





# LOTTE's "Value Line"

logo boldly illustrates its vision and its commitment to providing new and unexpected value in every moment of your life.

The dot represents the starting point of your life,

while the line represents the path you will take together with LOTTE.

 $The \ round, diamond-shaped \ backdrop \ framing \ the \ symbol \ is \ modeled$ 

after the base of LOTTE World Tower.

The symbol itself, which at first glance resembles an L, symbolizes LOTTE's modesty, dynamic spirit, and originality.

# **About LOTTE**

# **MISSION**

We enrich people's lives by providing superior products and services that our customers love and trust. **VISION** 

**LOTTE GROUP** 

Lifetime Value Creator

# MANAGEMENT PRINCIPLES

Strengthening Value-based On-site **Transparent** core competencies management management management



# **Financial Highlights**

LOTTE is Korea's 5th largest business group based on assets, and achieves steady annual growth with a stable financial structure.

## **FINANCIAL OVERVIEW (2018)**

# **Business ranking in Korea**



# Assets<sup>(1)</sup>



# Debt ratio(2)

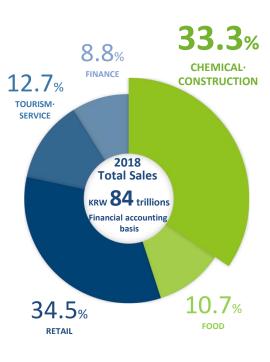


# Annual Sales(3)



## **SALES BREAKDOWN BY BUSINESS (2018)**



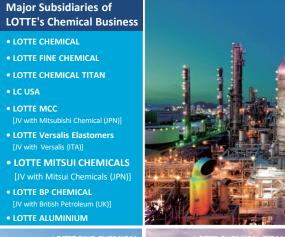


- \* Source: May 2019 announcement by the Korea Fair **Trade Commission**
- \* Note: Excluding public corporations and asset-based
- (1) Fair assets
- (2) Excluding financial corporations
- (3) Fair sales (based on domestic market sales, excluding internal transactions)
- \* Since 2017, we have reported total sales on a financial accounting basis rather than a managerial accounting basis.



# LOTTE GROUP's Chemical Business Unit

LOTTE's Chemical Business Unit(BU) has various business areas including Olefin, Polyolefin, Aromatics, Rubber Chain and Construction & Interior Materials. LOTTE is expanding its portfolio to high value-added businesses such as fine chemicals and engineering plastics through joint ventures, M&A.









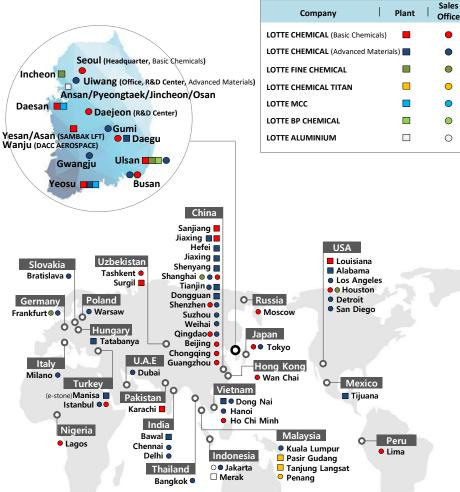








# The Global Presence



# LOTTE CHEMICAL CORPORATION

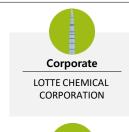


LOTTE CHEMICAL is Korea's leading chemical company, contributing to the healthy and rich life of humankind through creative challenges and innovation.



# **COMPANY OVERVIEW**

#### AT A GLANCE



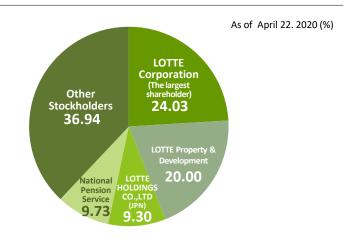








#### STOCK INFORMATION



# **BUSINESS PERFORMANCE (2019)**

**Annual Sales** 

KRW 151,235 Billion

**Total equity** 

RW 140,581 Billion



**Operating Income** 

KRW 11,073 Billion

Market Capitalization

76,777 Bill

**Operating Income/Net Income Status** (Unit: KRW 1 Billion) 29.297 Operating In 257443 Net Income 22.846 19.462 18,372 16.111 16.419 11.073 9,907 7,567 2015 2016 2017 2018 2019

