

Mitsuboshi Kogyo

ROTATION & REVOLUTION (ORBITAL MOTION) CENTRIFUGAL VACUUM MIXER

# HIGH-ROTOR SERIES

ハイ・ローター シリーズ

自転・公転遠心式真空ミキサー



*Stronger and More Precise!*



みつほし 三星工業株式会社

# Stirring Performance with Mechanism Unique to Industry

Employs a proprietary stirring mechanism. Reproducibility is realized from R&D to mass production.

We offer customer support based on our extensive know-how and experience.



## There's a reason why customers choose High Rotor.

### Dispersion power

With centrifugal mixers, the ratio of rotation to revolution greatly affects the stirring and defoaming performance.

High Rotor delivers a powerful dispersion force with the industry's only high-speed rotation type mixer, and is capable of stirring a variety of materials of low to high viscosity.

### Equipped with 4 cups

Typical centrifugal mixers can hold up to 2 cups, but Mitsubishi's "High-Rotor Series" is equipped with 4 cups as standard. This has resulted in production efficiency for R&D and mass production facilities of twice that of other manufacturers.

### Large machine for mass production

We offer a model capable of using a container with capacity of 20 L, the largest of its size both overseas or in Japan. The mixer is equipped with 4 cups, meaning a maximum total processing capacity of 80 L per batch.

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***"Strengths"***



“High-Rotor” series of the rotation and revolution mixer includes two types:

air (non-vacuum) stirring mixers of “Type A” and vacuum-defoaming mixers of “Type V”.

Each of the Type A and Type V includes various mixers, e.g., small-sized mixer for laboratory use, large-sized mixer for mass production.



0.6ℓ

HR003-02A/V



1.2ℓ

HR003-04A/V



2ℓ

HR005-04A/V



4ℓ

HR010-04A/V

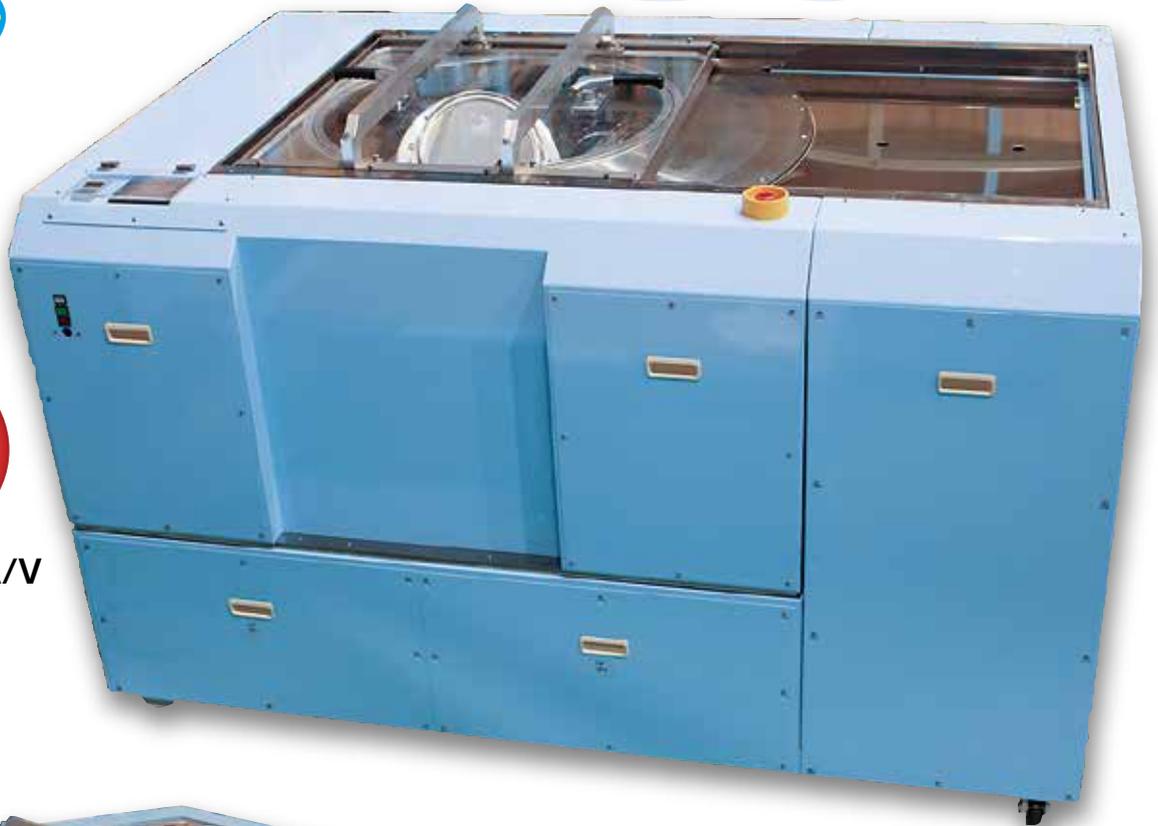


8ℓ

HR020-04A/V

**SERIES**

**Kogyo**



**80ℓ**

**HR200-04A/V**



**40ℓ**

**HR100-04A/V**

**16ℓ**

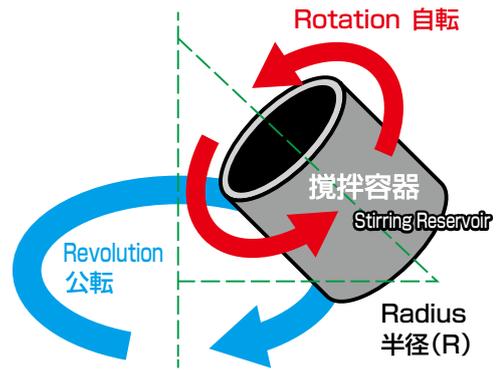
**HR040-04A/V**



# The merit of the High Rotor Mixing

## Stirring Principle

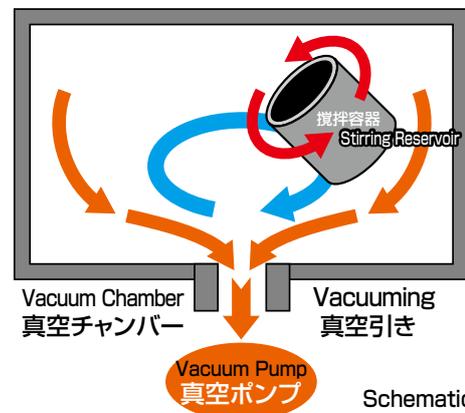
The "High-Rotor" mixer employs the centrifugal mechanism. Cups storing materials are rotated and revolved with a certain radius (R) at high speed. With this action, a great centrifugal force can be applied to the materials in the cups rotating and revolving, so that the materials can be well stirred.



