

PHASE SEPARATOR & STORAGE TANK

Brief Introduction



Best LN2 Application System in Korea

CVS has committed itself to developing machines for beverages and aluminum extrusion mold cooling systems with experience in developing various beverage-related equipment and technologies that require high vacuum insulation for extended periods of time



Founded in

2009

Design, R&D, Manufacture

- LN2 Doser
- Aluminum Extrusion Mold Liquid Nitrogen Cooling System
- Mini LN2 Doser
- Relief Valve, Vacuum Pipe

Headquarter Located in

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Republic of Korea, CVS Co., Ltd.

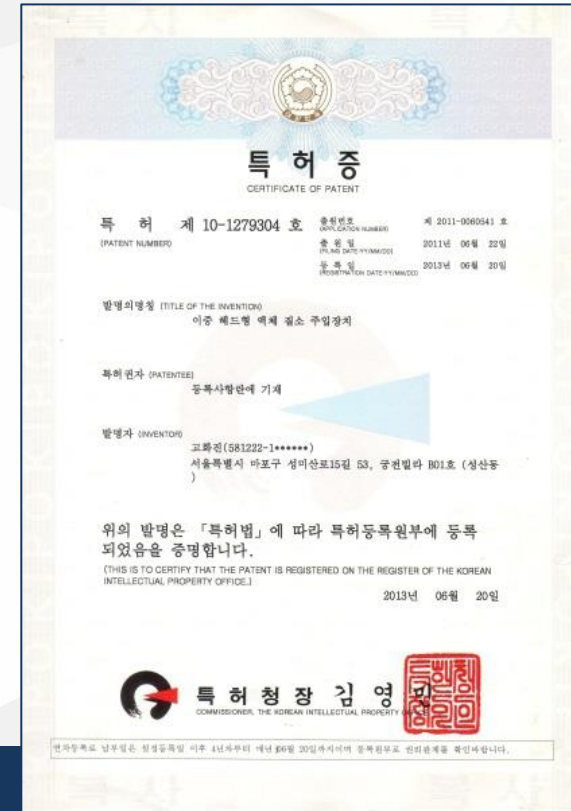
History of CVS



Certification



Aluminum Extrusion Mold Liquid Nitrogen Cooling System Patent No. 10-1878283



Double Head Liquid Nitrogen Doser Device Patent No. 10-1279304

01. Phase Separator Overview

When liquid nitrogen is supplied from the external LN2 tank to the LN2 doser, the process is delayed by vaporization. The phase separator manufactured by CVS prevents the cool down effect and supports the operation of the equipment by stably and promptly supplying the liquid nitrogen to the application equipment which utilizes it.

Liquid nitrogen is supplied through a vacuum pipe from an externally installed LN2 tank. This point, the liquid nitrogen is primarily stored in the phase separator in the double storage tank. The phase separator in the double storage tank is installed at the end of the vacuum pipe to store liquid nitrogen while also adjusting the internal pressure deviation.

The phase separator manufactured by CVS is a piece of equipment that prevents the cool down effect to smoothly facilitate the supply of liquid nitrogen. The phase separator immediately supplies liquid nitrogen to the application equipment that uses liquid nitrogen, providing support for stable operations.

When being injected with liquid nitrogen, the phase separator stores it inside the primary and secondary storage tanks in the lower part of the equipment and supplies it from the storage tanks in a timely manner without the influence of dynamic pressure.

The phase separator, installed as a part of the double storage tank, is a piece of equipment developed with CVS' own technology.



02. Phase Separator Functions

Gas-liquid separation and storage tank functions

The phase separator forms two storage spaces in the vacuum/insulated pressure vertical container.

When liquid nitrogen is supplied through a vacuum pipe, the phase separator separates the gas and liquid to externally discharge the gaseous nitrogen generated by the cool down effect. The lower tank is where pure liquid nitrogen, after being separated from the gas, is stored.