#### **SUBSIDIARY**

# **Major Subsidiaries & joint ventures**

- LOTTE FINE CHEMICAL
- LOTTE CHEMICAL TITAN
- LC USA
- KP CHEMTEC
- SAMBAK LFT
- DACC AEROSPACE
- SEETEC
- HANTOK CHEMICALS

- HYUNDAI CHEMICAL [JV with Hyundai Oilbank (KOR)]
- LOTTE-GS Chemical [JV with GS Energy(KOR)]
- LOTTE MCC [JV with Mitsubishi Chemical(JPN)]
- LOTTE BP CHEMICAL [JV with British Petroleum(UK)]
- LOTTE MITSUI CHEMICALS [JV with Mitsui Chemicals(JPN)]
- LOTTE Versalis Elastomers [JV with Versalis(ITA)]
- LC USR [JV with Ube Industries(JPN) & Mitsubishi Corp(JPN)]

# **HISTORY**



Beginning 19/0-1990

#### 1976. 3

Established Honam Petrochemical

#### 1979.6

• LOTTE Groups, Acquired Honam Petrochemical (Privatization completed)

#### 1979.12

 Started commercial production at all plants

#### 1982.11

• Achieved USD 100 Million Export

Growth 1990-2000

#### 1991. 5

· Initial public offering

#### 1991.6

 Completed construction of the Daejeon R&D Center

#### 1991. 12

· Completed construction of the NC plant

#### 1995.8

 Acquired ISO 14001 certification (Environmental management system)

# 2003. 6

 Acquired Hyundai Petrochemical (LOTTE CHEMICAL Daesan Plant)

2000-2010

#### 2004.7

 Acquired KP Chemical (LOTTE CHEMICAL Ulsan Plant)

#### 2006.7

• Established Honam Petrochemical Trading in Shanghai (The first subsidiary in China)

#### 2006. 8

 Established LOTTE MCC (JV with Mitsubishi Chemical)

#### 2010.11

 Acquired TITAN Chemicals (LOTTE CHEMICAL TITAN)

#### 2011. 11

 Established LOTTE MITSUI CHEMICALS (JV with Mitsui Chemicals)

# Takeoff 2010-

#### 2012. 12

 Merged KP Chemical and changed the corporation name to "LOTTE CHEMICAL"

#### 2014. 4

• Established Hyundai Chemical (JV with Hyundai Oil Bank)

#### 2015. 10

• Completed the Uzbekistan gas project (UZ-Kor)

#### 2016.5

 Acquired LOTTE ADVANCED MATERIALS, LOTTE FINE CHEMICAL from SAMSUNG Group

#### 2017. 11

• Completed construction of the LOTTE Versalis Elastomers plant

#### 2018.5

• Signed HPC project with Hyundai Oilbank to jointly build a new heavy feed petrochemical complex

#### 2019. 5

• Completed construction of the Ethane Cracking Center and Ethylene Glycol Plant in U.S.

#### 2020.1

Merged LOTTE Advanced Materials

#### 2020. 2

• Established LOTTE-GS Chemical (JV with GS Energy)

