



크라이오 에이치앤아이(주)

Cryo H&I

The Future of Cryogenics!

INTRODUCE

Cryo H&I is a company specializing in Cryogenic technology that develops and produces Cryocooler, supplies GM cryocooler, cryopump, LN₂ liquefaction, and cryogenic material tester using them.

It intends to contribute to Humanity and Industry through Cryogenic technology, which is essential for the environment·energy·defense·bio·quantum computers and basic science and technology.



Cryopump



Cryocooler



Helium Compressor



LN Liquefaction



Cryogenic Tensile Tester



Cryogenic CTOD Tester



Thermal Conductivity Tester



Charpy specimen
Cooling system



Cryo Chiller



Cryostat



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Cryo H&I

GREETING

The Leader of Cryogenics! Cryo H&I to create the future through cryogenic technology

Cryo H&I was founded in 2020 to contribute to the core field of the future industry based on the cryogenic technology based on "Cryogenics for Human & Industry".

We are the only company in Republic of Korea that develops and produces cryocooler, cryopump, and gas liquefaction devices based on cryogenic technology essential for semiconductor, display, bio/medical, hydrogen energy, and aerospace industries, as well as quantum computers, superconducting, and hydrogen and helium gas liquefaction, which are currently in the spotlight.

Cryo H&I continues to strengthen its technological competitiveness to lead the global market through constant R&D and quality innovation in the field of Cryogenic Engineering beyond simple manufacturing.

We deeply appreciate all customers and partners who always believe in Cryo H&I and we promise to provide the best technology and the best value.



HISTORY



- 2025. Selected as a Kibo-Star Valley Company
KOSDAQ Underwriter Appointed
Achieved IP Management Certification
- 2024. Expanded Cryogenic R&D center
Cryocooler Simulation Tool Development
- 2023. Developed LN₂ production equipment
Obtained of Advanced Technology product certification
by Ministry of Trade, Industry and Energy
- 2022. Registered LG Display partner
Developed Cryogenic testing equipment
- 2021. Completed Pyeongtaek new factory
- 2020. Established Cryo H&I
(Acquisition of GVT Cryopump Business)
- 2015. Obtained of new technology
by Ministry of Trade, Industry and Energy
- 2012. Registered LG Electronics partner
Developed Cryopump for OLED process equipment
- 2005. Registered SK Hynix partner
- 2004. Registered Samsung Electronics partner
- 2003. Established GVT Korea
- Acquired EBARA JAPAN Cryopump dept.

MANUFACTURE INFRA

Production line of Factory



3rd Floor

Office

General room
(1600 m²)

2nd Floor

R&D
(600 m²)

1st Floor

Office

Clean room
(1800 m²)

Production Capacity

※ Production capacity is on a monthly basis



[Cryopump]
200 units



[Cryocooler]
300 units



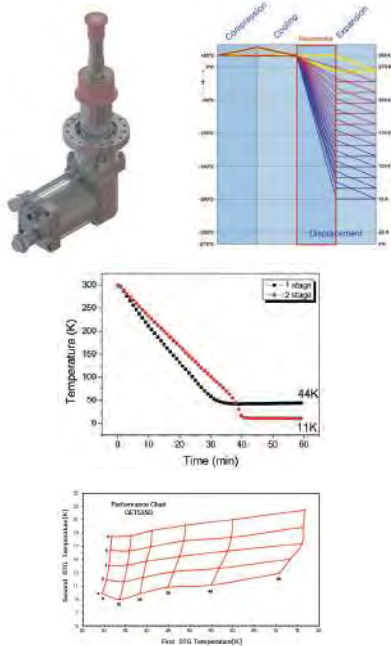
[He Compressor]
120 units

CRYOGENIC R&D CENTER

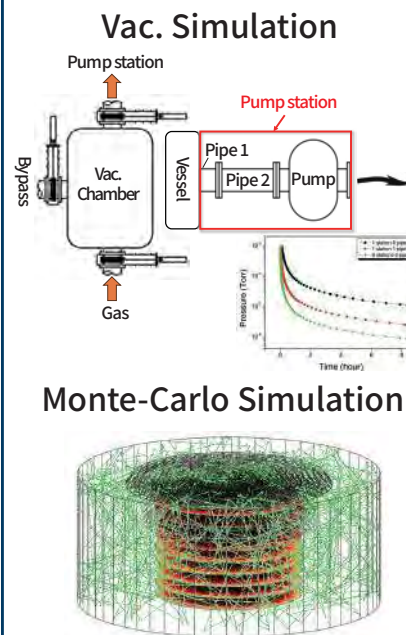
Cryo H&I Cryogenic R&D Center is upgrading Cryopump optimized for semiconductor · display process equipment and developing various applications in energy, medical, bio, superconductivity and aerospace using cryogenic technology and GM Cryocooler