Schematic View showing Rotation and Revolution  
自転・公転 模式図

## Vacuum-defoaming Mechanism

The reservoir to be rotated and revolved are provided in the vacuum chamber, and the materials can be simultaneously stirred and defoamed by actuating the vacuum pump for vacuuming the vacuum chamber. This mechanism is effective for materials in which air will be easily involved, e.g., epoxy resin and curing agent.



Schematic View showing Vacuum Structure  
真空構造 模式図

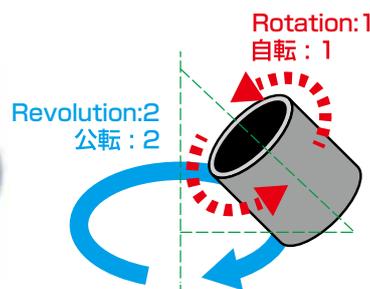
## The Number One Stirring Power in The Industry

Before



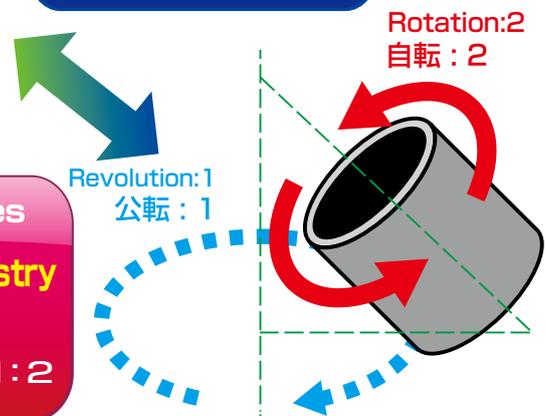
Oil-based Clay

After



Another Company's Mixer  
他社ミキサー  
Revolution : Rotation = 2 : 1  
公転 : 自転 = 2 : 1  
OR  
Revolution : Rotation = 1 : 1  
公転 : 自転 = 1 : 1

High-Rotor Series  
ハイローターシリーズ  
**Unique in The Industry**  
業界唯一!  
R/R Ratio 回転比  
Revolution : Rotation = 1 : 2  
公転 : 自転 = 1 : 2



In a "centrifugal" stirring mixer, the ratio of revolution : rotation (R/R ratio) highly influences the stirring and defoaming power. In case that the revolution speed is higher than the rotational speed, the defoaming power is increased; in case that the rotational speed is higher than the revolution speed, the stirring power is increased. The R/R ratio of "High-Rotor Series", i.e., [Revolution] : [Rotation], is 1:2, which is unique in the industry and which generates a great stirring power. As described above, even high-viscosity paste and semi-solid materials can be stirred in a short time.

# The merit of the High Rotor Mixing

## Mixing and Vacuum state is satisfactorily!

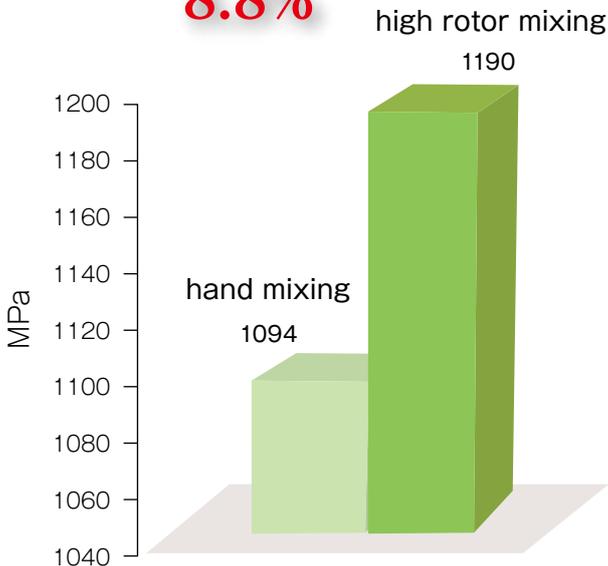
When fabricating CFRP, it is possible to stop uniform churning and air winning at worst by carrying out vacuum mixing of the base resin and the hardening agent of an epoxy resin using "High Rotor."  
(Right figure)



## FRP strength UP!!

### Bending strength

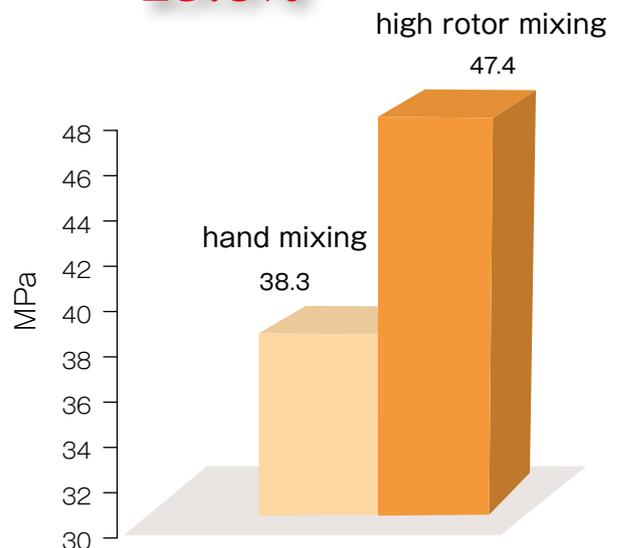
8.8%



GFRP Glass fiber resin:epoxy resin

### Interlaminar shear strength

23.8%



GFRP Glass fiber resin:epoxy resin

Moreover, as shown in the above figure, in order that the mixing state of resin may become good and may extract air by vacuum, the result that intensity physical properties become high as compared with FRP which uses resin of hand mixing has come out.