LOTTE CHEMICAL CORPORATION

LOTTE CHEMICAL BUSINESS UNIT

LOTTE CHEMICAL CORPORATION

# **DOMESTIC BUSINESS SITES**

**Main Products** 

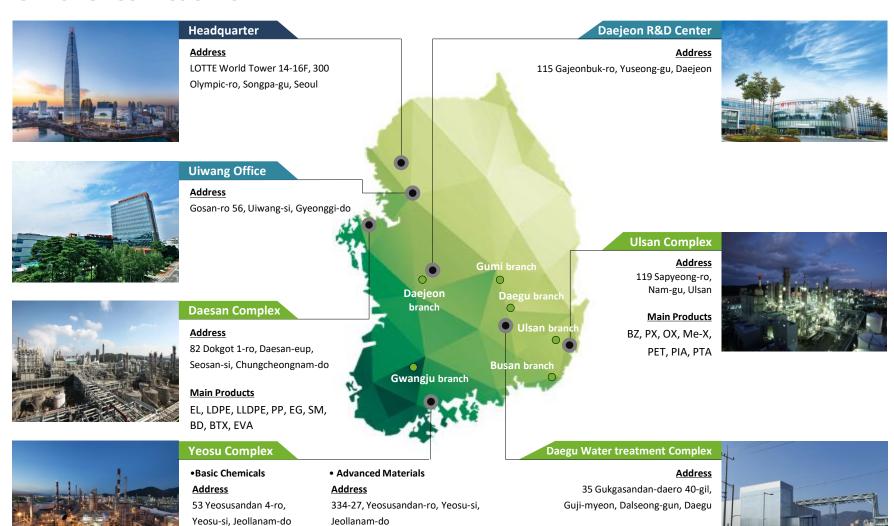
EG, BD, BTX

EL, HDPE, PP, PC, PET,

**Main Products** 

ABS, SAN, EPS, PC,

E-Stone, Solid Surface



**Main Products** 

UF Membrane for water treatment

# **GLOBAL NETWORK**

countries

**Production** Base

Exported to 120 countries

#### **Main Products**

China

LC Jiaxing EP Performance Material, LFT, EPP

LC Hefei EP Performance Material

LC Shenyang EP Performance Material

PC, ABS LC Tianjin EP PC, ABS LC Dongguan EP LC Sanjiang

**LC Jiaxing** MEA, DEA, TEA, VPEG, TPEG

Asia

NC(793KTA), PE, PP, BD **LC TITAN Malaysia** 

PE **LC TITAN Indonesia** 

ECC(390KTA), PE UZ-KOR Uzbekistan

LCPL **Pakistan** PTA LCVN Vietnam PC, ABS

U.S

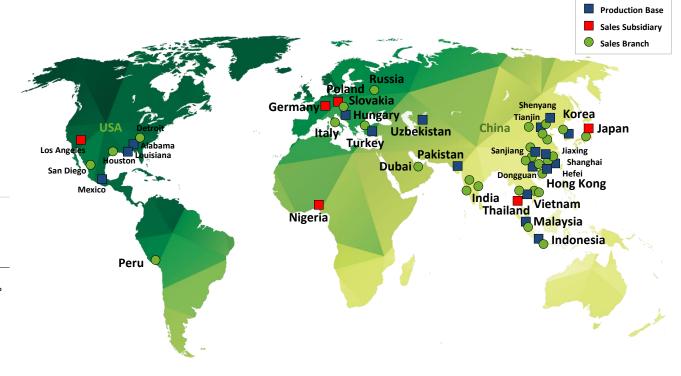
LACC, LCLA (Louisiana, U.S.) LC Alabama

LCMX Mexico

ECC(1,000KTA), EG PP Compound PC, ABS

Europe

LCHU Hungary PC, ABS









Uz-Kor - Uzbekistan







Location

Lake Charles, Louisiana, U.S.

Product

Ethylene 1,000KT, Ethylene Glycol 700KT

# Location

Ustyurt Gas Chemical Complex(Surgil), Uzbekistan

Product

Ethylene 390KT, Polymers(PE, PP)

#### Location Location Johor Bahru, Malaysia

**Product** 

(BZ, TL, BD),

Basic Petrochemicals

Polymers(PE, PP)

Cilegon, Banten, Indonesia

Product Ethylene 793KT, Polymer(PE)

# Location

LC EP - China

Jiaxing, Hefei, Shenyang Tianjin, Dongguan

Product

Performance Material, LFT, EPP Polymers (PC, ABS)

#### Location

Hungary Tatabanya

**Hungary LCHU** 

#### Product

Polymers (PC, ABS)

# **OUR BUSINESS**

Basic Chemicals Advanced Materials



Basic/Intermediate Petrochemicals

Polymer

Monomer

High Performanced Plastics

Construction & Interior Materials

Water Treatment Membrane

# **Basic Chemicals**

The Business of LOTTE CHEMICAL's Basic Chemicals has a diverse product portfolio ranging from Polyolefin, Monomers, Aromatics, based on the Ethylene production of No.1(4,500 Kilo Tonnes per Annum) among domestic chemical companies.