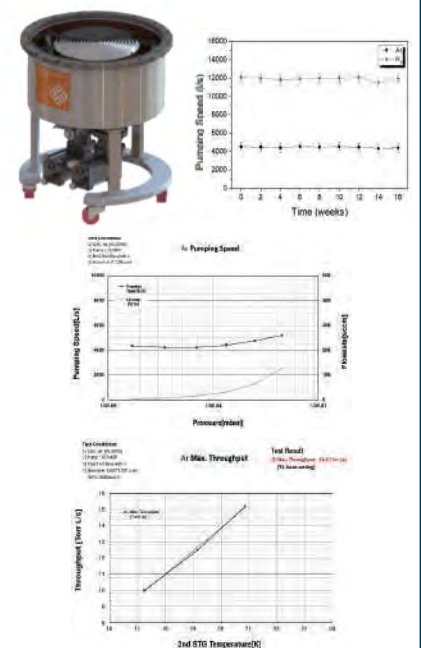
Cryocooler



Simulation



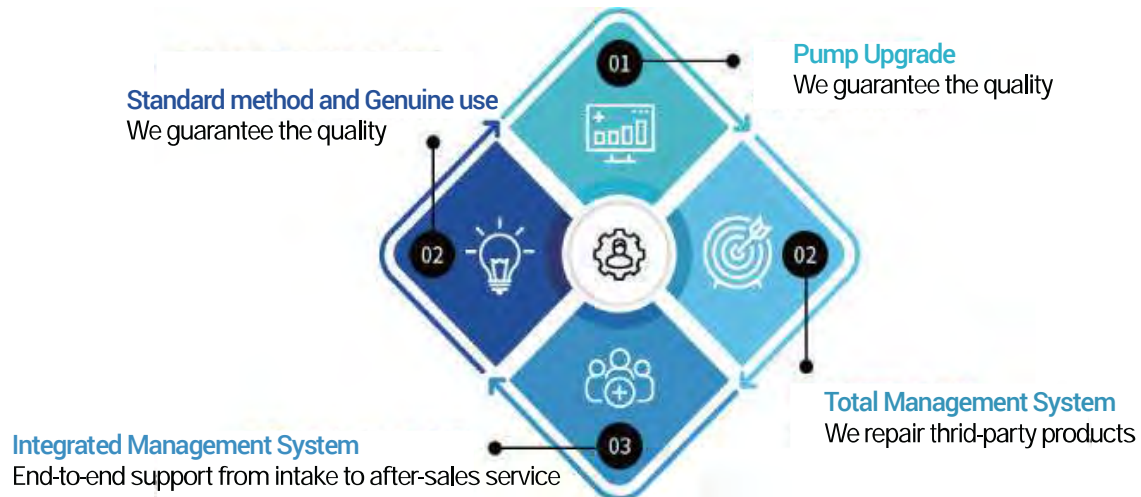
Reliability



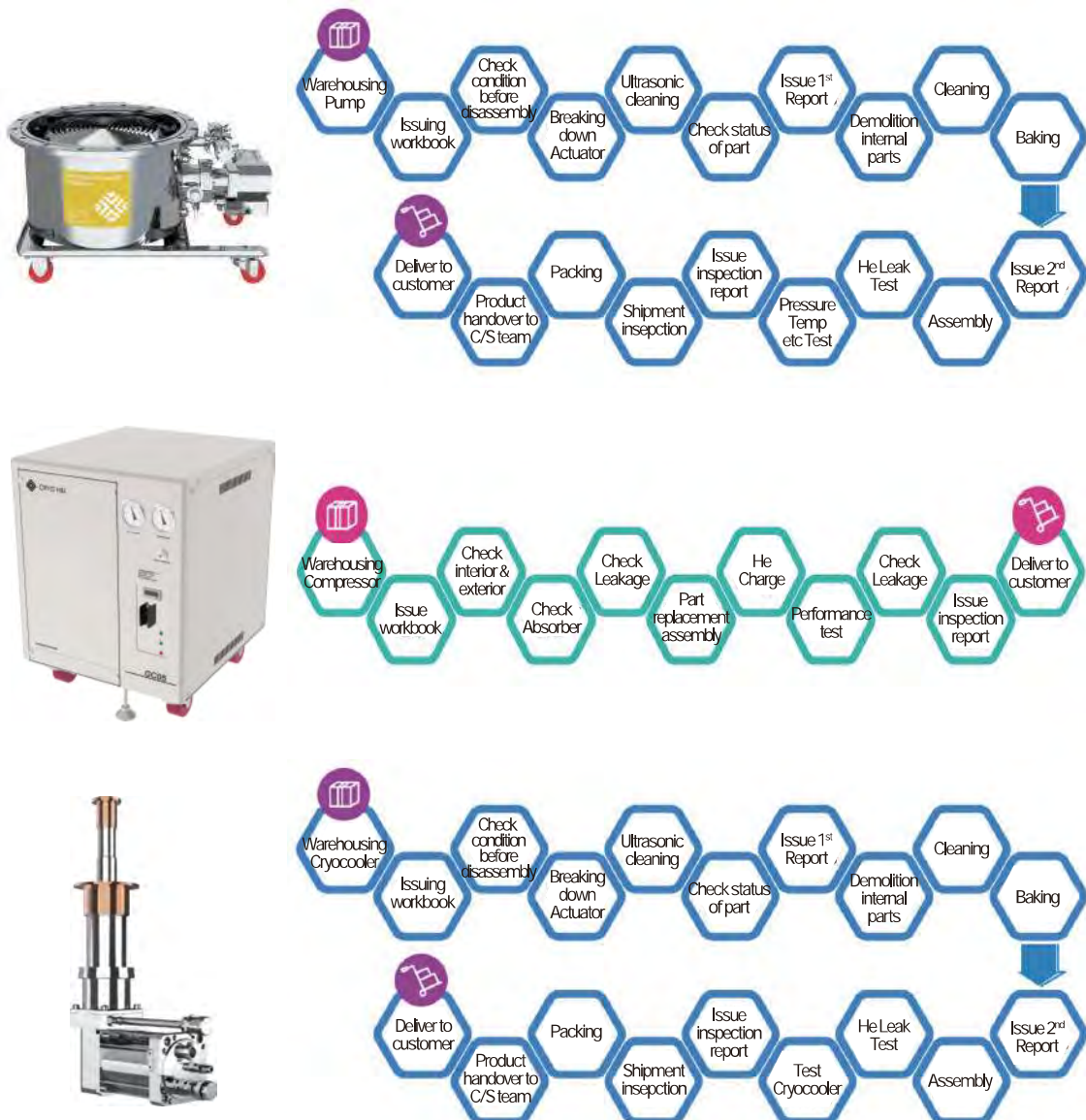
- According to the customer needs, we have the ability to develop a new core technology (Cryogenic GM Cryocooler)
- After confirming the basic concept through cryogenic simulation, proceed with product design
- Before applying the pump, we have the ability to confirm the optimization through vacuum simulation/verification design (Monte-Carlo Method)
- After manufacturing the prototype, we confirm the performance and reliability through various test facilities and measuring equipment for performance confirmation

