nepes

2023 INTRODUCTION

Semiconductor | Chemicals | Energy

CONTENTS

Part.01

ABOUT NEPES

INTRODUCTION

‘네패스’는 영원한 생명(Eternal Life)을 의미하는 히브리어에서 유래했습니다.

‘네패스’라는 사명社名은 강인한 생명력과 지속가능성이라는 회사의 비전을 담고 있습니다.

회사명	네패스
설립일	1990.12
대표이사	이병구
경쟁력	선도기술, 최고 품질, 기업 문화
사업장	• 한국: 7개 지역(충청북도, 서울) • 해외: 5개 지역(CN, US, PHL, IDN)
상장회사	네패스(1999.12) / 네패스아크(2020.11)
직원 수	2,840(2023.01)

BUSINESS PORTFOLIO

Wafer Level Package

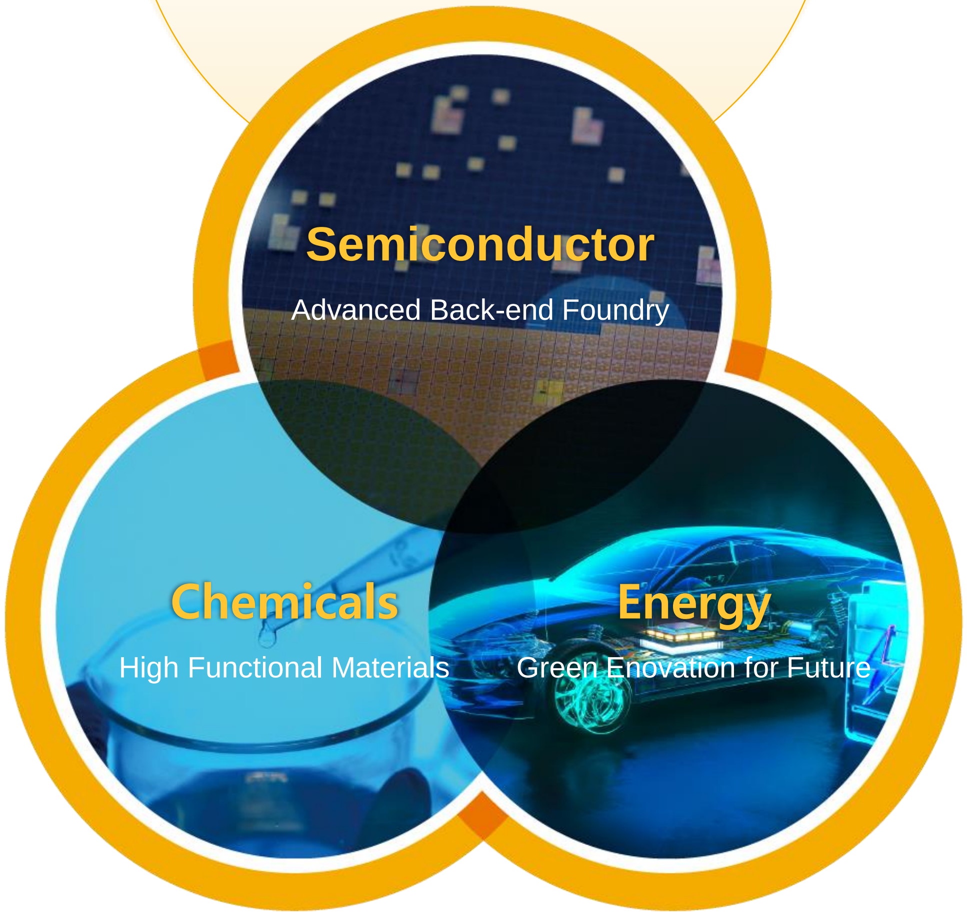
Fan-out PLP

System in Package

Semiconductor

Display

Solar Cell



Semiconductor

Advanced Back-end Foundry

Chemicals

High Functional Materials

Energy

Green Enovation for Future

Rechargeable Battery

Energy Saving

Green construction

Part.02

BUSINESS PORTFOLIO

nepes

CORE TECHNOLOGY

01.SEMICONDUCTOR

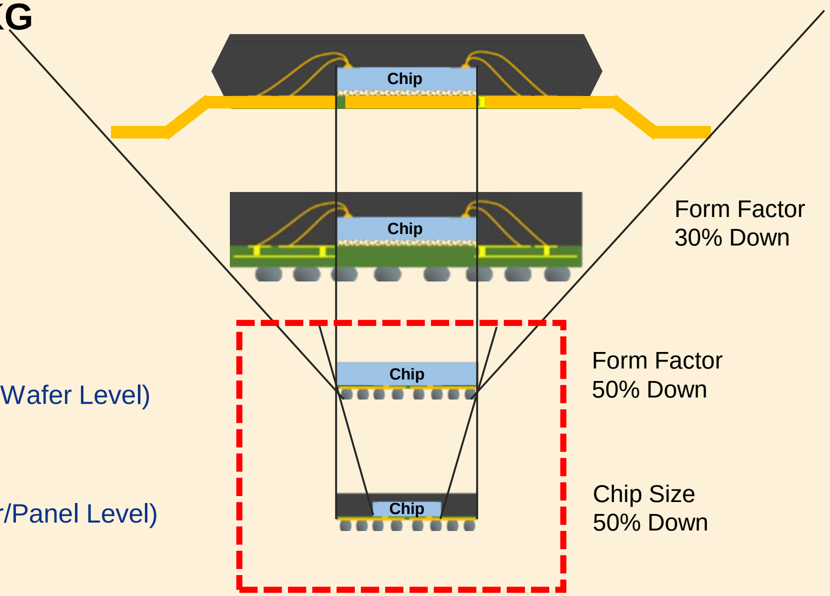
네패스는 첨단 반도체를 위한
핵심 후공정 솔루션을 제공합니다.

