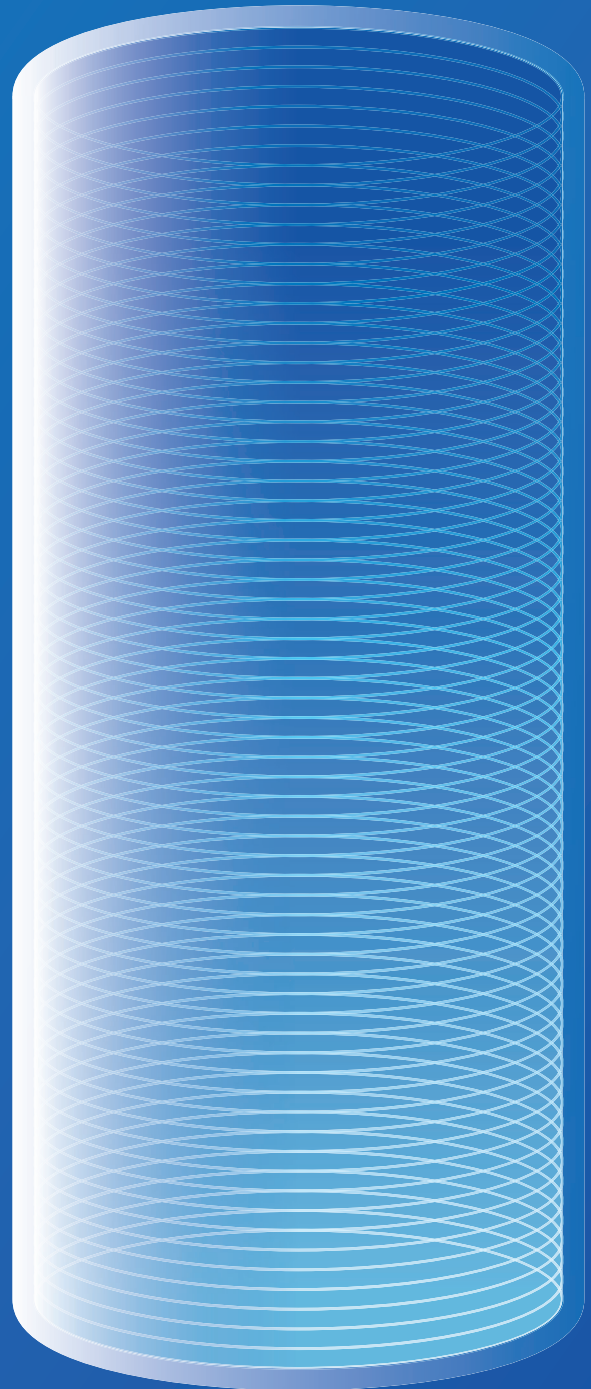


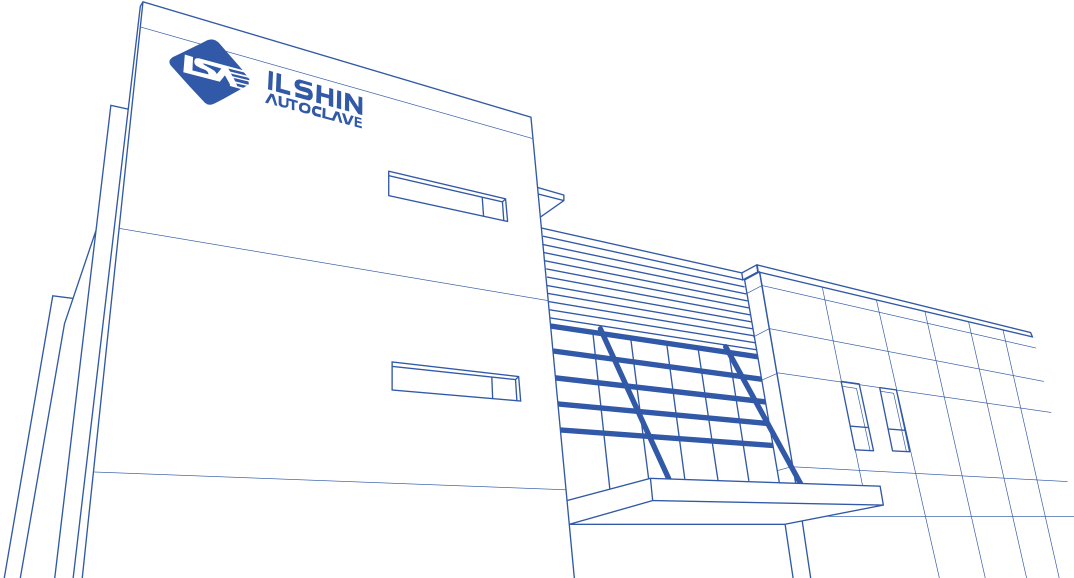
ILSHIN AUTOCLAVE

Company Profile

**WE
MAKE
YOUR
IDEA
POSSIBLE**



ILSHIN AUTOCLAVE



Contents

Company Profile	02 - 05
Product	
01. Pressure Vessel	08 - 09
02. Agitator (Magnedrive)	10 - 11
03. High Pressure Reactor	12 - 13
04. PCO Pressure Curing Oven	14 - 15
05. HIP Hot Isostatic Press	16 - 17
06. HiPPo HPP High Pressure Processing	18 - 19
07. CIP/ WIP Cold/ Warm Isostatic Press	20 - 23
08. Hydraulic Press	24 - 25
09. Supercritical Carbon Dioxide Fluid System	26 - 29
10. Supercritical Water	30 - 31
11. High Pressure Homogenizer	32 - 35
12. Mixer	36 - 37
13. Plant	38 - 39
14. Test	40 - 41

Company Profile

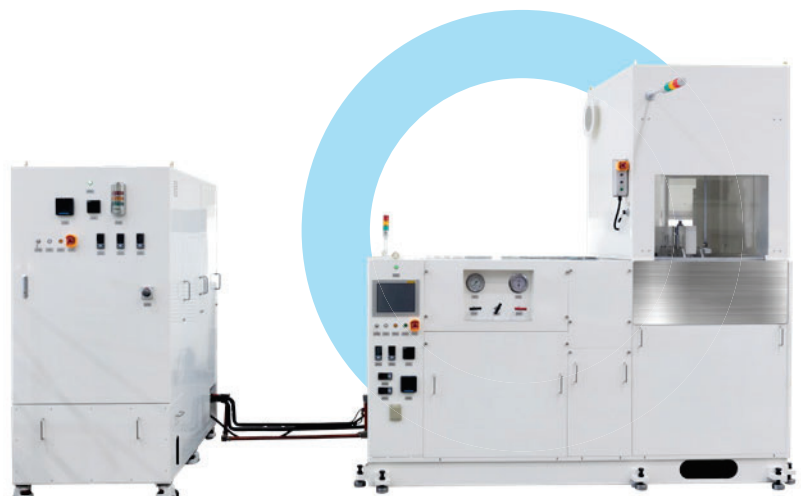
Overview



We make your idea Possible!

Ishin Autoclave was established in 1993 for nuclear power generation and thermal power generation. Starting with pressure vessel engineering, autoclaves, supercritical technology, We have succeeded in commercializing products such as ultra-high pressure instantaneous machines and hydrostatic pressure presses.

Ishin Autoclave provides prompt and accurate service by performing the entire process including technical sales, engineering, design, manufacturing, commissioning, and after-sales service.



History

With 30 years of technological know-how

We provide trust and satisfaction to our customers.

- one of the 200 Global Small Giant Companies by the Ministry of SMEs and Startups
- Youth-friendly small business
- Ultra-high pressure dispersion device patent registration
- Ultra-high Pressure Isostatic Pressure Device Patent registration
- renew ASME Stamp 'S', 'U', 'U2', 'U3'

2021

- Designated as a talent development small and medium enterprise
- Designated as a high-tech company by the Ministry of Science and ICT
- Obtained patent for winding device for Pressure Vessel
- Obtained patent for ultra-high pressure Plunger Pump for Tightening Jig
- Designated as a family company by Korea Institute of Energy Research

2020

- Establishment of ILSHIN AUTOCLAVE
- Development of Autoclave System in Korea
- Development of Hot Plate Press in Korea
- Development of Cold Isostatic Press in Korea
- Development of Super Critical Extraction Device in Korea
- Development of Mangetic Drive in Korea
- Development of Super Critical CO2 Cleaning Device in Korea
- Development of High Pressure Metering Pump in Korea
- Development of SSRT(Slow Strain Rate Tester) in Korea

1993-2000

- Establishment of Company affiliated research institute
- Achieved \$5 million in exports
- Achieved certification ISO 45001
- Renew certification of ISO 9001, 14001
- Renew A6 certification for Pressure Vessel

2022

- Won the Presidential Award at the Invention Patent
- Top 100 Small Giant Companies in Materials, Parts and Equipment
- Obtained Patent for ultra-high Pressure Intensifier Pump
- R&D excellence and corporate Confirmation
- Technologically innovative company (INNO-Biz)

2019

- Corporation Conversion of Ilshin Autoclave
- Obtained ASME Stamp 'S' 'U' 'U2' 'U3'
- Development of Gas Booster in Korea
- Development of Hot Isostatic Press(HIP)in Korea
- Development of Ultra-High Pressure Isostatic Press for MLCC in Korea
- Development of Ultra-High Precision Composite Material Molding Autoclave in Korea
- Development of Airgel Supercritical Drying Device and Supercritical Degreasing Device
- Development of Ultra-High pressure Nano Disperser in Korea

2001-2011

- Achieved \$7 Million in exports
- Achieved \$14 Million Sales in Daejeon
- New Model Development of Moter driven Disperser (NLM-100)
- Servo-controlled cam type Disperser Patent

2023

- Acquired Certification as an Excellent Employment Company from Daejeon Metropolitan City Mayor
- Radiation Room Completion
- HPP(High Pressure Processing) Development and Massive Production
- Obtained ultra-high Pressure Vessel NET new technical Certification

2017-2018

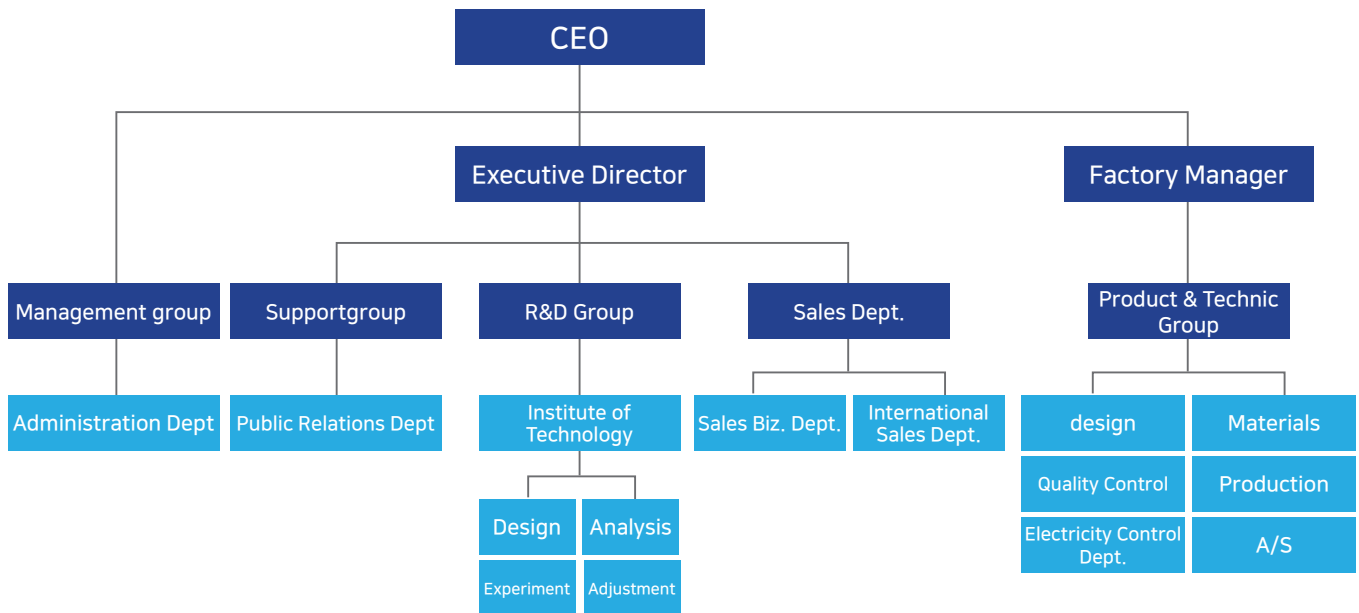
- Obtained Certification of China SEL (Special Equipment License)
- Won the Minister's Award at Productivity Awards
- Acquisition of CE Certification (WIP next-generation / LTCC)
- 1 Million \$ Export Achievement

2012-2016



Company Profile

Organization Chart



Subsidiary



HIFLUX®

Hiflux Co., Ltd. is a local Manufacturer of Ultra-High Pressure Valves, Fittings, and Piping Materials. Through Continuous Research and Development and Facility investment to pioneer new markets, We domestically produce a variety of High-Pressure piping materials that are difficult to Manufacture. Our technological prowess is recognized through our success. markets.

PUMSTER

INDUSTRY LEADER IN PUMP & BOOSTER

Pumpster Co., Ltd. has established itself as a leading company in the field of high-pressure pumps, boosters, and system equipment through continuous technological R&D. And as a leading company in field of high-pressure pump, we are growing beyond Korea and into the world based on our advanced technology.



KACECO

Korea Air Conditioning Engineering Co., Ltd. has been leading the HVAC system in Korea for the past 30 years and provides total solutions for various buildings and plant facilities.

Certifications

Ilshin Autoclave has established an unrivaled position in the high-Temp , high-Pressure field and strives to achieve customer satisfaction through continuous technology R&D.