OVERHAUL PROCESS

With long-standing manufacturer know-how and dedicated repair lines, 100% self-repair is carried out in accordance with genuine, quantitative/ISO standard regulations

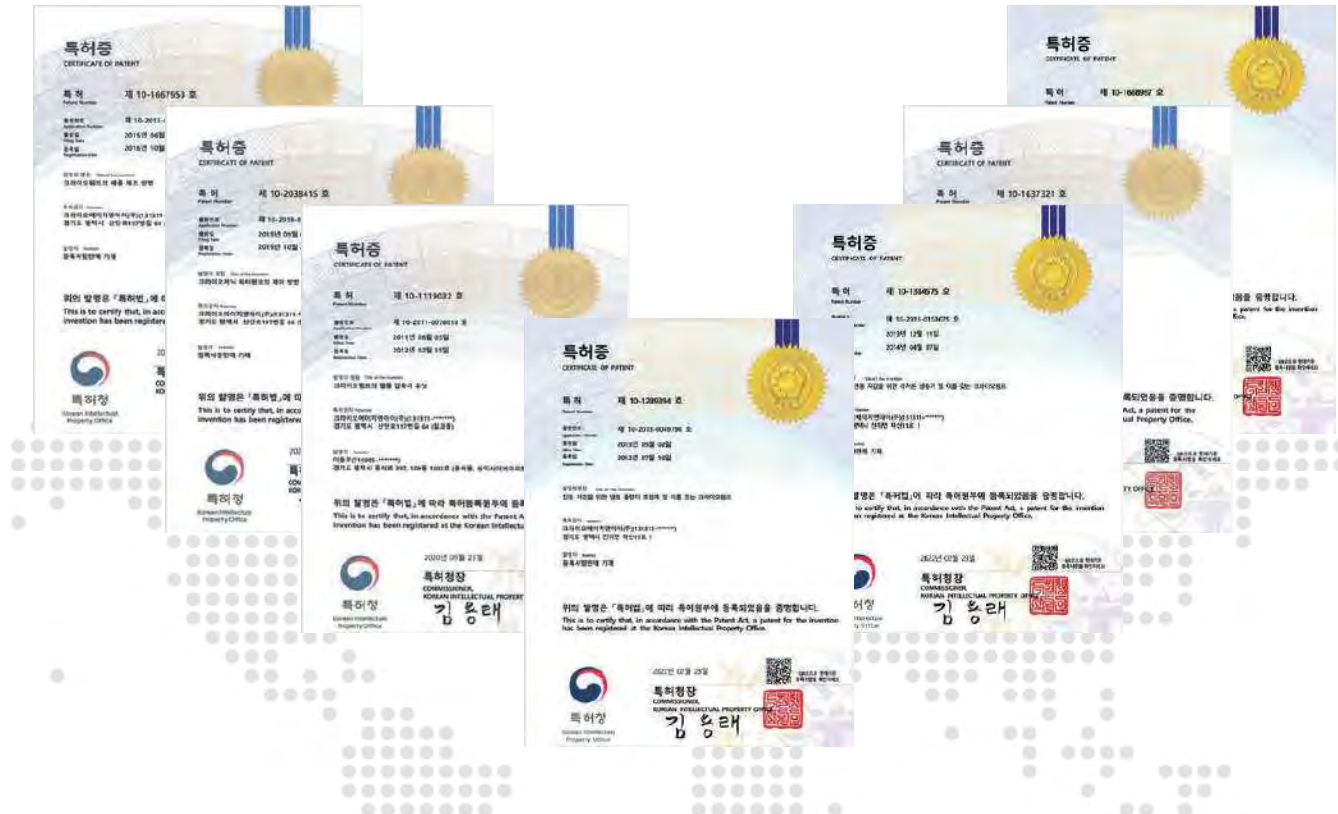


Overhaul Process



CERTIFICATE & PATENTS

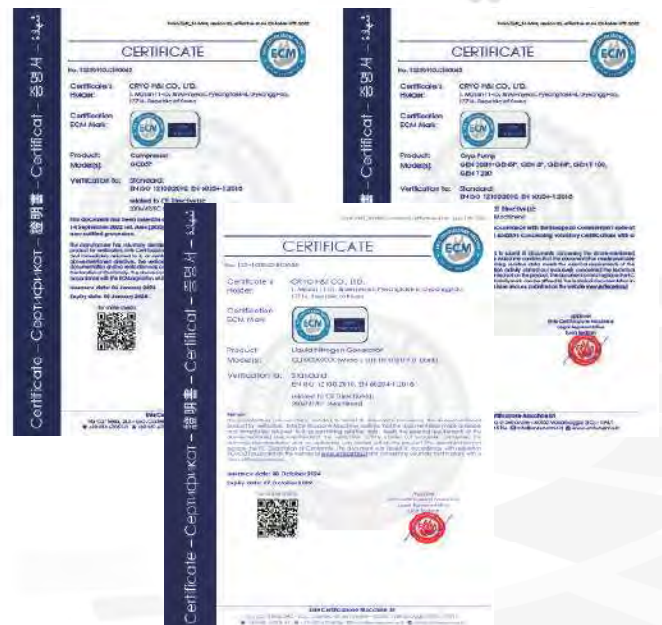
As of 2026 a total of 88 patent is registered and applied are under continuous patent applications to preoccupy core technologies in the cryogenic future



< ISO Certificate >



< CE Certificate >



APPLICATION

The field of Vacuum Cryopump



Vacuum Coating

Space Chamber

Sputtering

Encapsulation

Ion implantation

Particle Accelerator

Nuclear Fusion

Surface Analysis



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Cryo H&I

Cryo H&I, the only company in Korea with Cryogenic technology, creating the future through cryogenic technology



