



Company introduction

LOTTE Chemical is a global chemical company that operates 26 production bases in 22 countries, including Korea, Malaysia, the United States, and Uzbekistan, through constant challenges and innovation since its establishment in 1976.

We are building an efficient business portfolio based on superior cost competitiveness, and as a responsible member of society for creating social value under the 'Green Promise 2030' ESG Vision. LOTTE Chemical pledges to continue to be deeply involved in the concept of the 'Every Step for Green' vision of moving toward a greener and better tomorrow with leading technology for a sustainable future.

Product and Technology Introduction

LOTTE Chemical has a diverse product portfolio such as synthetic resins and other chemical products as well as for megatrend products used for architecture and interior design. As such, its products are used for internals/externals of home appliances and IT devices, and even widely applied to agricultural, industrial and construction materials as well as medical devices and automobiles.

LOTTE Chemical boasts excellent R&D capabilities and expertise, and is leading eco-friendly hydrogen business, the battery material business and expanding the eco-friendly recycling material and specialty material business for sustainable future.





Company introduction

Safety, high efficiency, fast charging and discharging speed and eco-friendliness. Standard Energy has been working towards one goal: to create a battery that meets all four conditions.

Standard Energy is a company specialized in Energy Storage System (ESS) and has finally developed the world's first Vanadium Ion Battery.

Established in 2013, Standard Energy has grown rapidly by attracting large-scale investment from Lotte Chemical following Softbank Ventures and LB Investment. By unveiling Charger5, the first ESS-linked ultra fast electric vehicle charging facility in the city, we are providing stable charging services to actual electric vehicle users.

In addition, we have installed ESS on the leisure vessel 'Possibility', and are in the process of installing an electric taxi charging facility in LPG charging stations with E1, an energy company.

We are also developing an ESS solution to be installed on power carriers developed by Korea Shipbuilding & Offshore Engineering. Furthermore, we are seeking new challenges with various clients.

We will grow and innovate until the day we supply the world with ESS that can be freely used in various fields without fear of fire or power loss.

Product and Technology Introduction

Vanadium Ion Battery (VIB) based ESS developed by Standard Energy will overcome the limitations of the existing ESS and set the 'standard' of the new ESS. VIB ESS, which will be a new start for energy innovation, has the following characteristics.

First, the risk of fire and explosion of VIB ESS is virtually 0%. VIB ESS, which is manufactured based on water-based liquid electrodes, has no risk of heat generation and ignition due to the nature of the material. Safety from fire has been proven through test results from Fire Insurers Laboratories of Korea, Korea Electrotechnology Research Institute, Korea Testing Certification Institute. It has passed various tests such as high temperature, overcharge, penetration, shock, and drop.

Second, it has long lifespan and high energy efficiency. Unlike existing battery-based ESS that shows capacity degradation from a certain point during continuous charging and discharging, VIB ESS maintains more than 95% capacity despite 10,000 consecutive charging and discharging cycles. It has a long lifespan and there is little concern about functional degradation due to cell capacity imbalance. It is economical and efficient because it can be used stably for a long time.

Third, it can be utilized for various applications. It is a 'multipurpose ESS' that can be operated at a wide range of C-rates from low to high output. We have a wide range of application fields, from renewable energy-linked power storage devices to ultra fast electric vehicle charging ESS.





Company introduction

AIRRANE is a leading pioneer of innovative membrane solution technology for gas separation. From hollow fiber membrane production to the design, manufacturing and servicing of membrane module and separation system, AIRRANE's goal is to serve as your one-stop provider of advanced membrane technology for gas separation.

Founded in 2001 as a National Research Laboratory, our growth as gas membrane specialist has been a journey of ceaseless innovation. Our vision is to build upon our varied portfolio and further develop membrane technology to offer a sustainable energy solution for a better future for all.

Product and Technology Introduction

Gas separation membranes are very fine hollow fibers through which different mixtures of gases are fed. As the gases travel through the tubes, a process called selective permeation (diffusion-sorption) allows us to separate gases using

Gas which permeates faster and more are collected outside of the hollow fiber as permeates while gases which do not permeate so well and stay inside of the fiber until they reach the other end are separated out as retentates. Depending on their properties of the desired gas, either or both of permeates and retentates can be used.





Company introduction

Founded in 1976, S-OIL is a refining & marketing company with a crude oil refining capacity of 670,000 barrels/day and has a diversified business portfolio including petrochemicals and lube base oil. S-OIL strives to realize its new vision 2030 by successfully achieving highest profitability and operational efficiency, petrochemical expansion and green growth.

In addition, S-OIL is actively investing in promising ventures to secure future technologies and capture new business opportunities. It targets areas that can create synergies with existing businesses, strengthen the company's manufacturing competitiveness, and have great potential to become the company's next growth engine.



