

Leading with **Science** for **Sustainability**

LG Chem

We Connect Science

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LG Group

LG Group | History





LG Group | Main Products & Services Overview

Sustainable Innovation for a Better Life

Chemicals



ABS Plastics Global No.1



Life Sciences Domestic 1st New Drugs U.S FDA Approval



Battery for EV Global No.1 (by Contract Size)



Cosmetics Domestic No.1

Electronics



Large OLED TV Panel / Rollable TV World's 1st Global No.1



Home Appliance Domestic 1st Global No.1







Smartphone Camera /3D Sensing Module Global No.1 Telecommunications & services

U⁺5G

5G Network World's 1st



Home loT Domestic No.1

Platform Business







– LG Chem

LG Chem | History

Since its founding, LG Chem is vigorously moving forward towards a sustainable future



1947 - 1999

- **1947** Established as Lucky Chemical Industrial Corporation
- **1969** Listed on Korea Stock Exchange
- **1974** Renamed as Lucky Corporation
- **1976** Completed construction of Yeosu PVC Resin Plant
- **1979** Opened Daedeok Central R&D Center
- **1991** Developed the world's first 4th-generation cephalosporin antibiotics
- **1995**Renamed as LG Chem, Ltd.
Completed construction of Tianjin PVC plant in China

2000 - 2009

- 2001 Spinned off business entities (LGCI, LG Chem, LG Household & Healthcare)
- 2003 Acquired Hyundai Petrochemicals Factive became first Korean new drug to receive U.S. FDA approval
- 2004 Developed the world's first nanotechnology-applied new EP material
- 2005 Established LG Chem (China) Investment Co., Ltd. Established a sales subsidiary in Europe (in Germany)
- 2007 Merged with LG Petrochemicals Co., Ltd
- 2008 Develped Korea's first metallocene-based elastomer
- 2009 Spinned off Industrial Materials Business (now LX Hausys)

2010 - 2023

- 2016 Acquired Dongbu Farm Hannong (Farm Hannong)
- 2017 Merged with LG Life Sciences Co., Ltd.
- 2020 Spinned-off battery business (now LG Energy Solution)
- 2021 Launched LETZero of Eco-friendly Materials brand Acquired separator business
- 2022 Established a separator joint venture LG-Toray (in Hungary) Established a Cathode Material joint venture LG-HY BCM (in Gumi)
- 2023 Acquired AVEO Oncology Started construction of Cathode Material Plant (in Tennessee)



Top 10 Most Valuable Brands

1	We create chemistry		2023 : \$8.36bn 2022 : \$8.353bn	
2	ىپياپك		2023 : \$4.72bn	
	<u>s</u> abia		2022 : \$4,67bn	
2	(b) LG Chem		2023 : \$4.53bn	
3			2022 : \$4.30bn	
			2023 : \$4.27bn	
4	Dow		2022 : \$4.29bn	
			2023 : \$4.14bn	
5	Linde		2022 : \$3.58bn	
			2023 : \$2.84bn	
6	lyondellbasell		2023 : \$2.8401 2022 : \$3.03bn	
7	新 RONGERN RONGSHENG PETROCHEMICAL CO., ETD.	▲ 1	2023 : \$2.56bn	
	RIGHENG RONGSHENG PETROCHEMICAL CO., LTD.		2022 : \$2.30bn	
8		▲ 3	2023 : \$2.31bn	
Ο	agriscience		2022 : \$1.88bn	
		· 1	2023 : \$2.24bn	
9	Shir Etsu	▲ 1	2022 : \$2.10bn	
			2023 : \$2.10bn	
10	Nutrien	NEW	2022 : \$1.81bn	

Brand value of chemical companies

"Global No.3"

* Source: Brand Finance Group, U.K.

Prospering In the pandemic TOP 100

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* Source: Financial Times, 2020

LG Chem | VISION

To achieve our vision, **"We Connect Science to Life for a Better Future,"** LG Chem will become **Top Global Science Company** that leads with **Science for Sustainability.**

We Connect Science to life for a Better Future



Leading with Science for Sustainability.

LG Chem | Sustainability Roadmap

Through the implementation of our sustainability strategy, we will **secure future growth engines and enhance ESG competitiveness**.