**Field of Business** 

Basic/Intermediate Petrochemicals, Polymers, Monomers, Aromatics



**Production Site** 

Korea, China, Malaysia, Indonesia, USA, Uzbekistan, Pakistan



**Employees** 

3,605 Domestic 3,059 Overseas 546

As of February 1, 2020



LOTTE CHEMICAL CORPORATION LOTTE GROUP LOTTE CHEMICAL BUSINESS UNIT LOTTE CHEMICAL CORPORATION

# **PRODUCT OVERVIEW** - Basic Chemicals

# **Basic/Intermediate Petrochemicals**

LOTTE CHEMICAL produces raw materials for various chemical products including ethylene which is called "The rice in the industrial society", based on diversified raw materials such as naphtha, ethane, and LPG.





<b>Basic Chemicals</b>	Intermediates	C5 Product
• Ethylene	• Me-X	• IPM
• Propylene	• OX	• DCPD
• Mixed C4	• PX	• PIP
• BD	• SM	
BTX (Benzene, Toluene, X	ylene)	

# Polymer

Our products range from daily necessities to advanced materials, improving the quality of everyday life.



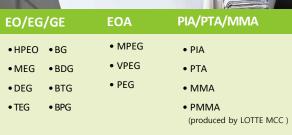


PE	PP	PET
• HDPE	Injection	• Cool
• LDPE	• Blow	• HOT
• LLDPE	• Yarn/Fiber	• ACE
• EVA	• Film	• BIO
	• TIPP	• HIT

# Monomer

LOTTE CHEMICAL is producing monomer products for construction, textile, and industrial products, and has a high competitiveness by establishing a high-quality mass production system





# **Advanced Materials**

LOTTE Chemical's advanced materials offer a wide array of specialized material solutions tailored for customers keen to innovate their products, ranging from interior/exterior parts of home appliance and IT devices to energy, medical devices and cutting-edge automotive parts.



**Field of Business** 

Plastics, Construction Materials, Water Treatment Membrane



**Production Site** 

Korea, China, Mexico, Hungary, Vietnam, India, Turkey



**Employees** 

3,072 Domestic 1,659 Overseas 1,413

As of February 1, 2020



LOTTE CHEMICAL CORPORATION LOTTE GROUP LOTTE CHEMICAL BUSINESS UNIT **LOTTE CHEMICAL CORPORATION** 

# **PRODUCT OVERVIEW** - Advanced Materials

# **High Performanced Plastics**

# starex | INFINO.

LOTTE Chemical offers a wide range of high-quality solutions generating new value and innovation in everyday life.



# starex | Styrene & General Product

#### ABS ABS Alloy

- General
- Extrusion
- Flame Retardant
- Heat Resistance
- Metal Plating

# /Painting

#### **EPS**

- General
- Flame Retardant

#### Transparent MABS

- Scratch Resistant MABS
- General ABS/GF
- Flame Retardant ABS/GF

#### Specialty

- · Weatherability ASA, ASA/PMMA
- High Weatherable ABS
- Luminous
- Medical (General/Transparent)
- Antimicrobial
- High-insulation · Eco-Friendly ABS, ABS/PET

#### INFINO **Engineering plastics**

#### PC

- Polymerization
- General
- Flame Retardant
- · Eco-Friendly
- Medical

#### PC/ASA PC/PET PC/PBT

PC Alloy

PC/ABS

PC/GF

PC/ABS/GF

#### High Performance EP

- PPS PCT

# Peformance **Materials**

#### POPELEN

• Thermoplastic Olefin (TPO)

#### SUPRAN

## · Long-Fiber reinforced

Thermoplastics (LFT) HOWPOL

 Eco-friendly Expanded Polypropylene (EPP)

#### LOTTMER(TPE)

• Thermoplastic elastomer (TPE)

• Modified Polyolefin Resin

# **Materials for Automotive**

LOTTE Chemical aims to provide advanced solutions in all aspects of future mobility by utilizing its cutting-edge material technology that reflects the latest trends in favor of lightweight products, unique design and eco-friendly properties.