Fuel Cell
Innovations



Company introduction

FCI is a global company that provides innovative energy solutions for a sustainable, low-carbon society. FCI is a JV between Korea and Saudi Arabia to promote energy industries for 'Hydrogen Economy' in Korea and 'Circular Carbon Economy' in Saudi Arabia. FCI is providing clean energy solutions based on high-temperature fuel cells such as SOFC and MCFC and electrolyzer (SOE) technology. In addition to this, we are commercializing cost-effective, large-scale fuel cell and electrolyzer products by utilizing FCI's core technology and advanced system engineering technology. FCI is also designing and constructing fuel cell hybrid plants that meet local market requirements and safety regulations in overseas countries. Through FCI's business scope, we aim to grow into a global company that aims for global business and leads the hydrogen economy and Green New Deal, targeting overseas markets such as the Middle East, Europe, and the United States.



Fuel Cell
Innovations

Product and Technology Introduction

FCI manufactures and sells solid oxide fuel cells (SOFCs) and hybrid systems in a variety of capacities.

FCI's fuel cell is an optimized, high-efficiency micro fuel cell cogeneration system that supplies high-efficiency power and heat to homes, businesses, public buildings, and smart farms. Currently, the product that can be commercialized is RevGEN 1.5 with a capacity of 1.5 kW, which can be installed in homes and buildings, and provides the highest efficiency in Korea with a power generation efficiency of about 55% and a total system efficiency combined with heat recovery efficiency of more than 95%. In addition, this product is capable of changing power generation output and heat supply according to demand. As FCI can provide specialized products for hybrid power generation with other power sources, FCI's products can be widely used in the domestic and overseas building fuel cell market.

FCI plans to expand the product line available for sale by obtaining KGS approval for the 45kW SOFC system by the first half of next year. In addition, we are developing SOFC products for 240kW power generation by 2024.





Company introduction

LiBEST is a company that develops and manufactures Flexible Li-ion Battery and received CES Innovation Awards in 2020, 2023.

LiBEST is special for the "full flexibility" as most of other flexible battery companies only have products that can't be bent fully and has low battery capacity. But LiBEST's flexible battery can be bent in full range and also maintains high capacity.

Product and Technology Introduction

Device manufacturers for wearable, metaverse, and healthcare have high demand for these flexible batteries. By applying this battery, it can solve many limitations in product design and become "thinner and lighter" while the traditional battery takes a lot of space in the device.

By adding more battery in the device, it will also allow the device to have "higher capacity" and extend the running time of the device.



Company introduction

Beomjun E&C is an eco-friendly company leading green growth which developed a new technology on using and processing concrete and asphalt additives for which it has got approval from the Ministry of Land, Infrastructure and Transport of the Government of the Republic of Korea, by modifying waste sulfur, an industrial by-product generated during the process of petroleum refining.

Product and Technology Introduction

1. Cement and Concrete Additives Made of Modified Sulfur (SU+C100)
A high-performance and eco-friendly cement concrete additive made by applying modifier materials to sulfur generated as a by-product during crude oil and gas refining and to DCPD discharged as a by-product from a petrochemical plant.
* It was designated as a new national technology and won the King Sejong Award



2. An eco-friendly asphalt binder made of modified-sulfur of which elongation is improved by use of sulfur by-products.

3. Developed a new eco-friendly (0 % calcium chloride) technology called PBI(Protection from Black Ice) method by adding to PCM (Phase Change Material) that increases strength when paving roads certain materials that absorb and release temperature of road surfaces depending on the atmospheric environment. When a road pavement is done using this method, the functions mentioned above last over a long period of time.

* An eco-friendly construction method developed by mixing porous materials and phase change materials (PCM) with CMA (Calcium, Magnesium, Acetate) instead of salt and calcium chloride which are anti-freezing agents.

* Prevention of damages such as traffic accidents that may be caused by black ice due to non-freezing at the temperature of above -4 degrees.





Company introduction

- As a national aerospace research institute, it contributes to the solid development of the national economy and enhancement of national life through new exploration as well as leading, developing, and disseminating technologies in the field of aerospace science and technology.

