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MEMSLUX



멤스룩스는 카이스트 전기 및 전자 공학부 교수님과 그의 제자가 연구실에서 10년 이상 연구, 개발한 아이템을 시업화 하고자 설립된 기술 기반 스타트업 입니다.

Decent Lighting Solutions

멤스룩스는 "Microelectromechanical systems"의 약자인 MEMS와 light의 라틴어인 LUX가 합쳐진 이름으로, MEMS 기술을 이용해 빛을 활용하는 다양한 제품을 만들고자 합니다.

멤스룩스는 "끊**임없이 도전하고 발전하는 기업**", "**작지만 강한 기술기업"**이라는 회사 비전을 가지고 있습니다. 저희가 보유한 핵심 기술을 통해 고객으로부터 신뢰를 얻고, 사회에 도움을 주는 기업으로 발전하겠습니다.

MEMSLUX is a technology-based start-up established to commercialize items studied and developed in the laboratory for more than 10 years by professor and his student in KAIST School of Electrical Engineering.

'MEMSLUX' is a combination of 'MEMS', the acronym for microelectromechanical systems, and 'LUX', the Latin for light, to create a wide range of products that utilize light.

MEMSLUX has the company's vision of 'a company that challenges and develops without disruption' and 'a small but strong technology company'. We will develop our core technology into a company that will gain trust with our customers and help society. MEMSLUX

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3D DIFFUSER LITHOGRAPHY

MEMS LUX

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MEMBRANE FILTER

MEMS LUX

WHAT IS 3D DIFFUSER

Conventional lithography uses only collimated UV light and leads to the fabrication of a rectangular cross-section in the photoresist.

LITHOGRAPHY? However, 3D diffuser lithography utilizes randomized UV light and forms various photoresist patterns by controlling process variables such as type of diffuser and the amount of UV exposure dose.

It is a very simple and effective method of creating various 3D microstructures.



VARIOUS 3D STRUCTURES

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Use of positive PR > Engraved 3D PR structures



Use of negative PR > Embossed 3D PR structures

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Other shapes (nanopore, nanoslit, nanotip, etc.)				



FABRICATION PROCESS & SCHEMATIC DIAGRAM

MEMSLUX have a convenient and mass producible membrane filter fabrication method which can be differentiated from other manufacturing methods.

We can fabricate membrane filter with various pore shapes such as round, conical and funnel.

Also, We demonstrated that the sidewall slope of the conical shape pores could be precisely controlled.

Since it can be made to very thin thickness, it is used for diverse applications.





MICROLENS ARRAYS

MEMS LUX

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NEXT GENERATION LIGHT GUIDE SHEET

MEMS LUX

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FABRICATION PROCESS & SEM IMAGES

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We have a simple and effective method to fabricate a uniform plastic microlens array (MLA) with high fill-factor(~100%) over a large area utilizing diffuser lithography.

Since we can control the aspect ratio and pitch of microlens, the fabricated MLA has various paraboloidal profiles.

Our method can be extensively applied for fabrication of large-size MLA sheets with plastic materials thanks to its simplicity and versatility.







The mechanism of MEMSLUX's light guide sheet(LGS) is that incident lights from the side light source travel through the LGS by means of total internal reflection(TIR).

Incident lights are ejected in an upward direction towards the front panel solely by TIR at the inclined sidewall of the inverse trapezoidal micropatterns located on top of the LGS surface.

Since MEMSLUX's sheet has various and remarkable characteristics which be combined each other, it can be used for diverse applications.



NEXT GENERATION LIGHT GUIDE SHEET : APPLICATIONS

MEMS LUX

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FRONT LIGHT SHEET

MEMS LUX

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TRANSPARENT **DISPLAY BLU**

Through the integration of transparent LC panels and BLUs for transparent displays, MEMSLUX can implement LC-based transparent displays without lightbox.

Transparent BLUs that can be applied to transparent LCDs have not yet been commercialized.









Built-in LEDs OFF

MEMSLUX BLU MEMSLUX BLU OFF ON



Built-in LEDs

ON

Built-in LEDs ON Built-in LEDs OFF Built-in LEDs OFF MEMSLUX BLU OFF MEMSLUX BLU OFF MEMSLUX BLU ON

2D LOCAL DIMMING BLU

MEMSLUX intend to develop a high quality innovative BLU using our own pattern structure.

Local dimming can also be implemented in the Edge-lit manner, which is Energy-Effective and high-contrast LC display.



FRONT LIGHT SHEET(FLS)



Since MEMSLUX's light sheet is a new light source that can light only in the required area, it could replace many parts of the existing light source.

The light emitted through the sheet reaches the object and passes it back through the sheet to the user and it can represent the texture of the side.

Our sheets can be applied to all printed materials, drawings, photographs, billboards, and exterior walls without any special manipulation or conditioning, and can be applied as user-friendly private lighting devices.

Also, because it is easy to replace images and prints, the application of our sheet is endless.



MEMSLUX light sheet OFF

MEMSLUX light sheet ON

APPLICATIONS



Traffic sign

Photo frame

Advertisement

Booklight

MEMSLUX

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BEAUTY & HEALTH CARE MEMSILUX PRODUCT

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PRIVACY LIGHT SHEET



BEAUTY & HEALTH CARE DEVICE

Since our sheet can be applied with a variety of light sources, they can be used as a UV sterilizer, a treatment device using infrared light, and a beauty device.

It can also be used as an optical medical device for the catalyst or improvement of effects of drugs, as well as products that benefit directly from light.

Unlike direct type LEDs, light guide sheet type MEMSLUX optical sheet is free from thermal problems with therapeutic LEDs that produce high energy.

Conventional products manufactured in a direct type use high-priced LEDs in large quantities, whereas MEMSLUX optical sheet can be uniform and have high light efficiency with very few LEDs(cost-effective).





MEMSLUX's light sheet applied IR LEDs



PRIVACY LIGHT SHEET(PLS)

Current privacy sheets reflect sunlight during the day to protect privacy, but they do not function as privacy protection at night because the interior lights are brighter than outside.

However, If the light emitted from our sheet is placed outwardly, it can greatly reduce the recognition of the inside of people outside.

Also, it has the advantage of being able to keep up with a sense of recognition that looks outward from the inside.





Differences in transparency by the light emitted direction

APPLICATIONS





External lighting of buildings

Normal Breaking Emergency lights controlling system for automobiles