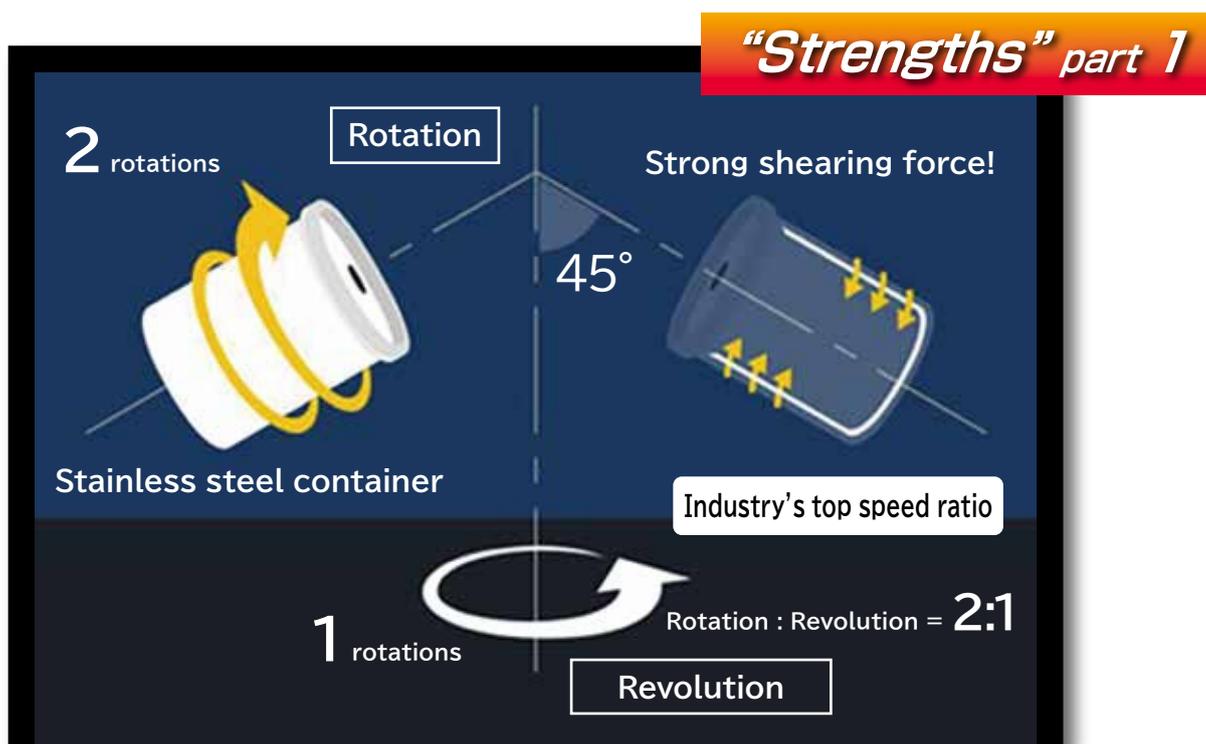
Please try High Rotor once.

# “Powerful Dispersion Mechanism”

Most conventional planetary mixers are of the type with high revolution speed in which the rotation to revolution ratio is “rotation ? revolution”, but High Rotor is a high-speed rotation type mixer in which “rotation > revolution”.

The rationale behind adopting a high-speed rotation type mixer is based on the results of analysis of the stirring mechanism (described on page 4), the understanding of which is being advanced through joint research with a university, and the fact that a rotation to revolution ratio of  $2 > 1$  clearly results in superior dispersion. (Research ongoing as of 2021)

Even with particularly high-viscosity materials, or materials with low fluidity that are difficult to disperse due to a composition with different specific gravity, or filler-rich composition, fluidity can be improved, resulting in quicker dispersal by applying a strong shearing force to the material. Moreover, improving fluidity also increases the effectiveness of high-viscosity material defoaming.



**Rotation:Revolution = 2:1 results in best dispersion!**

## Features by type for rotation to revolution ratio:

- ◇ **High-speed revolution type**  
(conventional mixer)
  - Air defoaming possible based on centrifugal separation principle
  - Excellent for dispersion of materials with high revolution “G”, low specific gravity, and low viscosity
- ◆ **High-speed rotation type**  
(High Rotor)
  - When high-speed revolution and high-speed rotation models are run under the same revolution speed conditions, the movement of material in the container is more aggressive and turbulent with the high-speed rotation type, resulting in increased dispersibility.
  - The greater movement of material results in lower air defoaming. Defoaming under vacuum is therefore recommended.
  - Can be used for materials with a wide range of viscosity, but the viscosity range of high-viscosity materials is particularly wide.
  - Dispersion time is shorter than that for the high-speed revolution type.

We also offer a new **“RS Series with Variable Rotation to Revolution Ratio”** (\* provisional name) for which the rotation and revolution speeds can be set freely based on the concept of incorporating the above two types into a single machine.

# Joint Research with Universities - "Analysis of Stirring Mechanism"

The following research results show that a High Rotor rotation to revolution ratio of 2:1 is most the most effective for dispersion.

## ■ Stirring performance map

In the test equipment in Fig. 1, a container was filled with water and starch granules, the mixer was run with rotation speed of 0 to 170 rpm and revolution speed to 0 to 95 rpm, and luminance was measured with an image camera. The results are shown with color conte in the diagram in Fig. 2. The vertical and horizontal axes in the diagram were normalized by the maximum rotation speed for each experiment. The results show that by measuring the dispersion in water containing starch granules from the amount of light diffusion, dispersion of the granules was most accelerated with rotation to revolution speed ratio of 2:1 (High Rotor rotation to revolution ratio).

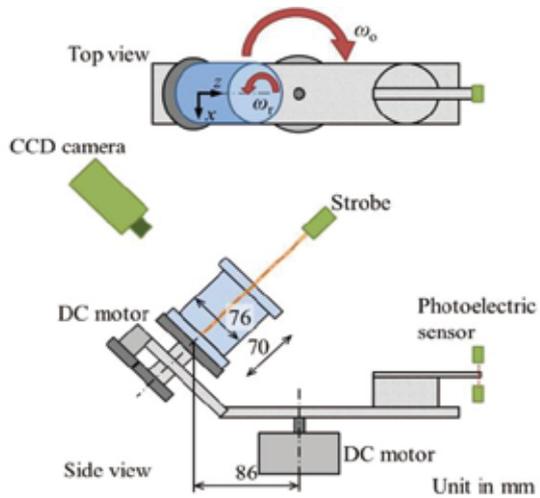


Fig. 1: Test equipment

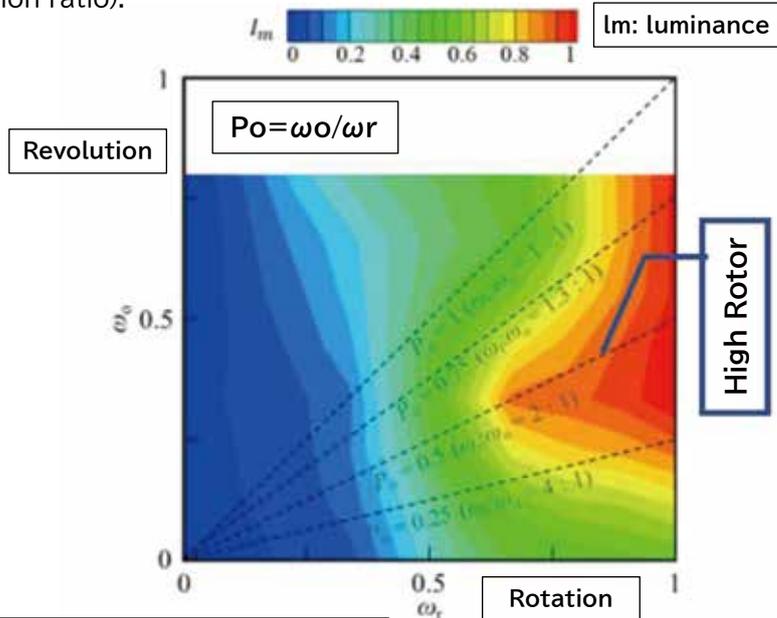
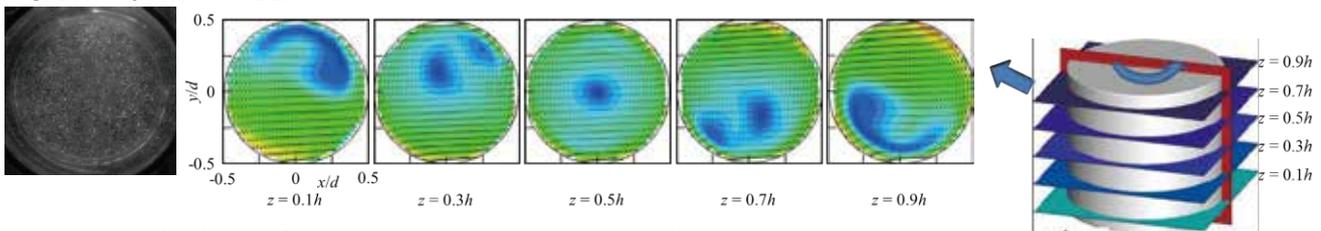