- **Patents - 58** : Supercritical (12), Nano-Disperser (20), Water-Jet (6), Etc (20)
- **TradeMark registration - 9**
- **CE Certification**

ASME Certification



ISO Certification



SEL Certification



Strength

Through Continuous Technological Development and innovation , selected to Material & equipment and globally strong Company Ilshin Autoclave , Provide design to construction to our customer by one-stop Service.



Through Discussion how to manufacture, Implement diverse fuction and performance.



Based on numerous manufacture experience , owned technology and know-how by itself.



Excellent compatibility with harsh conditions such as ultra-high temperature, high pressure, high RPM, Strong acid and strong base plant equipment.



Easy maintenance by easy assembly disassembly.



Prompt After Service by Customer satisfaction dept.



Design and Manufacture to fit High-pressure vessel safety regulation.



ILSHIN AUTOCLAVE PRODUCT

01. Pressure Vessel
02. Agitator (Magnedrive)
03. High Pressure Reactor
04. PCO Pressure Curing Oven
05. HIP Hot Isostatic Press
06. HiPPo HPP High Pressure Processing
07. CIP / WIP Cold / Warm Isostatic Press
08. Hydraulic Press
09. Supercritical Carbon Dioxide Fluid System
10. Supercritical Water
11. High Pressure Homogenizer
12. Mixer
13. Plant
14. Process Test



01. Pressure Vessel

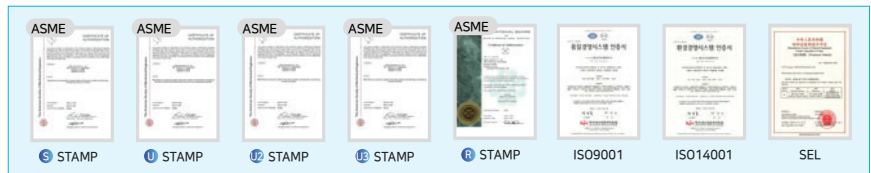
Pressure vessel takes certain Fluid Pressure(liquid/gas) to in/external, We manufacture a variety of containers , from reactors and small containers that can withstand high temp and pressure to large containers that can be used for industrial purposes such as heat exchangers , reactors , and storage tanks.



Feature —

1. Design and Manufactured by High Pressure Vessel Safety Regulation ASME. (The American Society of Mechanical Engineers)
2. Manufactured through certification by Korea Gas safety Corporation and Occupational Safety and Health Agency.
3. Manufacture customized equipment as diverse specification. (Temperature , pressure , volume)

Certification —



Industrial & Giant High pressure Vessel

Pressure Vessel can be used to various form , depends on usage purpose of Product Process , It is manufactured to diverse form and structure according to features , conditions , uses of fluids.



- ※ Depends on Application , Large Pressure Vessel is classified to generating steam , microbial , external pressure testing , heat-exchange.
- ※ Detailed specification about temperature , pressure , volume of pressure vessel should be discussed with person in charge.

Special and reactive Pressure Vessel

It is a pressure vessel used for reactions at high temperature and high pressure and can be applied to various fields such as chemical research , pharmaceutical research and removal of toxic substances.

Models are classified according to the fastening method , and can be selected to suit the desired specifications or purpose.

Model	Method of Contract	Temperature	Pressure	Seal Type	Agitation
CV Series	Cap Closure Type	200℃	100bar	O-ring	X
BV Series	Bolt Closure Type	Specifications consultation	Specifications consultation	O-ring / Gasket	O / X
CVB Series	Cap Closure Bolt Type	200℃	100bar	Surface	X
C-Clamp	C-Clamp Closure Type	Specifications consultation	Specifications consultation	O-ring	O / X



CV TYPE (Cap Closure Pressure Vessel)

1. Easy open/close by hand or simple tools
2. Mostly manufactured to small size , specialized to chemical experiment with Teflon Liner (Teflon is for anti-chemical)
50ml / 100ml / 200ml



CVB TYPE (Cap Closure Bolt Pressure Vessel)

1. A Pressure Container that is sealed using the slanted side of the teflon container.
2. Mostly used for chemical experiment , fasten by simple tool and less power
50ml / 100ml / 200ml



BV TYPE (Bolt Closure Pressure Vessel)

1. Most common type of pressure vessel
 2. A fastening method using bolts, in which the cover and body are in direct contact and sealed with a separate seal.
- Attach the gauge to check the inner pressure
 - Install the port line to charge and discharge for inner fluid



C-Clamp (C-Clamp Pressure Vessel)

1. Cap/bolt combination pressure vessel for easy fastening, pressure vessel that can be used without separate tools
2. use vessel which is highly withstandable to temperature/ pressure / anti-corrosion
3. A variety of O-rings can be selected with Teflon liner up to 200°C



VC TYPE (View Cell Pressure Vessel)

1. A pressure Vessel that equipped view cell that observe inside of vessel from one direction to bidirection
2. It can be used in high pressure due to quartz , enforced glass



PIV TYPE (Pin Closure Pressure Vessel)

1. A pressure vessel that maintains pressure by inserting pin-shaped parts when the pressure vessel cover is closed
2. Used for ultra-high pressure products in industrial facilities
3. Used for CIP/WIP

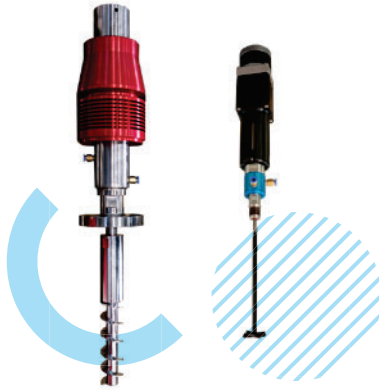


TV TYPE (Cone Thread Tubing Type Pressure Vessel)

1. Pressure Vessel that can be manufactured up to the smallest capacity the pressure vessel product line
2. Used for small to large precision experiments and performs high temperature and pressure

02. Agitator

Agitator with magnet is able to spinning high speed on high temperature and pressure in tank, reactor, vessel. Even gas, high viscosity liquid can be mixed and disused.

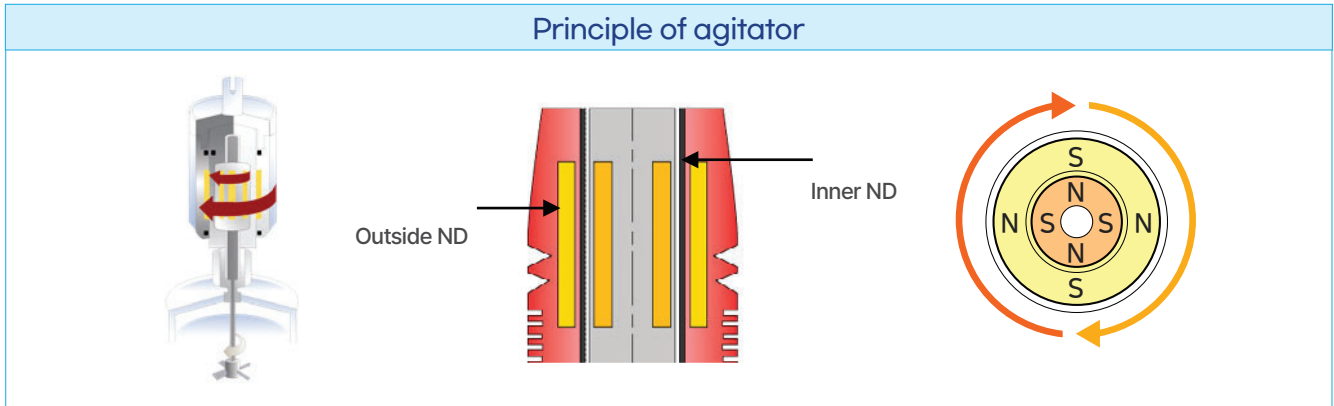


Features —

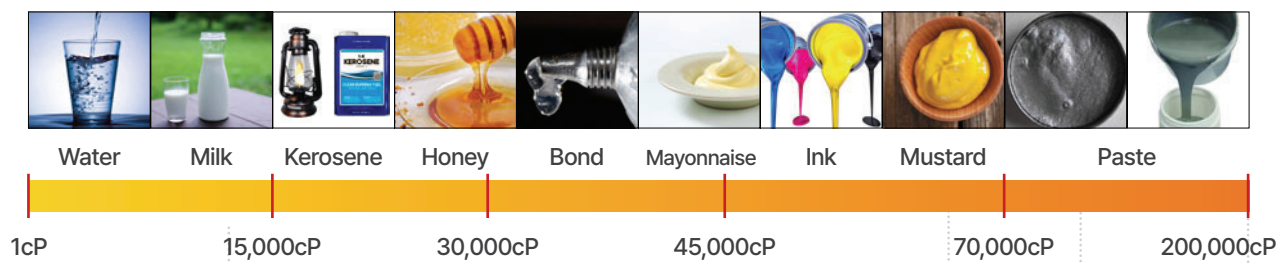
1. Applicable to high pressure and temperature (Max 330°C)
2. Access to high speed spinning on high pressure and temperature

Series	Pressure	Shaft Dia	체결방식
MDA Series	160bar at 300°C (Details need to be discussed)	Φ 10 ~ 30	Thread / Flange Type
MDB Series			

Principle of agitator



Example of viscosity



Examples of appropriate usage range



MDA Series



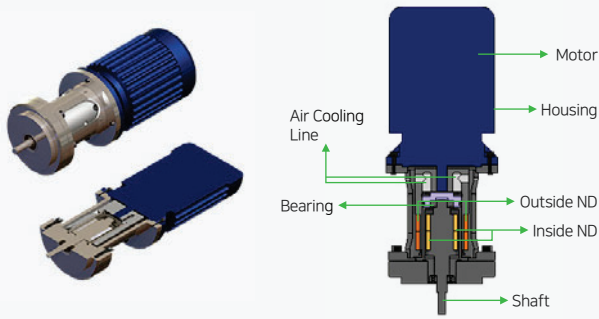
A motor-integrated, direct-rotation stirrer in which the Magnedrive directly rotates and stirs

MDB Series

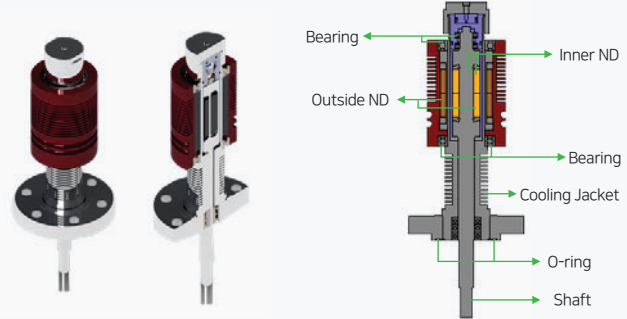


A stirrer that rotates the shaft by directly connecting the motor and the housing of the Magnedrive with a belt.

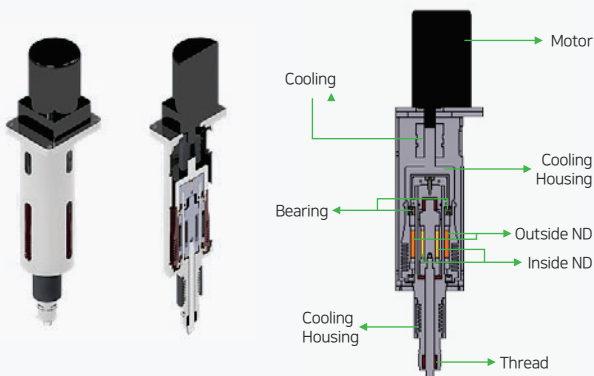
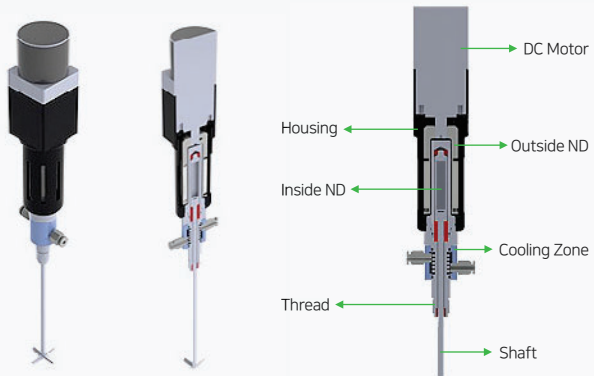
MDA - Flange Type



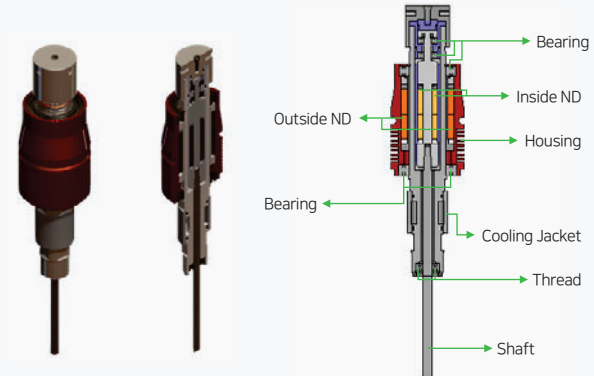
MDB - Flange Type



MDA- Thread Type



MDB - Thread Type



Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test

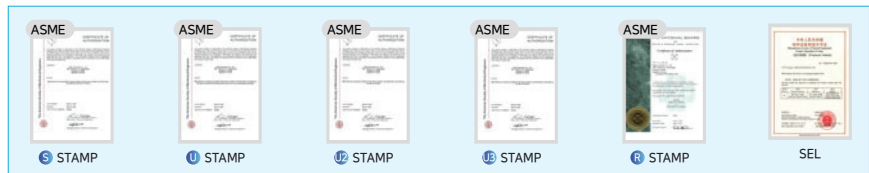
03. High Pressure Reactor

It is a research reactor that can perform various research such as chemical synthesis, decomposition, sublimation and extraction in a high temperature and high pressure environment. Temperature and pressure capacity can be selected, and various options can be selected depending on reaction conditions.