- Mission

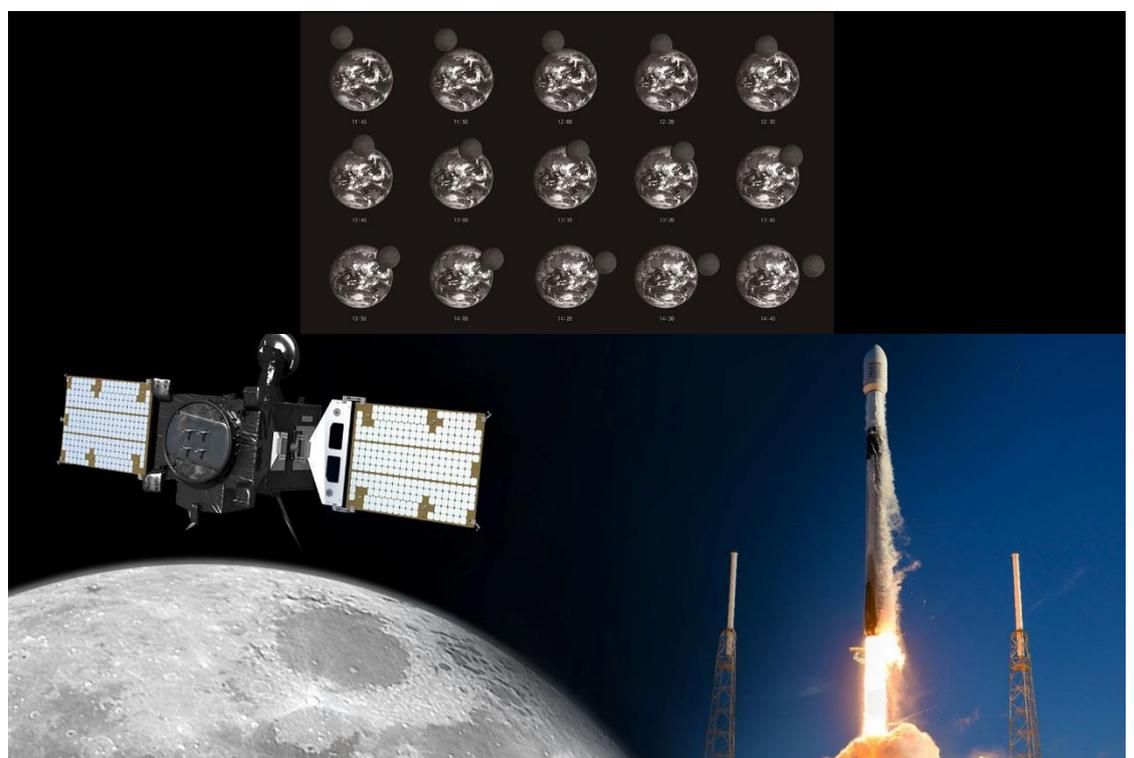
- (1) Research and development in systems and core technologies for aircraft, satellites, and space launch vehicles
- (2) Technology development, quality certification, and mutual certification between countries to secure aerospace stability and quality
- (3) Support for the establishment of national aerospace development policy as well as distribution, and dissemination of information regarding aerospace technology
- (4) Joint utilization of test and assessment facilities with the industry academy, and research institutes, as well as training of professional human resources in the major mission fields
- (5) Support collaboration with aerospace related SMEs and the commercialization of technology

- R & D

- (1) Aviation: UAV, OPPAV, rotocraft/helicopter, MIDAS, etc.
- (2) Unmanned Vehicle, UTM
- (3) Satellites: multi-purpose, geostationary orbit, next-generation medium-sized satellites, satellite payloads, etc.
- (4) Space launch vehicles: Naro, Nuri, Naro Space Center, etc.
- (5) Utilization of satellite information: control service/utilization business for satellite and international cooperation in using satellite images
- (6) Lunar exploration: Danuri(KPLO, Korea Pathfinder Lunar Orbiter), etc.
- (7) Satellite navigation: KPS(Korean Positioning System), KASS(Korea Augmentation Satellite System), etc.

Product and Technology Introduction

- Aviation: Integrated hybrid power apparatus, Air vehicle attitude control system/method, leader-follower formation flying method and system, etc.
- Satellites: method/system for receiving scheduling of satellite images, device/method for compensating for loss of thrust strength and MOI change in satellite by using propellant, and satellite imaging acquisition re-planning method and apparatus using AIS, etc.
- Launch Vehicles: Projectile landing apparatus to retrieve projectile, method/system for measuring level for calculating flow of propellant tank, accelerating of low-gravity environment simulation test equipment/method, etc.
- Satellite Navigation: Layered code-based spreading code authentication apparatus and method to counter deception in GNSS, low-orbit satellites and satellite systems including the same, and control method thereof, etc.
- Other aerospace fields: Lunar gravity simulation system for lander performance test, system for soil moisture calculation using SAR satellite data, wheel escape device for rough terrain like the moon, etc.





NARMA Inc.

Company introduction

Narma Inc. is the first spin-off company of Korea Aerospace Research Institute(KARI). Narma has developed world's first electric dual tilt-rotor drone optimized for delivery.