Lighting

• High Weatherable/Impact PC

High Modulus/Heat Resistant PP

• High Gloss/Low Gas PBT

# Exterior

#### Metal Plating ABS & PC/ABS

- High Weatherable ASA
- High Weatherable/Impact PC/ASA
- High Modulus PC/PET
- High Flow/Impact PC/PBT
- High Impact PP, LFT
- High Weatherable PP, LFT
- High Flow/Paint-free PP High Modulus/Impact
- Continuous Fiber Reinforced Composite (WLFT, 3D-Tow)

# Interior

- Low TVOC ABS
- Low Gloss ABS, PC/ABS
- Low Gloss, Emotional Feeling PC/ASA High Gloss/Low Gas PC/ABS
- Light Diffusion PC
- Light Blocking ABS, PC/ABS
- High Flow PC/ABS
- High Heat/Chemical Resistant PC/ABS, PC/PBT
- Chemical Resistant PC/ABS
- Low TVOC/Odor PP, LFT
- Surface Quality LFT
- · High Impact/Scratch Resistant, Expansion PP

# Structure

# · Conductive/High Heat Resistant

- PA/PPE/CNT
- · Dimensional Stability PBT/ASA/GF
- High Flow/Surface Quality PBT/PET/GF
- · High Heat Resistant PPA
- High Flow LFT
- High Heat Resistant LFT

LOTTE CHEMICAL CORPORATION LOTTE CHEMICAL BUSINESS UNIT LOTTE CHEMICAL CORPORATION

# **PRODUCT OVERVIEW** - Advanced Materials

# **Construction & Interior Materials**



Acrylic solid surface with hygienic property and various design applications



**Natural quartz engineered stone** with durability and natural beauty



**Engineered porcelain surface** with natural and beauty



Decorative Surfacing Materials - Wall coverings, Displays, Kitchen tops & Bathroom sink

- Eco-friendly Construction & Interior Materials with excellent material properties
- Easy maintenance and a wide variety of patterns and colors
- Acrylic solid surface with upscale texture and excellent processability for construction

# **Water Treatment Membrane**



We provide clean and safe water through world-class water treatment solutions based on system and process engineering technologies suited to the water treatment industry.



# **UF Membrane for water treatment**

#### **TECHNOLOGY**

- Optimized process design
   based on self developing mat
- based on self-developing materials
   The technology of Membrane fouling control
- Operation monitoring system

#### SERVICE

- Outstanding engineering technologies and specialists
- Quality assurance through after-sales service

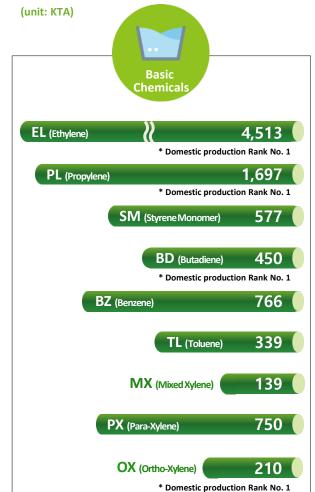
#### COST

- Products with
- high energy efficiency
- Reduced operation and management costs

#### QUALITY

- safe quality of water after treatment

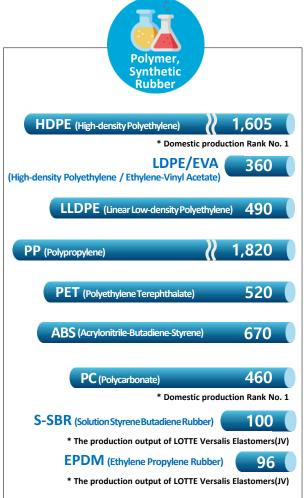
# **CAPACITY**

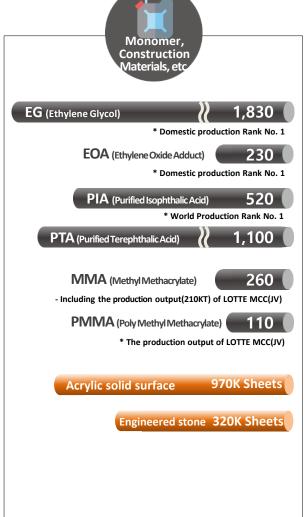


MeX (Meta-Xylene)

