

If you wish to receive a quotation, please provide the information below.

(1) Liquid name:

(2) Original liquid amount: (kg/h	h/day)
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(3) Density:	(Original liquid	wt%)	(Concentrate	wt%)

(4) Original liquid temp: (°C)

(5) Liquid properties:	Specific gravity	Viscosity	Boiling pt elevation
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(5) Liquid properties:	Specific gravity	Viscosity		Boiling pt elevation
		mPa•s at	°C	
Original liquid		mPa•s at	°C	°C
		mPa•s at	°C	
Extracted density liquid		mPa•s at	°C	°C
		mPa•s at	°C	

*If you send us a sample liquid, we can measure.

(6) Purpose of concentration (Circle applicable item below.)

Concentration before drying / Concentrate is the product / Pre-concentration for crystallization

Other()

(7) Utility

Steam:(MPa) (t/h or less)	(Unit price	yen/kg)
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Power:(V) (Hz) (kW or less)	(Unit price	yen/kW)
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Water :(°C) (m ³ /h or less)	(Unit price	yen/m ³)
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*Cooling tower water / Industrial water / Tap water / Well water

(8) Installation site: Indoor / Outdoor

(9) Materials specified by your company:

(10) Other requests (such as special handling of liquid, if applicable)

Company name	
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Address	Zip code
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Person in charge	Department
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Person in charge	Department
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☎ FAX.

☎ FAX.

Ikoma Plant



The Ikoma Plant develops and installs Hisaka's proprietary production equipment and makes high-quality products. Using state-of-the-art equipment, Hisaka creates world top-class products and has major market shares in various fields in Japan and overseas.



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ORKS, LTD., Process Engineering Division is both ISO9001 and ISO14001 certified.
ORKS, LTD., IkomaPlant is ISO45001 certified.

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FO-CE000800
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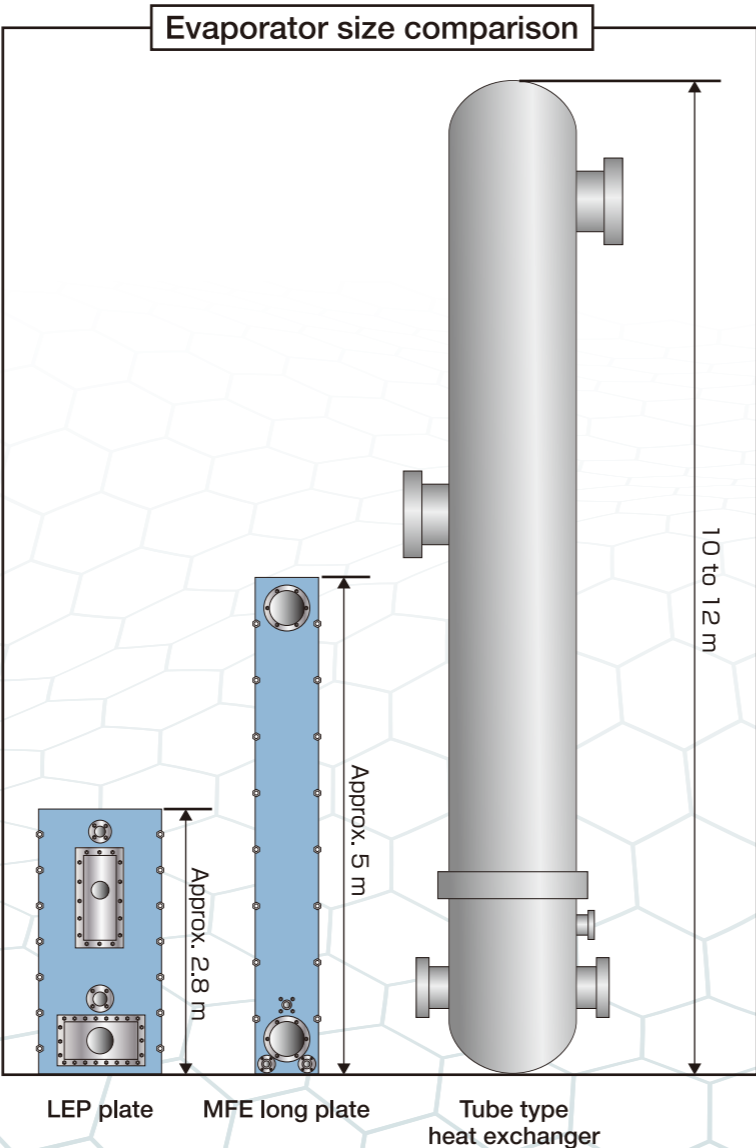
with hopeful technology