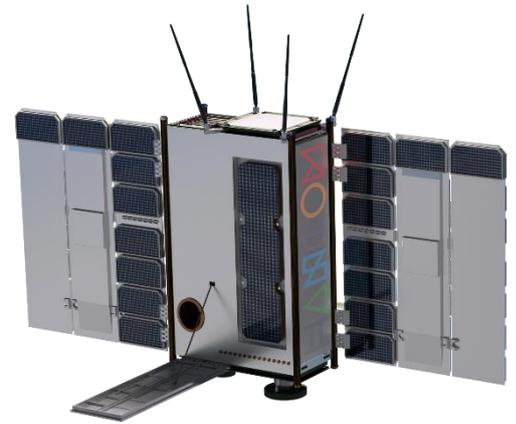
Narma is the only Korean drone company to be approved by the government for BVLOS(Beyond Visual Line of Sight) and Night flight at the same time. Narma has successfully finished multiple government projects and performed thousands of demonstration flights such as Blood delivery, AED Delivery and Antidote Delivery, suggesting solutions to drone delivery market.

Now Narma plans to enter into a full-scale drone delivery service in cooperation with CU, the largest convenience store in Korea. As a next step, Narma is looking beyond Korea to expand drone delivery business across the World.

Product and Technology Introduction

Narma's AF100 overcame the limitations of multicopter and fixed-wing drones. The AF100 is capable of vertical takeoff and landing (VTOL) and flies at high speed. The AF100 can fly at a high speed within 3 minutes for a distance of 5km and is optimized for emergency delivery.

Narma's drone can fly automatically using simple control device such as KIOSK without the need for manual operation.



Company introduction

HANCOM InSPACE Co., Ltd. is a company specializing in technology development in the aerospace industry and provides 'Image all-in-one service' encompassing video data collection, management, analysis, and sales. HANCOM inSPACE's areas of expertise are space, aviation, and ground surveillance. It provides satellite ground station systems, unmanned drone operation platforms, and long-range surveillance camera services, and is expanding its scope to various monitoring and analysis businesses using satellite and drones.

Product and Technology Introduction

In the new space era, where private companies are taking the lead in the space industry, Hancom Group succeeded in launching the LEO nanosatellite 'Sejong-1' in May 2022. We will be the first Korean company to handle from head to toe: procurement of images, image processing, image analysis, and sales of images. Sejong1 nanosatellite is 6U, and its actual size is 10 x 20 x 30cm.

Starting from Sejong-1 satellite, we are planning to launch at least four more satellites by 2025. With this experience, we will be able to secure satellite manufacturing technology. Our goal is to launch more than 50 cluster satellites by 2030 so that we can provide both earth observation and satellite communication services. Through an integrated monitoring system that links drones and drone stations using domestic technology, we have developed a system that monitors urban areas, forests, and borders in real-time.



Company introduction

INFINIQ is a leading company in Korea's AI-based data services to help artificial intelligence (AI) developers access better data through fast, accurate, and convenient solutions such as DataStudio, a DataOps technology, to provide services according to the difficulty of artificial intelligence for each industry.

Product and Technology Introduction

The Data Studio utilizes data governance to provide restricted access to the system and cooperative data process between producers and consumers of AI data. Data Studio also ensures protection of personal information, usage restriction and data integrity. With Data Studio, producers can secure speed and continuity of data processes, and consumers can benefit from cost savings through high-quality data.





Company introduction

Caliverse was founded in 2017 and has been producing ultra-high-definition VR content.

We not only have differentiated technology for real-time images and precise synthesis of graphics based on 3D VR, but also have its own technology and know-how to realize realistic graphic visuals and large-scale simultaneous access based on real-time rendering.

In addition, Caliverse has 'interactive patented technology' that provides an experience of actually communicating with people in 3D virtual reality contents. Since we became a member of the LOTTE Group in 2021, we've been developing a hyper-realistic next-generation metaverse centered on shopping and entertainment by utilizing this.

Product and Technology Introduction

The ultra-realistic metaverse pursued by Caliverse is a next-generation platform that realizes synergy in a circulatory structure where reality and virtual coexist.

In the metaverse world of Caliverse, you can experience offline services in a very realistic sense without time or space limitations, and sometimes you can directly experience fantastic hyper-realistic services that you have never experienced in reality.

In the virtual store, We pay attention to implementing interactivities such as touching products in the virtual store and talking to AI assistants, and In the entertainment area, we focus on providing fantastic and irreplaceable experiences that cannot be replaced.

In the creative area for a world created by users, we have prepared comfortable User-generated content (UGC) tools and intuitive communication systems such as body tracking for realistic and natural communication in virtual space.