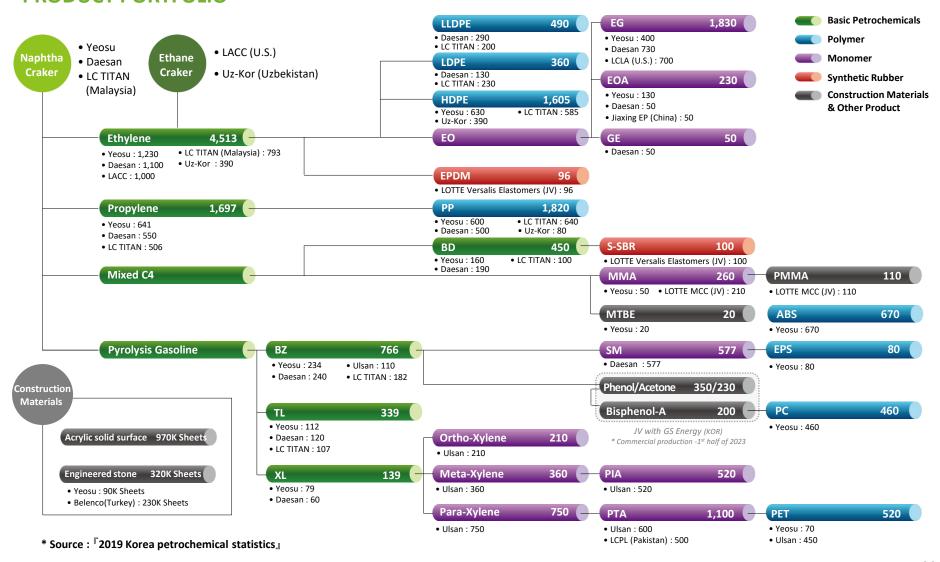
360

\* Domestic production Rank No. 1





# PRODUCT PORTFOLIO (Unit: KTA)



Expansion Quantity Commercial

Production

# **INVESTMENT PLANS**

# HPC Project (JV with Hyundai Oilbank)

 
 Project Overview
 New project to build a heavy feed-based petrochemical complex (HPC) using heavy fuel oil as a feedstock through Hyundai Chemical Corp.

 Total Investment
 KRW 2.7 triillion (USD 2.4 billion)

 Product
 PE 850KT, PP 500KT

Commercial Production 2nd half of 2021

# LOTTE-GS Chemical (Tentative name- JV with GS Energy)

Project Overview New joint venture with the oil refiner to secure the raw materials for PC production and expand C4 products

Total Investment KRW 800 billion (USD 679 million)

BPA 200KT, Phenol 350KT, Acetone 220KT,

Product C4 Products (BD 90KT, TBA 70KT, BN-1 40KT, MTBE 15KT)

Commercial Production 1st half of 2023



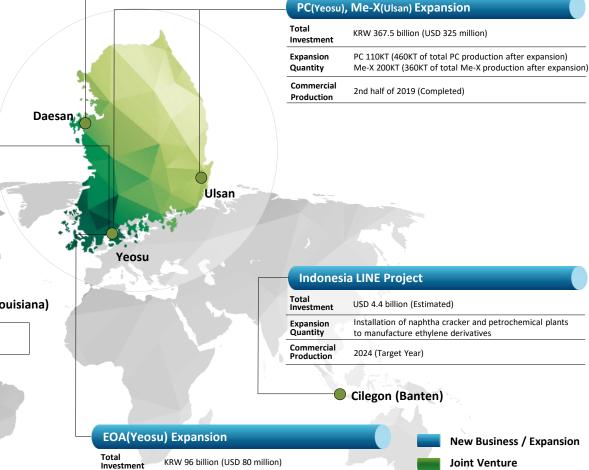
# **USA Shale Gas Project**

 
 Project Overview
 Construction of Ethane Cracker(LACC) & MEG plant(LCLA) based on Shale gas in U.S. (The first Korean chemical firm to operate a massive petrochemical complex in U.S.)