LG Chem Innovative Sustainability

Vision

Strategic Directions Deliver advanced, innovative and sustainable solutions for our environment and society

Leading Sustainable Innovation for Customer

+

Managing the Impacts of Climate Change

+

Making a Positive Contribution to Society



Key areas

Responsible Products * Circular Economy * Environment Protection (ZWTL) * _{Zero Waste to Landfill}



Climate Action * Renewable Energy * Water Management *



Responsible Supply Chain * Human Rights / Diversity Safety / Wellness

LG Chem | Decarbonization Strategy for Sustainable

Towards Top Global Science Company

Carbon-neutral growth by 2030, Net-Zero by 2050



Acceleration of low-carbon transition

Expansion of eco-friendly product portfolio

Transition to renewable energy

Offset carbon emissions



Enhancement of competitive edge in low-carbon products

Introduction of new processes and expanded use of eco-friendly raw materials and fuels

Establishment of Scope 3 management system, measurement and supervision of suppliers' carbon footprints Implementation of net-zero through partnerships

Demonstration of global leadership to combat climate change

Development of innovative technologies and a circular economy through cross-industry collaboration

LG Chem | Growth Engine business for Sustainable

Towards Top Global Science Company

Accelerate of Growth Engine Business



Sustainable business centered around eco-friendly materials

Accelerate development of bio materials

Establish circular economy of waste plastics

Foster renewable energy material business

Towards World's Top Comprehensive Battery Materials Company

Produce first-rate cathode materials in the world

Expansion of higher value-added battery materials business

Reinforce R&D for next-gen battery materials

World-class innovative drug development

Enhancement in the quality of new drug pipeline

Develop global clinical trials and accelerate business

Bolster investment in R&D for new drug development

LG Chem | Technology Innovation for Sustainable

Towards Top Global Science Company

World-class Science company with strong R&D capability



Foster bioplastics and low-carbon technology

Mechanical/chemical recycling technologies

Develop and commercialize biodegradable plastics

CO2 capture/utilization technology



Improve battery performance and safety Develop next-gen battery materials

Cost innovation in cathode material development

Development of flame-arresting materials

Development of next-generation materials (pure silicon, materials for all-solid-state batteries)



Gain leadership in cancer /autoimmune diseases, diabetes /metabolic diseases

Acceleration of global clinical Development for major new drugs against gout and cancer

Multi-modality strategy : synthetic, bio, cellular therapeutics * Various approach to drugs

LG Chem Eco-friendly Materials Brand

LETZer

Eco-friendly Materials Brand LETZero

A compound word of "Let" and "Zero," which means "to turn harmful substances to the environment and the net increase in carbon emissions into zero."

LETZero Product Line







LG Chem | Domestic Sites

Yeosu Complex (Est.1976)

NCC, PVC, ABS, SAP, PE, AA





LG Chem | Business Area



- Sustainability
- Nexolution
- NCC / Polyolefins
- PVC / Plasticizers
- ABS
- Acrylates
- HPM(High Performance Materials)
- Catalyst

- Cathode Materials
- Battery Separator
- Engineering Materials
- Electronic Materials
- RO Membrane

- Primary Care
- Specialty Care
- Aesthetic
- AVEO Oncology

Introduction of LG Chem -

01

Petrochemicals Company

Petrochemicals Company

Establishment (Year)

1976

Sales (\$) *As of 2023

13.8bn (Approx.)

Workforce (Person)

Domestic 6,442 / Overseas 2,264

Business Area

Petrochemical Products

2023	Started the construction of Korea's first supercritical pyrolysis plant and next- generation insulator plant Launched COMPOSTFUL™ of compostable brand Established the CS Center of Europe in Germany					
• 2022	Launched Asia's first plant-based eco-friendly ABS					
• 2021	Acquired *ISCC for Korea's first eco-friendly (bio-circular balanced, Chemical Recycle) product. * ISCC (International Sustainability and Carbon Certification)					
	Launched digital CRM system LG Chem On					
2019	Established the largest petrochemical tech center in Korea (Osan CS Center)					
2015	Launched Hwanam Tech Center in Nanjing, China					
• 2003 ~ 2010	Acquired Dow Polycarbonate business(10) Merged with LG Petrochemicals Co., Ltd.('07)					

