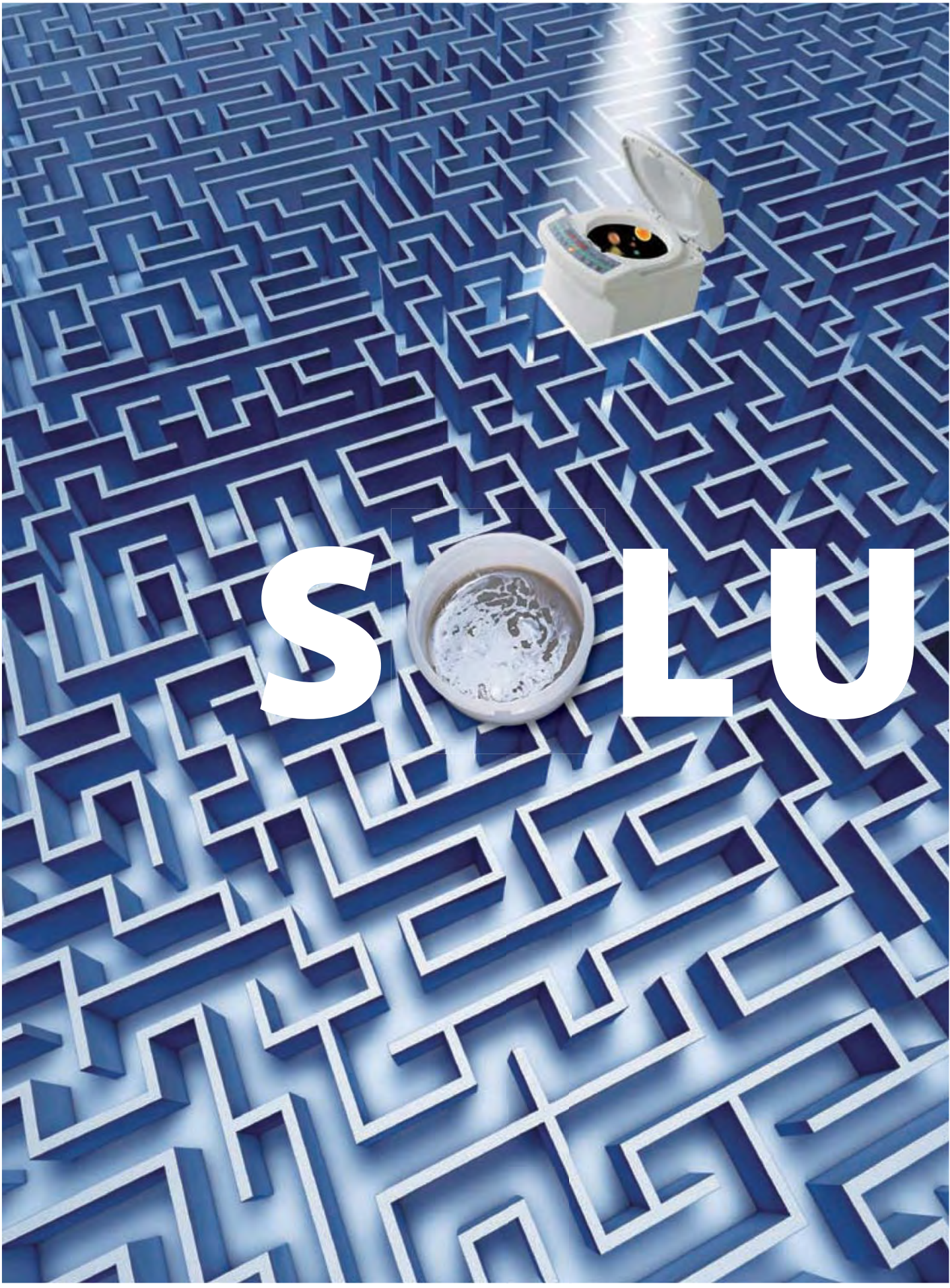
THINKY

Pioneering planetary centrifugal mixers

THINKY MIXER Series

Original material processing & in-depth know-how
mean outstanding technological innovation!


SOLU

1—To improve the quality of materials and expand research possibilities

2—To reduce production costs and increase production efficiency

3—To ensure more effective use of resources and reduce environmental impact

THINKY's unique technology opens a new window on your processing problems and helps establish firm foundations for the mass production of materials.