HISAKA

Hisaka Plate Type Concentrators: Compact, Excellent Maintainability, and High-Performance Unit which Work Well on the Concentration Process

Plate Type Concentrator Advantages

- (1) **Excellent concentration performance**
Fallig liquid film-type evaporation within plate passages provides higher performance than other types of concentrators. Since the liquid flows at a high flow rate through plate passages with plate patterns independently designed by Hisaka, it is difficult for scale to adhere, and liquid concentrates without thermal degradation.
- (2) **Compact installation space**
With plate type concentration, the size is compact, with height approximately half that of a tube type. Since it is compact, the cost of transport, assembly, placement, piping, and other installation work can be greatly reduced.
- (3) **Quick start and operation responsiveness**
Since a plate type evaporator's holding quantity is small, system start and response to operating condition changes are also quick.
- (4) **Easy maintenance**
With a plate type evaporator, the heat transfer plate installed in the frame is fastened by bolts and nuts. Heavy equipment is not required for the maintenance. Just loosen the fastening bolts to disassemble. The entire plate surfaces can then be cleaned and checked, allowing quick maintenance and a return to original performance.
- (5) **Easy plate replacement**
With a plate type, a heat transfer plate can be easily replaced if it corrodes or deforms. You can also increase the number of heat transfer plates according to its working conditions, which enables flexible adaptation to operation plans.



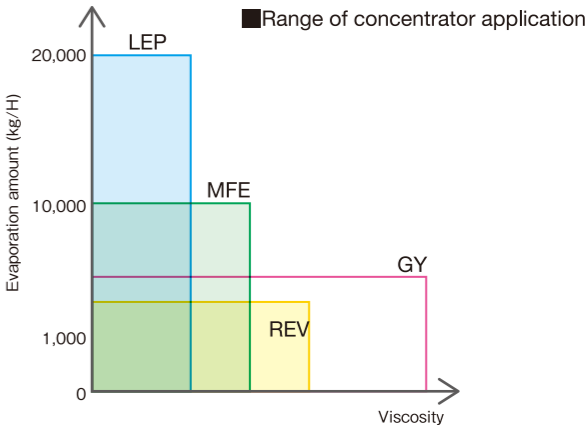
Concentrator Lineup





Hisaka concentrators provide optimum solutions according to product liquid features and requests to "reduce thermal degradation of product liquids," "support small-volume production of a large variety of products," and "suppress liquid foam and ensure consistent operation."

Hisaka concentrators include plate types and coil rotation types.

- General features of plate type concentrator
- Prevents adherence of scale thanks to the plate type.
 - Can be disassembled due to the plate type.
 - Suitable for steam-compressor, multiple-effect, and thermo-compressor types, and saves energy.

- General features of coil rotation type concentrator
- Thanks to simple structure, product loss is minimal.
(Optimum for concentration of valuable liquids.)



	Long plate type	Plate type		Coil rotation type
Type/System	 <p>One-pass concentrator REN-MFE</p>	 <p>Circulation concentrator REN-LEP</p>	 <p>Flash concentrator REV</p>	 <p>Global concentrator GY</p>
Features	Fallig liquid film-type evaporation One-pass evaporation while flowing down in thin films within plate <ul style="list-style-type: none"> Reduces thermal effects Minimal amount of holding From small to large volume concentration Energy saving with multiple effects 	Fallig liquid film-type evaporation Circulation evaporation while flowing down in thin films within plate <ul style="list-style-type: none"> Large-volume concentration Energy saving with multiple effects Titanium plate available 	Flash evaporation Flash evaporation in separator after heating in plates <ul style="list-style-type: none"> Suppression of liquid foaming High versatility Titanium plate available 	Coil thin film evaporation Evaporation via rotating heat transfer coil in separator <ul style="list-style-type: none"> High-viscosity support available Easy cleaning, minimal contamination (Coil can be pulled out) Also supports solid-containing liquid
Evaporation amount	100 to 10,000 kg/h	1,000 to 20,000 kg/h	50 to 1,300 kg/h	20 to 2,500 kg/h
Uses	Extracts/seasonings: Seafood, seaweed, chicken bones/meat, plant extract, yeast, amino acid Fruit/vegetables: Apples, peaches, oranges, prunes, tomatoes, carrots, green juice Carbohydrates: Sugars (glucose, sucrose), oligosaccharide, polysaccharide (dextrin), honey, sugar alcohol Medicines/supplements/cosmetic materials: Chinese herbal extracts, glycerin, collagen peptide Chemicals/industrial waste: Latex, food wastewater, fermentation wastewater, water-soluble waste oil, plating wastewater, degreasing wastewater			

*Small-capacity testing machines are available for the aforementioned concentrators.

