20mm	11.5mm / 11.5mm	8.0mm / 8.0mm
LED Quantity / Sheet	16 X 16 array(256EA)	24 X 32 array(768EA)	42 X 52 array(2,184EA)	30 X 75 array(2,250EA)
LED Resolution (EA/M ²)	1,102 EA/M ²	2,667 EA/M ²	7,583 EA/M ²	15,625 EA/M ²
Thickness	1.3mm	1.3mm	1.2mm	1.2mm
Luminance	3,500 nit	1,500 nit	1,000 nit	1,000 nit
Operating Voltage	12V	48V	48V	5V
Power Consumption	45W	70W	100W(max)	100W(max)
Picture				
Remarks	MP	MP	MP	-

❖ Applications

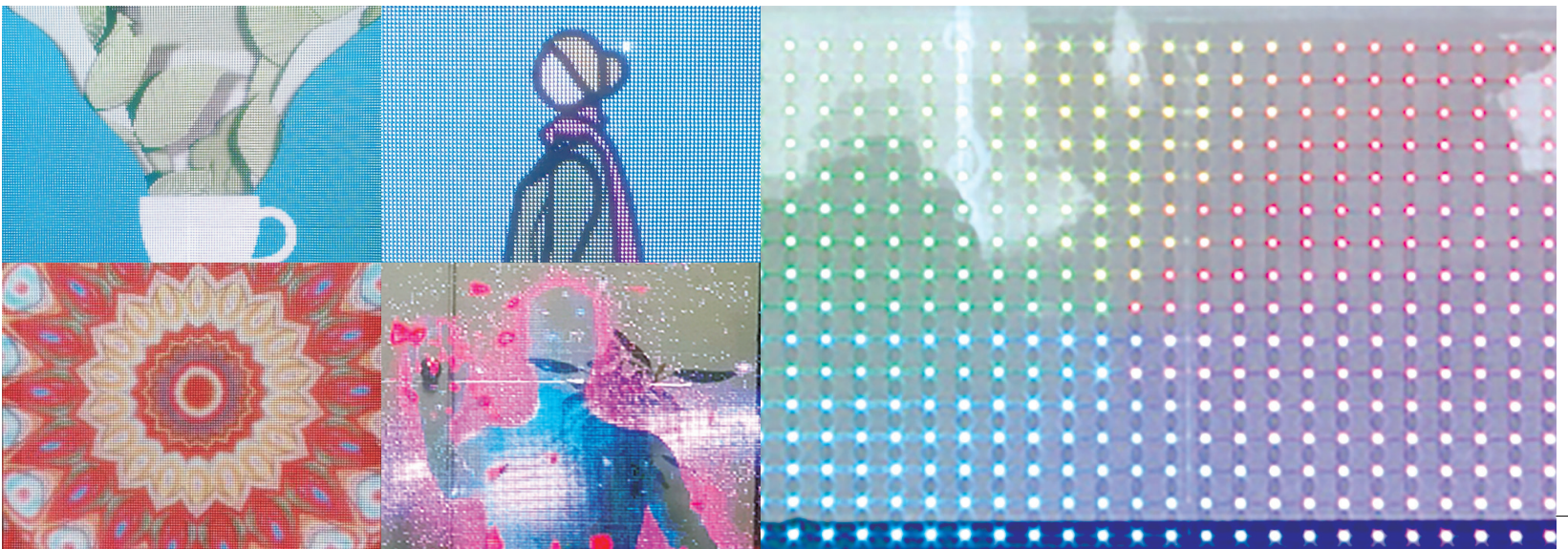
Applications	Examples	Size(mm)	Detailed application area
MEDIA FACADE		250 x 250 x 4 sheets 500 x 500 x 4 sheets customer demand size up to 36m	Used as a digital information transmission display on the exterior of various types of buildings
SHOP & DEPARTMENT ADVERTISEMENT (SHOW WINDOW)		900 x 900 900 x 1,800 900 x 2,700 customer demand size	Store transparent electric sign board, franchise, shopping mall, brand store, real estate, other stores, transportation, education, media art, etc.
SCREEN MEDIA		250 x 1,000 450 x 1,800 customer demand size up to 36m	Outdoor billboards, indoor billboards, performance halls, exhibition halls, shopping centers, churches, wedding halls, portable outdoor advertisements (video walls, video screens)
DIGITAL POSTER		plan-card form customer demand size	Airports, presentation halls, exhibition halls, individual stores, stores, etc.
SELF ASSEMBLY		500 x 500	Self-advertisement, information board, media art, etc.

04 Construction Example



14
15

OCCS Transparent Display Installation Case





Transparent Display
Product Introduction

OCCS Co., Ltd

Head Office_ 34326 | 2, Sinilseo-ro 18beon-gil, Daedeok-gu, Daejeon, Republic of Korea

Seoul Office_ 10090 | 751, Taejang-ro, Gimpo-si, Gyeonggi-do, Republic of Korea

T +82-42-933-7022

F +82-42-931-7021

E evergreenbk@naver.com

WWW.OCCS.CO.KR