Internally, the phase separator is comprised of a gas-liquid separation section in its upper side and a liquid nitrogen storage tank in its lower side. A shut-off valve is installed between the upper and lower sections.

The phase separator controls liquid nitrogen levels as well as the internal pressure and vents gaseous nitrogen through the Sol Valve when liquid nitrogen vaporizes, increasing the internal pressure to its preset conditions.

When the inner pressure is below its set conditions, gaseous nitrogen is injected from the outside in order to maintain those conditions and to supply LN2 at a constant pressure to the cooling unit.

Inevitably, when the internal pressure rises above the set pressure, the relief valve opens and releases gaseous nitrogen to adjust the pressure.

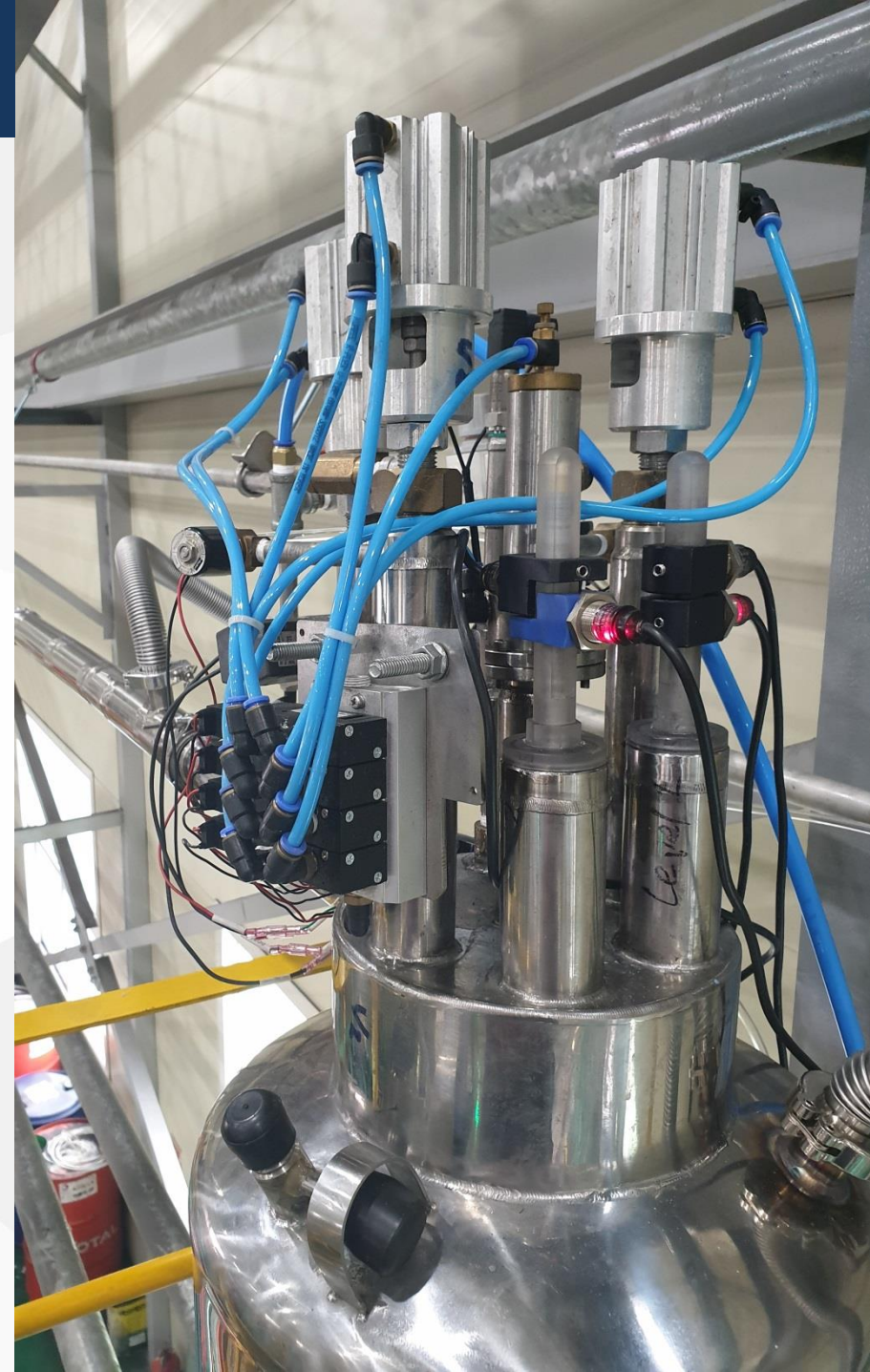
Upper Section Composition : Installation of various units including a supply valve/ outgassing vent / pressure sensor / relief valve / level sensor / sol valve for pressure maintenance / pressure transmitter