Fig. 2: Luminance distribution diagram

## ■ Analysis of velocity field in container using starch granules

1) Starch granules were dispersed in silicon resin, and the luminance of the granules was analyzed by taking photos with a camera.

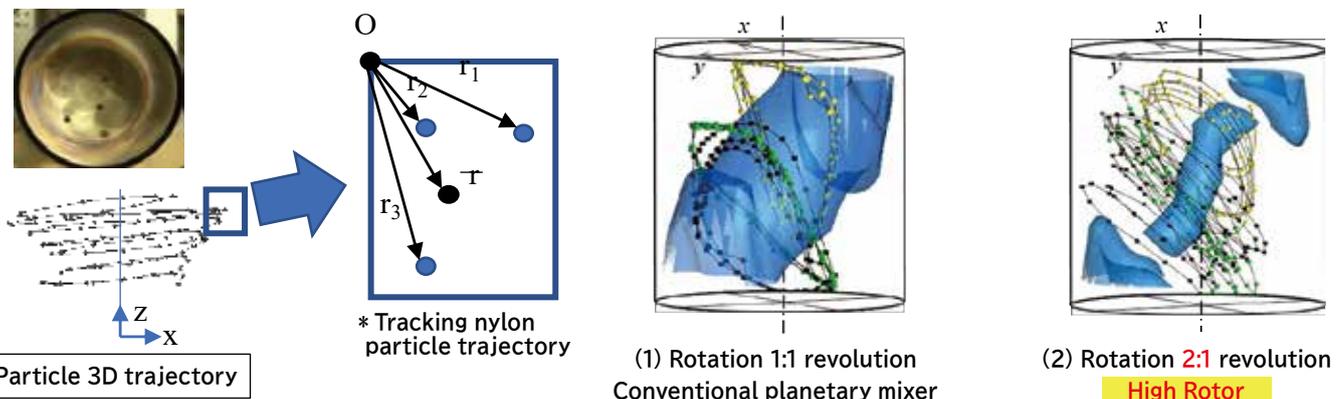
\* Analysis was carried out at the cross section of the container in the depth direction. The speed order is blue < green < yellow < red.



## ■ Analysis of velocity field in container using nylon balls

2) Nylon balls were added to silicon resin, and the trajectory of the balls was analyzed (rotation: 60 rpm / (1) Revolution 60 rpm, (2) Revolution: 30 rpm)

\* The blue region is a three-dimensional representation of the slow region in the analysis in 1) in the depth direction.



Results: From the analysis results of 1) and 2), in (1), the blue low-speed region is wide, and the particle trajectory is constant, and in (2), the low speed region is narrow, and the particle trajectory is complex. Consequently, we can see that the movement of the material in (2) generates a flow that increases dispersibility.

## High Productivity Realized with Industry's Only 4-Cup Simultaneous Processing

Conventional planetary mixers can hold 1 or 2 cups, but all High Rotor models can hold 4 cups. Consequently, the production quantity is simply double that of other manufacturers, making it suitable for mass production in terms of productivity. Moreover, higher productivity contributes to improved development efficiency for research and development also.

### *"Strengths" part 2*



**HR003**



**HR100**

- In addition to standard containers, we can provide any size of container to meet customer needs. Do not hesitate to contact us to discuss your container requirements.



# Industry's Largest 20 L Container x 4 Cup Model Lineup

High Rotor destroys the myth that “planetary mixers are for low-volume production”. This was realized with the completion of a model equipped with a 20 L container and 4 cups, the highest capacity in its class in the industry.

Continuous and kettle batch mixers are commonly used for large batch dispersers. However, producing a wide variety of products with limited number of mixers requires much “labor” and “time”. That’s why this 20 L model is so useful.

**“Strengths” part 3**

Model	HR200-04V
Container	20 ℓ container (designated container)
Number of cups	4 cups
Fillable weight	14 kg/cup
Rotation speed	250 rpm (revolution)



***HR200-04V (20 ℓ container)***

We also offer a lineup of large models which includes the HR100 (10 L) and HR040 (4 L).