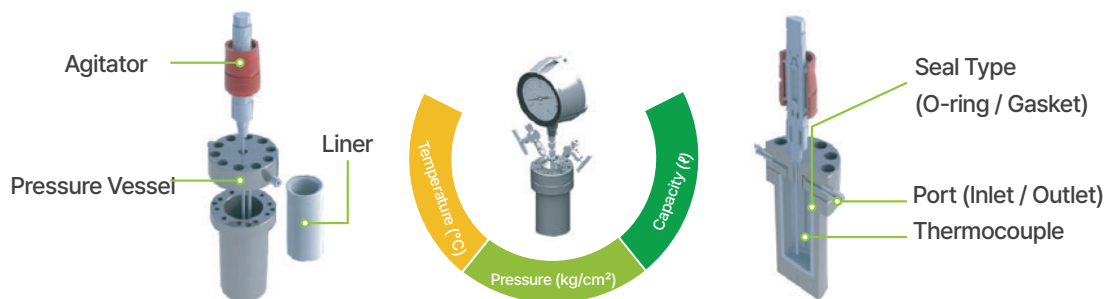
Features —

1. Design and Manufacture to fit High-pressure vessel safety regulation called ASME (The America Society of Mechanical Engineers)
2. Manufacture customized equipment as diverse specification (Temperature, pressure, volume)
3. easy maintenance by easy assembly/disassembly
4. It can be manufactured to special purposal specificaiton with stirring, vibrating, rotating

Certification and patent —



Components of high pressure reactor



Options

Options	Applications
Agitator	1. A directly connected motor stirrer can be applied.
Heater	1. The sample or liquid can be directly heated by inserting the immersion heater into the vessel.
	2. It can be applied using a ceramic band heater or mold heater heating method.
	3. It can be applied as a heating method that can raise and cool the temperature through heat transfer oil using a jacket boiler.
	4. By adding an insulating jacket or a heated jacket to the top cover, you can increase thermal efficiency and improve temperature precision.
Open/Close Method	1. The container can be opened and closed automatically using the C-clamp or bolt method, and the cover also can be opened and closed automatically through the cylinder.
	2. The reactor cover and stirrer are opened by moving up and down with an electric hoist. This can be applied when the cover is heavy
	3. It is possible to move up and down through the reactor body cylinder and back and forth through rails and cylinders, making it easy to charge/discharge samples.
	4. The body of the reactor can be moved up and down manually using a ball screw.
	5. The reactor can be moved up and down using the cover and stirrer cylinder.
Extra options	1. Easy and convenient touch screen installation allows USB data extraction and can be linked to a PC upon customer request.
	2. By adding a condenser, it can be used as a reflux to liquefy the internal vapor, and can condense the steam generated when cooling after the process is completed under high temperature and high pressure conditions in the reactor.

Bench Type Reactor



It is simple to operate and has a compact design that is not limited by space, so it can be used for a variety of research purposes.

Multi Purpose Reactor



This reactor can be configured with various optional specifications depending on the customer's purpose of use, such as temperature, pressure, capacity, material, and RPM. It can be used for various research purposes such as hydrothermal synthesis reaction, rotation reaction, thermal decomposition reaction, rotational combustion reaction, and detonation reaction.

Comprehensive reactor



It is used in a polymerization reaction where small molecules called monomers combine with each other to create large polymer substances.

Catalytic Reactor



It can perform catalytic reactions for various substances and is safe against heat and endotherm generated during catalytic reactions.



You can make specification inquiries and custom orders through consultation with the person in charge.

Hydrogenation Reactor



It is a reactor capable of hydrogenation, a chemical reaction that occurs between hydrogen molecules and elemental compounds in the presence of a water catalyst, and can perform hydrogenation reactions on various substances.

Ultra-High Temperature and Pressure Reactor



It is a reactor that can perform chemical, hydrothermal, catalytic, hydrothermal carbonization reactions, etc. at ultra-high temperature and pressure conditions. It is widely used in heat treatment, industrial heating systems, chemical and petrochemical, and aviation fields.

Continuous Process Reactor



It is a reactor that can cause chemical reactions in stages, and can perform stage-by-stage catalytic reactions of coal or petrochemical products, and is configured to suit the reactivity of each stage.

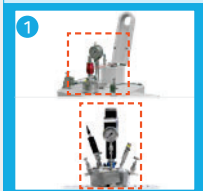
Pilot Plant and mass production reactor



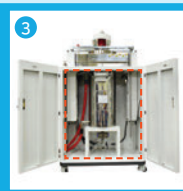
From small R&D facilities to pilot plants and mass production reactors, we can produce a variety of products to suit customer requests.

Image of Components

Agitator



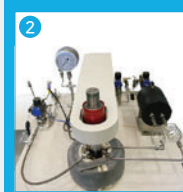
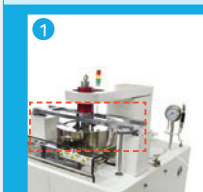
Heater



Extra options



Open/Close Method



Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test

04. Pressure Curing Oven

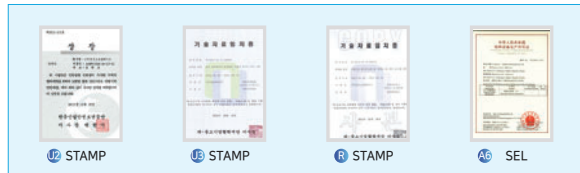
The process for bed pressure and forming is carried out while maintaining uniform pressure and temperature. This is applied to attaching a touch screen or small LCD film, and is suitable for advanced semiconductors. It is used in various fields of the parts industry.



Features —

1. Remove air bubble by pressure and temperature.
2. Curing operation by temperature.
3. Strengthening adhesion by pressure.

Main certification and patent —



Components of Pressure Curing Oven

Main O-ring

Conservation of inner Pressure

Heating/Cooling Line

Heating/Cooling Device

Circulation Fan and Motor

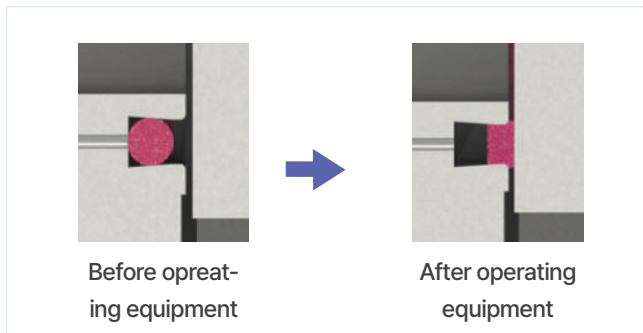
For internal temperature deviation control

Booster

Pressurizing Device

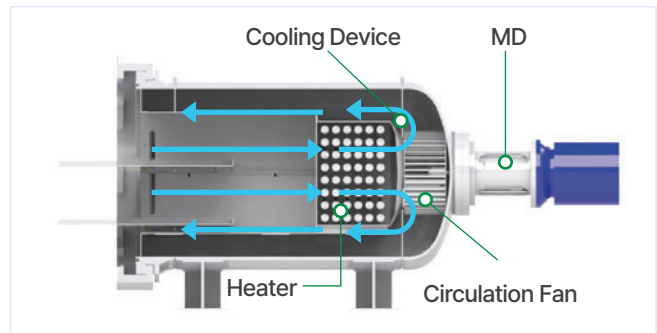
Features

Main O-ring




- Extend O-ring lifespan
- Select material suitable for temperature
- No foreign matter generated

Flow

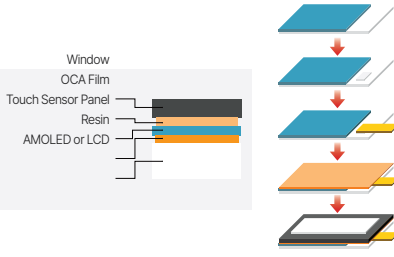


- Temperature Range : $\pm 3^{\circ}\text{C}$
- Temperature Control : Convection Type
- No wasted space : Compose cooling system by using unnecessary space

Film Adhesion (FA)



It is applied to the lamination process that requires bonding of multiple films and performance is improved through uniformity of layers by removing bubbles between film layers




Glass Bonding (GA)



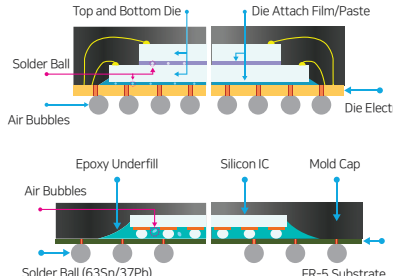
It is applied to the lamination process that requires joining multiple sheets of glass, and improves performance by equalizing the layers by removing bubbles between the glass layers.



Semiconductor Package Process (HA)

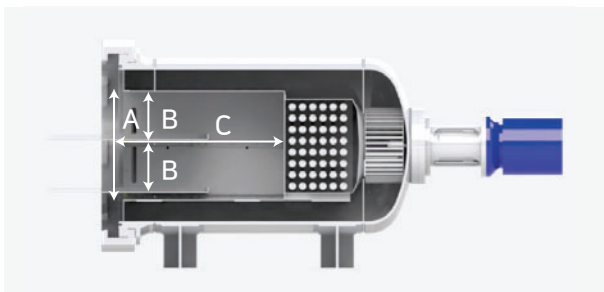


This is a equipment that cures epoxy resin and simultaneously removes internal bubbles and voids through isodirectional compression at a constant pressure using gas. The curing and degassing processes are carried out simultaneously, resulting in high process efficiency.



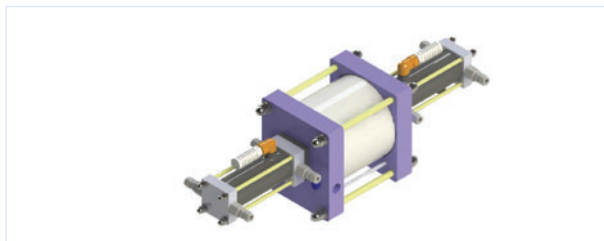
Pressure Vessel
 Agitator
 High Pressure Reactor
 Pressure Curing Oven
 Press
 Supercritical
 High Pressure Homogenizer
 Mixer
 Plant
 Process Test

Selection Criteria



- 1 Size (A, B, C)
- 2 Pressure
- 3 Temperature
- 4 Cooling
- 5 Pressurizing Device (Booster or Compressor)
- 6 Pressurizing Medium (Air or Gas)

Booster



- Prompt Service to customer by our own company 'PUMSTER'
- Able to installed in a smaller space than a compressor
- Cheaper price compared to compressors
- Excellent durability

05. HIP Hot Isostatic Press

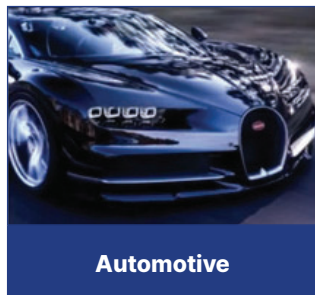
This is a performance improvement facility that uses gas as a transmission medium and applies pressure at a temperature below the melting point of the material to perform high density sintering (metal , ceramic powder material) and diffusion bonding of dissimilar metals.



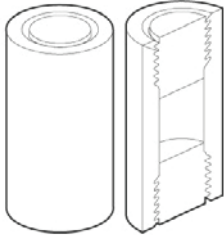
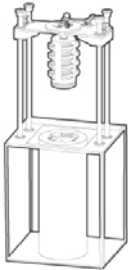
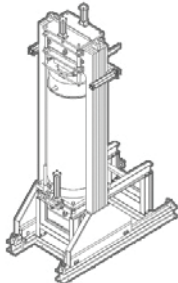
Features —

1. Design/Manufacture the most appropriate Pressure Vessel
 - Based on ASME , Design / Analysis / Manufacture Pressure Vessel
 - KGS / ASME U, U2, U3 certification
2. Design/Manufacture Hot zone(electrodes, insulation)
 - Design/Manufacture of Heaters and insulation materials
 - Thermal flow analysis verification
3. Design/Manufacture Customized PLC & UI
4. Apply high Temperature and Pressure environmental control technology
5. Design/Manufacture Gas recovery system

Applications



I Options Pressure vessel Selection

Spiral Seal type	Split spiral seal type	Yoke frame seal type
		
<p>A Vessel that can implement various experimental conditions with a perfectly sealed structure.</p> <ol style="list-style-type: none"> 1. Cover partial automatic option available (Add product/safety device) 2. Hot heater and insulation structure 3. Easy cleaning and maintenance 4. Semi-automated process possible 5. Various sealing structures and materials can be applied 	<p>A Vessel that can be used at high pressure and is suitable for producing large quantities of products on a laboratory scale.</p> <ol style="list-style-type: none"> 1. Available to move upper cover 2. High Pressure cylinder wire winding technology can be applied 3. Durability improvement / Life span extended 4. Applicable to various products 5. Capable of producing some large quantities 6. Some sealing structures and materials can be applied 	<p>Vessel suitable for mass production scale with automatic opening and closing type tailored to large sizes</p> <ol style="list-style-type: none"> 1. Yoke movable cover opening and closing 2. Double cover can be opened and closed (Heater and Insulation Repair applications) 3. High Pressure cylinder wire winding technology can be applied 4. Stable operation on high Pressure and Temperature 5. Available to automatic operation 6. Various sealing structures and materials can be applied

HIP - Mass production



- Process of Metal Material (~1,350°C, ~100 MPa)
- Process of Ceramic Material (~2,000°C, ~200 MPa)

HIP - Experimental



- Process of Metal Material (~1,350°C, ~100 MPa)
- Process of Ceramic Material (~2,000°C, ~200 MPa)

Model	Hot zone dimensions	Temp. range	Pressure	compressor
ISA-HIP 100	Φ100 X 200	~ 1,500°C	~ 100MPa	Air booster/ Hydraulic booster
		~ 2,000°C	~ 200MPa	
ISA-HIP 200	Φ200 X 300	~ 1,500°C	~ 100MPa	Hydraulic booster
		~ 2,000°C	~ 200MPa	
ISA-HIP 300	Φ300 X 500	~ 1,500°C	~ 100MPa	Hydraulic booster
		~ 2,000°C	~ 200MPa	
ISA-HIP 400	Φ400 X 1,000	~ 1,500°C	~ 100MPa	Hydraulic booster
		~ 2,000°C	~ 200MPa	
ISA-HIP 600	Φ600 X 1,500	~ 1,500°C	~ 100MPa	Hydraulic booster
		~ 2,000°C	~ 200MPa	
ISA-HIP 800	Φ800 X 2,000	~ 1,500°C	~ 100MPa	Hydraulic booster
		~ 2,000°C	~ 200MPa	

* The basic specifications are examples to help customers understand. For other changes and optional specifications (gas recovery system certification, etc.), please consult with your sales representative.