Cryogenic field Cryocooler

Energy

– Hydrogen Liquefaction, Fuel Cells

Medical

– MRI, Bio Health Care, Medical Device

Cryogenic

– Cold Chain, Cryo Preservation

Advanced Information and Communication

– Quantum Computer, Defense IR Sensor

Superconductivity

– Magnetic Refrigerator, Accelerator

New Material · New Functional

– Cryogenic Material/Device Tester

Basic physics

– Cryostat / Probe station



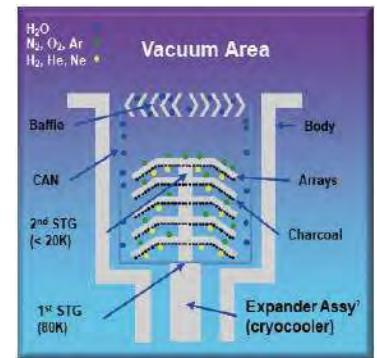
PRODUCT



※ Please contact Cryo H&I for detailed specification

GEN Standard Series

※ Line-up by type, industry and size



< Internal Schematic diagram of Cryopump >

GEN Smart Series

- ※ Up to 8" x 8 pumps can be connected to one compressor
- ※ Equipped with a recognition function before problem occurs



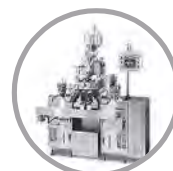
Application



Nuclear Fusion



Particle Accelerator



Encapsulation



Sputtering



Surface Analysis



Vacuum Coating



Ion Implantation



Space Chamber

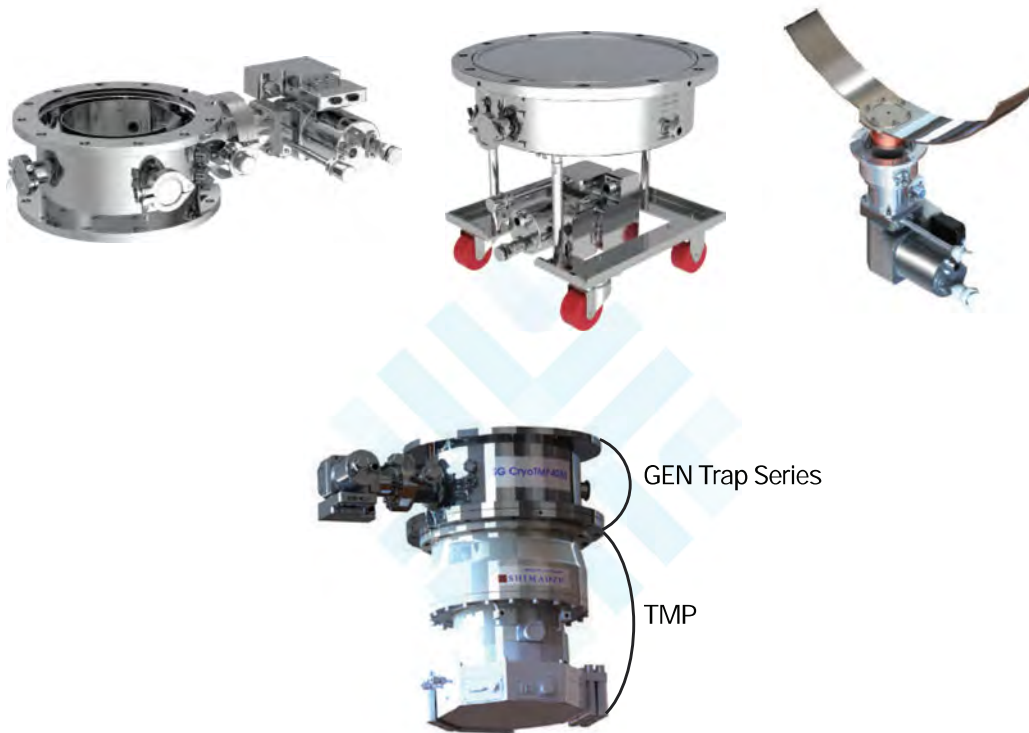
PRODUCT



※ Please contact Cryo H&I for detailed specification

GEN Trap Series

- ※ Water trap specialized for water (H₂O) pumping, which complements the weaknesses of TMP
- ※ Provide customized products to customer specifications by deriving various solutions for applications using GM Cryocooler
- ※ Line-up by size