Long Plate Type

One-Pass Concentrator

Suitable for steam-compressor,
multiple-effect, and thermo-compressor types

REN type
MFE

Liquid-friendly, and ace of concentration, large-variety/small-volume production

This powerful, state-of-the-art plant secures high-quality concentrate from liquids that are sensitive to heat and whose fragrance by enabling a one-pass type with super-long plate and minimizing holding liquid within the system. Three plate sizes are available for different amounts of evaporation.

Features

- **Concentration without harming properties of original liquid**
Reduces time from reception of original liquid to extraction of concentrate to several minutes.
 - **Support for large-variety, small-volume production**
The amount of holding liquid in the system is minimal.
 - **High efficiency, low running cost**
With super-long plates, the system prevents stagnation of treatment liquid and provides low-cost concentration.
- **Even greater energy savings**
Heat transfer plate is optimal for not only multiple-effect types but steam-compressor and thermo-compressor types.
 - **Vast improvement in scaling**
Constantly high flow rate of liquid prevents scale adherence.
 - **Small installation area**
Compact design with a vertically lengthened evaporation plate.

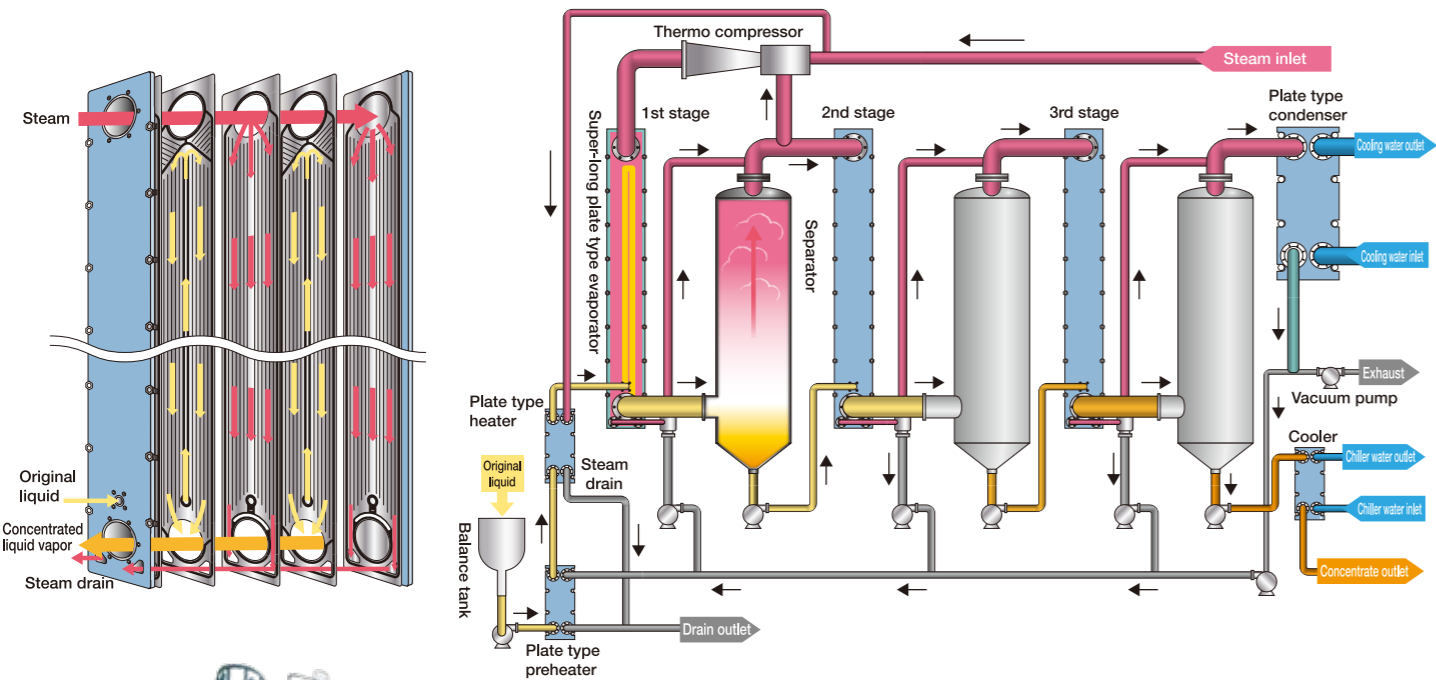


Plate model	No. of stage	Evaporation amount max.(kg/h)	Installation area W×L×H(m)
MFE-01	Single	200	3.0×2.0×3.0
	Double	400	4.0×2.0×3.0
	Triple	750	4.0×2.5×3.0
MFE-05	Single	600	4.0×3.5×5.5
	Double	1,000	5.5×3.5×5.5
	Triple	2,000	6.5×3.5×5.5
MFE-15N	Single	2,000	4.0×4.0×7.2
	Double	4,000	6.0×4.0×7.2
	Triple	8,000	7.5×4.0×7.2
	Quadruple	10,000	10.0×4.0×7.2

Plate Type

Evaporator

Suitable for steam-compressor,
multiple-effect, and thermo-compressor types

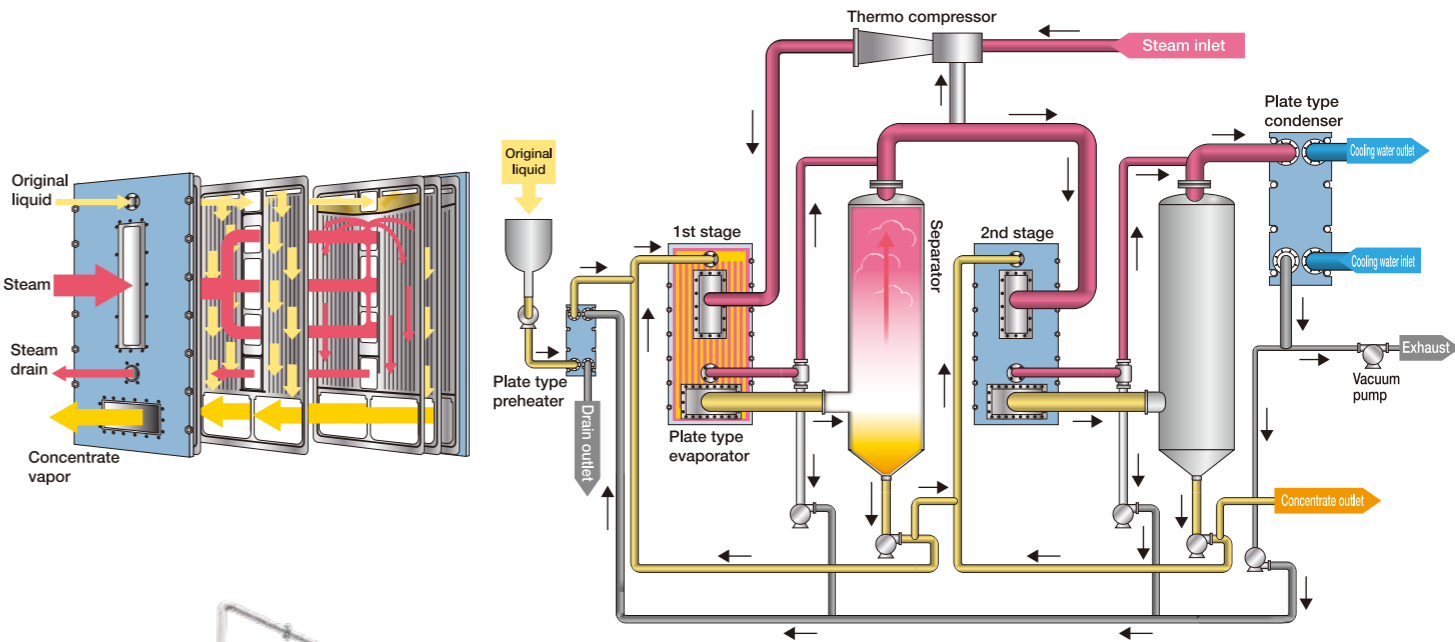
REN type
LEP

Concentration that limits scale adherence

Thermal evaporation occurs in just seconds by flowing down in thin films through plate surfaces. Vapor produced on plate surfaces causes the flow rate of the liquid in the equipment to increase, making it difficult for scale to adhere.