◆◆ Conventional PKG

- QFP (Quad Flat Package)
- BGA (Ball Grid Array)

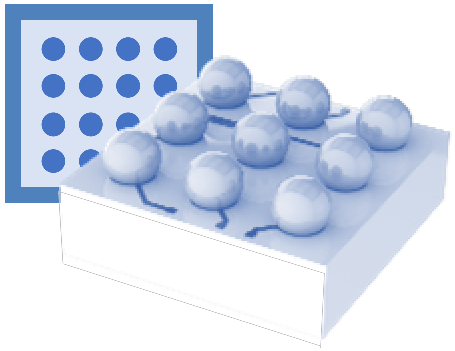
◆◆ Advanced PKG

- FIWLP (Fan-In Package: Wafer Level)
- FOWLP/PLP
  (Fan-Out Package: Wafer/Panel Level)



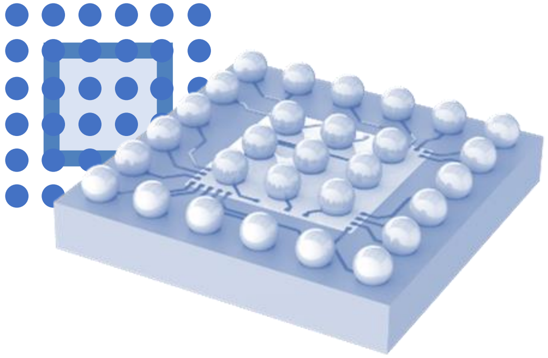
SEMICONDUCTOR

국내 최초 WLP 기술 개발 양산 / 세계 최초 PLP 개발 양산 / 초박형 SiP(nePAC) 확보 및 양산



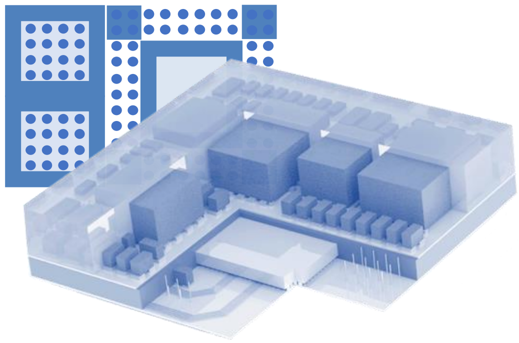
WLP Solutions

- Wafer Level Packaging – chip size packaging solution
- 8 & 12inches turnkey service
- 300mm FOWLP (KR, PH)



FOPLP Solutions

- Fan Out packaging @ 600mm sq. PLP
- World 1st 600 mm PLP production
- Single & multi dies packaging
- Package on Package



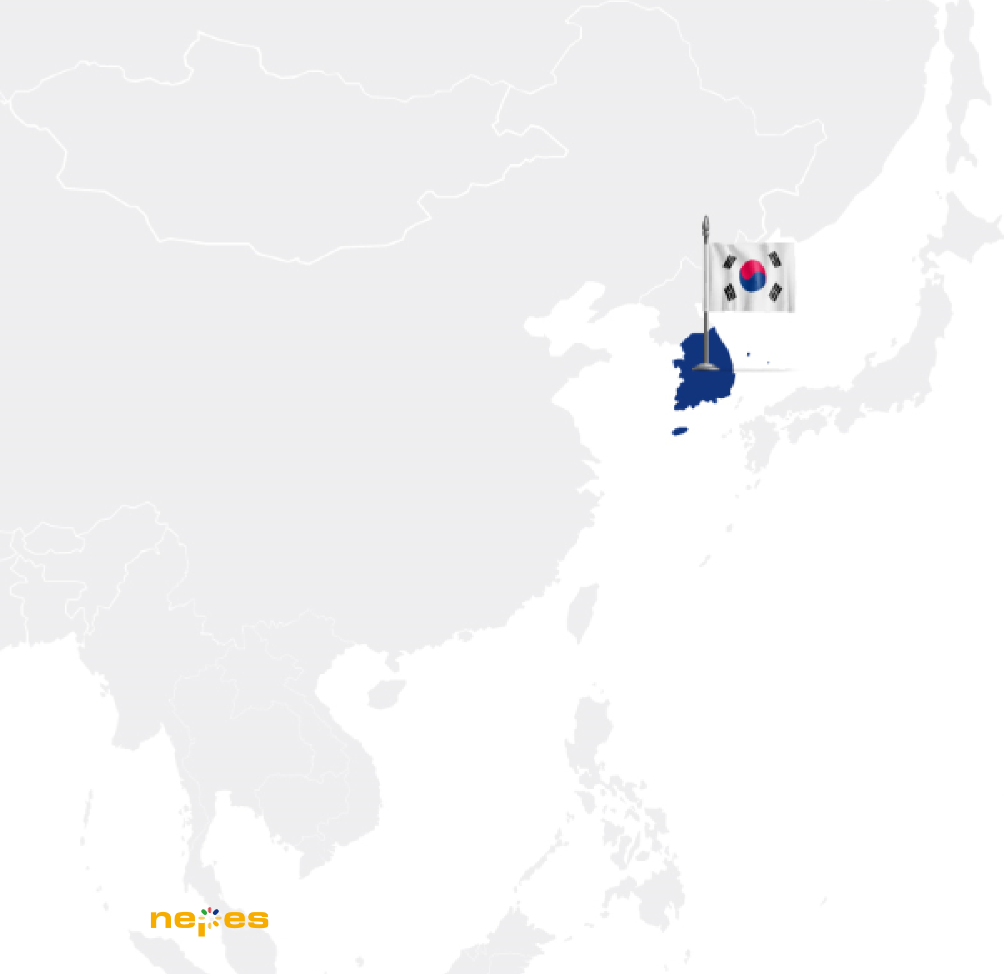
nePAC Solutions

- Nepes System in Packaging
- No substrate -Chip last on RDL interposer
- High integration & small form factor

SEMICONDUCTOR

Advanced Back-end Foundry Solutions | **생태계의 전환**

네패스는 Global Top-tier 고객들과 함께 성장하고 있습니다.