Hybrid type of Cryopump & TMP

Application



Automotive parts Coating



General Industry



Eyewear Coating



Erosion resistance Coating

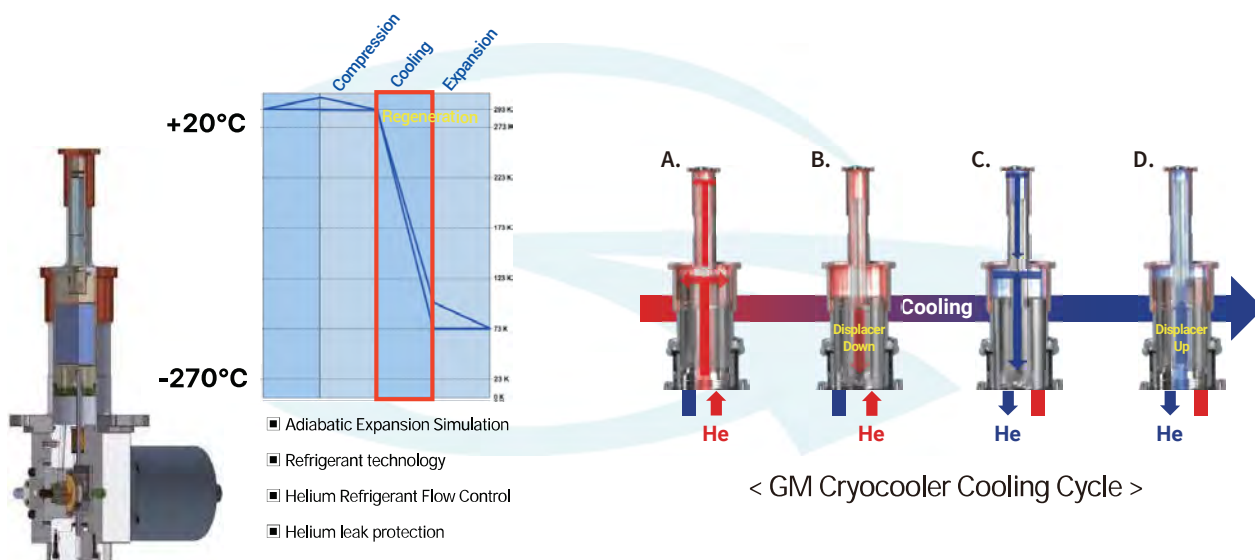
PRODUCT



※ Please contact Cryo H&I for detailed specification

GEN Cooler Series

※ Various line-up by cooling capacity



Application

4K



Quantum Computer



MRI



Accelerator



Probe Station



20K



Hydrogen Liquefaction



Fuel cell

77K



Nitrogen liquefaction

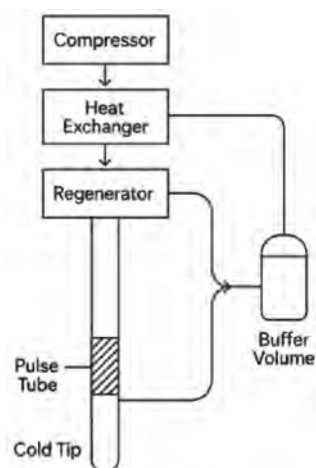


Cryo preservation

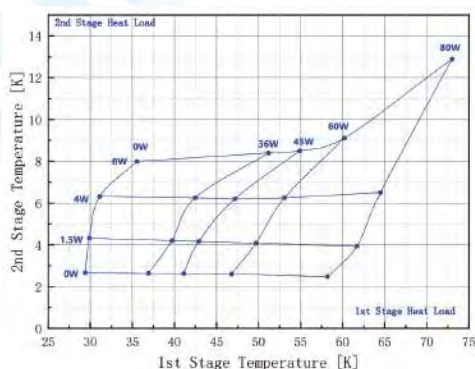
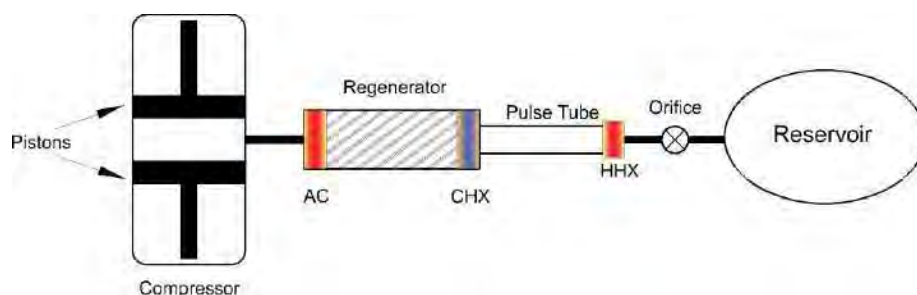
PRODUCT

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GEN PT Cooler Series



Pulse Tube Cryocooler



GM Cryocooler VS Pulse Tube Cryocooler

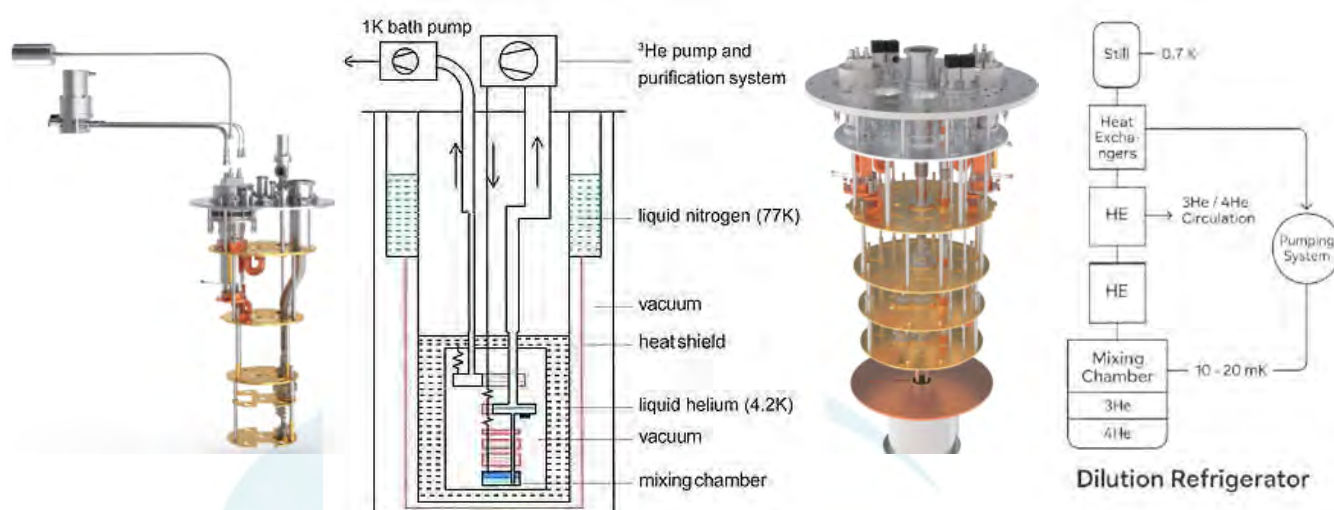
Category	GM Cryocooler	Pulse Tube Cryocooler
Driving part	Displacer reciprocating motion	Stationary (non-mechanical components)
Vibration	Slight	Negligible
Cooling temperature	Possible below 4K	Possible below 4K
Durability / Maintenance	Regular cycle maintenance required	Very good (almost no wear on parts)
Application	MRI, Cryopump, Experimental equipment	Satellites, Quantum chips, Infrared sensors
Initial cost	Relatively economical	High-priced
System complexity	Simple structure	Important for phase control