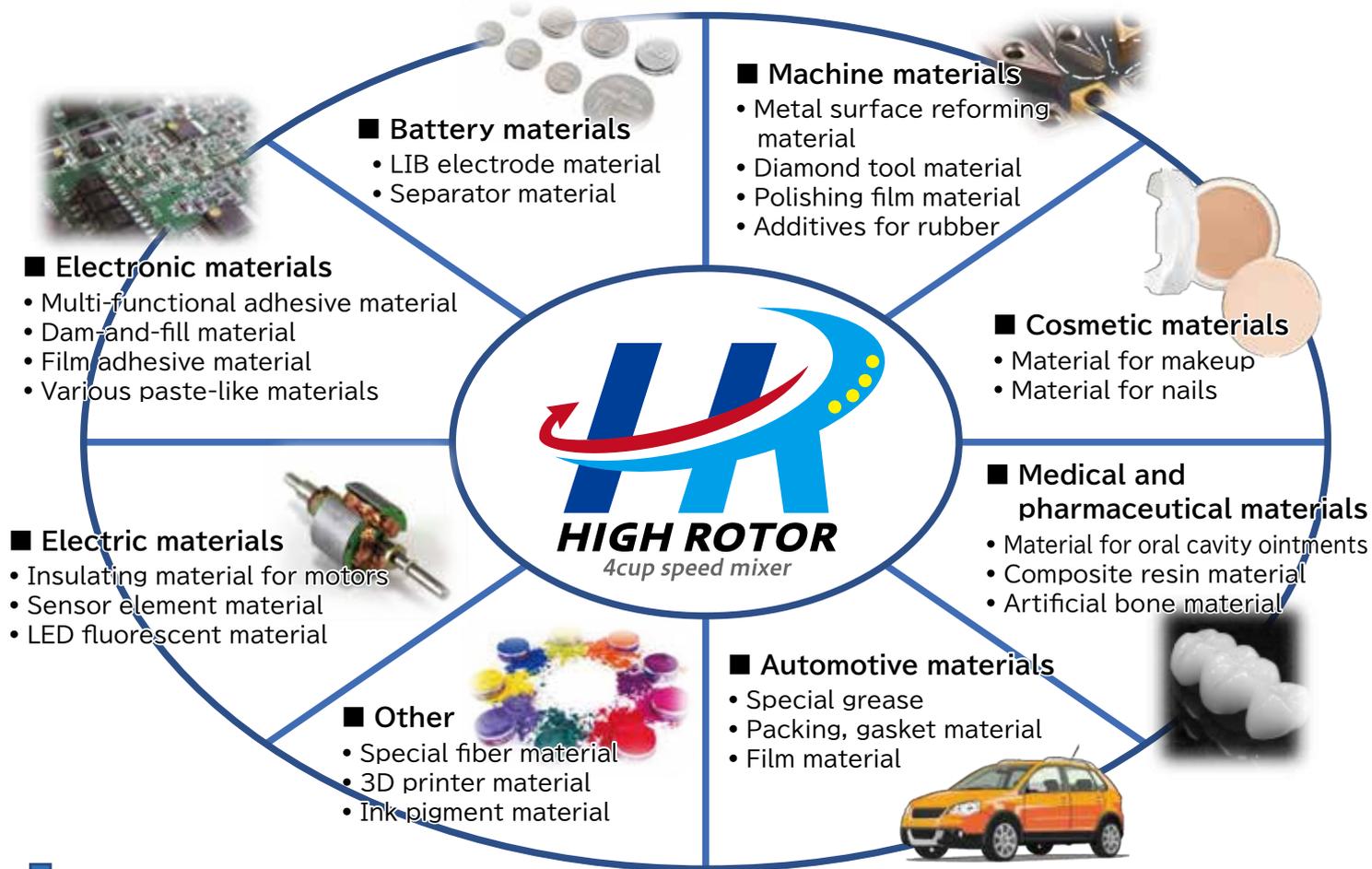
***HR100-04V (10 ℓ container)***



***HR040-04V (4 ℓ container)***

# Applications by Industry

The following chart highlights industries with a proven track record of using Mitsubishi mixers, and examples of some applicable materials. High Rotor can be used in any industry. These fields cover a wide range from R&D to production.



## Stirring Examples

### Oil-based mascara

[Constituent materials]

2-Ethylhexyl palmitate  
Isohexadecane  
Carbon black  
Cross polymer  
Aminomethyl propanol  
Ethanol

[Operating conditions]

Model: HR003-02V  
Rotation: 1,200 rpm, revolution: 600 rpm for 5 min

before



after



### Conductive film

[Constituent materials]

Epoxy resin + coupling material (15% Wt)  
Spherical fused silica (80% Wt)  
Other additives (5% Wt)

[Operating conditions]

Model: HR003-02V  
Rotation: 2,000 rpm, revolution: 1,000 rpm for 5 min

before



after



### LED fluorescent material

[Constituent materials]

Fluorescent material YAG/SGASN (30% Wt)  
Silicon resin (70% Wt)

[Operating conditions] Model: HR003-02V

Rotation: 2,000 rpm, revolution: 1,000 rpm for 1 min

before



after

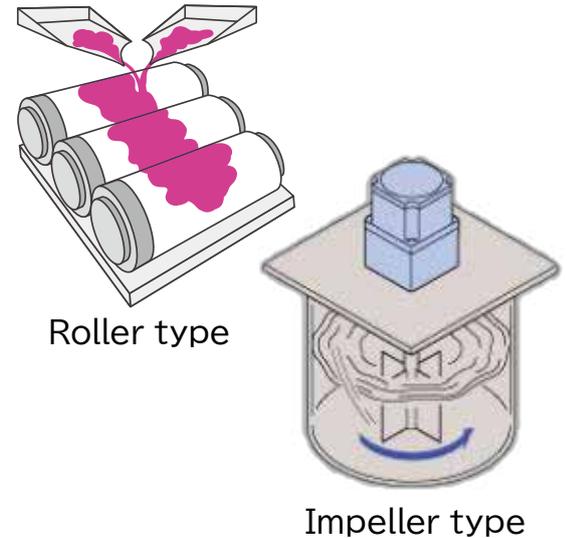


# Comparison of Features of High Rotor and Other Mixers

Here we compare a conventional mixer using an impeller, a roller mixer, and High Rotor.

## Impeller/3-roller type mixer

- Variations in dispersion occur in containers with high-viscosity products.
- Material is damaged through physical contact with the structure.
- It takes time to clean and restore after use.
- Stirring takes much time.
- Stirring and defoaming are performed in separate processes.
- Workers may become caught in rollers, etc.
- For mass production
- Running costs are incurred for consumable parts, etc.



## High Rotor



- Stable and uniform dispersion is possible even at high viscosity.
- Stirring is performed only by centrifugal force, meaning no damage due to physical contact.
- No foreign matter contamination occurs.
- No need to clean after use (if disposing of containers).
- High-speed rotation ensures quick dispersion.
- Equipped with a vacuum pump for simultaneous stirring and defoaming.
- There is no risk of becoming caught in the machine, ensuring maximum worker safety.
- Ideal for wide variety, small quantity production
- Containers are the only consumables.

# Frequently Asked Questions

Here are answers to some of the many questions posed by our users.

### ***Q1 : I want to perform high-definition defoaming.***

A1 : High Rotor performs defoaming with a 0.67 Pa spec. vacuum pump in an absolute vacuum.

### ***Q2 : I want to keep the material temperature after dispersion to within XX°C.***

A2 : High Rotor supports an option used to inject cold air into the vacuum chamber. High Rotor can also be customized to automatically measure the container temperature while the machine is running to control operation.

### ***Q3 : Can you tell us about the inspection items?***

A3 : The rubber part of the rotation cup should be checked as part of daily inspection. Periodic inspection mainly involves applying grease to bearings and replacing the vacuum pump oil.

### ***Q4 : I have a particular container that I would like to use.***

A4 : We can deliver customized High Rotor cups compatible with your container. We also design and manufacture adapters which allow various containers to be used.

# Operation Method

## Screen description

High Rotor employs a touch panel to achieve both operability and expandability. The input parameters (set values) are “time”, “revolution speed”, and “ultimate vacuum (absolute vacuum pressure)”.