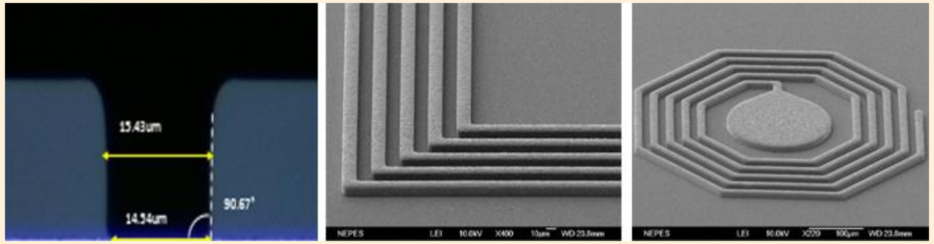


New ecosystem

CORE TECHNOLOGY

02.CHEMICALS

네패스는 첨단 반도체와 디스플레이를 위한
핵심 소재를 공급합니다.



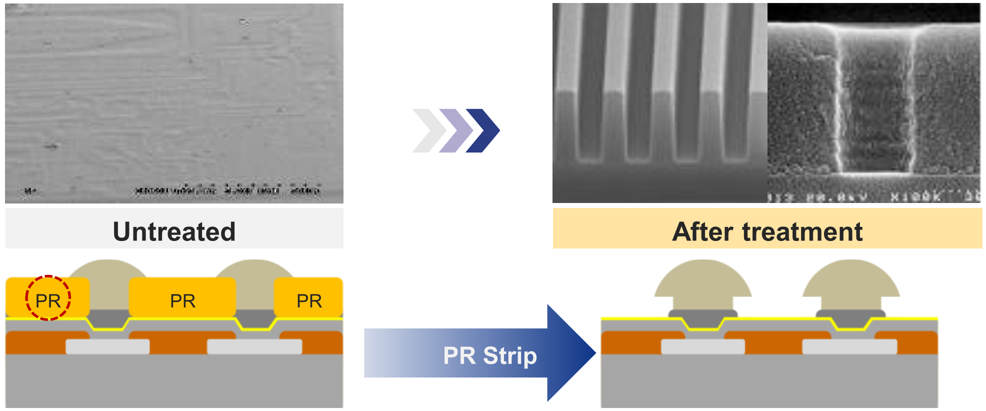
Nega PR : NNBP-103T, NUTP-264

CHEMICALS

네패스는 반도체 및 디스플레이 제조 공정에 적용되는 첨단 중합형 리소그래피 소재와 기능성 wet chemical을 제공하고 있습니다.