PRODUCT

※ Please contact Cryo H&I for detailed specification



GEN Dilution Refrigerator



PRODUCT



※ Please contact Cryo H&I for detailed specification

GEN Comp. Series

※ Compressor technology is one of the core technologies of refrigeration devices, and its large-capacity/low-voltage helium refrigerant compression technology allows cryogenic cooling of less than 10K (-263℃)

※ Line-up by helium flow rate @ returned helium pressure 100 psig

▶ The combination is based on 8-inch pump



GC02 Series

1 to 1 combination



GC05P Series

1 to 2 multi combination



GC06P Series

1 to 3 multi combination



GC10P Series

1 to 6 multi combination



GC66P Series

1 to 8 multi combination

Optional Parts



Multi Digital Temperature
Monitor



Flexible Helium
Hose



Multi system
Manifold



Purge Gas
Heater

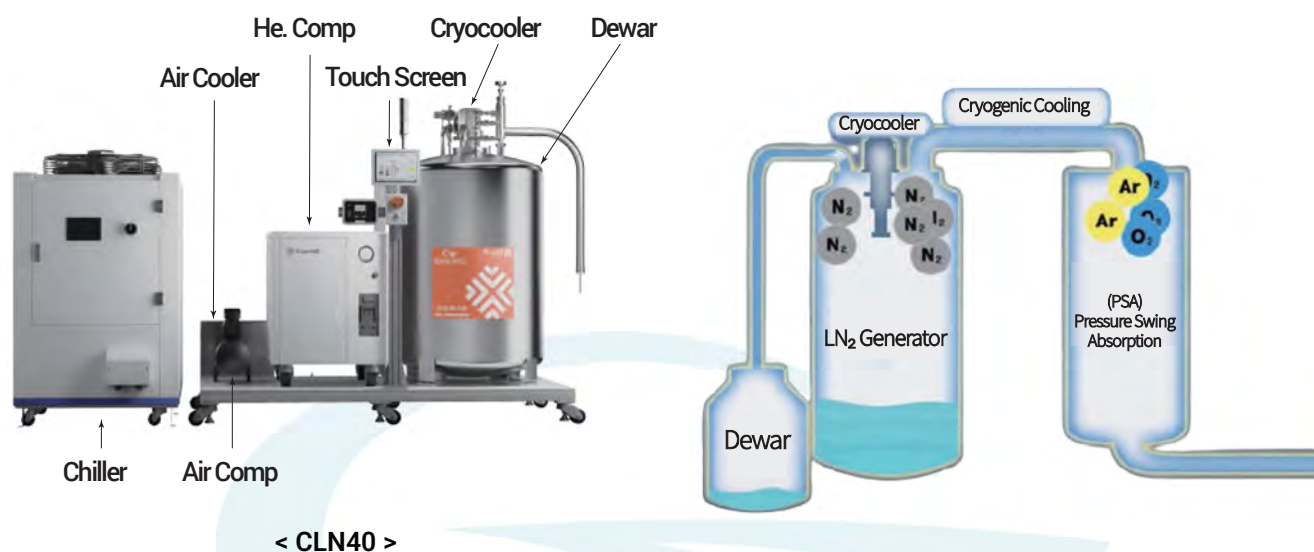
PRODUCT



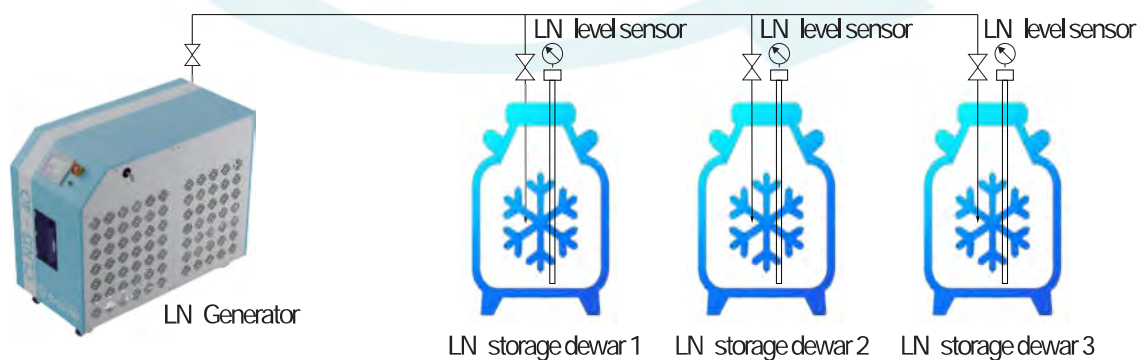
※ Please contact Cryo H&I for detailed specification

LN₂ Generator

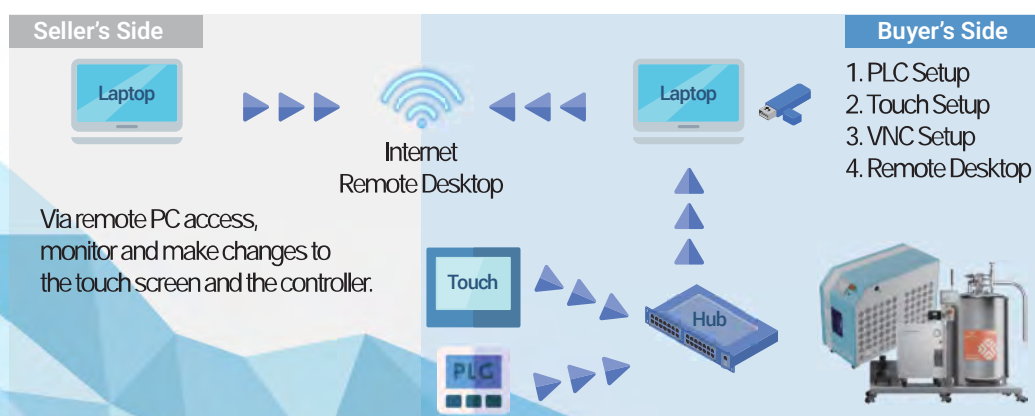
System that can be conveniently and stably produced and supplied directly by simply operation by liquefying gaseous nitrogen in the atmosphere with cryocooler and automatically supplying the liquid nitrogen