[Pattern]: Single program running up to 16 consecutive steps

[Step]: Operating parameter for single operation



Step operation setting screen

## Description of operation

The input parameters are:

[Time]: Operating time  
(revolution setting speed)

[Speed]: Revolution speed

[Vacuum]: Target ultimate vacuum

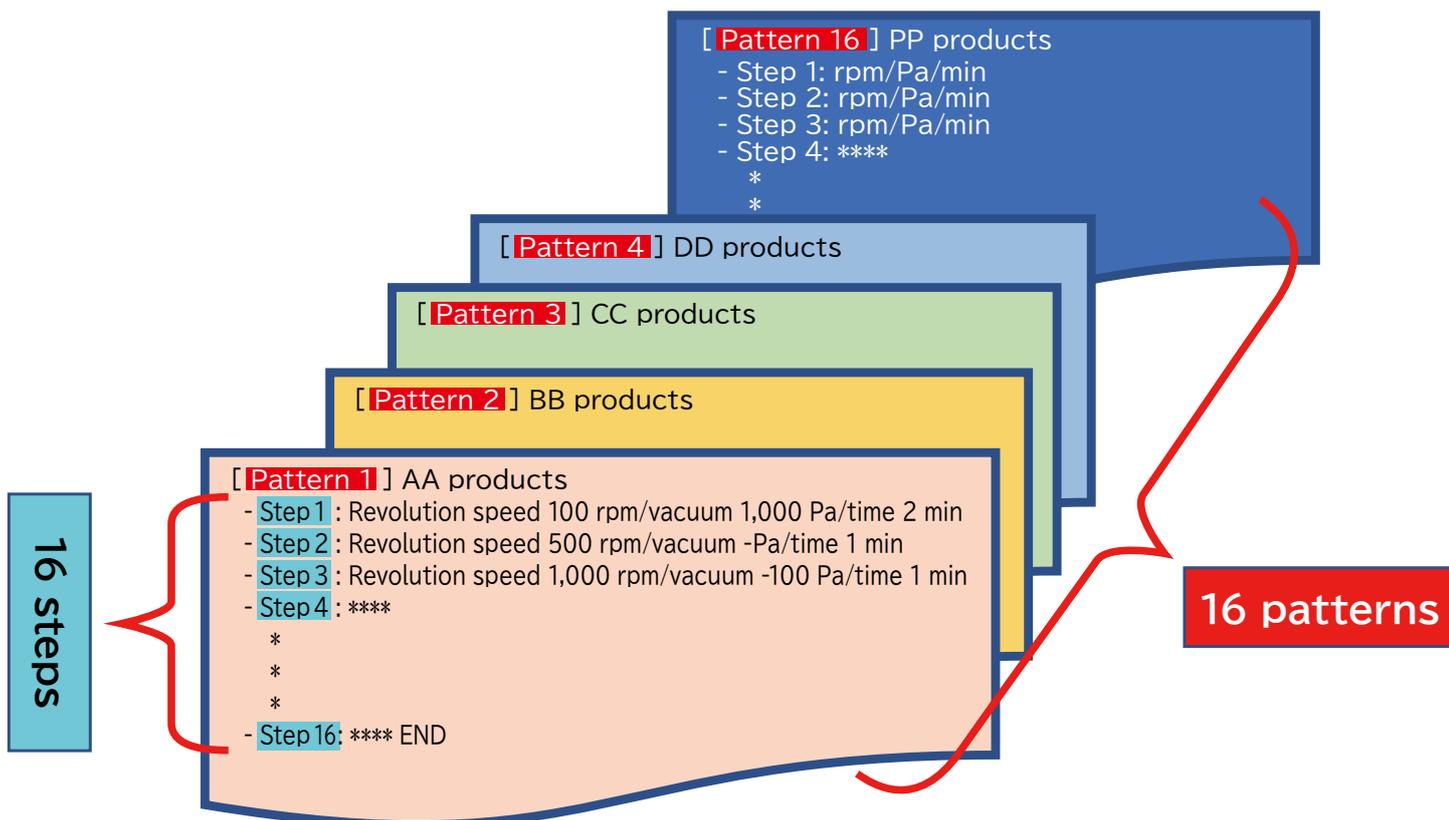
## Patterns and steps

A single pattern consists of 16 steps, and conditions for stirring and defoaming can be registered for each step.

By registering detailed conditions, material can be finished with the desired condition.

Moreover, 16 patterns can be registered (memorized), allowing processing conditions for 16 products to be registered.

This leads to improved work efficiency and the resolution of issues such as work errors.



# Special Specifications and Customization

We make every effort to customize High Rotor to meet the needs of our users. Please don't hesitate to contact us.

## ■ Dry ice cooling options [Patent No. 5711425]

This option works by producing cold air with temperature of  $-78^{\circ}\text{C}$  from dry ice pellets to cool material from outside the container.

This has a cooling effect of  $-10$  to  $-20^{\circ}\text{C}$ .

## ■ Explosion-proof construction

We offer customized models built to specification based on the explosion-proof construction required (by law) for installation by users. (There is a limit to the explosion-proof level provided.)

## ■ Container temperature measurement

High Rotor measures the temperature of the container during operation, allowing production to proceed to the next step. When the set temperature is reached, the process immediately proceeds to the set step.

## ■ Labor-saving equipment

Due to the large container capacity of our large model, we can offer a tool balancer to reduce the extra weight involved to improve workability.



HR200 & tool balancer

# Various Containers and Adapters

High Rotor uses containers which match the physical properties of material and the amount of material filled for the purpose of dispersion, mixing, and defoaming. We offer equipment customized according to containers used by the user. Please don't hesitate to contact us.

## ■ Examples of various containers (incl. commercial products)

- Mitsubishi Kogyo, standard containers (HDPP)
- KINKI YOKI CO., LTD. (PE), Mixing Containers, Hi-Bessel Containers, etc.
- Takemoto Yohki Co., Ltd. (plastic), tube bottles
- SANKO Co., Ltd. (plastic), Samper
- SANPLATEC CORPORATION (plastic), PE jars, bottles
- Shimizu Akira Inc. (SUS), 3dia
- Oya Seisakusho Co., Ltd. (SUS), Stock Pot
- Syringes, barrels, cartridges by various companies
- As One (plastic), disposable cups



## ■ Adapters for container sets (\* Designed exclusively)

- For syringes, barrels
- Size-reduction adapters for plastic and SUS containers
- Adapters for cooling



# Product Lineup

Vacuum defoaming type

Atmospheric deaerating type

Common to all sizes	
Rotation to revolution ratio	Rotation 2:1 revolution
Input parameters	Revolution speed 1 [rpm]
	Operating time [min, sec]
	Vacuum (absolute vacuum) [Pa]
Operation system	Automatic (16 consecutive steps)/manual (1 step) operation
Vacuum pump type	Oil rotary vacuum pump

## 300 mℓ research lab scale model



300mℓ

HR003-02A/V



300mℓ

HR003-04A/V

	Vacuum defoaming type	Atmospheric deaerating type	Vacuum defoaming type	Atmospheric deaerating type
Model No.	HR003-02V	HR003-02A	HR003-04V	HR003-04A
Cup size [mℓ]	300 x 2 cups		300 x 4 cups	
Permissible filling capacity/cup [g]	300		300	
Rotation speed [rpm]	2000		2000	
Revolution speed [rpm]	1000		1000	
Equipment size (W x B x H) [mm]	660 x 570 x 753		660 x 570 x 753	
Equipment weight [kg]	140	130	145	145
Power supply capacity [kVA]	3	2.5	5	4
Ultimate vacuum (dry) [kVA]	40	-	40	-
Vacuum pump pumping speed [ℓ/min]	50	-	50	-

