Smarter and Better World with Our Cryogenic Technology

Have you been aware of where cryogenic technology works?

Our cryogenic products play important roles in many different fields ranging from eyeglasses, LED, TV, smartphones advanced medical treatment, cell preservation to space development.

We continue our effort so that our technology make even more positive contributions in the new era of 5G to achieve better lives.
We are Committed to Make Positive Contributions to the Future of Manufacturing

Message from the President

We are doing business in the fields where rapid technological innovations are taking place and excellent quality products are required. We have our production and development base in Korea and China to sense what the customers need on a timely manner and to provide products and services that precisely meet the demand. Based on our Credo, “Technology, Creativity, Passion and Trust”, all three Ulvac Cryogenics companies will be working very closely to deliver values for the future that lead to further growth cycle.

Ulvac Cryogenics was founded in 1981 as a joint venture of Japan Vacuum Engineering Co., Ltd. (currently ULVAC, Inc.) and Helix Technology (currently Edwards Vacuum LLC) CTI Cryogenics Department. Our main business at that time was manufacturing and sales of cryopumps that are indispensable to create ultra-high vacuum, and has since steadily expanded the business. Currently, our products are employed in many fields of manufacturing or research facilities such as OLED displays, lighting, semiconductors, power semiconductors, sensors or optical thin films. We keep the number one share in the world’s cryopump market for many years.

In addition, we are accelerating product development in cryogenic equipment fields where rapid growth is now taking place or expected in future, to name a few,

(1) Liquid Nitrogen Generator: Liquid nitrogen is indispensable in advanced medical fields such as reproductive medicine or cell cryopreservation. We provide LN₂ Generators, a standalone device that produces liquid nitrogen from the air. Our LN₂ Generators play a very important role for medical treatments when liquid nitrogen is unavailable due to disasters.

(2) Liquid helium is used in MRI, cutting-edge medical device, to cool down superconducting magnet. We launched a new cryocooler that prevent liquid helium from evaporating.

(3) We have been working hard to develop a cryocooler that provides temperature as low as almost absolute zero for quantum computers. Although quantum computers are expected as next generation computers and are actively being developed, their semiconductor devices only work in such low temperature range.

(4) Analysis of all materials, regardless organic or inorganic, are done in very low temperature. We deliver cryocoolers that provide such low temperatures.

Our products are now needed in increasingly more fields. We are no longer satisfied solely with being the world’s number one cryopump maker, but are actively expanding business in cryogenic equipment field for our growth, and for making further contributions to the society.
Our Products by Temperature

**Cryopumps**

We provide cryopumps that respond to the requirements ranging from producing familiar products such as desktop PCs, eyeglasses, TV sets, cameras or automobiles to cutting-edge research facilities.

1. Cryopumps for vacuum deposition equipment or sputtering to manufacture eyeglasses, TV sets or smartphones.
2. Cryopumps for ion-plating or DLC coating which are used for car components or processing tools.
3. Cryopumps for JAXA that support space development with technology or leading-edge research facilities that are working for next generation energy.

**Cryogenic Equipment**

We have been selling cryogenic equipment products for analytical instruments or R&D so far, and now we are entering into many new fields including:

1. LN₂ generator for fertilizing treatment or cell preservations.
2. 4K GM cryocooler for producing silicone, semiconductor material, or for MRI, advanced medical device.
3. Quantum computers are now drawing attention as the next generation computers. We are also working to develop dilution refrigerators for quantum computers.

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**Temperatures and Corresponding Values**:

- **100K** (~173°C)
- **77K** (~196°C)
- **10K** (~263°C)
- **4K** (~269°C)
- **<0.01K** (~273.14°C)

**Notice**:

- 1K (kelvin) means Absolute zero, at which all molecular motions stop.
- 0K = -273.15°C (Absolute zero)
- 0.01K = -273.14°C
- 4K = -269.15°C
- 77K = -196°C
- LN₂ = -196°C
- LN₁₀ = -263°C

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**Production Site**

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**Symbols**:

- **NMR**: Nuclear Magnetic Resonance
- **MRI**: Magnetic Resonance Imaging
Our cryopumps are employed in a broad range of applications for both industries and academic research of cutting-edge OLED displays, lighting, semiconductors, power devices, sensors or optical films.

Sputtering Equipment for Semiconductor Production

OLED Manufacturing Equipment

Batch Type High Vacuum Deposition Equipment

LCD Manufacturing Equipment

Cryopumps installed on Manufacturing Equipment

Display

LED Element

Semiconductor

Memory IC

Power Device

Thin Film

CMOS Image Sensor

Cryopumps

Trillions of Chips will Change our Lives in the Future.

Society and Lives from Now

Our vacuum technology of cryopumps plays an important role for faster communication, higher energy efficiency, automation in transportation and logistics or more efficient farming by supporting device production.
In such a special condition as ultra-low temperature, many substances show splendid properties that they never show at room temperature. Cryogenic technology is the key for the development in leading-edge technology fields including superconducting, new technology, or new medicine.
Liquid nitrogen is indispensable for preserving cells for which higher demand is expected from now. We are pleased that we can make positive contributions to preserve endangered animals in the world with our vacuum and cryogenic technologies.

Liquid nitrogen is indispensable for preserving sperms, eggs or stem cells of other endangered animals. Besides the use for preserving sperms, eggs or stem cells of pandas, it works for preserving and breeding of other endangered animals. Liquid nitrogen is indispensable for preserving cells for which higher demand is expected from now. We are pleased that we can make positive contributions to preserve endangered animals in the world with our vacuum and cryogenic technologies.

UCN serves as an important production base of cryopumps in China that offers production, repair and maintenance service. Along with the expansion of cryopump sales and overhaul, UCN works closely with ULVAC Group’s maintenance providers to deliver prompt and precise support services in all over China. UCN also works hard to expand sales in growing semiconductor industry and cryogenic equipment market which is indispensable for basic research.

UCK Dominates Display Market in Korea with 99% Share

UCK's operation includes processing parts, manufacturing, sales and servicing of vacuum and cryogenic equipment with strict quality management. Based on technical and manufacturing experience and know-how of ULVAC Cryogenics, UCK delivers highly reliable products to customers. UCK has 99% share in the display market in Korea, and is now expanding into semiconductor or new fields of cryogenic equipment. UCK is working hard to further improve customer satisfaction by strengthening competitiveness and customer services through its new smart factory and by launching RMC (Re-Manufacturing Center).

Business Area
Manufacturing, assembling, sales and services, import and export of cryopumps and cryogenic equipment.

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Global Network to Deliver Reliable Customer Services

Ulvac Cryogenics has production and development base in Japan, Korea and China and responds to the customers’ requirements in precise and prompt manner in rapidly growing Asian market.

We also work very closely with ULVAC Group companies in the world to provide reliable services with proven technology to the customers around the world.