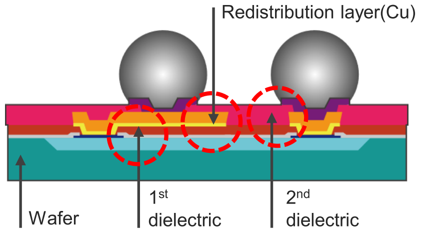
Process chemicals

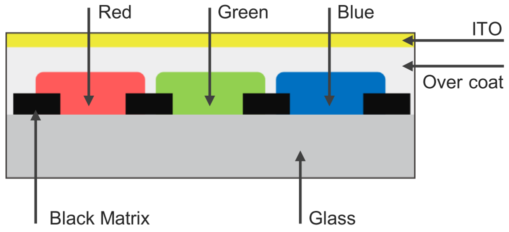
- PR
- Developer
- Stripper
- Etchant



Functional chemicals

- ILD/PSPI
- Cu 도금액
- Color paste





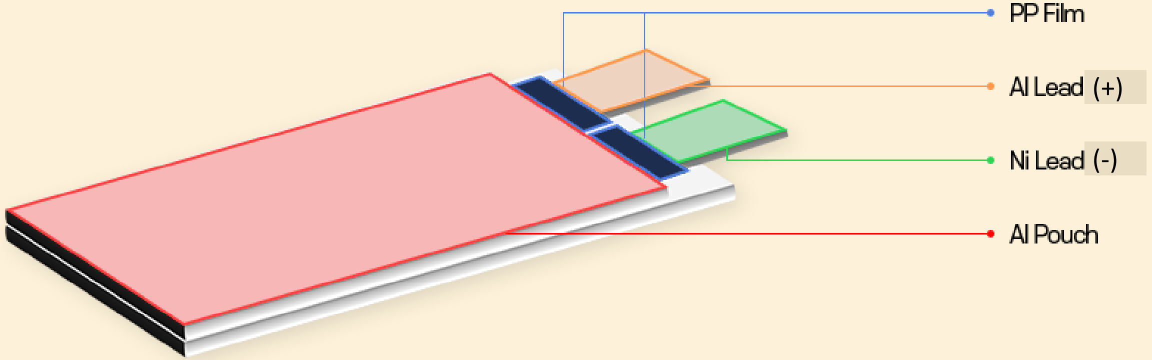
Applications

Semiconductor
Display(LCD, OLED)
Solar Cell

CORE TECHNOLOGY

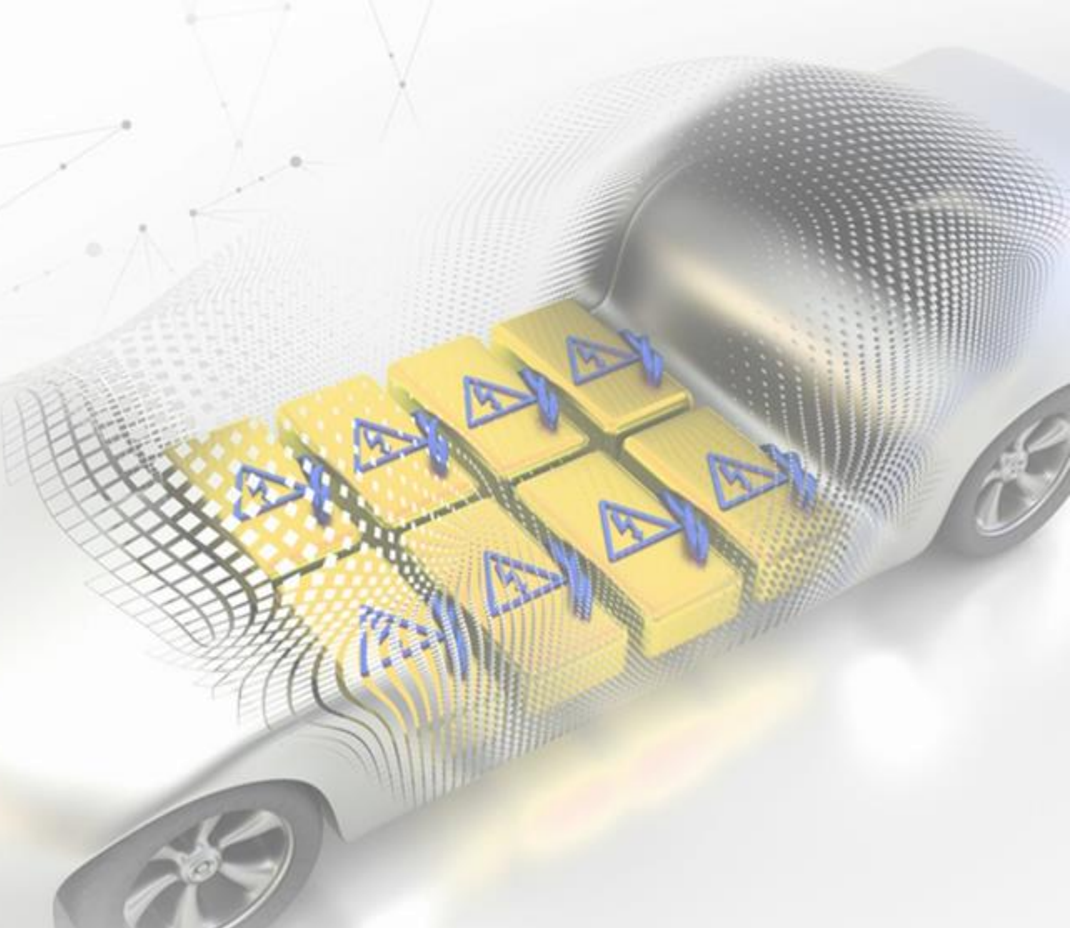
03.Energy

네패스는 지속 가능한 친환경 에너지 솔루션을 제공합니다.



ENERGY | Lead Tab

네패스는 국내외 고객사로 이차전지의 주요 부품인 리드탭의 공급을 확대하며 빠르게 성장하고 있습니다.



Service & Products

- Lead Tab
- Thermal barrier assembly
- LIB anode electrode

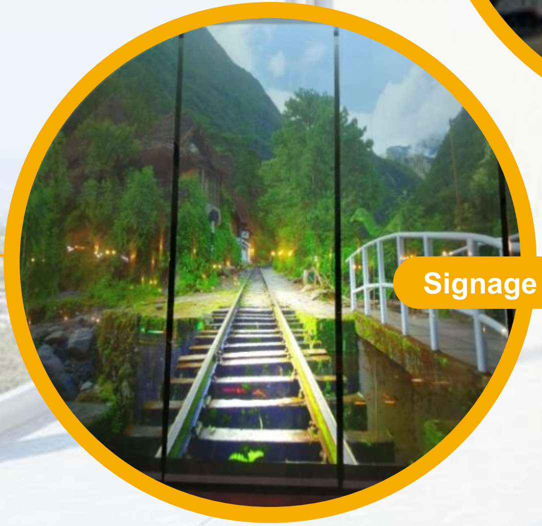
Applications

ENERGY | Smart film

네패스는 전자재료 기술을 기반으로 세계 최초로 리버스 스마트 필름(PNLC)을 성공적으로 상품화했습니다.

네패스의 스마트필름은 기존 건축물이나 자동차 등에 쉽게 부착 가능하며, 간편하게 전자 블라인드 기능을 구현하고, 에너지 절감에 도움을 줍니다.

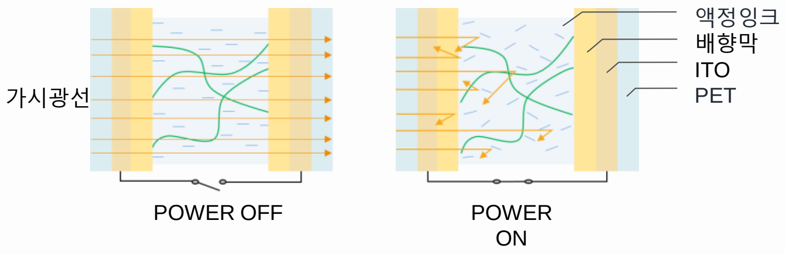
Super LC(PNLC)



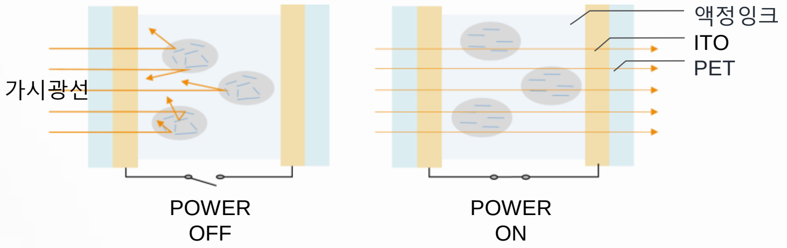
Signage 적용 사례

Super LC Structure and Principles

- PNLC (Polymer Network Liquid Crystal)



- PDLC (Polymer Dispersed Liquid Crystal)