Vacuum defoaming type  
Atmospheric deaerating type

*0.5 ℓ / 1 ℓ - Research lab to small-scale mass-production models*



HR005-04A/V

0.5ℓ

HR010-04A/V

1ℓ

	Vacuum defoaming type	Atmospheric deaerating type	Vacuum defoaming type	Atmospheric deaerating type
Model No.	HR005-04V	HR005-04A	HR010-04V	HR010-04A
Cup size [ℓ]	0.5 x 4 cups		1 x 4 cups	
Permissible filling capacity/cup [g]	500		1000	
Rotation speed [rpm]	1600		1600	
Revolution speed [rpm]	800		800	
Equipment size (W x B x H) [mm]	650 x 810 x 955	550 x 670 x 855	740 x 870 x 1040	
Equipment weight [kg]	260	200	320	260
Power supply capacity [kVA]	10	9	18	17
Ultimate vacuum (dry) [kVA]	40	-	40	-
Vacuum pump pumping speed [ℓ/min]	135	-	200	-

# Product Lineup

Vacuum defoaming type

Atmospheric deaerating type

**2ℓ medium-capacity mass-production model**

HR020-04A/V



2ℓ

	Vacuum defoaming type	Atmospheric deaerating type
Model No.	HR020-04V	HR020-04A
Cup size [ℓ]	2 x 4 cups	
Permissible filling capacity/cup [g]	1500	
Rotation speed [rpm]	1400	
Revolution speed [rpm]	700	
Equipment size (W x B x H) [mm]	850 x 950 x 1105	850 x 900 x 1085
Equipment weight [kg]	400	340
Power supply capacity [kVA]	20	17
Ultimate vacuum (dry) [kVA]	40	-
Vacuum pump pumping speed [ℓ/min]	600	-

Vacuum defoaming type  
Atmospheric deaerating type



**4 ℓ medium-capacity mass-production model**

HR040-04A/V



4ℓ

	Vacuum defoaming type	Atmospheric deaerating type
Model No.	HR040-04V	HR040-04A
Cup size [ℓ]	4 x 4 cups	
Permissible filling capacity/cup [g]	3000	
Rotation speed [rpm]	1000	
Revolution speed [rpm]	500	
Equipment size (W x B x H) [mm]	1050 x 1650 x 1135	
Equipment weight [kg]	1200	1000
Power supply capacity [kVA]	33	30
Ultimate vacuum (dry) [kVA]	70	-
Vacuum pump pumping speed [ℓ/min]	800	-

# Product Lineup

Vacuum defoaming type

Atmospheric deaerating type



**10 ℓ large, mass-production best seller**

HR100-04A/V



10ℓ

	Vacuum defoaming type	Atmospheric deaerating type
Model No.	HR100-04V	HR100-04A
Cup size [ℓ]	10 x 4 cups	
Permissible filling capacity/cup [g]	7000	
Rotation speed [rpm]	700	
Revolution speed [rpm]	350	
Equipment size (W x B x H) [mm]	1350 x 2000 x 1220	
Equipment weight [kg]	2200	2000
Power supply capacity [kVA]	38	34
Ultimate vacuum (dry) [kVA]	100	-
Vacuum pump pumping speed [ℓ/min]	1300	-

Vacuum defoaming type  
 Atmospheric deaerating type



**20 ℓ ultra-large mass-production high-performance model**

HR200-04A/V



**20ℓ**

	Vacuum defoaming type	Atmospheric deaerating type
Model No.	HR200-04V	HR200-04A
Cup size [ℓ]	20 x 4 cups	
Permissible filling capacity/cup [g]	15000	
Rotation speed [rpm]	500	
Revolution speed [rpm]	250	
Equipment size (W x B x H) [mm]	1610 x 2260 x 1350	
Equipment weight [kg]	3500	3300
Power supply capacity [kVA]	58	53
Ultimate vacuum (dry) [kVA]	200	-
Vacuum pump pumping speed [ℓ/min]	1500	-

# High-Rotor RS Series with Variable Rotation to Revolution Ratio

## HR003-04VRS

*Suitable for a wide range of materials.*

### What kind of planetary mixer is this?

- Unlike the fixed rotation to revolution ratio of 2 to 1 on the conventional High-Rotor Series, the speed of each rotation and revolution axis can be changed freely on this series.
- The rotation to revolution ratio is the highest in the industry within the speed range. [Practical setting range (rotation speed)] \* The speed can be set in 1 rpm increments in the following range.  
 Rotation: 0 to 3,600 rpm  
 Revolution: 0 to 1,500 rpm (from rotation of 2,000:1 to 1:1,000 rpm)
- This RS model can even be run in the range in which the operating speed of conventional high-speed revolution type planetary mixers is limited.
- The container can hold 4 cups.
- The mixer is equipped with a vacuum pump as standard.
- Specifications table

Model	HR003-04VRS
Container	300 ml commercially-available container (HDPE)
Number of cups	4 cups
Fillable weight	300 g/cup (gross)
Revolution speed	0 to 1500 rpm (2:1)
Rotation speed	0 to 3,600 rpm
Vacuum pump	Oil rotary type
Ultimate vacuum	100 Pa (not filled with material)
Power supply	200 V, three-phase
External dimensions	780 W × 600 D × 1200 H
Weight	425kg



300 ml commercially-available container (HDPE)

# Vacuum Syringe Centrifugal Deaerator

## Model information

*The air bubbles in the syringe are defoamed by centrifugal force.*

After filling, the material in the syringe is defoamed under a vacuum by centrifugation.

- The syringe in the vacuum chamber is defoamed by centrifugal force.
- Syringes are available in capacities ranging from **30 to 70 cc**. Cartridges are available up to **20 oz**. Mitsubishi offers customized syringes and cartridges for customers wishing to use other than those listed in the specifications.
- Specifications table

Supported syringes	30 cc, 50 cc, 70 cc, 6 oz, 8 oz, 12 oz, 20 oz
Syringe capacity	8/batch for 8 oz syringes
Max. speed	2000 rpm
Vacuum chamber	SS400 Kanigen plating
Vacuum pump	Dry vacuum pump (500 L/min)
Vacuum gauge	Pirani vacuum gauge
Setting parameters	Speed (rpm)
	Operating time (sec)
	Vacuum pressure (Pa)
Power supply	200 VAC, three-phase, 29 kVA
External dimensions	1200 × W1200 × D1239 H
Weight	1500 kg



## Desktop Vacuum Syringe Filling Machine

**AWA02MERUKUN COSFI13**

*Space saving high speed filling  
Continuous filling*

A small machine that fills syringe with materials dispersed and defoamed by a High Rotor.