1995 ~

1998

1976

d Dow Polycarbonate business(10) with LG Petrochemicals Co., Ltd.('07) Acquired PVC Business of Hyundai Petrochemicals Co., Ltd.('03)

Established Manufacturing Subsidiary in China / India / Vietnam (PVC, ABS)

Completed construction of Yeocheon PVC resin factory Entry into the petrochemical business

Leading Business Sustainability with Eco-Friendly Materials

Focused cultivation of sustainability business and achievement of net zero



Bio Material

- Acquired 58+ ISCC Plus-certified products
- Mass-produced world's first bio-circular balanced SAP,
- launched Asia's first bio-based ABS
- Stable sourcing of raw materials through internalization of bio-based material production and partnerships (NESTE, ADM)



Compostable

- Stable quality and sourcing of raw materials through internalized production processes
- Developed own simulation modeling technology for compostability
- Obtained international compostability certifications and complies with food contact substance regulations





Recycling (Establish circular economy of waste plastics)

- Built a product portfolio of global brands (PCR)
- Secured a stable pool of raw material supplies through a technology partnership on chemical recycling with MURA
- Established a closed loop through strategic partnerships



Energy Transition

(Discover new renewable energy materials)

- Produces higher value-added products for solar panels and lithium-ion batteries
- Established an eco-friendly biomass power plant
- Constructed CCU plants to produce blue hydrogen

Production Capacity (As of 4Q, 2023)

Unit : KTA

Ethylene	3,350	HDPE	550	Acrylic Acid	650
Propylene	1,980	LLDPE	600	IPA	205
BD	510	PP	380	NPG	175
BZ	900	LDPE/EVA	460	Synthetic Rubber	365
SM	520	PVC	1,280	Specialty Resin	31(
BPA	505	Plasticizer	175	POE	380
ABS/SAN	2,290	Alcohol	300	CNT	
PS	40	PC	170	SAP	500
EPS	90	NAOH	1,020	NBL	555



Sustainable Materials

LG Chem conducts various sustainability businesses centered on eco-friendly materials in the fields of bio, recycling, and energy transition. We also present innovative sustainability solutions to our customers and contribute to the creation of future value through our eco-friendly material brand LETZero, which embodies our determination to achieve net zero carbon emissions and damage to the environment.

Compostable(COMPOSTFUL™) Bio(Bio-Circular balanced, Bio-based) Recycle(PCR, Circular balanced) Energy Transition(POE, CNT)



Applications



Mulching Film



Compostable Bag



Electronics housing



Solar power film



lithium-ion batteries



Conductive Plastics

Nexolution materials

LG Chem is working ceaselessly to develop new functional materials with high technology barriers.

Our super absorbent polymer (SAP), a highly absorbent resin used in diapers and feminine hygiene products, acquired the world's first ISCC+ certification using plantbased materials, and our NBR latex, used in medical and industrial gloves, is recognized for the world's highest quality

with excellent tensile strength and chemical resistance. Aerogel is an effective insulant with high durability used in industrial applications such as plant piping.



Naphtha Cracking Center (NCC)

NCC (Naphtha Cracking Center) is a process for producing base oils for petrochemical products, such as ethylene and propylene. They are supplied as raw materials for various products such as PO, synthetic rubber, and ABS. In addition to achieving the world's highest energy efficiency, LG Chem discovers and supplies alternative raw materials such as bio-materials and pyrolysis oil from waste plastic to reduce carbon, and develops various technologies for renewable energy and carbon capture for the eco-friendly conversion of our petrochemical plants.



Polyolefin (PO)

PE (polyethylene) and PP (polypropylene) are general-purpose plastics that are used in everyday life, used to make containers, packaging, and medical equipment. After use, discarded products transform into PCR PE and PCR PP through LG Chem's mechanical recycling technology, used to produce packing film and containers.



PVC / plasticizers

Polyvinyl chloride (PVC) is a material with excellent durability and insulation, processed with plasticizers to give it flexibility. It is used in various building materials and household products, such as flooring, windows, and artificial leather. Caustic soda is used in many industries, from basic to advanced sectors such as cathode manufacturing. Polycarbonate (PC) is also widely used in electronics, automobiles, and mechanical components due to its excellent impact and heat resistance. LG Chem aims to lead the eco-friendly trend by producing bio-circular balanced products from bio materials and post-consumer recycled (PCR) PVC and PC using recycling technology.