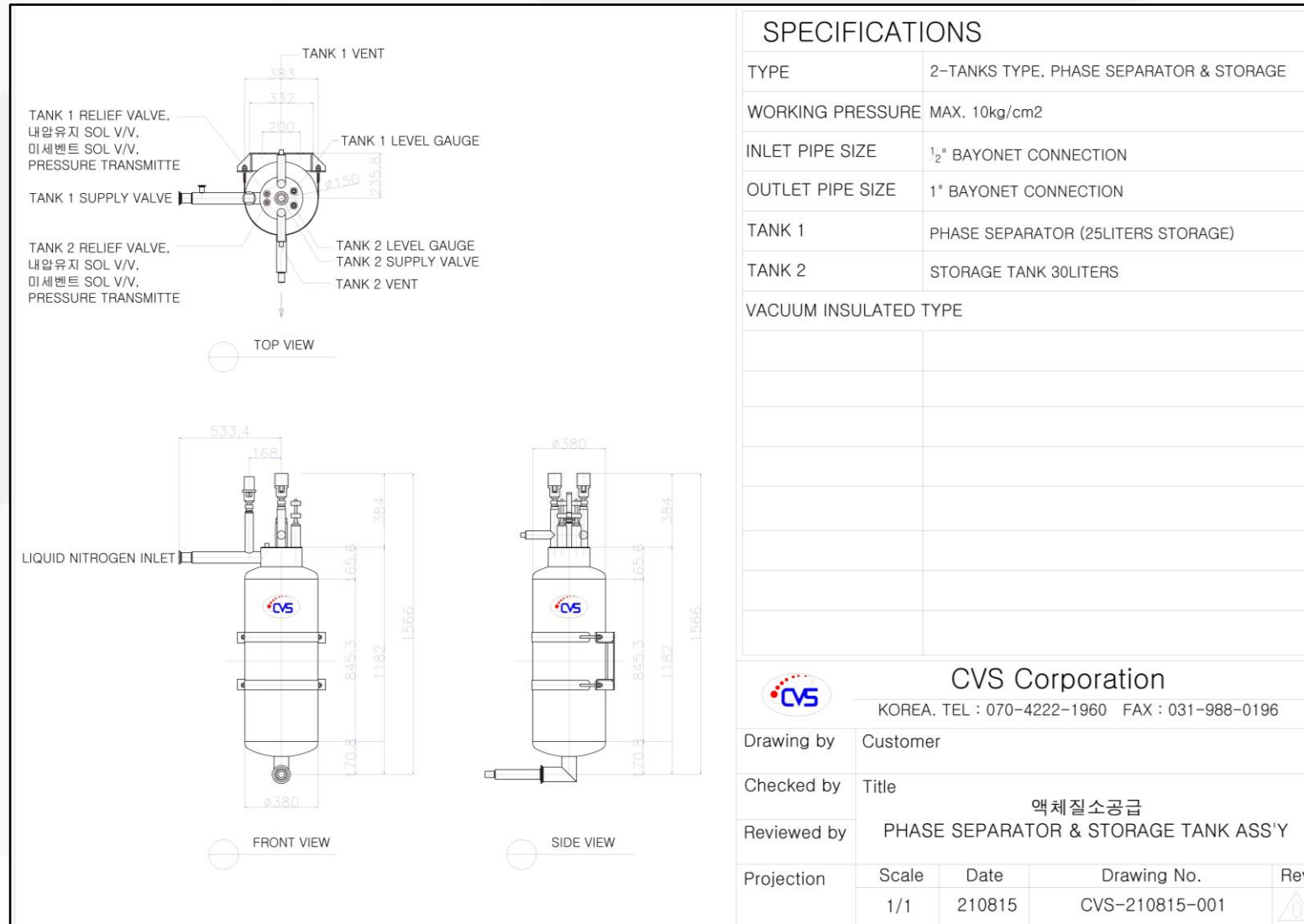
03. Characteristics and Application of the Phase Separator