TION for MIXING

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Efficiency+Deaeration

Mixing+Deaeration

Pioneering planetary centrifugal (vacuum) mixers
THINKY MIXER Series

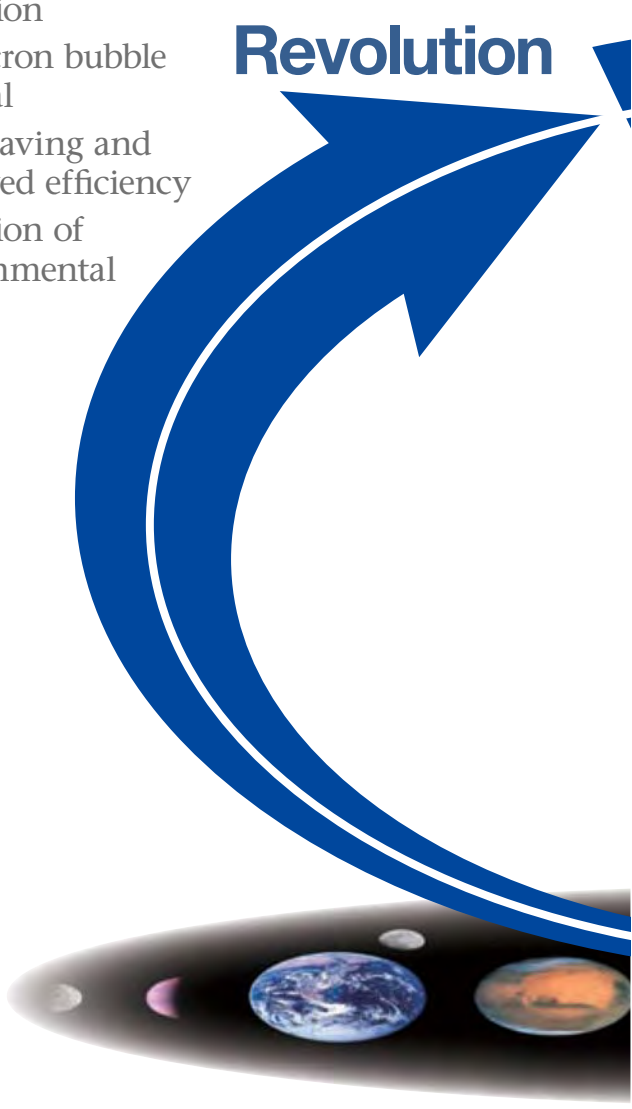
The unique THINKY Mixer is a no-touch, no-blade way of mixing materials employing rotation and revolution. In much the same way as the Earth revolves around the Sun, the mixing container orbits the center and also turns upon its axis; these two contradictory forces simultaneously and thoroughly mix, disperse and deaerate materials in the container.

- Uniform mixing of materials with different viscosities or specific gravities
- Dispersion of high-density material with no sedimentation
- Dispersion of nanoparticles with no aggregation
- Nano-level pulverizing and dispersing of insoluble compounds
- Mixing high volumes of particles into resin

As new materials are developed, new demands also increase; our planetary centrifugal THINKY Mixer Series with deaeration technology enables highly advanced and efficient material processing.

Our models with a vacuum pressure reduction function eliminate micron-sized bubbles. The time and costs required for cleaning machines and material waste are also kept to the minimum. These models have been enthusiastically taken up by a broad range of industries and are found in research and development labs and production facilities for semiconductors, liquid crystals, paints, pharmaceuticals, cosmetics, food products, and such electronic materials as resin and metallic paste.

- Particle level uniform dispersion
- Submicron bubble removal
- Labor saving and improved efficiency
- Reduction of environmental impact



Short Movie Now Spinning!!

You can see the rotation and revolution movement on our WEB site.