 Total Investment
 KRW 3.4 trillion (USD 3.1 billion)

 Product
 Ethylene 1,000KT, MEG 700KT

 Commercial Production
 1st half of 2019 (Completed)



EOA 100KT (330KT of EOA production at expansion)

2nd half of 2020

<sup>\*</sup> HPC: Heavy Feed Petrochemical Complex

# LOTTE CHEMICAL R&D : Daejeon

LOTTE CHEMICAL established the R&D Center of LOTTE Groups' chemical business part in 2005 by integrating the R&D centers of its subsidiaries.

It is actively researching new growth engines such as securing source proprietary technologies, developing high value added products for sustainable growth.

#### AT A GLANCE



#### **HISTORY**

1976-1990

#### 1976.3

• Established LOTTE Chemical

#### 1979. 4

 Launched Research and Testing Department

#### 1986. 6

· Established R&D Center

1991-2010

#### 1991. 1

 Moved to Daeduk R&D Complex and changed name to
 "Daeduk R&D Center"

#### 2005. 2

 Launched integrated R&D Center by merging three R&D Centers of LOTTE's chemical companies

# 2011

#### 2012. 12

 Changed name to "LOTTE CHEMICAL R&D Center"

#### 2015. 4

Established the 'Water Treatment Division'

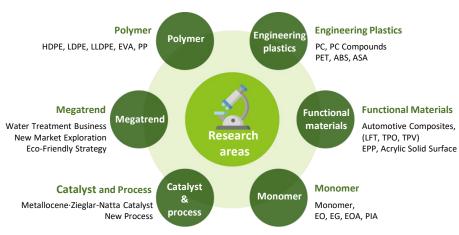
#### 2018. 1

 Established Seoul R&D Center (Magok Industrial Complex)

## **R&D VISION**



#### **RESEARCH AREAS**



# **LOTTE CHEMICAL R&D**: Uiwang

LOTTE Chemical's Uiwang R&D Center is building up a wide range of product portfolio by continuously pushing for the development of technology while offering differentiated products and customized solutions by strengthening its R&D infrastructure.

## Tech&Future Hall

LOTTE Chemical delivers differentiated material solutions suitable for diverse business areas, drawing strength from the continued research efforts.

#### **Research Areas**

Styrene & General Product	Engineering Plastics	Construction & Interior Materials
ABS, ABS Alloy, ASA, EPS, PP	PC, PC Alloy, PBT, mPPE, PPS	Acrylic Solid Surface Engineered Stone



## In-house test lab for UL certification

Advance offering of solutions tailored for customers

thanks to the in-house materials testing facility for safety certification.

# **In-house Integrated Process**

Certification	Certification	Result
Test	Report	Review

#### UL 94 [Flame Retardant] Cert Lab



- Asia-first UL 94 flame retardant cert in-house test lab (2012)
- Flame retardant test (HB, V, 5VB/5VA) & Review

# UL RTI [Long-term Heat-resistance] Cert Lab



- South Korea-first RTI (746B) long-term heat-resistance cert in-house test lab (2018)
- Long-term heat-resistance test & Review
- : High-temp. testing of materials (for more than 60,000 hrs.)

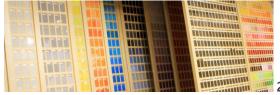
# Crea Lab/Color Lab

# Design Solution of Materials/Color

Collaboration with customers, Meta trend & MYX material, Mass production case for specific application.



Customized Color Solution +55,000



# SUSTAINABILITY MANAGEMENT VISION

# Creation of future values and fulfillment of social

responsibility as a Global Top 7 Chemical Company



Maximization of profit for our stakeholders & Enhancement of customer values



Reduction of environmental impact caused by products and processes & Expansion of eco-friendly business



Social Values

Contribution to the sustainable development of communities and local societies



# **Compliance Management**

Operation of the compliance system by building global-level compliance infrastructure

# **Ethical Management**

Internalization of a Fair and Transparent Management Culture



# **Environment & Safety Management**

Investment in eco-friendly equipment & product development and strengthening of preemptive safety & health management system



# **Social Contribution**

Enhancing corporate image and improving external credibility by strategic social contribution programs



## **Mutual Growth**

Establishment of fair trade practice and support for the strengthening of the partner companies' competitiveness