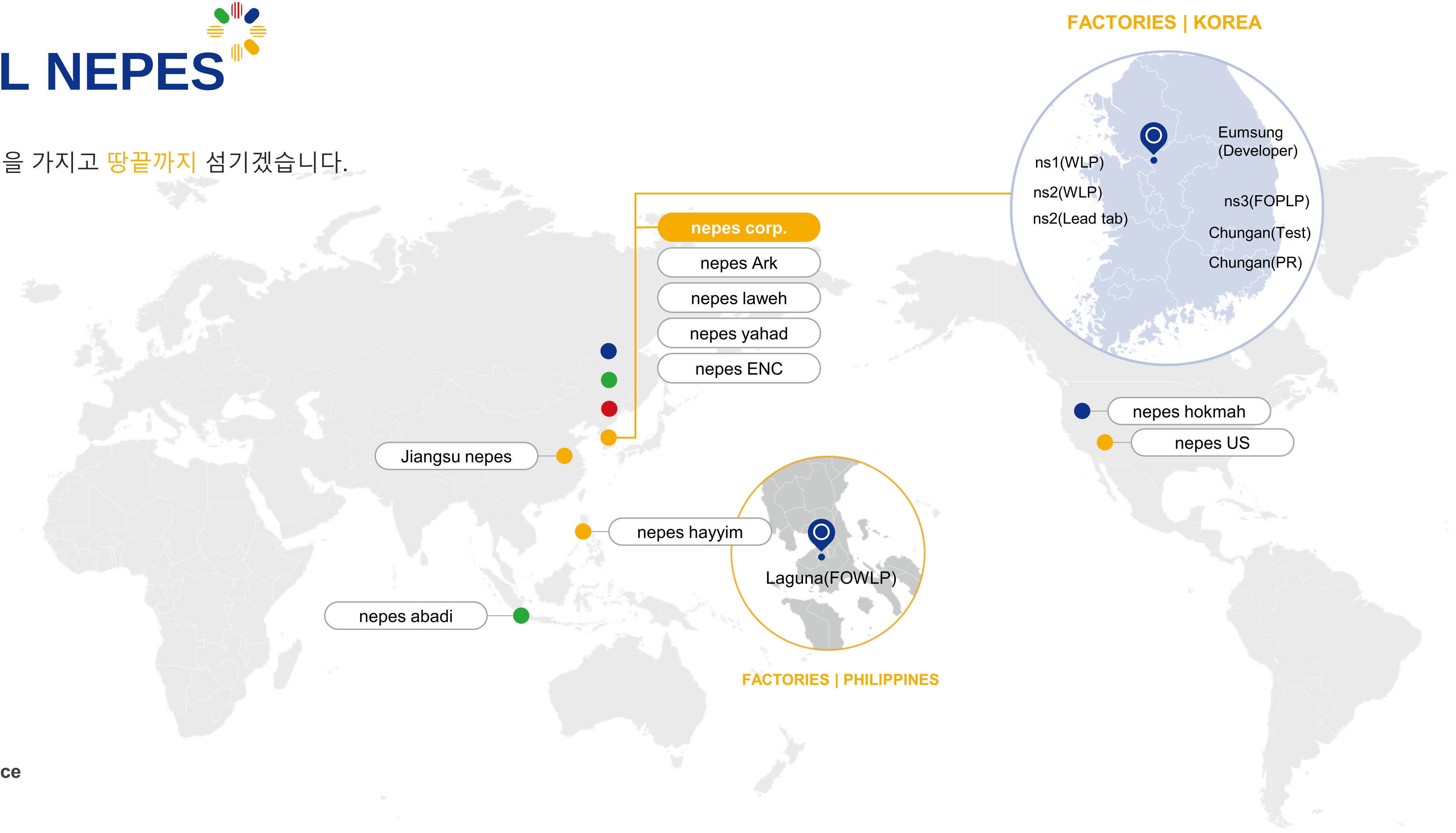


Service & Products

- Building & Interior
- Signage & Electronics

GLOBAL NEPES

우리의 기술과 제품을 가지고 땅끝까지 섬기겠습니다.



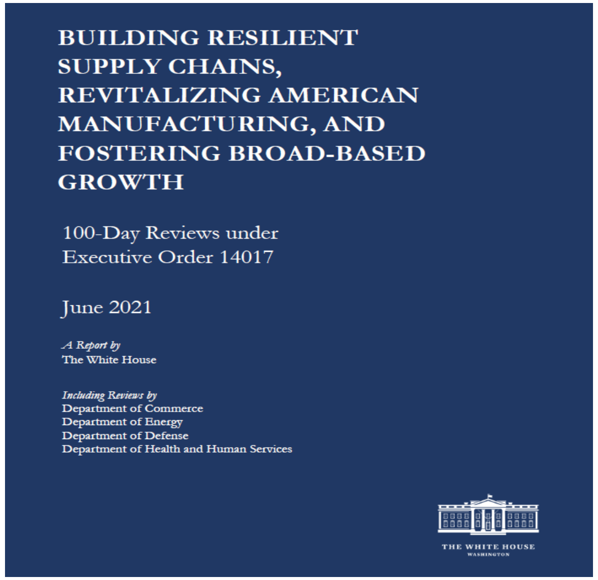
- ● Semiconductor
- ● IT materials
- ● Energy
- ● Artificial Intelligence

Part.03

RECOGNITIONS

White House report quotation

보고서에는 국가 안보에 중요한 첨단 패키징의 필요성을 강조하여 국내 반도체 제조 생태계 강화하자는 제안과 함께 글로벌 Top10 첨단 패키징 기업 중 하나로 네패스를 조명함



BUILDING RESILIENT
SUPPLY CHAINS,
REVITALIZING AMERICAN
MANUFACTURING, AND
FOSTERING BROAD-BASED
GROWTH

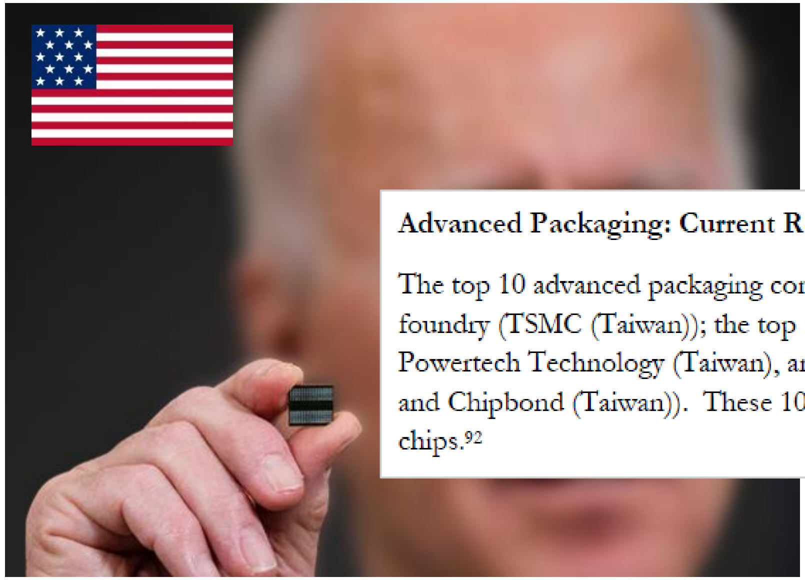
100-Day Reviews under
Executive Order 14017

June 2021

A Report by
The White House

Including Reviews by
Department of Commerce
Department of Energy
Department of Defense
Department of Health and Human Services

THE WHITE HOUSE
WASHINGTON



- It contained the proposal of strengthening the domestic semiconductor manufacturing ecosystem by highlighting advance packaging necessary for important national security other than commercial use, and this shed light on nepes among the global top10 companies

Advanced Packaging: Current Resilience [43p.]