* The heater uses basic graphite material , but molybdenum is also available.

* Products other than the series can be manufactured according to customer requests.

06. HiPPo HPP High Pressure Processing

HPP refers to a technology that uses water to process vacuum-packed products at a high pressure of 3000 to 6000 bar. It is the safest and most efficient sterilization and processing process to increase the shelf life of food without destroying nutrients.







Features —

Technical Skills

1. Holds relevant certifications such as ASME and SEL
2. Possesses wire winding technology and facilities
3. A number of experience in high pressure systems

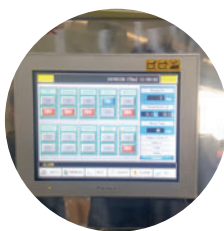
Competitive Point

1. Reasonable Cost
(Self-production from spare parts to systems)
2. Prompt Response
3. Built an equipment manufacturing system

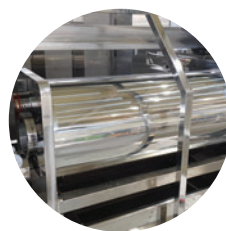
<p>1,000 Bar</p> <ul style="list-style-type: none"> • Protein Dissociation • Cell wall destruction • Changes in enzyme reaction rate <p>Vibrio</p>	<p>2,000 Bar</p> <p>Reversibility of enzymes Inactivation</p>  <p>Compylobacte</p>	<p>3,000 Bar</p> <p>Exterminating microorganisms and viruses</p>  <p>Most E.coil</p>
<p>4,000 Bar</p> <ul style="list-style-type: none"> • Starch gelatinization • Protein denaturation and precipitation  <p>Salmonella</p>	<p>5,000 Bar</p> <ul style="list-style-type: none"> • Protein Dissociation • Cell wall destruction • Changes in enzyme reaction rate <p>Vibrio</p>	<p>6,000 Bar</p> <p>exterminating Heat-resistant spore</p>  <p>E.coil</p>

Strengths

1. Inactivate microorganisms to increase shelf life
2. Maintain fresh quality through non-heating process
3. Prevent secondary contamination by sterilizing the finished product.
4. Eco-friendly process does not produce compounds or secondary by-products.
5. Maintain the original taste, scent and nutrients of raw materials.
6. Microbial control possible according to pressure changes.
7. Short processing time and simple mass processing.



Touch Screen



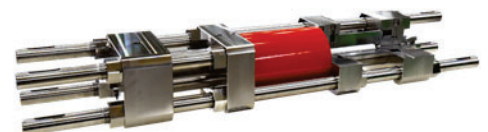
Pressure Vessel



Basket

Ultra High Pressurizing Pump (Intensifier)

1. It consists of a high-pressure part of the driving part, and ultra-high pressure is generated through the linear reciprocating motion of the hydraulic piston of the driving part and the cross - sectional area ratio with the high-pressure part
2. Developed a self-sealing device with durability and reliability using an electric motor-driven hydraulic system <100% develop in Korea>
3. Maximum operating pressure 6,000bar(600Mpa) , maximum pump discharge flow rate realized
4. Minimize noise and vibration caused by pulsation phenomenon
5. Self-produced by affiliate company <Pumpster>





Mini HIPPO
[0.5ℓ]

* Multipurpose research use



Small HIPPO
[20ℓ, 50ℓ]

Model	Hippo 0.5	Hippo 20	Hippo 50	Hippo 100
Volume	0.3ℓ	20ℓ	50ℓ	100ℓ
Inner Diameter	φ54	φ160	φ200	φ300
Length	2,130mm	3,090mm	3,970mm	4,420mm
Pressure	6,000bar (600MPa)			
Temperature	10 ~ 35°C			
Pump (Optional)	X	1intensifiers 1unit (30kw)	1intensifiers 1unit (50kw)	2intensifiers 1unit (100kw)
Cycle Time	-	7 ~ 8 / hour (3min of holding time)		
Production Capacity	-	12L / Cycle	30L / Cycle	65L / Cycle
Required Air	X	7 bar (0.7MPa)		
Weight	0.6ton	8ton	15ton	25ton



Medium HIPPO
[100 ℓ, 150 ℓ]



Large HIPPO
[350 ℓ, 450 ℓ, 550 ℓ]

Model	Hippo 150	Hippo 350	Hippo 450	Hippo 550
Volume	150ℓ	350ℓ	450ℓ	550ℓ
Inner Diameter	φ300	φ380		
Length	2,130mm	3,090mm	3,970mm	4,420mm
Pressure	6,000bar (600MPa)			
Temperature	10 ~ 35°C			
Pump (Optional)	2intensifiers 4intensifiers 1unit(150kw)	4intensifiers 2unit (300kw)	8intensifiers 4unit (700kw)	8intensifiers 4unit (700kw)
Cycle Time	7~8 / hour (3min of holding time)		7~10 / hour (3min of holding time)	
Production Capacity	100L / Cycle	230L / Cycle	315L / Cycle	380L / Cycle
Required Air	7bar (0.7MPa)			
Weight	30ton	65ton	-	-

Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test

07. CIP / WIP Cold / Warm Isostatic Press

This is a equipment that uses the principle of transmitting the same force in the same direction using fluid. The pressure generated by the internal fluid exerts a uniform force on all surfaces, and is used in processes such as compression molding and lamination molding in the material process, high-density densification of the electrolyte layer, and sterilization in the food process.

They are classified according to the purpose of use and temperature specifications, and are used in various fields such as ceramics and food using ultra-high pressure.



Features —

1. Customized manufacture :

Reflecting Customer requirements / A variety of options can be added / Minimizing Processes / Pursuing maximum efficiency

2. Technology:

Possess relevant certifications such as ASME, SEL, etc. / Possess ultra-high pressure wire winding technology / Possess ultra-high pressure pump technology / A number of experience in high-pressure systems

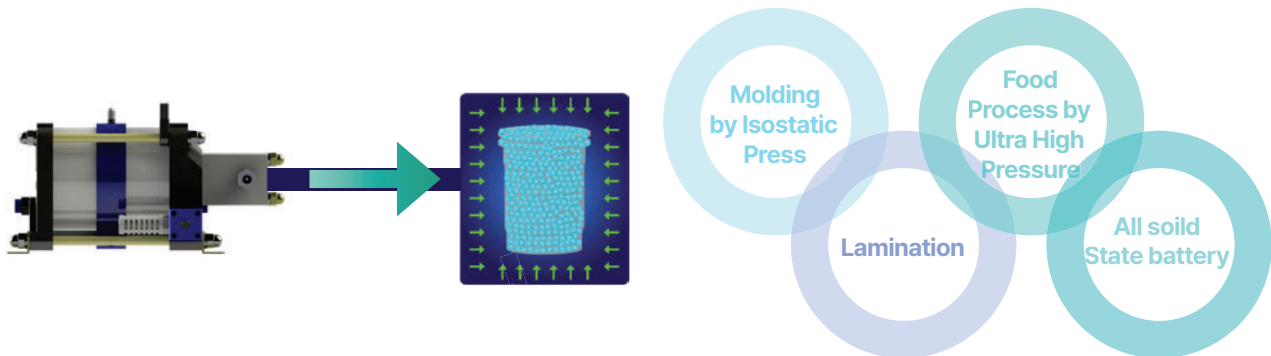
3. Competitiveness:

Price competitiveness, quick response / Establishment of equipment production system (in-house production from parts to systems)

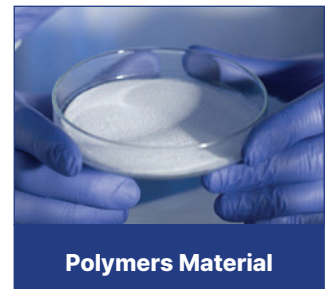
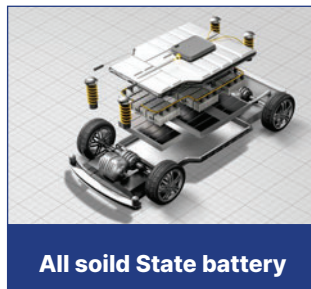
4. Convenience:

Designed for user convenience / Convenient program design / Convenient maintenance

Principle of Isostatic Press



Applications



Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

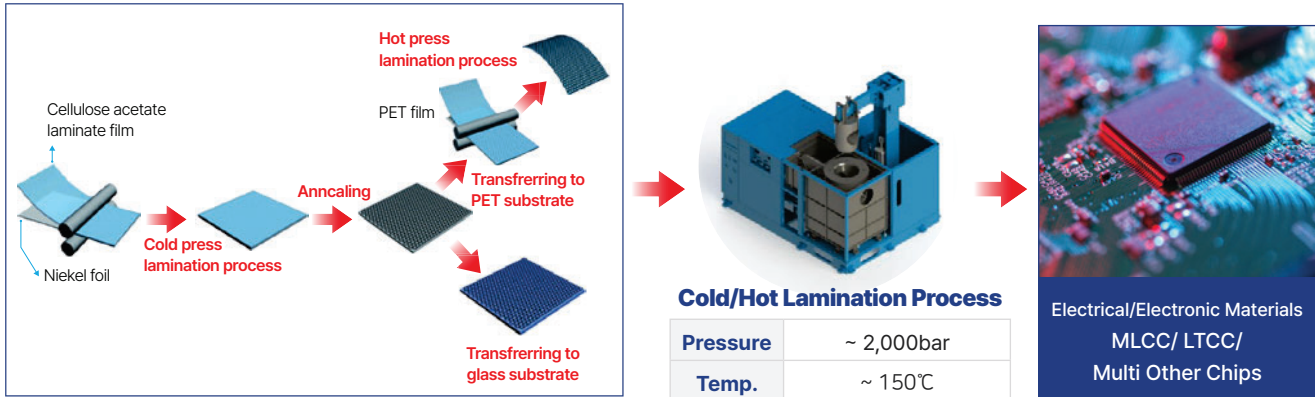
Mixer

Plant

Process Test

MLCC

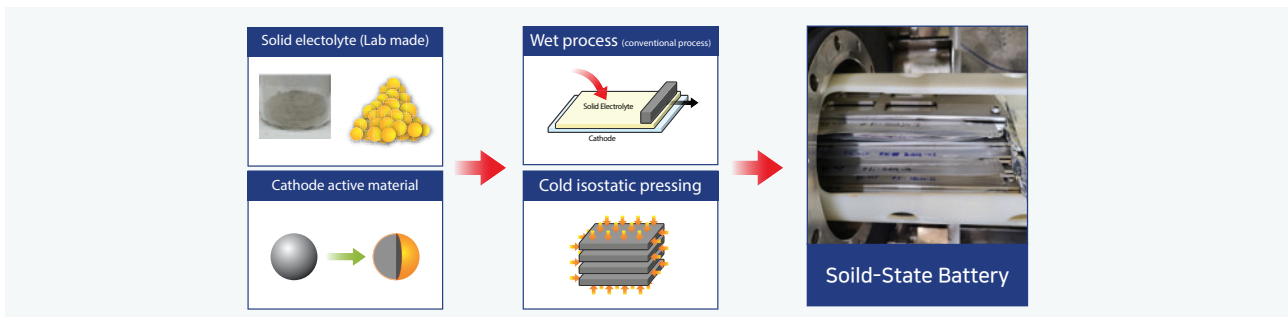
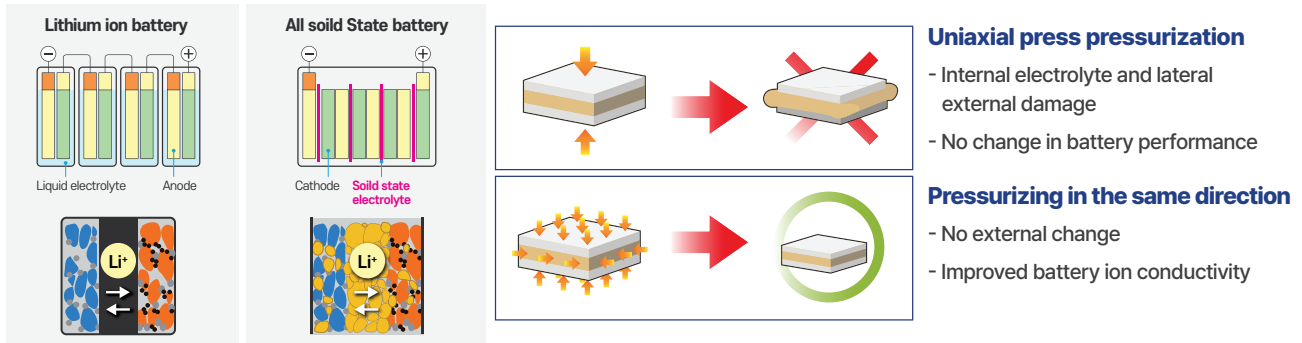
Increases Production efficiency through cold/hot lamination process through isostatic pressure molding of MLCC material



All-solid-state battery

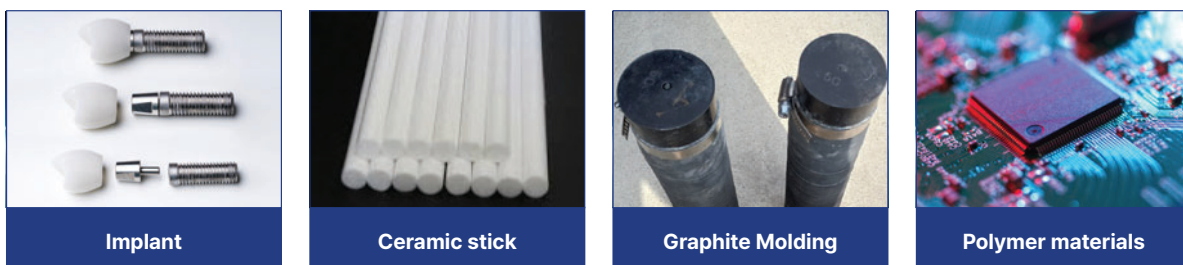
Excellent all-solid-state battery performance is secured by lowering the interfacial resistance through high-density densification of the electrode layer and solid thickener layer through isostatic press molding of the all-solid state battery.