1. Among the primary and secondary storage tanks where vaporized gaseous nitrogen is released and liquid nitrogen is stored, the lower storage tank supplies liquid nitrogen to the doser without the influence of dynamic pressure.
2. Since the phase separator supplies liquid nitrogen without the influence of the outdoor storage tank's dynamic pressure, it can supply liquid nitrogen under optimal conditions to liquid nitrogen using equipment such as the LN2 doser, extrusion mold LN2 cooler, etc.
3. The phase separator, which can maintain a constant internal pressure via simple operations, can be controlled.
4. As all parts are localized, cost of maintenance is low, with prompt follow-ups guaranteed.

Application of Phase Separator : When the vacuum pipe supplying liquid nitrogen is lengthy due to its distance from the external LN2 tank, it supplies liquid nitrogen in a timely manner at an adjustable, constant pressure without the influence of dynamic pressure.



04. Phase Separator Layout



SPECIFICATIONS

TYPE	2-TANKS TYPE, PHASE SEPARATOR & STORAGE
WORKING PRESSURE	MAX. 10kg/cm ²
INLET PIPE SIZE	1/2" BAYONET CONNECTION
OUTLET PIPE SIZE	1" BAYONET CONNECTION
TANK 1	PHASE SEPARATOR (25LITERS STORAGE)
TANK 2	STORAGE TANK 30LITERS

VACUUM INSULATED TYPE



CVS Corporation

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Drawing by Customer

Checked by Title

Reviewed by 액체질소공급
PHASE SEPARATOR & STORAGE TANK ASS'Y

Projection	Scale	Date	Drawing No.	Rev.
	1/1	210815	CVS-210815-001	

05. Phase Separator Specifications

TYPE	CAPACITY	OPERATING SYSTEM	GROUND CONDITION	LN2 SUPPLY PIPING SYSTEM
VACUUM INSULATED & 2 STORAGE TANK PHASE SEPARATOR TYPE	25 LITTER	WITH LN2 DOSER FULLY AUTOMATIC LN2 SUPPLY	TEMP 80°C, WATERPROOF DEVICE & ELECTRONIC CONTROL PANEL & CABLE NETWORK	VACUUM INSULATED PIPING BAYONET JOINTING SYSTEM

06. Phase Separator Composition



▲ CVS Phase Separator



▲ Control Panel



▲ Vacuum Pump



▲ outdoor tanks and
Insulation piping line

CVS PRODUCT

CVS Product

LN2 Doser

The LN2 doser, developed with our very own technology for the first time in Korea and installed in a number of automated lines, is our flagship product and has been operating in domestic canned beverage production lines for over 10 years.

The self-developed equipment stacked with CVS' technology has been recognized by many companies. It is also patented equipment for CVS' proprietary technology.

The LN2 doser produced by CVS has been supplied to domestic companies such as Coca-Cola Korea, Dongwon F&B, OKF, Wooil Beverage, and Naturecell, being recognized for its excellent performance.