The top 10 advanced packaging companies include: two IDMs (Intel (U.S.) and Samsung (South Korea)); a foundry (TSMC (Taiwan)); the top five global OSATs (ASE Group (Taiwan), SPIL (Taiwan), Amkor (U.S.), Powertech Technology (Taiwan), and JCET (China)) and two smaller OSATs: Nepes (South Korea) and Chipbond (Taiwan)). These 10 companies process approximately three-fourths of all advanced packaged chips.[92]

[Source: The White House, 'Building Resilient Supply Chains, Revitalizing American Manufacturing, and Fostering Broad-based Growth', Jun '21]

Joining ASIC : American Semiconductor Innovation coalition

IBM 및 회원들은 네패스의 WLP 및 FOPLP와 같은 첨단 패키징에 대한 전문지식이 연합에 큰 가치를 제공할 것으로 기대

The News with Shepard Smith @thenewsoncnbc · Apr 23

Congress will be back in session from a recess next week. A top item on the agenda is a bill that would dedicate $52B to making more semiconductors in America. U.S. scientists invented the tiny computer chips, but most of them are now made in Asia. @ylanmui reports from New York.

www.asicoalition.org

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IBM®

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Microsoft

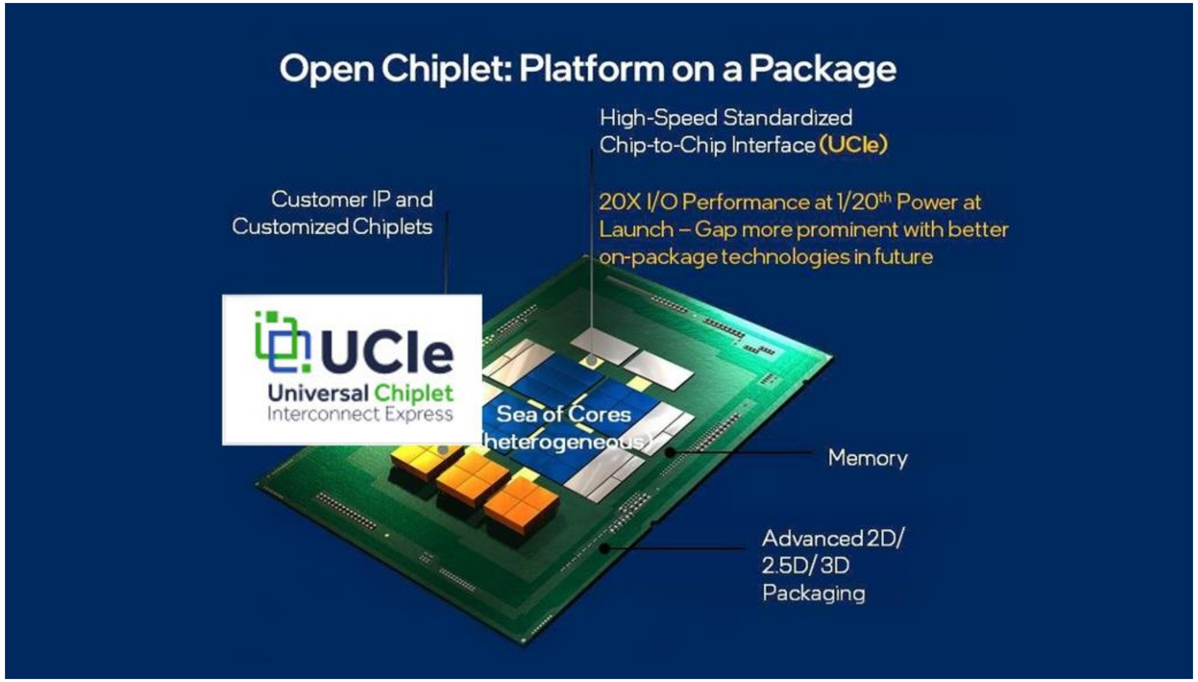
MIT

MARVELL

SIEMENS

Joining UCIe : Universal Chiplet Interconnect Express

초미세공정 전환에 따른 기술적 한계를 극복할 대안으로 평가받는 첨단패키지 기술 구조의 새로운 표준 정립을 위해 글로벌 주요 반도체(삼성, 인텔, AMD, Arm 등) · IT 기업(마이크로소프트, 메타 등)들이 참여



Open Chiplet: Platform on a Package

High-Speed Standardized Chip-to-Chip Interface (UCIe)

20X I/O Performance at 1/20th Power at Launch – Gap more prominent with better on-package technologies in future

Customer IP and Customized Chiplets

UCIe
Universal Chiplet Interconnect Express

Sea of Cores (heterogeneous)