Features

- **Limited scale adherence**
Mass velocity is high and liquid distribution is uniform.
 - **High heat transfer performance**
Heat transfer performance is 2 to 3 times that of tube type.
 - **Short processing time**
Liquid makes contact with heat transfer surface for about 2 seconds. Suitable for heat-sensitive liquids.
- **Easy operation**
With adoption of circulation system, easily handles changes in original liquid.
 - **Easy to maintain, change capacity**
Easy to disassemble plates, clean, and change number of plates.
 - **Plate material**
Stainless steel/titanium



No. of stage	Evaporation amount (t/h)	Installation area W×L×H(m)
Single stage	1	3.0×7.0×5.5
Double stage	3	6.0×7.5×5.5
Triple stage	8	6.0×11.0×5.5
Quadruple stage	20	10.0×15.0×8.0

Flash Concentrator

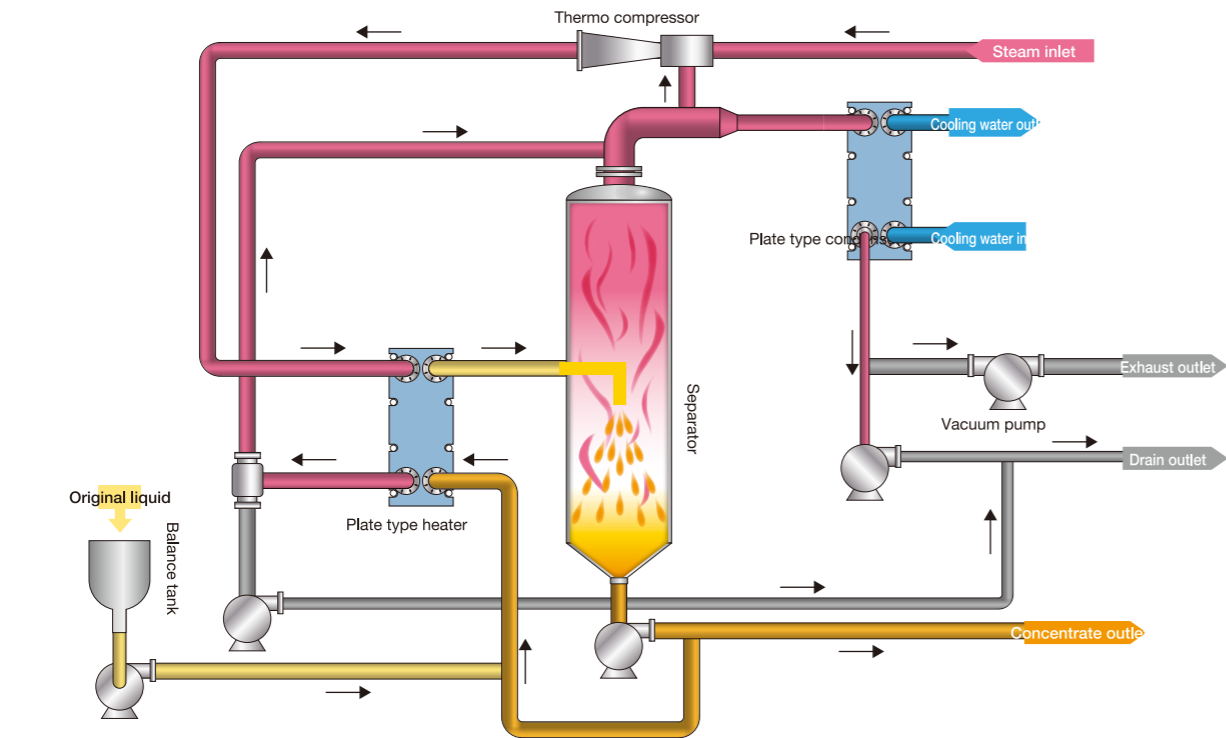
Suitable for thermo-compressor types

REV type

Concentration that limits liquid foaming

Liquid is heated in a high-performance plate type heat exchanger, and flash evaporation occurs in a separator tank. This evaporation concentrator is small, unitized, and fully automatic. Not only capable of concentrating small-volume liquids, this superb system can operate while completely suppressing foam, even that of a variety of highly foaming liquids.