CVS Product

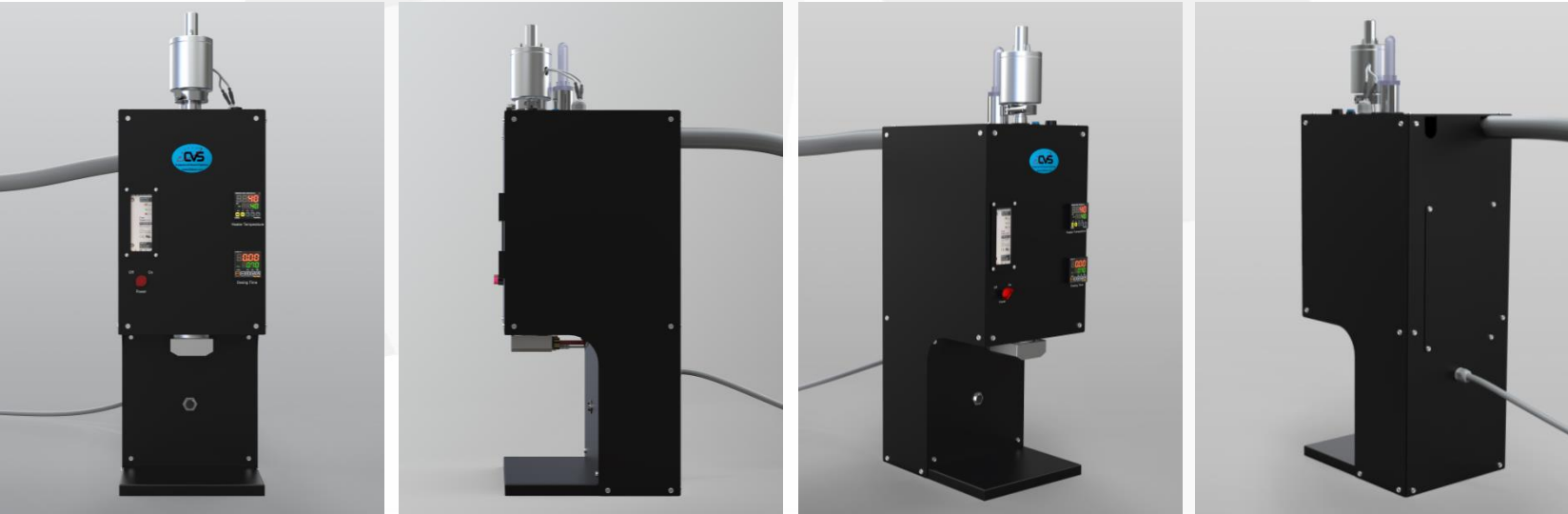
Mini LN2 Doser (M-2100)

The existing LN2 dosers are mostly installed in beverage mass production lines. They are large in size and designed exclusively for mass production processes.

The mini LN2 doser is a piece of equipment that has minimized the volume and functions of the existing LN2 dosers.

It is a newly developed doser that has been reduced in size, aiding small businesses, such as retail stores, home brewed coffee shops, and homemade juice sellers, with easy liquid nitrogen injections, rather than mass production automated factories.

CVS' LN2 doser, with its reduction in size and price when compared to the LN2 dosers designed for mass production, allow for easy access of liquid nitrogen dosers to individual cafe owners and can/PET beverage producers.