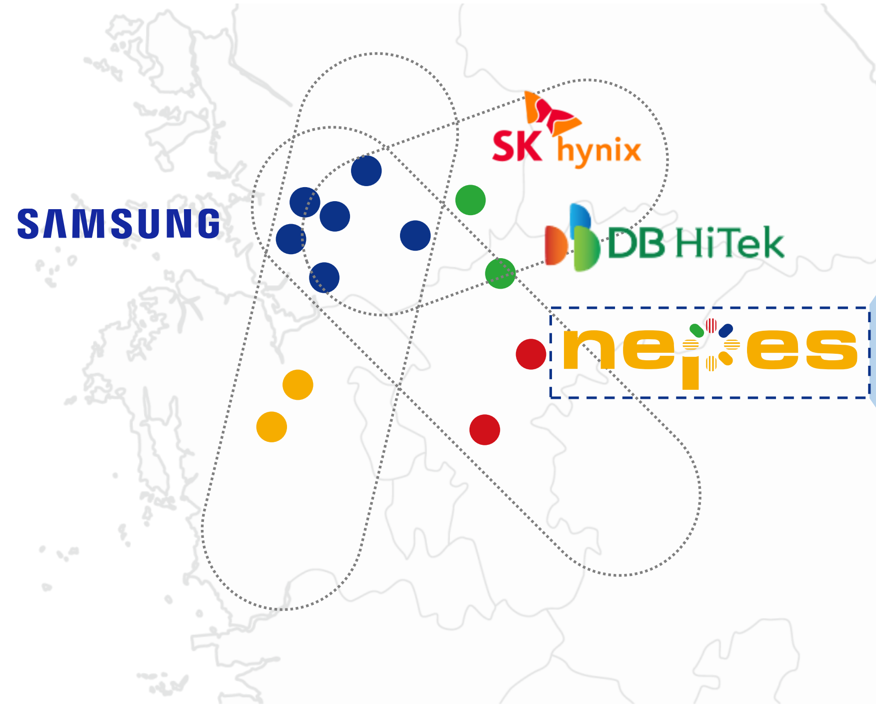
Memory

Advanced 2D/ 2.5D/ 3D Packaging

AMD
arm
ASE GROUP
Google Cloud
intel
Meta
Microsoft
Qualcomm
SAMSUNG
tsmc
M² SEMI 超摩科技
MEDIATEK
Micron
摩尔精英 MooreElite.com
nepes nepes corporation
NEURON IP

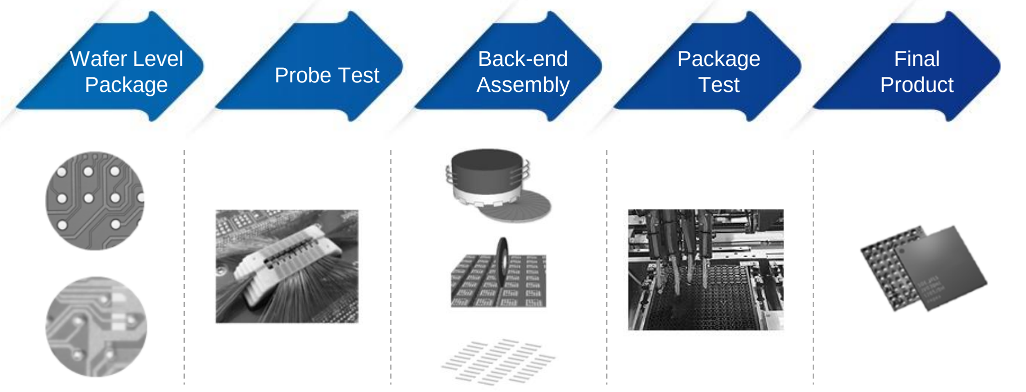
Core back-end foundry for k-semiconductor belt

K-반도체 벨트



● 팹리스 ● 소재/장비 ● 프트트엔드 파운드리 ● 백엔드 파운드리

Back-end Foundry Turnkey Solution


Wafer Level Package → Probe Test → Back-end Assembly → Package Test → Final Product

'K-반도체 전략 보고대회'
반도체 패키징 대표기업으로 참석

Korea Semiconductor

으뜸기업

2022.01.10

핵심전략기술 분야에서
글로벌 수준의
성장 잠재력을 지닌 기업

올해의 브랜드 대상

2022.09.02

대국민 소비자 투표를 통해
한 해를 빛낸 최고의 브랜드로
선정된 기업

등대기업

2022.11.17

타기업의 방향성을 제시하는
혁신 모범 중견기업

차세대세계일류상품

2022.11.18

높은 기술력과 경쟁력으로
국가 경제발전에 기여하는 상품

기업문화 우수사례

네패스의 독창적 경영 철학은 조직을 지속 성장하게 하는 창조적 경쟁력으로 인정 받아 각종 국제 학술대회에서 '우수경영 사례'로 소개되었습니다.

St. John's Univ. (2022.5.19-21)

FIFTH GLOBAL CONFERENCE ON INTERNATIONAL HUMAN RESOURCE MANAGEMENT

CIHRS
Center for International Human Resource Studies

Michigan Univ. (2022.6.23-24)

Professor Sunny Jeong (Wittenberg University) presented the case of nepes corporation.

Presented by:

MICHIGAN ROSS | CENTER FOR POSITIVE ORGANIZATIONS

Best Selling Books

1) 국제 인사경영 글로벌 콘퍼런스
2) 미국 긍정조직한 연구 콘퍼런스
3) CEO 경영서 (아마존, 네이버, 인터파크 베스트셀러)

THANK YOU

To Him who alone does great wonders, His love endures forever. Psalm 136:4

* A dandelion means ‘Gratitude’ in the language of flowers

nepes corporation

2415, Nambusunhwan-ro, Seocho-gu, Seoul, Korea
Tel : 02-3470-2700 Fax : 02-3470-2708
www.nepes.co.kr

Part.04

APPENDIX

nepes

APPENDIX 1 | Core technology(Semiconductor)

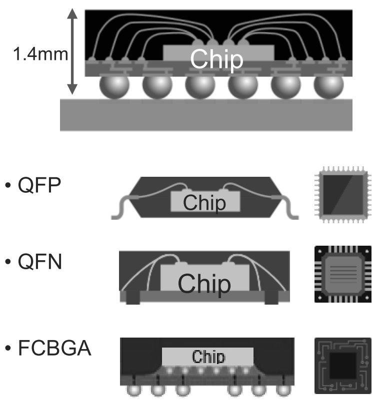
Market Trend

Smaller form factor (Based on Wafer-Level Platform)