Secondary battery system comparison



Ceramic & Polymers Material

Produce uniform, high-density products by forming powder materials and removing pores through isostatic pressure molding of ceramic and polymer materials.



07. CIP / WIP Cold / Warm Isostatic Press

Experimental



Features

- Compact design for optimal use of experiment space
- Minimizing temperature deviation through various temperature raising methods

Mass Production



Features

- Stable operation on high Pressure
- Available to automatic operation
- Efficient Energy level

I Options Closing Type

C-Clamp Type	Pin Closing Type	Yoke Frame Type
		
<ol style="list-style-type: none"> 1. Pressure : ~ 1,000bar 2. Temperature : 50 ~ 120°C 3. Volume : Custom 4. Air Driven Liquid Pump / Hydraulic Pump 5. O-ring / U-packing / Energizer Seal 6. CIP / WIP 	<ol style="list-style-type: none"> 1. Pressure : ~ 6,000bar & Custom 2. Temperature : 50 ~ 120°C 3. Volume : ~ 100 ℓ & Custom 4. Air Driven Liquid Pump / Hydraulic Pump 5. O-ring / U-packing 6. CIP / WIP / HPP 	<ol style="list-style-type: none"> 1. Pressure : ~ 6,000bar 2. Temperature : 50 ~ 120°C 3. Volume : ~ 550 ℓ & Custom 4. Hydraulic Pump 5. O-ring Seal / U-packing / Energizer Seal 6. CIP / WIP / HPP (Wire Winding)

CIP (Cold Isostatic Press)



CIP Series

Cold Isostatic Press

Used for product molding at Room Temperature
Polymer, Ceramic, Metal, Carbon

WIP (Warm Isostatic Press)



WIP Series

Warm Isostatic Press

Increases production efficiency by reducing the cold/hot lamination process to one process

Electrical/Electronic Materials (MLCC, LTCC), Multi Other Chips

Securing excellent all-solid-state battery performance through high-density densification of the electrolyte layer

All-solid-state battery

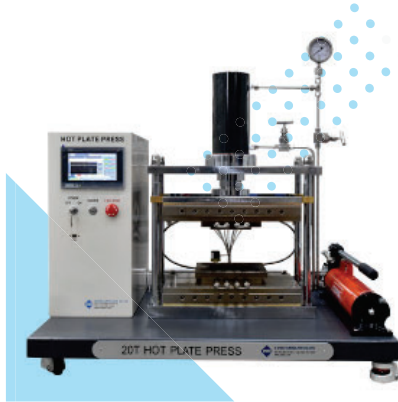
Model	Pressure	Internal Diameter	Working Media	Temperature
CIP Series	~ 6,000bar	Custom	Oil / Water	ordinary temperature
WIP Series	~ 6,000bar	Custom	Oil / Water	50 ~ 150°C

* Detailed Specifications should be discussed by person in charge

08. Hydraulic press

This refers to equipment that can process objects such as metal or non-metallic materials into the shape desired by the user through processing methods such as compression, cutting, and bending.

Presses are divided into manual presses and automatic presses depending on the power used, and are divided into pneumatic, hydraulic, and servo motor presses depending on load. Ilshin Autoclave's WP Series (Work Plate Press) and HP Series (Hot Plate Press) are manufactured in a custom-tailored manner.



Features —

1. **Custom production** : Production through continuous consultation with users / Reflection of customer requirements / Various options can be added / Minimization of operation process / Pursuit of maximum efficiency /
2. **Competitiveness** : Meeting customer needs / Rapid response / Building an equipment manufacturing system
3. **Convenience** : Designed to pursue user convenience / Automatic system to maintain constant pressure / Customized control system / Convenient maintenance

Features

Product composition according to load

1. Can be manufactured with a maximum load of 1 ton to 30 tons.
2. The maximum temperature can be freely adjusted up to 300°C
3. Generate pressure using Hand Pump (manual)

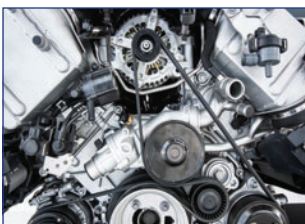
Optional

1. Spacer for height adjustment
2. Control system (Touch Screen)
3. Measuring device certification (KOLAS)

Precise control

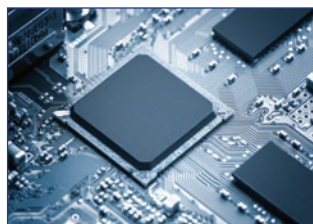
1. Using a pressure gauge with high precision (0.5%) controllable

Applications



Metalworking and industrial component manufacture

- Car parts assembly
- Processing and pressing of metals
- SUS parts processing
- Forced press operation
- Bearing manufacturing
- Powder metallurgy forming operations
- Punching work, etc.



electrical, electronic components and circuit boards

- Crimping of circuit boards
- Assembly of electronic components
- Compression when manufacturing functional films, molding work



Production and processing of various inorganic material parts

- Assembly of dental artificial teeth
- Compression of refractory materials
- Zirconia ball
- Silicon nitride parts processing
- Ceramic Powder Molding Compression
- Artificial biomaterial processing work, etc.



Polymer plastic resin synthesis and processing

- Extrusion of polymer resin
- Molding processing
- Production of plates at Ilshin Autoclave Co., Ltd.
- Compression property test
- Compression of functional multilayer film
- Punching work, etc.

WP (Work Plate Press) Manufactured so that a load of up to 30 tons can be freely adjusted using hydraulic pressure.



HP (Hot Plate Press) A hydraulic press with an added temperature process is equipment that can apply load and heat at the same time.



Model	WP	HP
Plate Size	Custom-made / 150 X 150 ~ 300 X 300	
Max.Load	1 ~ 30ton	
Cylinder Type	Single acting Spring Return Type / Double acting Type	
Cylinder Stroke	Single acting ~ 300mm / Double acting 300mm or more	
Max. Pressure	~ 350kg/cm ² (Cylinder Effective area X Pressure (kg/cm ²))	
Max. Temperature	-	~ 300°C

Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test

09. Supercritical Carbon Dioxide Fluid System

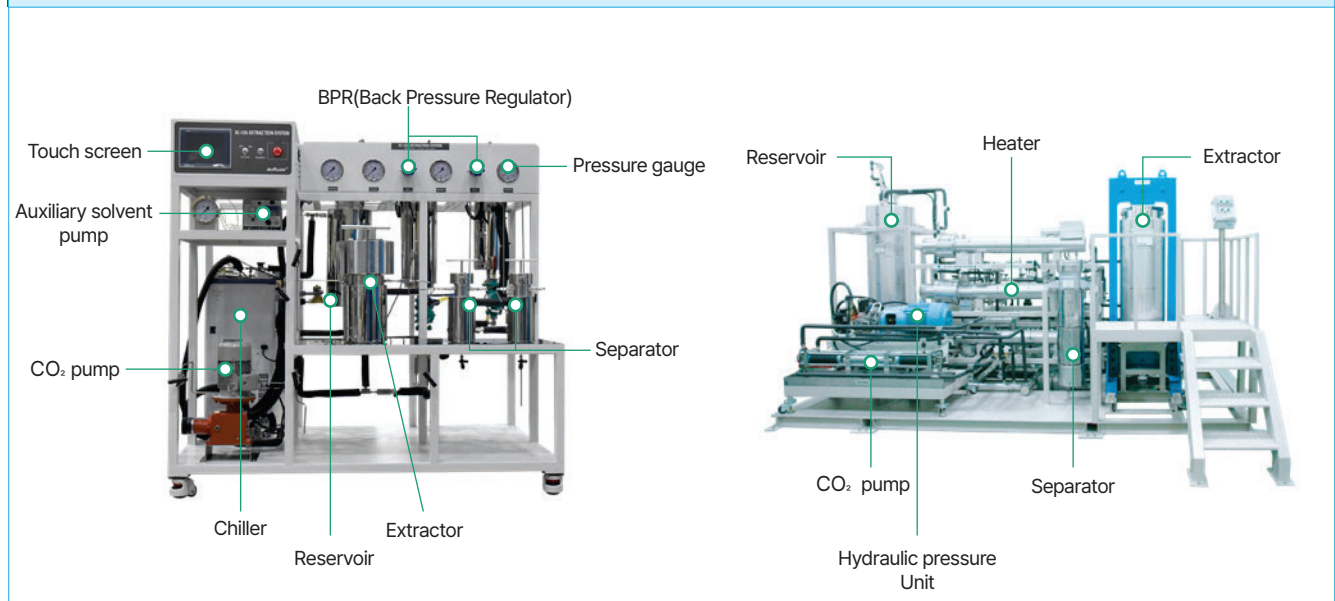
This technology uses supercritical carbon dioxide as a solvent and can be applied to extraction and separation processes by utilizing the properties of supercritical fluids, which are different from liquids or gases. Because it has almost no surface tension, it easily penetrates the pore structure, has good diffusion, and has strong dissolving power, making it efficient in the extraction process. It is a clean technology that is friendly to the environment and the human body and is a cutting-edge technology that can be applied to high-purity and high-quality product processes. It utilizes supercritical characteristics to enable stable production in low-temperature processes such as selective extraction and heat denaturation materials.



Patents —

1. Substrate processing device using supercritical fluid that can move the substrate placement unit up and down
2. Substrate processing device using magne drive and supercritical fluid
3. Extraction method using supercritical solvent
4. Extraction device using supercritical solvent
5. Impurity removal device and method using supercriticality in the multilayer ceramic capacitor manufacturing process
6. Supercritical carbon dioxide circulation device and circulation method
7. Method of supplying a supercritical fluid mixture using a mixing device of supercritical fluid and chemical liquid
8. Supercritical device equipped with load cell

Configuration of supercritical equipment



[Lab Scale]



[C-Clamp Type]



[Yoke Frame Type]

Supercritical extraction



Supercritical degreasing



Supercritical drying



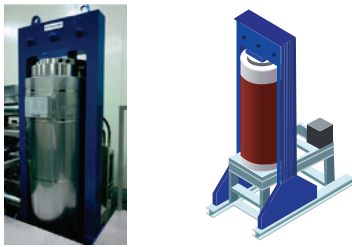
Supercritical nanoparticle manufacturing



Supercritical foaming

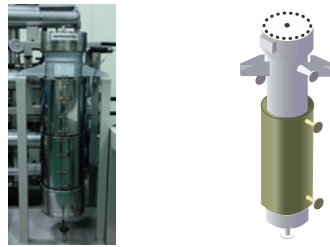


Extractor



1. Container for reaction of supercritical CO₂ and sample. Manufactured with a yoke frame or clamp type to facilitate sample discharge.
2. Safe even at high pressure by applying safety factor, improved stability by multi-level interlock.
3. Yoke frame (Clamp) operates automatically for convenience.

Separator



1. Supercritical carbon dioxide changes into gaseous phase to separate extract from carbon dioxide.
2. Made with cyclone structure to improve separation efficiency.

Reservoir



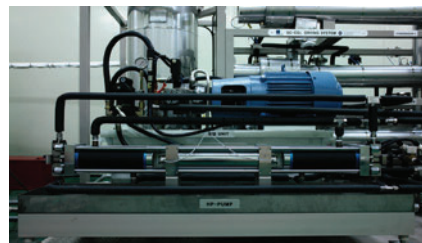
1. Containers required for storage and recirculation of carbon dioxide separated during the process.

Condenser



1. Improved liquefaction and pressurization efficiency of carbon dioxide
2. Apply Shell & Tube or Double Pipe method considering cooling efficiency

High pressure pump



1. The role of pressurizing CO₂ to process conditions and continuously injecting it
2. Depending on the discharge capacity, motor drive method or hydraulic drive method can be selected.

Pre heater



1. Pressurized CO₂ is heated to the process temperature and supplied to the extraction tank.
2. Improved separation efficiency by raising the temperature of CO₂ cooled under reduced pressure before supplying it to the separation tank.

Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test

09. Supercritical Carbon Dioxide Fluid System

Supercritical Fluid Extraction



Sesame oil extraction

Extractor : 2,300ℓ X 3Uints
Working Pressure : 450bar



Removal of harmful ingredients and extraction of oil

Extractor : 600ℓ X 2Uints
Working Pressure : 460bar



Production of medicinal active ingredients

Extractor : 600ℓ X 2 Uints
Working Pressure : 500bar



Versatile extraction pilot production

Extractor : 400 ℓ X 2 Uints
Working Pressure : 700bar

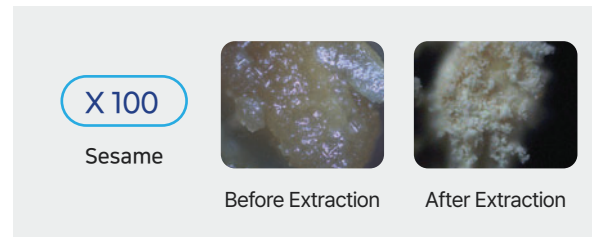
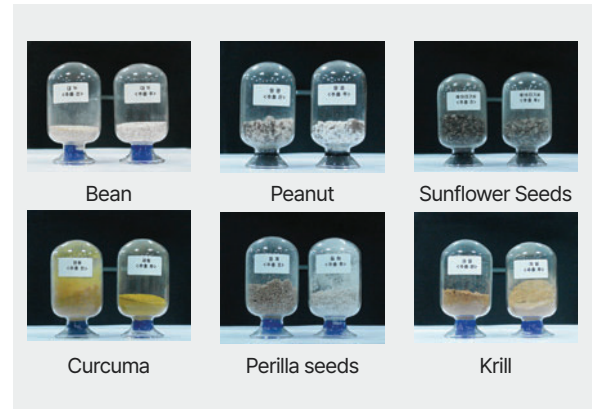
Volume	Max. Pressure	Max. Temperature	Raw Material Phase
0.3ℓ	500bar	80°C	Solid & Liquid
0.5ℓ			
1ℓ			
2ℓ			
5ℓ			
10ℓ			
20ℓ			
50ℓ			
Plant			

* Customization other than basic specifications possible, consult with a technical sales representative

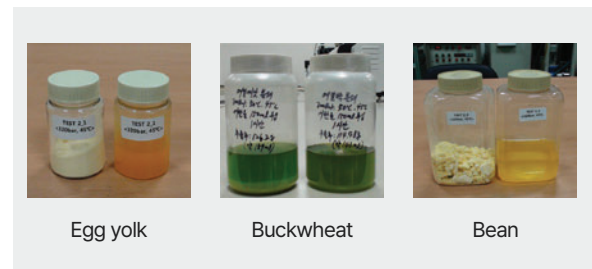
Process test

Sample	Condition		Yield
	Pressure	Temperature	
Sesame	300 ~ 500bar	40 ~ 60°C	40%
Corn Germ			35%
Bean	15%		
Rape Seeds	300 ~ 450bar		25%
Sunflower Seeds			34%
Paprika	200 ~ 400bar		40 ~ 50°C
Palma Christi	400 ~ 500bar	40 ~ 60°C	25%
Grape Seeds	300 ~ 500bar		8%
Pepper Seeds	400 ~ 500bar	50 ~ 60°C	20%
Coffee	200 ~ 350bar	40 ~ 60°C	7%
Green tea			Use of auxiliary solvent
Calamus	100 ~ 300bar	40 ~ 50°C	6%
Herbal medicine	200 ~ 350bar	40 ~ 60°C	Use of auxiliary solvent
Rice bran	400 ~ 500bar	55 ~ 60°C	10%
Black raspberry	300 ~ 400bar	50 ~ 60°C	15%
Curcuma	350 ~ 400bar	55 ~ 60°C	10%
Citron	200 ~ 350bar	45 ~ 50°C	Fragrance ingredients
Egg yolk	300 ~ 400bar	40 ~ 60°C	30%
Fish Oil	150 ~ 200bar		deodorization
Camellia oil	200 ~ 300bar		
Torreya	300 ~ 500bar	50 ~ 60°C	20%

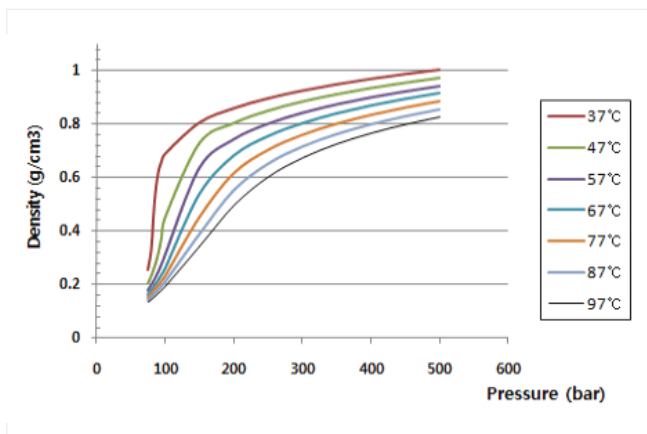
Oil component extraction



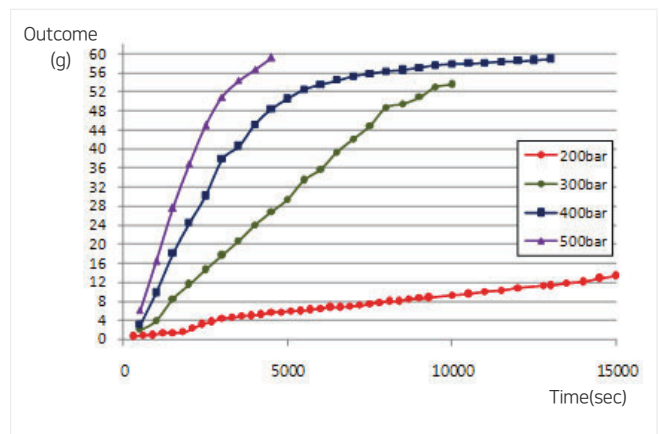
Extraction of active ingredients



Density change of CO₂ depending on pressure and temperature



Extraction speed comparison according to pressure



10. Supercritical Water

This refers to a process that is carried out using water as a supercritical fluid. It is made above the critical temperature(374°C) and critical pressure(221bar) to have the characteristics of supercritical water, and this is used to perform processes such as hydroxylation and hydrothermal synthesis using supercritical water. It is useful in a variety of industries, including industrial wastewater treatment and battery raw material business.

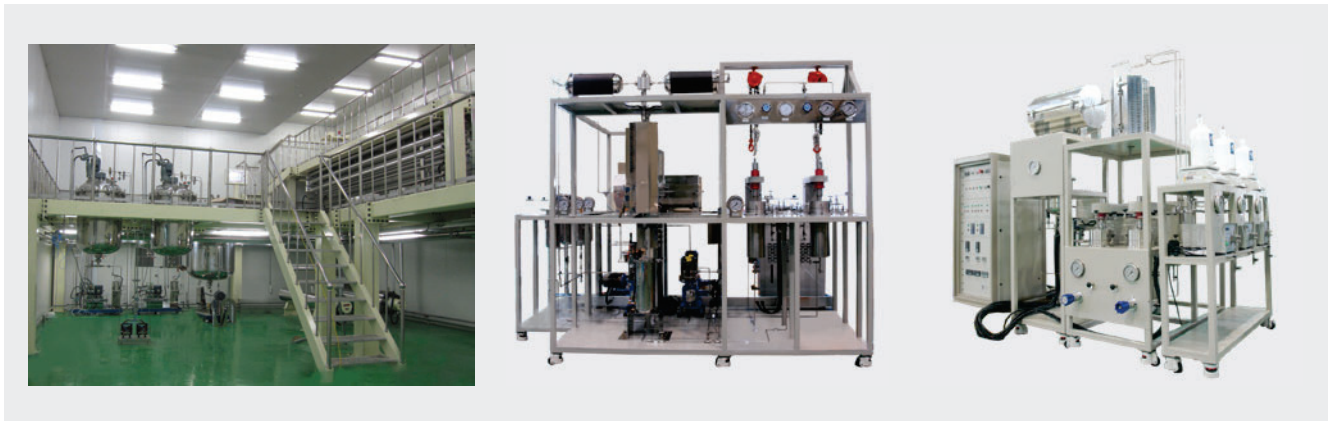


Features —

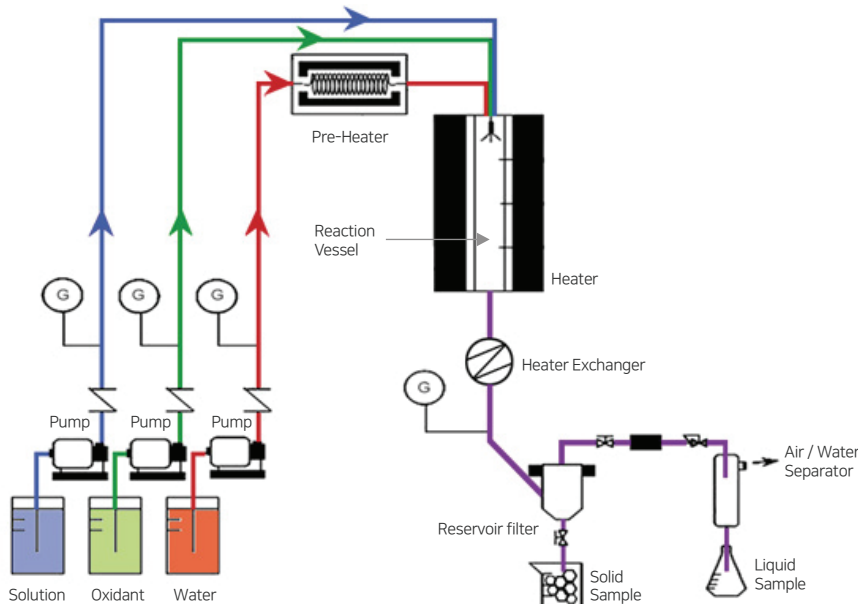
1. Fast reaction speed due to single-phase oxidation reaction
2. No secondary pollutants generated due to complete oxidation reaction
3. Complete oxidation is possible because oxygen is abundant and uniformly dissolved.
4. Easy precipitation and separation by using the difference in solubility of inorganic substances
5. Above the critical value of water(374°C , 221bar), physical properties such as density, dielectric constant, electrical conductivity, and solubility change.
6. It has excellent dissolving power for organic substances that do not dissolve in water.

Supercritical hydrothermal synthesis

Synthesis method using water under supercritical water conditions / Used in manufacturing chemicals, materials, materials, etc.



Schematic diagram of Supercritical hydrothermal synthesis



Application field

1. Abrasives (SiO_2 , TiO_2)
2. Cosmetics (ZnO , TiO_2)
3. Catalyst (CeO_2)
4. Jewelry (PE, Pd)
5. For Optical devices
6. For Magnetic
7. For Structuring

Supercritical water oxidation

Decompose countless components within a short reaction time (equipment designed to conduct experiments on small amounts of various non-degradable wastewater)

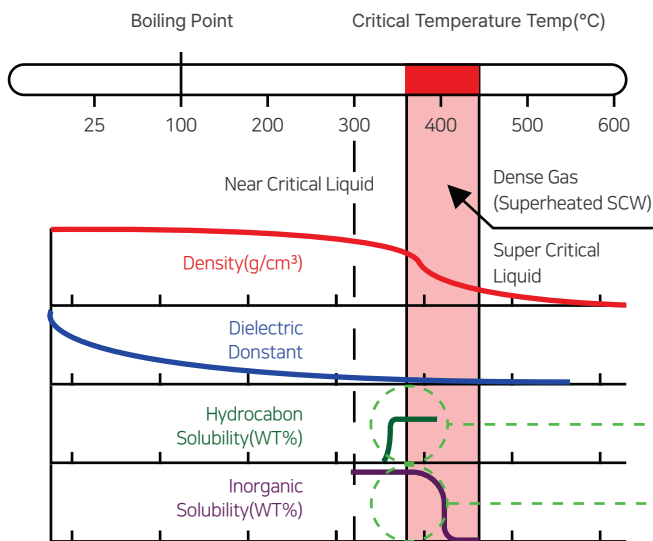


Pressure Vessel

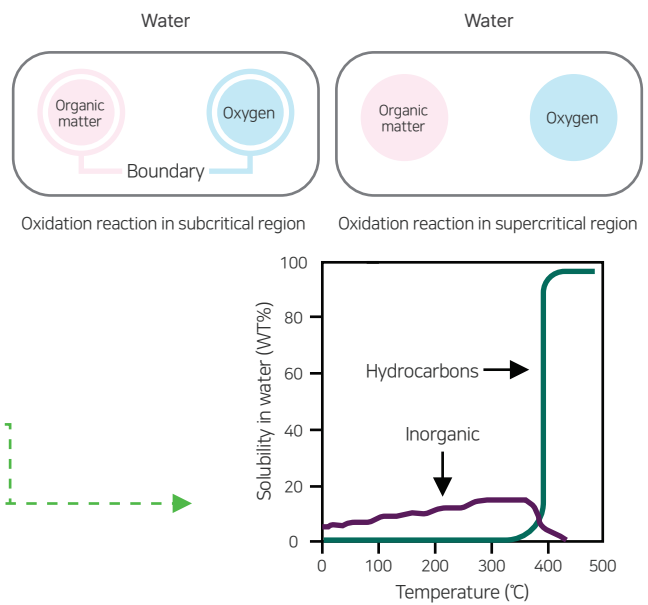
Agitator

High Pressure Reactor

Physical properties of water depending on temperature



Solubility graph in supercritical water



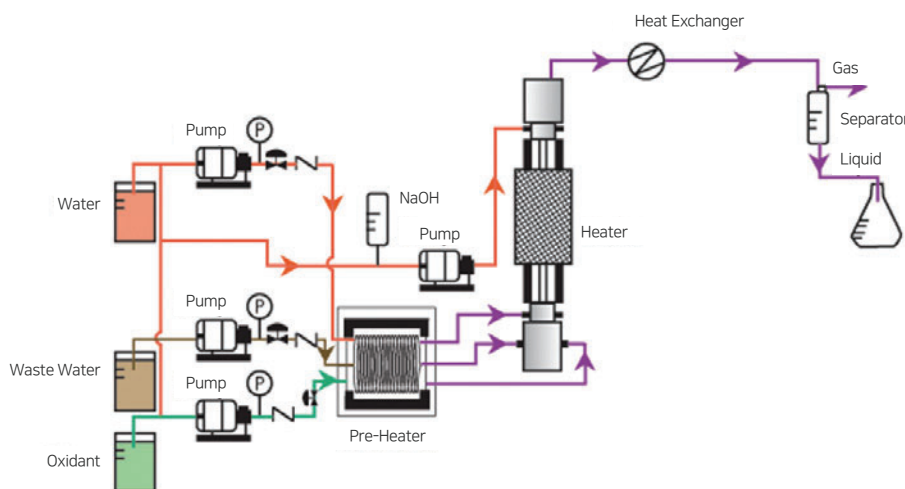
Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Schematic diagram of supercritical water hydroxide synthesis



Application field

1. Non-degradable wastewater
2. Radioactive waste
3. Chemical mineral wastes
4. Pulp factory wastewater

Mixer

Plant

Process Test

11. High Pressure Homogenizer

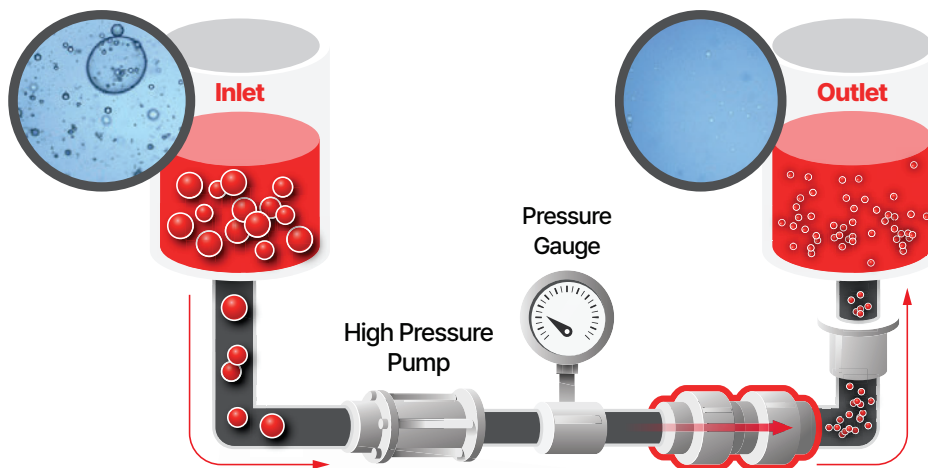
It is a dispersion and homogenization device using high pressure and is used for dispersion of fine particles and droplets, homogenization, emulsion, and cell wall destruction.