LN₂ Auto Filling System



LN₂ Remote system



PRODUCT

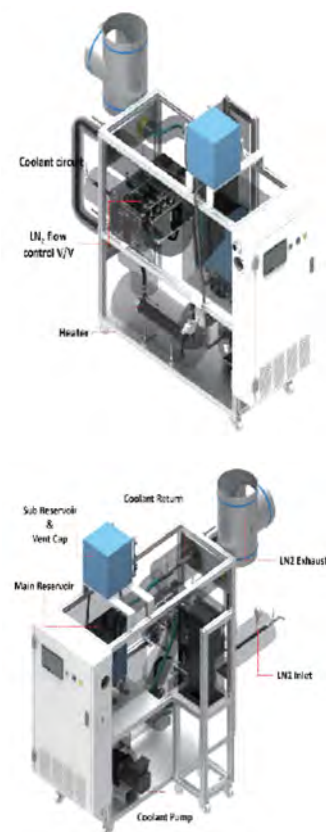


※ Please contact Cryo H&I for detailed specification

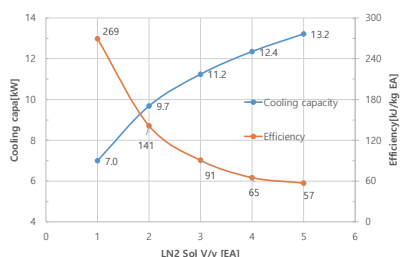
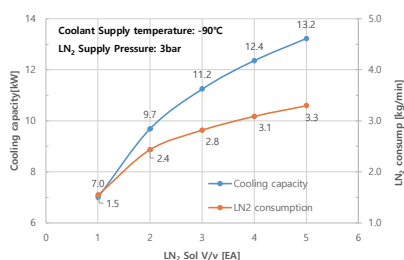
Cryo Chiller

Cryogenic chiller device that using liquid nitrogen (-196 °C) and chiller coolant heat exchange

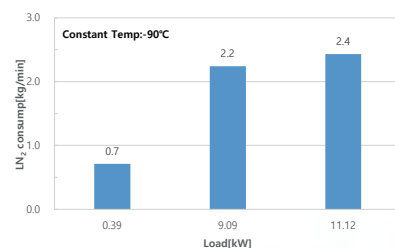
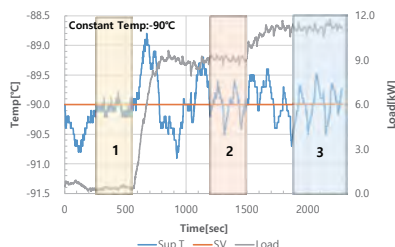
No.	Item	Description
1	Cooling Type	Heat Exchanger 1 Channel
2	Channel	Channel 1
3	Temp Range	-90 °C ~ +30 °C
4	Temp Accuracy (IDLE)	±0.5 °C
5	Cooling Capacity	12kW at -90 °C
6	Max Flow Rate (Coolant)	30LPM at 3~5bar
7	Coolant	HFE-7200
8	Refrigerant	LN (Liquid Nitrogen) / (GWP:0)
9	LN Consumption	2.5kg/min (3.0 /min) @3bar
10	Heater	4kW
11	Pump	Magnetic Pump 2.2kW (220V 3P3W+PE)
12	Display	LCD Touch panel (Proface)
13	Interface for Main M/C	Analog/Digital
14	Ambient Temp. & Humidity	Temp. : +15 °C ~ +35 °C Humidity : Less than 70%
15	Facilities Requirements	Electrical Power : 200~220VAC, 3phase, 50/60Hz Main Breaker : 3P 40A LN supply pressure : More than 3bar
16	Connection Type	Coolant : 3/4" Lock Type LN : 1/2" Lock Type
17	Dimension	630 x 1400 x 1350 (W x D x H)



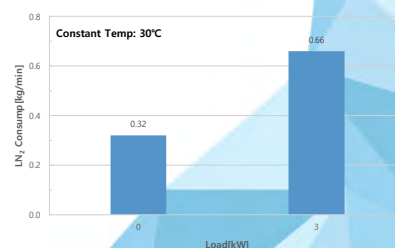
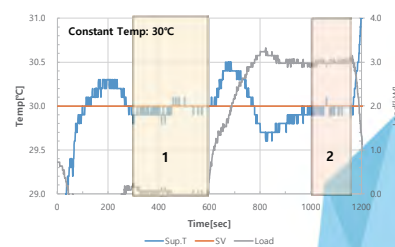
► Max Cooling Capacity



► Constant Temperature Control (-90 °C)