THINKY Search

Simple Operation

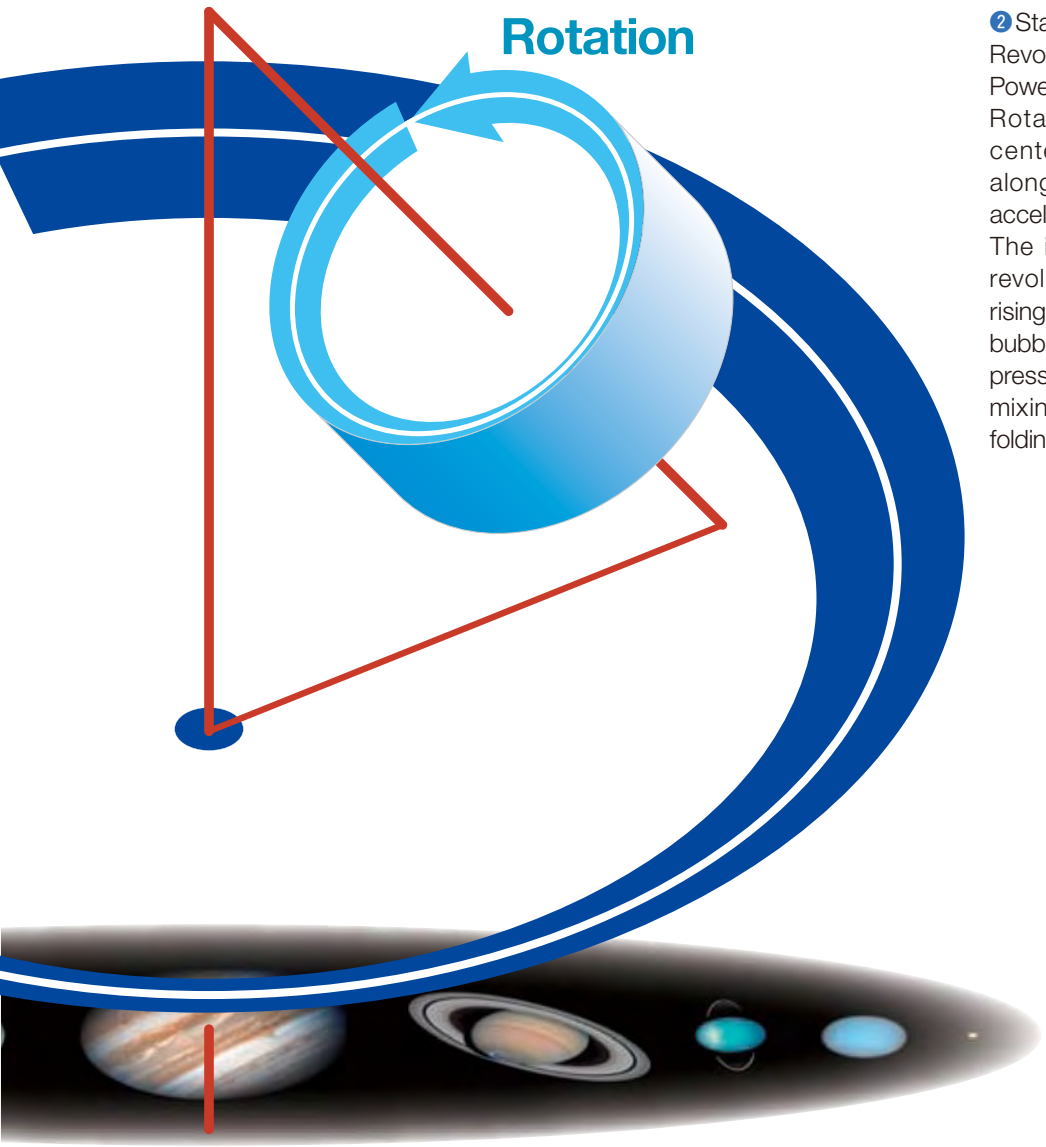
1—Place the container and material* into the unit. Adjust the weight balance**.
2—Use the memory and timer to set the number of rotations and mixing time, and switch on.
3—High quality mixing completes in a short time.

*Container types differ according to the model.
**Adjust the weight balance to take account of the material weight, container and adapter.


1


2

Rotation and Revolution: A universe within which two centrifugal forces powerfully and harmoniously orbit, turn and spin
THINKY Mixer with deaeration technology means no bubbles.



Mechanism of the THINKY Mixer

❶Place the container and materials into the holder angled at 45 degrees to the revolution axis.

❷Start operation

Revolution: Wide clockwise revolutions. Powerful acceleration of deaeration.