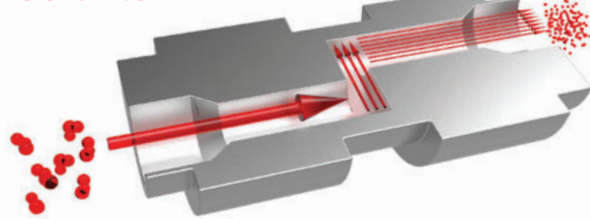
Patents —

1. Cleaning structure and method of ultra-high pressure disperser
2. High-pressure homogenization device that allows easy separation and combination of the plunger and the pressure power generation means.
3. High-pressure homogenization device with the function of preventing solidification of raw materials.
4. Air vent integrated pressure intensifier for high pressure disperser
5. Intensifier head cooling device of high pressure disperser
6. Screw type high pressure generator
7. Ultra-high pressure disperser nozzle cooling device and ultra-high pressure disperser cooling system including the same
8. Ultra-high pressure disperser for high viscosity
9. Continuous metal oxide nanoparticle manufacturing device using an ultra-high pressure homogenizer and manufacturing method using the same
10. Method for producing monodisperse iron oxide nanoparticles using an ultra-high pressure homogenizer and monodisperse produced thereby iron oxide nanoparticles.

Principle of High Pressure Homogenizer



Nozzle Chamber

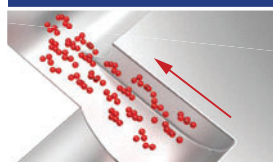


Impact



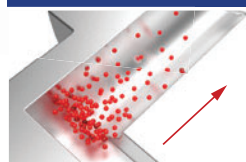
Particles in the fluid collide with the walls of the pipe, and are finely shattered by the impact of these particles.

Shear force



Fluid passing through a pipe at supersonic speed is subject to shear force within the fluid due to resistance such as speed difference and friction, causing particles or droplets to break off.

Cavitation



In supersonic fluid generated by ultra-high pressure, the cavitation phenomenon occurs due to the pressure difference, which destroys the cohesion between the fluid's molecules.

Application field

1. Particle Size Reduction

- Emulsions
- Suspensions
- Liposomes

2. Nano-Encapsulation

- Polymers
- Liposomes
- Emulsions

3. Cell Disruption

- E-coil
- Yeast

Nano Disperser (NH 100)

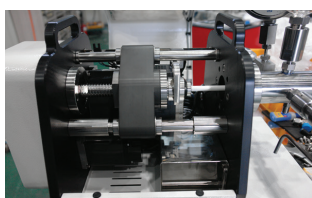


Operating Pressure	Max. 1,500bar
Flow Rate	Max. 100ml/min
Pump System	Motor Driven Type [220VAC, 1PH, 60 Hz, 1HP]
Inlet Reservoir	500ml
Dimension	583(W) x 576(D) x 435(H)mm
Weight	Approx. 45kg

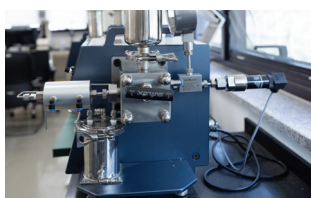
Flow Rate	Max Pressure	Interaction Chamber	
		Size	Type
100ml/min	1,500bar	75um	Z Type

Flow rate and pressure may vary depending on the diamond chamber option and must be discussed in advance when using samples.

*Customization possible
*Flow rate: Based on Water



It is driven using a motor, and a screw is installed inside so that the plunger reciprocates and generates pressure.



Install a valve to expel the air inside the pressure intensifier to facilitate sample injection.



Pressure can be controlled by adjusting the motor speed.



A cooling device can be installed to cool samples discharged after the process.

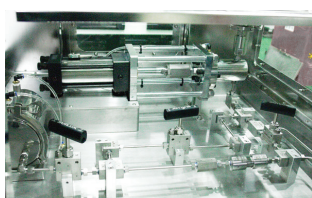
Nano Disperser (NH 500)



Operating Pressure	Max. 1,500bar
Flow Rate	Max. 500ml/min
Pump System	Hydraulic Unit System
Inlet Reservoir	2,000ml
Dimension	800(W) x 850(D) x 1,500(H)mm
Weight	Approx. 450kg

Flow Rate	Max Pressure	Interaction Chamber	
		Size	Type
500ml/min	1,500bar	100um	Z Type

*Flow rate: Based on Water



Back Flushing System allows for convenient cleaning in case of chamber blockage.



Install a cooling device on the pipe discharged after the process to prevent damage to the sample due to heat generated after passing through the chamber.



Safety is ensured by installing an external case on the piping line excluding the sample injection section.



Adjusting chamber pressure using a hydraulic unit

Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test

11. High Pressure Homogenizer

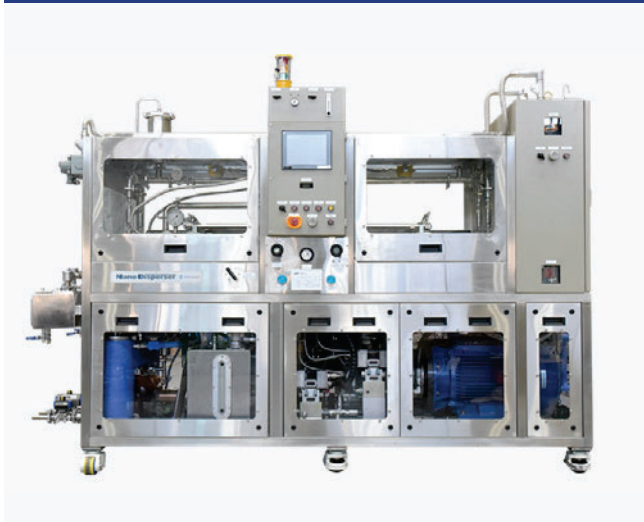
Nano Disperser (NH 2000)



Nano Disperser (NH 4000)



Nano Disperser (NH 8000)



Nano Disperser (Special Model)



Series	Flow Rate	Max Pressure	Interaction Chamber	
			Size	Type
NH 2000	2,000 ml/min	1,500bar	100/400um	Z/Y Type
NH 4000	4,000 ml/min			
NH 8000	8,000 ml/min			

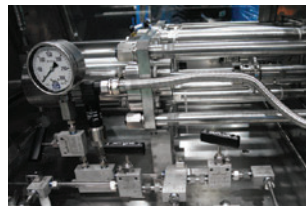
*Flow rate: Based on Water



Equipped with a solution storage tank and automatic valve to prevent solidification of raw materials when not in operation



You can check the operating status of the equipment during operation, and the alert system allows quick response when problems occur.

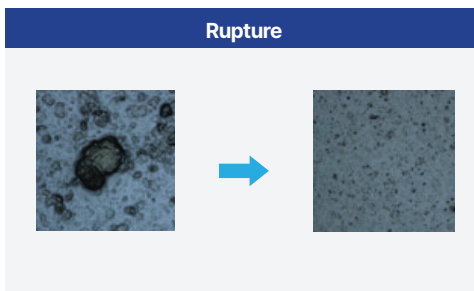
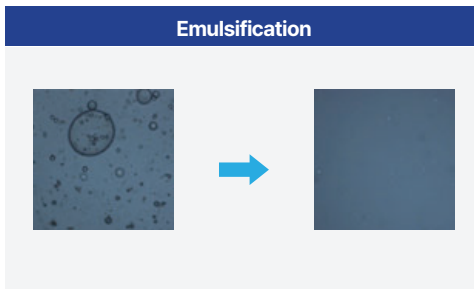


Minimizing damage due to friction by installing a cooling line in the high pressure area to extend the life of the internal seal



Back Flushing System allows for convenient cleaning in case of chamber blockage.

Sample	Effect
Milk	Dispersion
Soy Milk	Homogenization
CNT	Dispersion
Water + Oil	Emulsification
CERAMIC(Si)	Dispersion
TiO ₃	Rupture
Graphite	Rupture
CeO ₃	Dispersion
Cosmetic ingredients	Emulsification
pigment	Dispersion
polymeric material	Rupture
Al ₂ O ₃	Dispersion



Pressure Vessel

Agitator

High Pressure Reactor

Pressure Curing Oven

Press

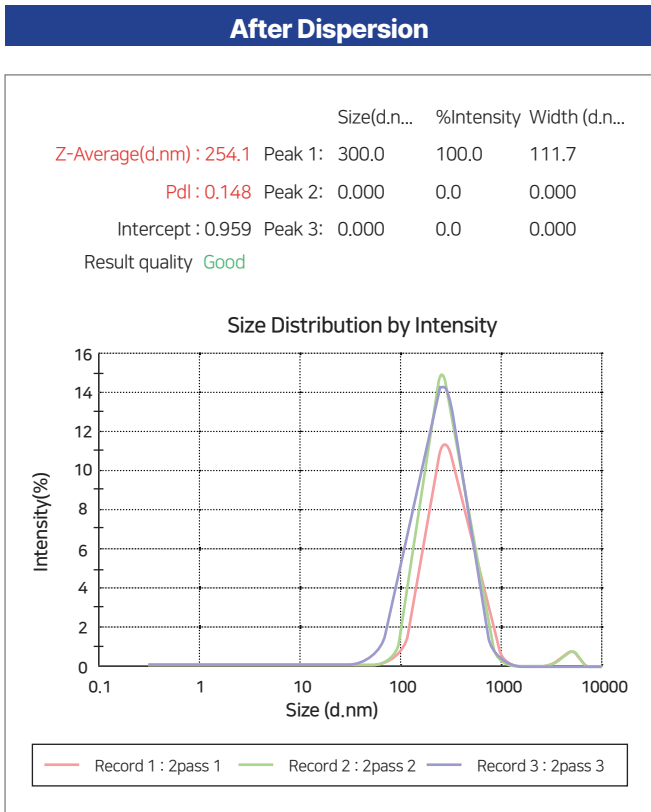
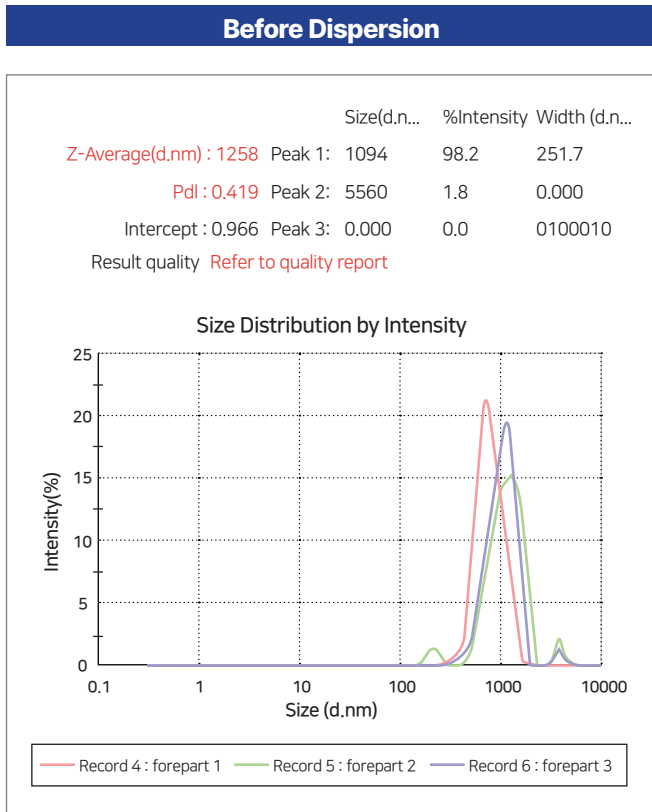
Supercritical