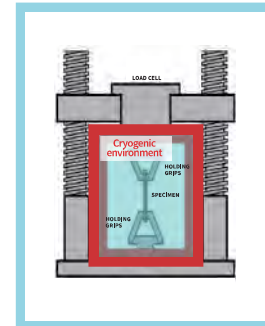
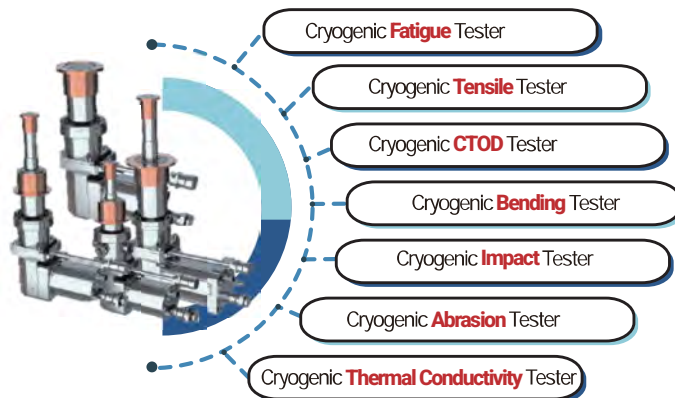
► Constant Temperature Control (+30 °C)



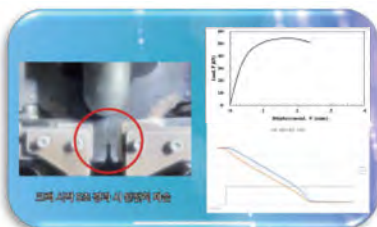
PRODUCT



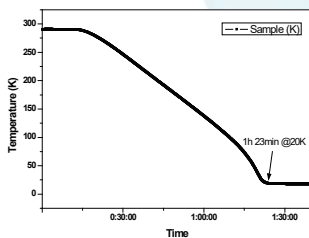
※ Please contact Cryo H&I for detailed specification



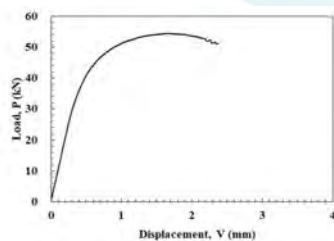
Cryogenic CTOD Tester



20K CTOD Test



< Sample cool down time >



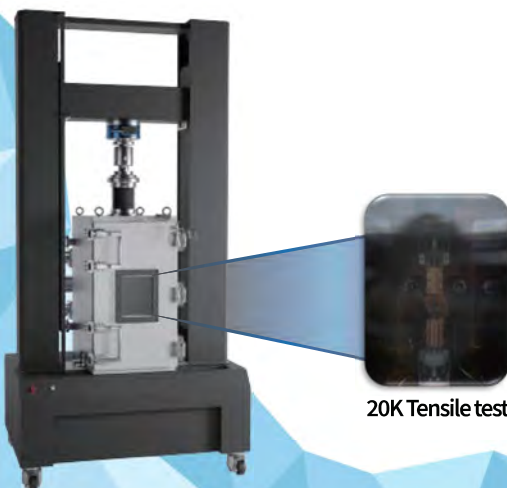
< STS 316L parent material CTOD test >

No need for liquefied substances
(liquid nitrogen, hydrogen, helium)
for cryogenic testing



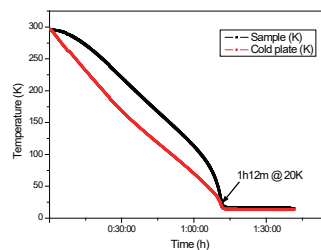
[Cryo UTC-20K-C1]

Cryogenic Tensile Tester

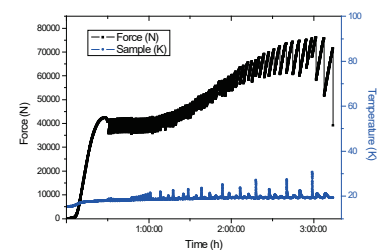


[Cryo UTC-20K-T1]

20K Tensile test



< Sample cool down time >



< Stainless Steel (SUS 304) tensile test >

PRODUCT

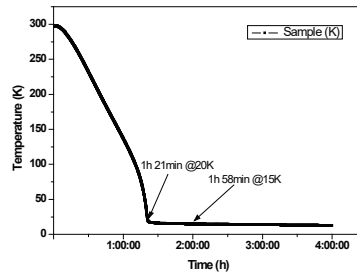


※ Please contact Cryo H&I for detailed specification

Charpy Specimen Cooling System



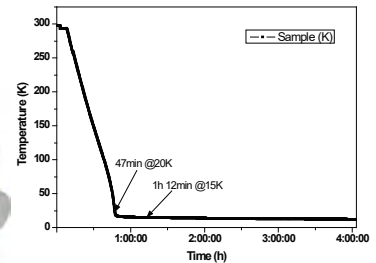
[Cryo UTC-20K-P1-6 Specimen]



< Cool down time >



[Cryo UTC-20K-P2-1 Specimen]

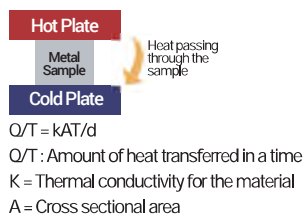


< Cool down time >

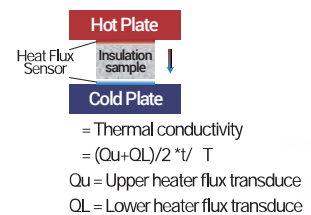
Thermal Conductivity Tester



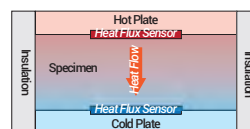
[Cryo UTC-20K-M1]



[Cryo UTC-20K-F1]



[Cryo UTC-20K-H1]



Measured by Heat Flux Sensor

$$q''_{Avg} [W/m^2] = \frac{q''_{Hot} + q''_{Cold}}{2}$$

Measured by Silicon Diode or RTD

$$\lambda = k = q''_{Avg} \cdot \frac{d}{\Delta T}$$



www.cryohi.com



cryohi@cryohi.com



+ 82 31 663 1122



1, Masan 11-ro, Jinwi-myeon,
Pyeongtaek-si, Gyeonggi-do
Republic of Korea



크라이오 에이치앤아이(주)

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