PVC, caustic soda, plasticizers, alcohol, PC Applications Sashes Flooring Pipes Cable sheath Cathode materials Car headlamps

Acrylonitrile Butadiene Styrene (ABS)

Acrylonitrile Butadiene Styrene (ABS) is a highly functional material mainly used in automobiles, home appliances, and IT devices for its excellent heat resistance, shock absorbance, and processability. LG Chem provides differentiated solutions to our customers, from producing chemical industry's very first white-colored PCR ABS and Asia's first eco-friendly ABS made of plant-based materials.



Acrylates

LG Chem is the only manufacturer of acrylic acid, IPA, and NPG in Korea, and produces high-quality products based on proprietary technology. Mainly used in paints, plasticizers, and SAP, Acrylates, Acrylic Acid have a myriad of applications in various fields for its excellent chemical reactions. IPA is a semiconductor cleaning agent with the highest level of purity, and NPG is a highly favored eco-friendly material used to make powder coating.



High Performance Materials (HPM)

Synthetic rubber is used to produce automotive tires and golf balls.

Methacrylate Butadiene Styrene (MBS) is used as an additive for impact reinforcement agents and for enhancing adhesion with other resins in bio plastic compounds. Styrene Butadiene Styrene (SBS) is used as a modifying agent for asphalt and a special additive that imparts various functions.



Catalyst

Catalysts are the core technology for various petrochemical processes. We are the Korea's first and world's fourth company to independently develop catalysts for acrylic acid production. Polymer catalysts are used to manufacture metallocene polyolefins and functional chemical materials. We provide tailored solutions to customers with exceptional technology.



02

Introduction of LG Chem

Advanced Materials Company

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Advanced Materials Company

Establishment (year)

1999

Sales (\$) * As of 2023

5.7bn (Approx.)

Workforce (Person)

Domestic 4,062 / Overseas 2,050

Business Area

Battery Materials, Engineering Materials, Electronic Materials 2023

2022

2004

2000

- Started construction of Cathode Material Plant (in Tennessee)
- Established a cathode material joint venture LG-HY BCM (in Gumi) Established a separator joint venture LG-Toray (in Hungary)
- 2021 Commercialized battery separators (Acquired separator business from LG Electronics)
- 2019 Reorganized Advanced Materials Company (to provide customized solutions in high-performance materials)
- 2018 Established Chinese joint venture for manufacturing Precursor and cathode material
- 2016 Acquired GS E&M, a renowned cathode manufacturer
- 2006 Commercialization of battery materials (cathode material, electrolyte)
- 2003 Established IT&E Manufacturing Subsidiary in Nanjing, China
- 2000 ~ Commercialized LCD, OLED, Process materials
 - First to develop PDP fluorescent substance in Korea.
Towards World's Top Comprehensive Battery Materials Company

Global Top Tier Cathode Materials

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- Strengthen metal competitiveness through owning mines and strategic cooperation with smelting and refining companies
- Develop leadership in high capacity and cost-innovative technology
- Expand business sites worldwide



Capacity building of separator business

- Development of next-generation highsafety separators
- Expand a global production base in Poland (2021) and Hungary (2022)

Upgrading the battery Materials portfolio

• Expanding business in higher valueadded battery materials such as CNTs, anode binders, cathode dispersants





Increased investment in R&D

• Differentiate technology and gain market leadership



Battery Materials

In addition to cathode binders and dispersants, LG Chem is producing over 10 types of battery materials, including cathode materials and separators, which are core materials for secondary batteries. We are also bolstering

R&D across a wide range of fields, such as developing new materials for the technological advances in the next-generation

batteries. LG Chem will continue to strive to become the world's No. 1 comprehensive battery materials company with the highest level of safety and competitiveness.



Engineering materials

In mega trends such as e-mobility and sustainability, LG Chem is striving to create world no. 1 products by producing high-strength, lightweight automotive materials and eco-friendly PCR materials that are optimized for customer products and processes.



Electronic Materials

LG Chem produces light-emitting materials for OLEDs and semiconductor back-end process materials, which are key materials for IT devices. We are also working to accelerate the growth of our electronic film and adhesive products used in e-mobility.