- Features
- Strong against even highly formable liquids
Special mechanism completely prevents foaming, even with protein liquids and soapy liquids.
 - Adaptable to highly viscous liquids
Possible up to 2,000 cP.
 - Compact unitization
By repeating batch operations, the system greatly reduces cost. Compact design minimizes installation space.
 - Plate material
Stainless steel/titanium



Model	Evaporation amount (kg/h)	Holding liquid (l) max./min.	Installation area W×L×H(m)
REV-T2	5~6	4.0/1.2	0.7×1.0×1.8
REV-40/10	100	100/20	2.0×2.2×3.1
REV-60/30	300	200/60	2.4×3.6×4.3
REV-80/60	600	400/100	2.4×4.1×4.6
REV-100/90	900	600/200	2.6×4.3×4.8
REV-120/130	1,300	900/250	2.8×4.5×5.0

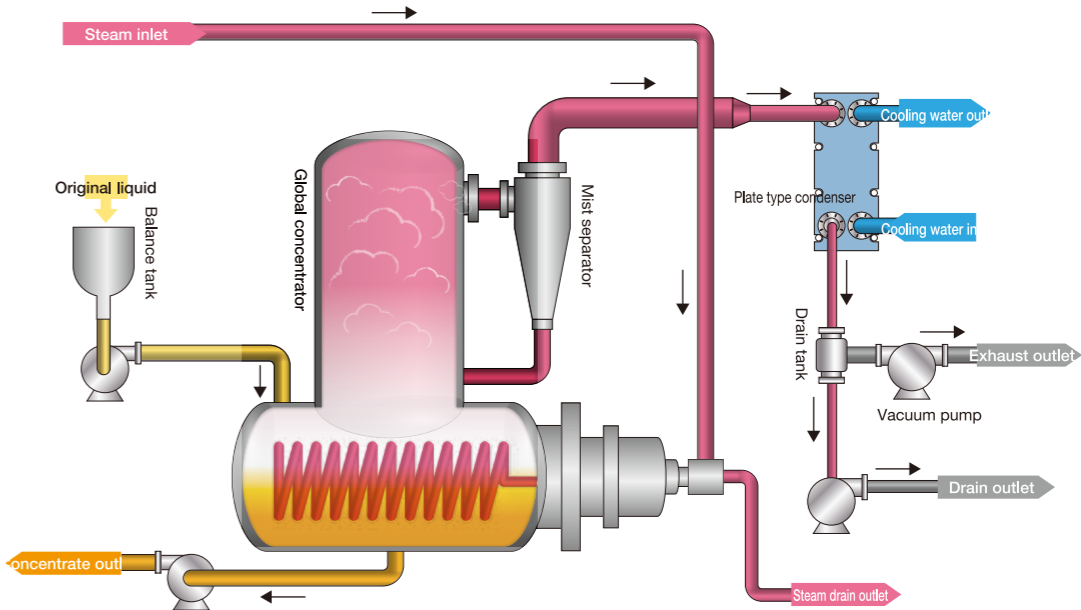
Global Concentrator

GY type

For concentration of highly viscous liquids

A coil type heat transfer tube rotates in the concentrator, causing concentrate adhering to the coil surfaces to separate by centrifugal force and agitate the liquid. Excellent heat transfer effects can thus be obtained.

- Features
- Concentration at low temperature possible
Can obtain product with high-quality medicinal ingredients.
 - Optimum for concentration of valuable liquids
 - Very little decrease in evaporation capacity
Due to renewal of heat transfer surfaces and liquid boundary films, scale adherence and scorching are nearly nonexistent.
 - Concentration of highly viscous liquids possible
 - Easy cleaning, suitable for large-variety concentration
Coil can be pulled out.
 - Minimum contamination, full amount recoverable



Model	Evaporation amount (kg/h)	Holding liquid (l) max./min.	Installation area W×L×H(m)
GY-02	20~30	30/3	2.1×1.1×2.0
GY-10	100	240/20	3.0×2.3×3.8
GY-20	200	300/30	3.5×2.4×4.0
GY-30	300	500/30	4.6×2.6×4.0
GY-50	500	920/40	4.7×3.1×4.6
GY-100	1,000	1,500/55	5.5×3.3×5.1
GYW-150	1,500	2,000/250	5.2×3.8×6.0
GYW-200	2,000	2,500/300	5.2×4.0×6.4

Steam-Compressor Type Evaporator

VEV type

Ultra-energy-saving, water-saving, economical concentration

LEP plates and MFE plates have been adopted for the evaporation heater part of the steam-compressor type evaporator. These plates (Fallig liquid film-type) have extremely high heat transfer performance even with small temperature differences, and form optimum heat transfer components for steam-compressor type evaporators with almost no temperature difference secured.

Features

●Low running cost

This energy-saving type is equivalent to 10-stage type or higher.