- Containers with maximum filling capacity of 1.5 L containers can be set.  
Containers filled with material dispersed and defoamed by the High Rotor can be set on this filling machine as is.
- Rotating table is installed and it enables high speed and continuous efficient filling
- Syringes are available in capacities ranging from 30 to 70 cc.

### ■ Specifications table

Model	AWA02MERUKUN COSFI13
Supported syringes	30 cc, 50 cc, 70 cc
Syringe capacity	4
Filling speed	0.03mm/sec to 7mm/sec
Setting parameters	Filling speed(mm/sec)
	Vacuum pressure(Pa)
Power supply	single-phase 100V
External dimensions	450W × 240D × 670H
Weight	65kg



# Vacuum Syringe Filling Machine

**FIL100-V**

*Material is vacuum filled directly into the syringe from the High Rotor.*

The syringe (cartridge) is filled in a vacuum with material dispersed and defoamed by the High Rotor.

- A vacuum forms inside the syringe to prevent air bubble contamination during filling.
- Containers with maximum filling capacity of 10 L containers can be set.  
Containers filled with material dispersed and defoamed by the High Rotor can be set on this filling machine as is.
- Syringes are available in capacities ranging from 30 to 70 cc. Cartridges are available up to 8 oz.



## ■ Specifications table

Supported syringes	30 cc, 50 cc, 70 cc, 6 oz, 8 oz
Syringe capacity	1 to 5/batch
Filling speed	0.1 mm/sec to 1.25 mm/sec
Vacuum chamber	Stainless steel
Vacuum pump	Oil rotary vacuum pump (336 L/min)
Vacuum gauge	Pirani vacuum gauge
Setting parameters	Filling speed (mm/sec)
	Vacuum pressure (Pa)
Power supply	200 VAC, three-phase, 3 kVA
External dimensions	950 W × 610 D × 1722 H
Weight	900 kg

## Actual testing in demonstration room

We always have test versions of all models available, and users are free to view models, or to use them as test machines to conduct dispersion and defoaming tests.

Please don't hesitate to contact us to arrange a visit.



## Demo equipment rental

All models can be rented. \* Fee required.

Rental is the ideal choice for products that cannot be taken outside the company, materials that are difficult to handle, or materials that require post-processing.

Moreover, this service is necessary for the production of pre-samples when considering purchasing the equipment, and when looking into its actual use such as determining actual production conditions.

Please don't hesitate to contact us.

## Flow from business inquiry to delivery

Inquiry → testing → specifications check → estimate → order receipt → manufacture → inspection → shipping (installation)

The same flow applies both domestically and overseas.



## Customer requests

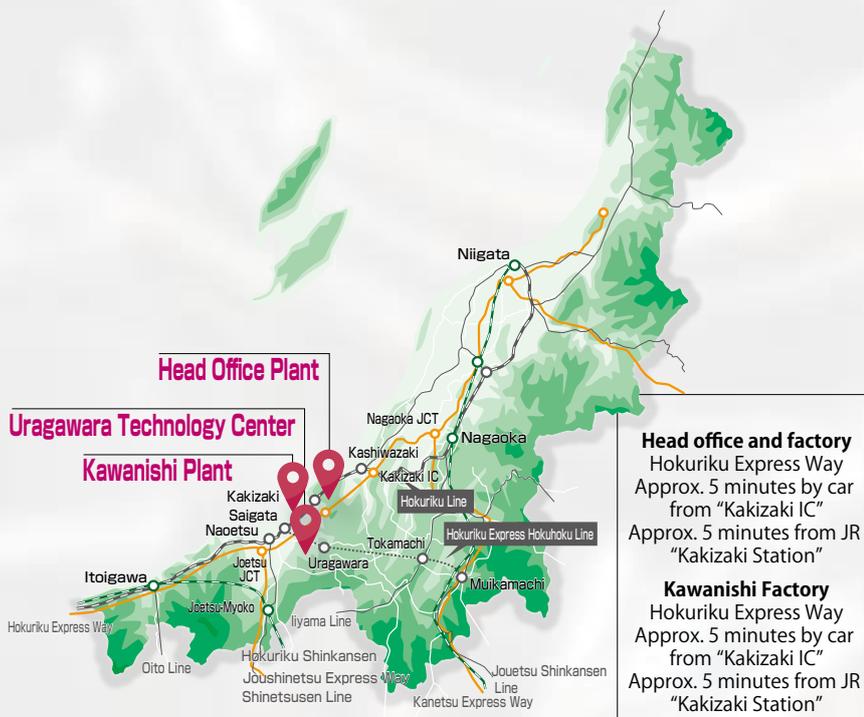
- Please be aware that the specifications of models listed in this catalog may be subject to change without prior notice for the purpose of improvement or performance enhancements. We appreciate your understanding.
- Please read the instruction manual provided with the equipment carefully, and do not use the equipment in a manner other than described.

## Support for special specifications

Mitsuboshi operates a system that allows us to supply the High Rotor machine in a one-stop process from design to delivery. As an engineering company, we at Mitsuboshi Kogyo specialize in customization, and are happy to respond to your requests wherever possible by utilizing our proprietary technologies. Please feel free to contact us to discuss the following or any other requests your may have.

- Cooling option
- Explosion-proof specification
- Communication of operating information
- Various containers, size change adapters
- Labor-saving equipment
- Automatic supply/collection unit
- Custom vacuum pump
- Clean room compatibility
- Body size and shape

## Access



■ **Head Office and Kakizaki Factory**  
 345, Houonji, Kakizaki-ku, Joetsu City, Niigata  
 Prefecture 949-3211 Japan  
 TEL: +81-25-536-2257 FAX: +81-25-536-2519



■ **Kawanishi Factory**  
 661-1 Kawai, Kakizaki-ku, Joetsu-shi, Niigata  
 949-3213 Japan  
 TEL: +81-25-536-6456 FAX: +81-25-535-2118



みつ ぼし  
**三星工業株式会社**  
 Mitsuboshi Kogyo Co., Ltd.

[www.mitsuboshi-k.co.jp](http://www.mitsuboshi-k.co.jp)



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<https://www.mitsuboshi-k.co.jp/>

Inquiries

- Department in charge: Mechanical System Dept., Kawanishi Factory  
661-1 Kawai, Kakizaki-ku, Joetsu-shi, Niigata Tel: [+81-25-536-6456](tel:+81255366456) Fax: [+81-25-535-2118](tel:+81255352118)
- Kakizaki Factory, Head Office  
345 Houonji, Kakizaki-ku, Joetsu-shi, Niigata Tel: [+81-25-536-2257](tel:+81255362257) Fax: [+81-25-536-2519](tel:+81255362519)