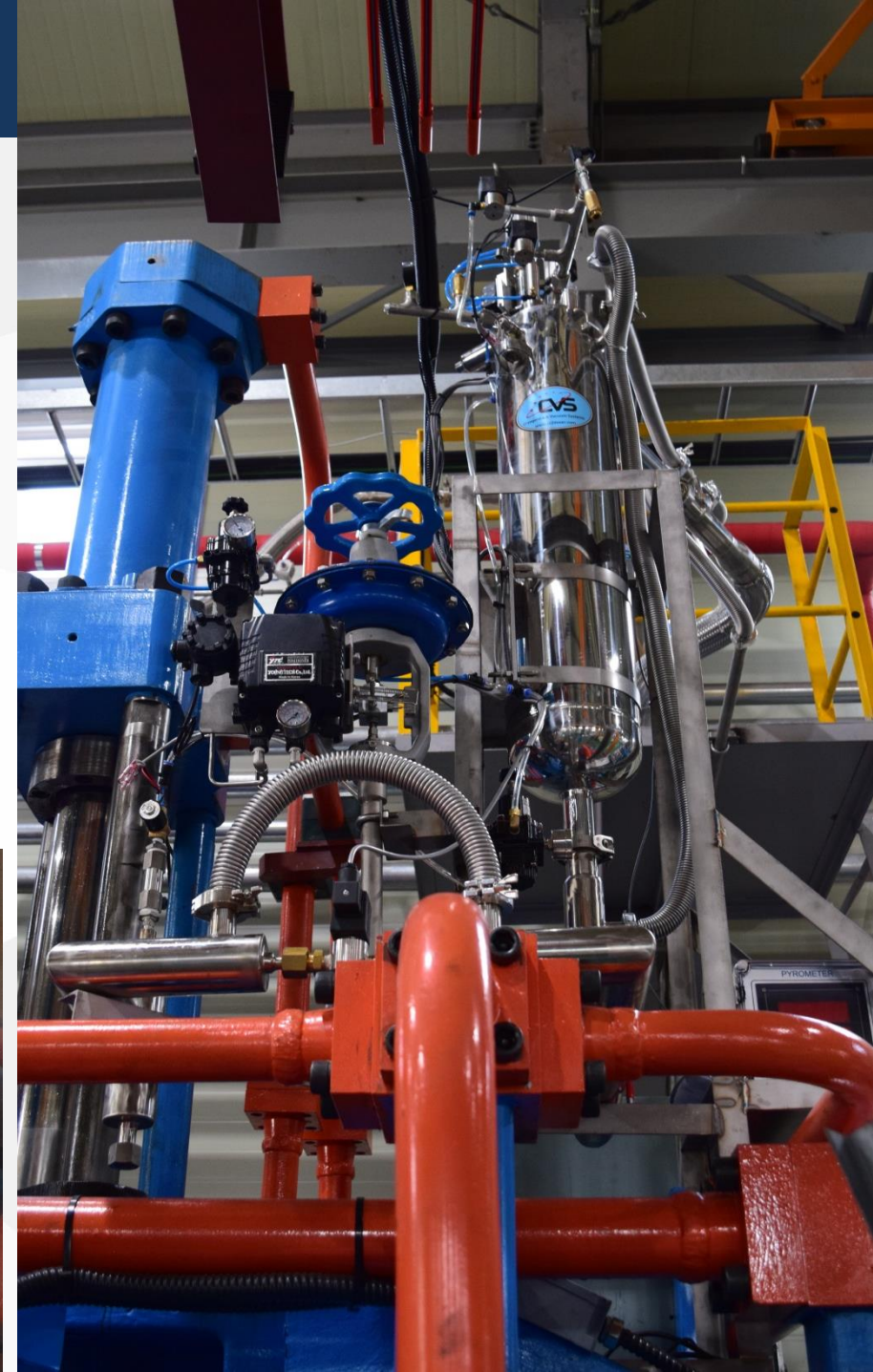
CVS Product

Aluminum Extrusion Mold Liquid Nitrogen Cooling System

The world's first aluminum extrusion mold LN2 cooler is a piece of equipment that provides innovation to the aluminum extrusion process.

The LN2 cooler locally cools the frictional heat given off from the extrusion mold's bearing surface in order to increase the extrusion speed to the set temperature by more than two-fold; while reducing the defect ratio of extruded products to drastically improve the surface quality.

CVS' self-developed extrusion mold LN2 cooling system is the first of its kind in the world, and is developed with new patented technology that can innovate the aluminum extrusion process.