Highly integrated Wafer-Level system in Package

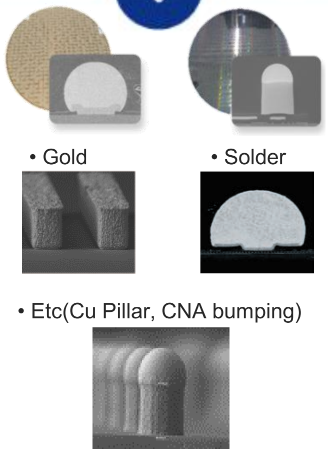
Tech. Roadmap

Conventional PKG



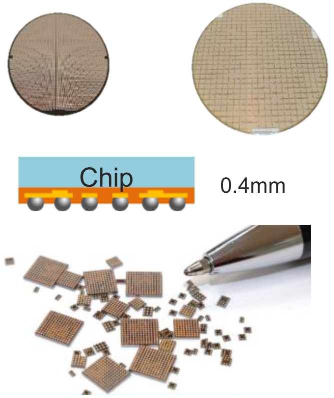
- QFP
- QFN
- FCBGA

Bumping



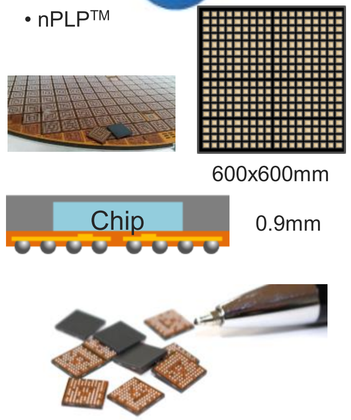
- Gold
- Solder
- Etc(Cu Pillar, CNA bumping)

WLP



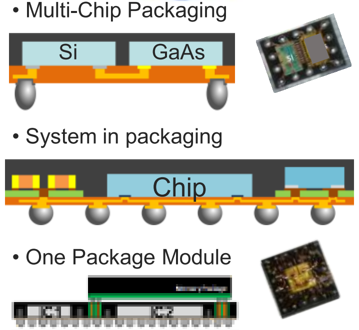
- 8”WLP
- 12”WLP

Fan-out WLP/PLP/PoP



- nPLP™

SiP



- Multi-Chip Packaging
- System in packaging
- One Package Module
  - AP, PMIC
  - Flash Memory
  - Neuromorphic

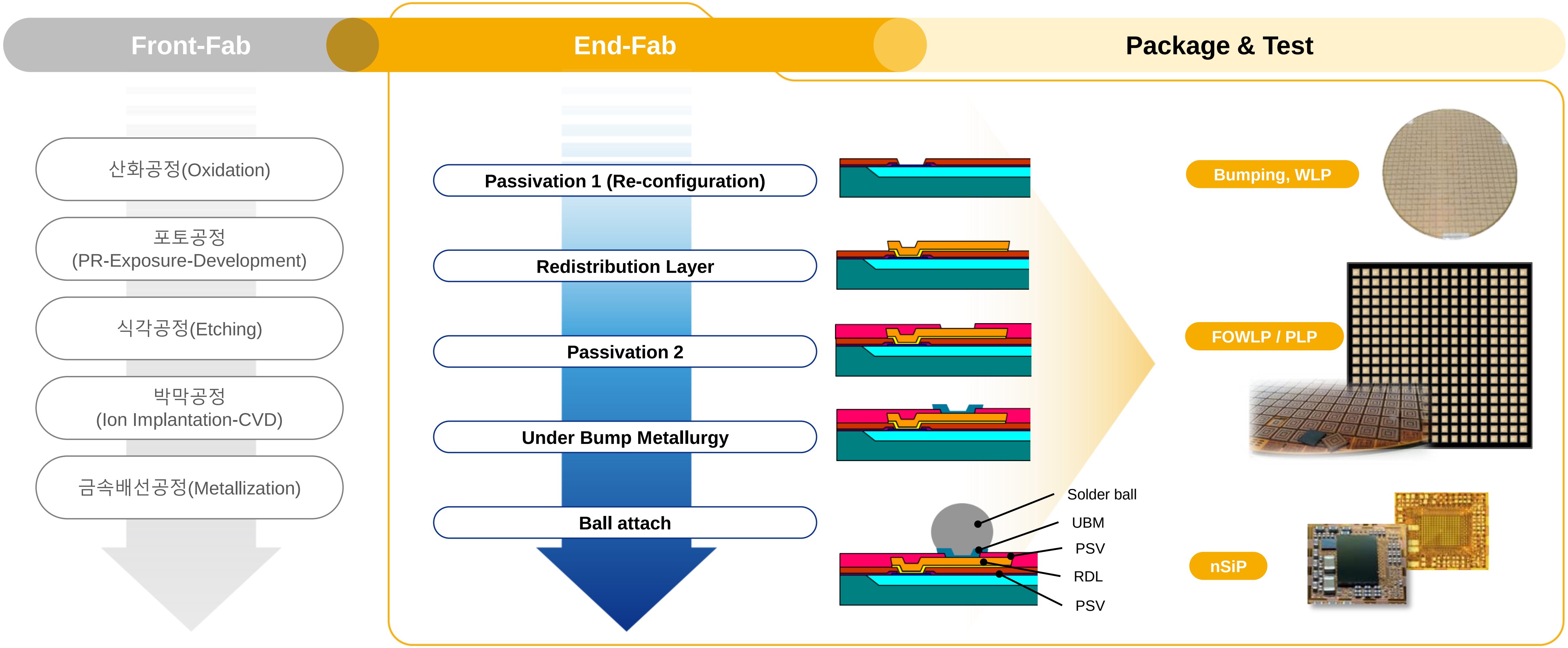
Position

nepes: **Back-end Foundry |** (Bump, WLP, FOWLP, FOPLP, nSiP, TEST)

Other OSAT | Conventional wire bonding packaging & Typical WLP technology

APPENDIX 2 | What is End-fab?

Front-Fab 공정 이후 Passivation, RDL 공정 및 Bump 공정을 지칭합니다.



Front-Fab

- 산화공정(Oxidation)
- 포토공정 (PR-Exposure-Development)
- 식각공정(Etching)
- 박막공정 (Ion Implantation-CVD)
- 금속배선공정(Metallization)

End-Fab

- **Passivation 1 (Re-configuration)**
- **Redistribution Layer**
- **Passivation 2**
- **Under Bump Metallurgy**
- **Ball attach**

Package & Test

- **Bumping, WLP**
- **FOWLP / PLP**
- **nSiP**

APPENDIX 3 | What is FOPLP?

- 네패스의 FOPLP는 업계 최대의 패널 사이즈로 새로운 PLP의 표준을 제시합니다.
- FOWLP 경험과 재료 내재화, End-fab 기술을 바탕으로 독자 FOPLP 기술을 확보하였습니다.