●No condenser needed

Does not require large amount of cooling water.

●Limited scale adherence

Features low-temperature evaporation, high mass velocity, and uniform liquid distribution.

●High heat transfer performance

Heat transfer performance is 2 to 3 times that of tube type.

●Easy to maintain and change capacity

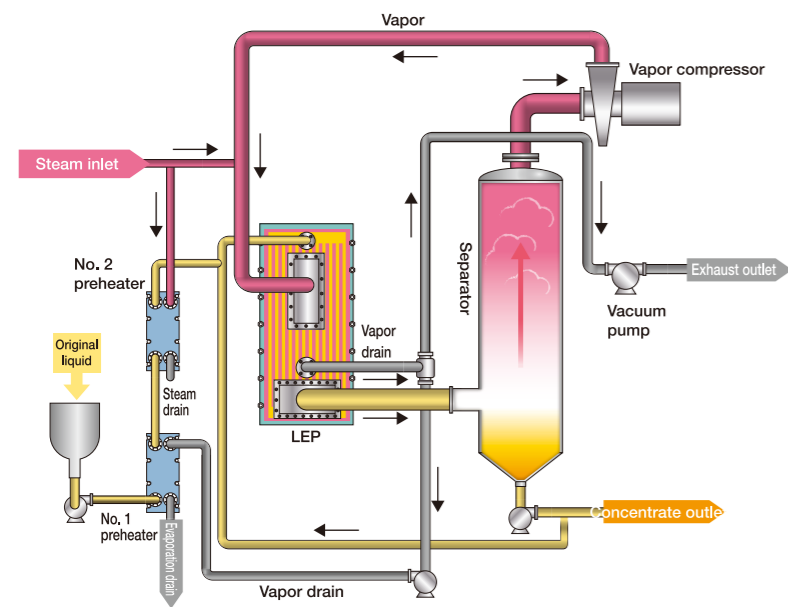
Easy to disassemble plates, clean, and change number of plates.

●Includes fully automatic and safety features

Simply press start button for automatic operation, including CIP. Also, "Low liquid" and other emergency safeguards are ensured.

●Plate material

Stainless steel/titanium



Steam-compressor type vs. multiple-effect type

●Comparison of energy required for 3,000 kg/h evaporation (calculated for 0.6 MPa steam)

	Steam for evaporation (kg/h)	Power (for steam compressor) (kW/h)	Energy supply required for 3,000 kg evaporation (kW)
Double stage	1,450	0	980
Triple stage	1,140	0	770
Steam-compressor type	150	75	300

●Running cost comparison (per hour)

3,000 kg evaporation/h

Double stage

5,000 yen

Triple stage

4,000 yen

Steam compression

2,100 yen

750

1,350

●Unit price conditions
Steam: 5,000 yen/t
Power: 18 yen/kW/h

From Test to Equipment Selection

From concentrate sample tests to actual equipment selection, many types of testing machines for a variety of liquids are available at Hisaka. Hisaka also has a wide range of test equipment for testing peripheral processes that accompany the concentration process. You are welcome to use them.

(1) Confirmation of concentration specifications

(2) Sample liquid concentration test

(3) Actual machine selection

Confirmation of original liquid type, original liquid properties (such as corrosiveness, volatility, and foamability), stock solution density, concentrate density, evaporation temperature, etc.

Sample liquid is concentrated (and physical properties measured) using Hisaka testing machines.

Actual machines are designed and recommended based on data obtained from sample liquid concentration tests.

Flash type concentration tester REV-T2

- Evaporation amount: 5 to 6 kg/h
- Holding liquid amount: 1.2 to 4 l
- Evaporation temp: 45 to 80°C
- Installation area:700×1,000×1,800 (H) mm
- Utility:Cooling water...400 l/h
Power used...7.2kW (200V)



Long plate type concentration tester REN-2-T

- Evaporation amount:40 kg/h (single-stage specifications)
60 kg/h (double-stage specifications)
- Holding liquid amount: 20 l
- Evaporation temp: 40 to 75°C
- Installation area:2,700×1,500×3,600 (H) mm
- Utility:Steam...52kg/h (0.7MPa)
Cooling water...4m³/h
Cleaning water (fresh water)...3.5m³/h
Power used...5kW (200V)



Global concentration tester GY-2

- Evaporation amount:20kg/h
- Holding liquid amount: 3 to 30 l
- Installation area:2,100×1,200×2,000 (H) mm
- Utility:Steam...23kg/h (0.2MPa)
Cooling water...2.2m³/h
Power used...3kW (200V)