RO Membrane

LG Chem's seawater desalination and industrial RO Membrane is a water treatment filter that utilizes our proprietary Thin-Film Nanocomposite (TFN) nanotechnology. This product is leading the global market with an unrivaled removal efficiency of 99.89%.



Introduction of LG Chem –

03

Life Sciences Company

Life Sciences Company

Establishment (Year)

1984

Sales (\$) *As of 2023

1.1bn (Approx.)

Workforce (Person)

Domestic 1,962 / Overseas 407

Business Area

Pharmaceuticals, Vaccines, Aesthetic

- **2023** Acquired AVEO, a US-based cancer drug company
- **2022** Applied for global Phase III clinical trial for Tigulixostat (new drug for gout) in the US
- 2021Established LG Jiansheng Life Science in ChinaSuccessfully completed Phase II clinical trial for new gout drug in the US
- 2019 Established Life Sciences Innovation Center in Boston, US (Now LG Chem Life science USA, Inc.)
- **2012** Developed 1st Korean diabetes medicine, 'Zemiglo'
- 2003 11st Korean new chemical entity (NCE) approved by U.S. FDA (Factive)
- **1996** 1st Korean hepatitis B vaccine 'Euvax' approved by WHO PQ
- **1991** Developed World's first 4th generation Cephalosporin

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1984 Start of pharmaceutical business (Established Pharmaceuticals business division)1961 Acquire of manufacturing license pharmaceuticals products

Toward a World-Class Innovative Drug Developer



5 or more innovative new drugs by 2030 Diabetes, metabolic diseases, cancer, autoimmune diseases

Expand new drug pipelines in clinical development stage



- Invest over USD 250mil in annual R&D
- Strengthening of Open innovation





- New tasks for global clinical development
- Continued growth of AVEO's oncology business in the US

Primary Care

LG Chem has developed Korea's first diabetes drug, Zemiglo, and arthritis drug, Synovian, increasing its competitiveness in Korea as well as overseas, and has expanded its efforts to develop new drugs and to collaborate with other companies through partnerships in the areas of diabetes and cardiovascular, musculoskeletal, and autoimmune diseases.



Specialty Care

LG Chem is the first company in Korea that has successfully developed a growth hormone stimulator, and is also

concentrating its R&D capabilities on treatments for special diseases.

LG Chem has been strengthening competitiveness in the global market with its WHO-approved hepatitis B and pentavalent combination (5-in-1) vaccine.



Aesthetic

YVOIRE, the first hyaluronic acid filler developed with LG Chem's proprietary technology in Korea, is receiving attention for its superior product quality leading to expanding market share.



AVEO Oncology



AVEO Oncology, acquired by LG Chem in 2023, is an oncology-focused biopharmaceutical company based in Boston, U.S.

Approved by U.S. FDA in 2021, AVEO is expanding its Kidney cancer drug(Fotivda[®]) sales, and is accelerating pipeline development including Head and Neck cancer drug. Through AVEO Oncology, LG Chem aims to strengthen competitive edge in U.S. market for New drugs and become a global leading Oncology company.

Representative Product

Pipeline



Kidney Cancer Drug FOTIVDA®

Projects	Indications	Stage
FIERCE-HN	Head and Neck Cancer	Phase III
AV-380	Solid Tumor	Phase I
TiNivo-2	Kidney Cancer	Phase III







Subsidiaries



LG Energy Solution

LG Energy Solution embarked on a new journey as a global battery company when we became a separate entity from LG Chem's battery business in 2020.

We were the first to mass-produce lithium-ion batteries and supply them for electric vehicles, and have been offering a comprehensive portfolio of products related to automotive batteries.

LG Energy Solution also provides battery systems for ESS batteries in various applications, including power grids, residential and commercial use, and uninterruptible power supplies (UPS).

C LG Energy Solution



No. 1 in automotive battery global market

1st in Korea to successfully mass produce small lithium-ion batteries No. 1 in ESS batteries globally



Farm Hannong

Farm Hannong, an LG Chem's affiliate, is the top domestic agricultural company —No. 1 in agricultural chemicals and No. 2 In the fertilizer and seed in the Korean Market—and aims to be a global leader in green agriculture and ICT industry technologies.



THANK YOU

We ConnectScience

LG Chem

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