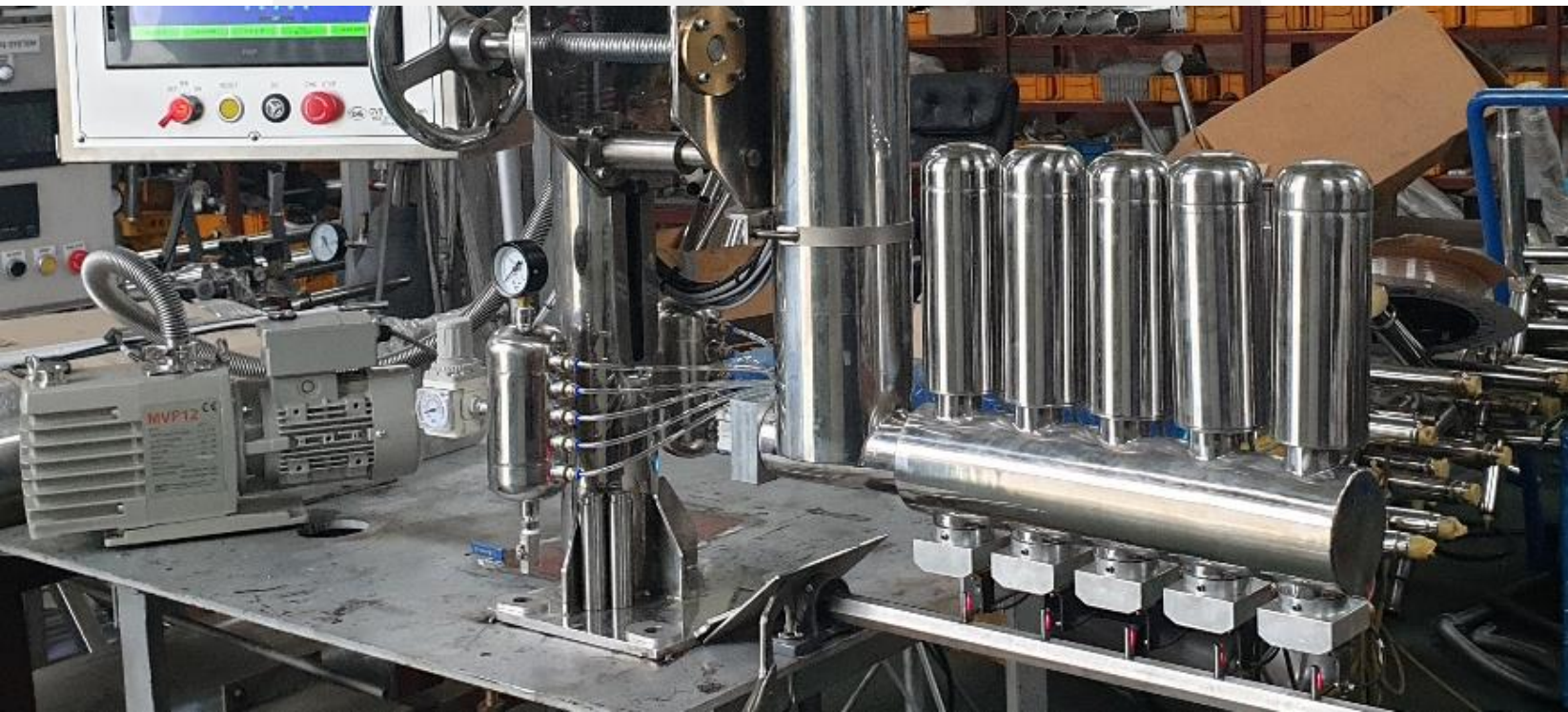


CVS Product

Application LN2 Doser

The medium-sized LN2 doser supplied to HITEJINRO and its corporate research institutes is used for the purpose of conducting corporate research as well as for experiments and tests.

Additionally, CVS are leaping forward drastically to develop and manufacture new cryogenic application equipment in collaboration with companies.



Thank You !



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