Other testing service machine

Pilot sterilizer: Cooking and sterilization testing for retort food

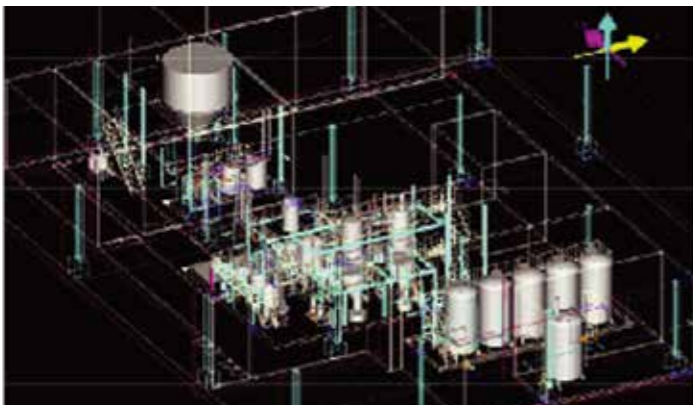
Continuous immersion concentration tester: For testing immersion cooking of food

Plate type liquid continuous sterilization tester: For sterilization testing of low-viscosity liquids

Tube type liquid continuous sterilization tester: For sterilization testing of high-viscosity and solid-containing liquids

Vacuum belt drying tester: For dry testing of concentrated liquids

Plants That Use Concentrators (Examples)



This is an example of an extract manufacturing plant for items such as meat, seafood, and seaweed. This plant's principal processes are extraction, concentration, sterilization, and drying. Hisaka offers its' own products for such processes which is why Hisaka can make unique plants as a manufacturer who knows these machines thoroughly. Hisaka will propose a plant that will be optimal for your purpose and use.

Concentrator



We will propose the ideal concentrator for your purposes (one-pass, flash, or global).

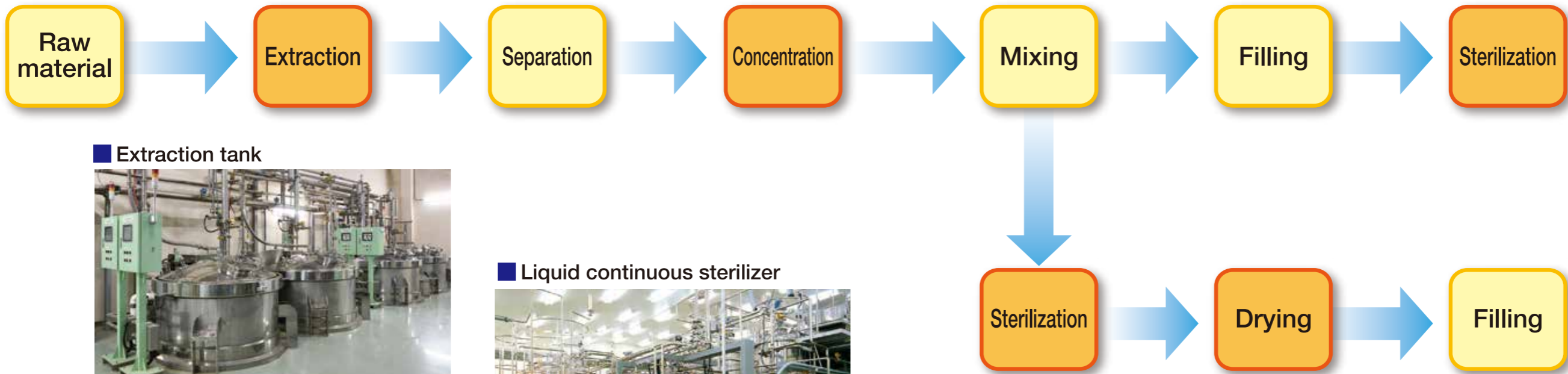
Mixing



Retort sterilizer



Having the world's best technology is useful when making products that are secure, safe, and consistent.



Extraction tank



We will propose the ideal extractor (normal pressure, high pressure, alcohol, etc.) for your purposes.

Liquid continuous sterilizer



We will propose the ideal sterilizer for your purposes (plate, tube, injection, or joule).

Vacuum belt dryer



Low-temperature vacuum drying is useful when making high-quality extract powder products with excellent solubility.

Plants where introduced (examples)

- Chinese medicine extract plant
- Extract extraction-concentration plant
- Vegetable juice plant