High Pressure Homogenizer

Mixer

Plant

Process Test



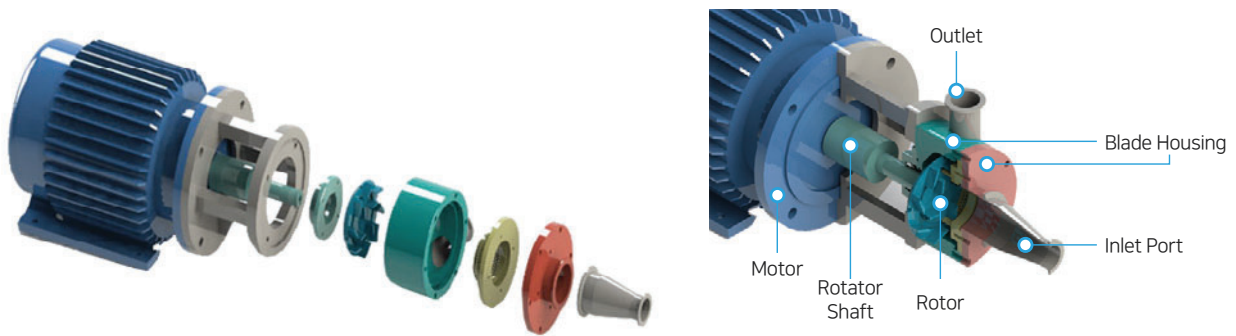
12. Mixer



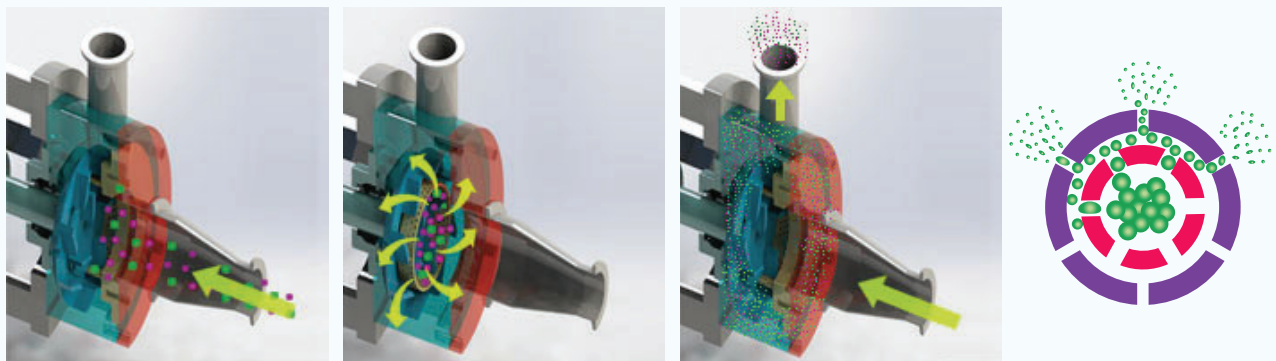
High Shear Inline Mixer

The high-shear homomixer is driven by a high-speed rotating motor (Max. 8,000 rpm), and generates high shear force in the form of a nozzle combined with a stator and rotor to maximize mixing/emulsification/dispersion. It is a size suitable for research and experiment and is easy to maintain. It can be implemented according to the production purpose required by the customer.

Exploded view of Inline mixer head



Direction of fluid flow

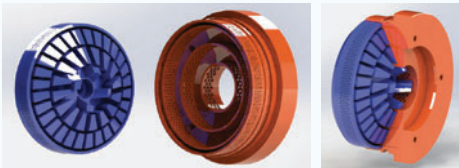


* Confirm and discuss with sales representative for specific specifications

Super High Shear Inline Mixer

Ultra-high shear mixers generate high shear forces with very high rotational force, and utilize the cavitation phenomenon by configuring two or more overlapping rotors and stators to provide more effective dispersion and mixing effects than general homogenization equipment.

Nozzle Type



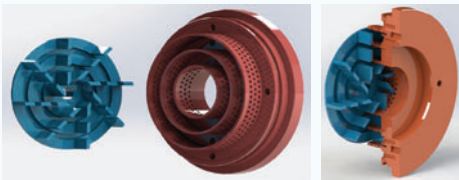
Combination Type

It is the form in which the internal energy is the greatest, and the precise and numerous holes in the stator serve as jets, making it suitable for reaction and emulsification process.



Chamber Type

It has an arch-shaped structure and a wide internal space, making it suitable for the initial process of dispersion during liquid homogenization / grinding process / emulsification process / chemical process.



Nozzle Type

Similar to the "Combination Type", internal energy acts greatly, and it's suitable for reaction and emulsification process.

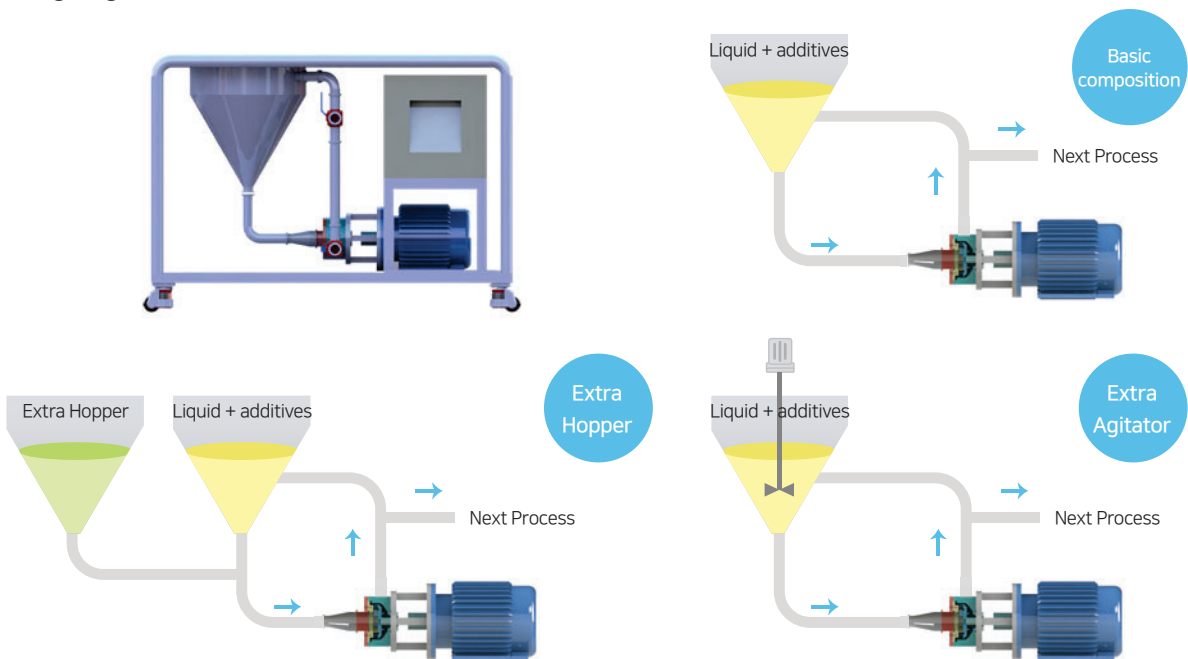


Cone Type

The cone-shaped structure allows for pulverization and homogenization of liquids with generally low strength and large particles.

* The basic material is SS316, and Hasteloy/Inconel can be selected.

Configuring various lines to suit the customer's environment



13. Plant

Ilshin Autoclave provides high-quality equipments specialized for various industrial fields.

We specialize in pressure vessel plant business utilizing heaters, heat exchangers, chemical reactors, etc. Through this, it is used for a wide range of purposes in the chemical, food, bio, pharmaceutical, power generation, and mechanical plant fields.

In addition, we comply with safety standards at domestic and abroad, and obtain inspections and certifications from safety agencies to produce stable and reliable equipment.

Based on the know-how and experience accumulated over many years, we manufacture customized equipment to meet customer's needs and contribute to improving productivity in industrial sites through excellent technology and innovative solutions.

Based on the principles of customer-oriented service and quality first, Ilshin Autoclave supports modern and efficient production in various industrial fields and proves reliability and performance in the field of industrial equipment.

Features



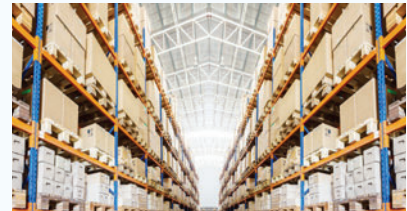
1. Ensuring high pressure gas safety

- ASME certification for pressure vessel
- Korea Gas Safety Corporation(KGS) certification
- Korea Occupational Safety and Health Agency(KOSHA) certification



2. Improved productivity through design know-how and in-house production

- Optimal production through many years of know-how
- Own production process line
- Improving productivity and secure production



3. Enhancing competitiveness through production infrastructure for high-pressure parts

- Securing subsidiary infrastructure
- Improving performance and securing quantity of high-pressure parts
- Improving domestic and international competitiveness of production facilities



Supercritical CO₂ Extraction System

- Year/Month : 2006/06
- Client : OTTUGI
- Purpose : Sesame Oil Extraction
- Spec : 400bar, 80°C



Supercritical Hydrothermal Synthesis System

- Year/Month : 2009/10
- Client : LG CHEMICAL
- Purpose : Nano Powder Production
- Spec : 400bar, 450°C



Pressure Vessel

- Year/Month : 2012/10
- Client : Korea Institute of Machinery & Materials
- Purpose : Performance Test Loop System
- Spec : 160bar, 345°C



Control Element Drive Mechanism (CEDM)

- Year/Month : 2008/10
- Client : DOOSAN
- Purpose : Performance Test Loop System
- Spec : 160bar, 345°C



Hydrogenation Catalyst Process System

- Year/Month : 2013/01
- Client : NEUROPID
- Purpose : High Added-Value Powder Production
- Spec : 200bar, 80°C



Hydrothermal Carbonization Process System

- Year/Month : 2014/05
- Client : S Chemical company
- Purpose : High Temperature Carbonization
- Spec : 100bar, 260°C



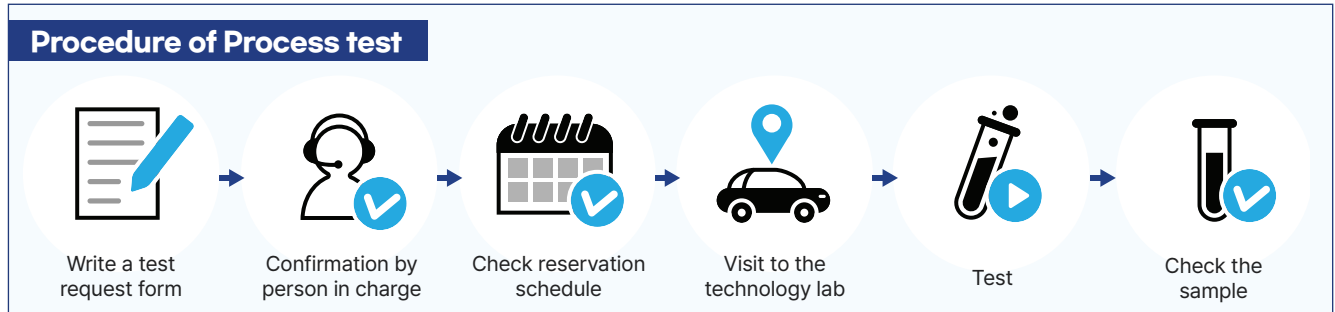
Synthetic Resins Hydrothermal Synthesis System

- Year/Month : 2015/01
- Client : SOGANG UNIVERSITY
- Purpose : Synthesis Synthetic Resin
- Spec : 100bar, 260°C

14. Process Test

Sample testing can help determine suitability and applicability for equipment. Applications are processed through the sales department, and fees are charged depending on the number and amount of samples.

* There are precautions when preparing samples depending on each equipment, and it is carried out after consultation over the phone.



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Location	12, Gukjegwahak-ro, Yuseong-gu, Daejeon, Republic of Korea
Website	www.suflux.com
Business hour	(Weekday) AM 08:30 ~ PM 05:30

* Test request forms and price lists can be found on the Ilshin Autoclave website.

Equipments for test

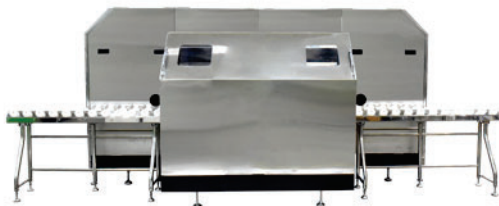
Cold Isostatic Press



Max. Operating Pressure	5,000bar
Temperature	ordinary temperature
Size	I.D 380mm X I.L 3100mm
Volume	350L

1. Isostatic pressure molding (compression, lamination molding)
2. Ultra-high pressure food sterilization/deshelling

Warm Isostatic Press



Max. Operating Pressure	5,000bar
Temperature	80°C
Size	I.D 160mm X I.L 1100mm
Volume	20L

1. Isostatic pressure molding
2. Multi Layer Ceramic Condenser (MLCC) pressure molding
3. All-solid-state battery pressure molding



Pressure Curing Oven

Max. Operating Pressure	20bar
Temperature	200°C
Size	Inside diameter: 520 Inside depth: 630

1. Removing air bubbles
2. Curing operation
3. Enhanced adhesion

Pressure Vessel

Agitator

High Pressure Reactor



High Pressure Homogenizer (Nano Diperser)

Max. Operating Pressure	1,500bar
Max. Flow Rate	4L / min
Interaction Chamber Size/type	400 um / Z Type 100 um / Y Type
Pump System	Hydraulic Unit System

1. Dispersion
2. Emulsification
3. Rupture

Pressure Curing Oven

Press



High Pressure Homogenizer (Nano Diperser)

Max. Operating Pressure	1,500bar
Max. Flow Rate	0.5L / min
Interaction Chamber Size/type	100 um / Z Type
Pump System	Hydraulic Unit System

1. Dispersion
2. Emulsification
3. Rupture

Supercritical

High Pressure Homogenizer

Mixer



Supercritical Carbon Dioxide Extraction System

Extractor	450bar/80°C (300ml)
Seperator 1,2	50bar / 80°C
CO ₂ Flow Rate	50ml / min
Co-Solvent Flow Rate	Max. 12ml / min

1. Natural product extraction
2. Supercritical degreasing / foaming / drying
3. Supercritical cleaning / nanoparticles

Plant

Process Test

**WE
MAKE
YOUR
IDEA
POSSIBLE**

Contact us

If you have any questions about the product,
Please contact us using the contact information below



**Product consultation
and inquiry**

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A/S inquiry

+82-42-602-8067

Inquiry hours: Weekdays 8:30 - 17:30 [12-13:00 lunch time]



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