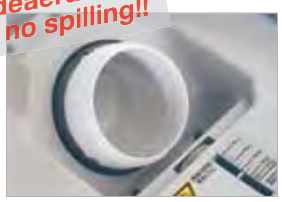
Rotation: Rotates counterclockwise centered on the container axis and along the revolution orbit. Power that accelerates mixing.

The interaction between rotation and revolution generates a spiral flow and rising and falling convection currents. Air bubbles within the material are efficiently pressed out to the surface, thus enabling mixing and dispersion without bubbles folding back into the mix.

●The THINKY Mixer Series and their related technology incorporate a number of industrial property rights including Japanese utility model registration No. 2018953 and patent No. 3896449; the latter is particularly significant and includes the technology for the vacuum system within the container holder, which in recent years has become an increasingly important tool of industry.

3

Vacuum deaeration ensures no spilling!!



◀**THINKY Mixer ARV Series**
The ARV Series has a vacuum pressure reduction function in addition to the rotation and revolution system, and generates powerful centrifugal forces, removing any concerns of material spillage; with just one switch, anybody can now carry out quick and easy simultaneous mixing and deaeration and ensure the highest quality.

◀**Conventional vacuum deaerators**
Conventional vacuum deaeration systems are costly in terms of time and labor, requiring constant monitoring to control spillage, and there are limitations on precision and accuracy.

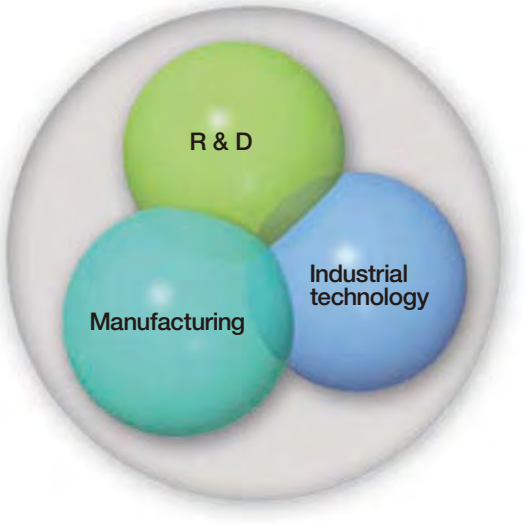
THINKY Mixers: Features and Applications

Short time simultaneous processing: uniform mixing, dispersion and deaeration

Features

- Uniform mixing and in a short time: many different materials can be mixed, from liquids and high-density materials to nano-level powders.
- Uniform mixing of materials with very different compound ratios and specific gravities.
- Powerful acceleration exceeding 400 Gs* allows simultaneous mixing and deaeration. Products with a vacuum pressure reduction function eliminate micron-sized bubbles. The product range also includes models with an atmospheric pressure deaeration mode, which is compatible with materials that are not suitable for vacuum deaeration, such as solvent components or water.
  *Acceleration differs according to the product.
- Mixes and disperses materials while maintaining their constituent shape (fibers and powders) and functions without causing breakdowns.
- Mixing and deaeration of very small volumes.
- Timer setting and memory function for registering procedures allows the creation of recipe manuals for each material.
- No blades means no tool cleaning.
- Simple structure ensures simple maintenance.
- More than 22,000 units were delivered worldwide; we enhance our product reliability with first class technical support and services that guarantee customer satisfaction.

THINKY Mixers: A key player on the industrial field



- Next-generation energy technology, e.g. fuel cells, solar cells, secondary cells
- Car electronics
- Next-generation energy saving technology, e.g. FPD, LED, OLED
- Communications technology
- Printed electronics, nano printing applications
- Aerospace industry
- Semiconductor industry
- Sensor technology, robotics
- Chemical products
- Dental engineering, bioengineering, bio-related
- Drug development, pharmaceuticals, reagents
- Food products
- Testing and analysis techniques

Mixing process of high-viscosity materials using oil-based clay (ARE-310)

The mixing of two layers of high-viscosity oil clay has started. In just seven minutes uniform mixing has completed. No air bubbles are found.

Start

THINKY Mixer Series Material Processing Example—1

Comparison: before and after mixing

Sample-1 Epoxy Resin (base + hardener) and alumina powder

2-part resin and white alumina powder are uniformly mixed to a solid green color.

Sample-2 Silver Paste

Silver particles are uniformly dispersed throughout the resin base, giving a smooth material surface with no air bubbles.

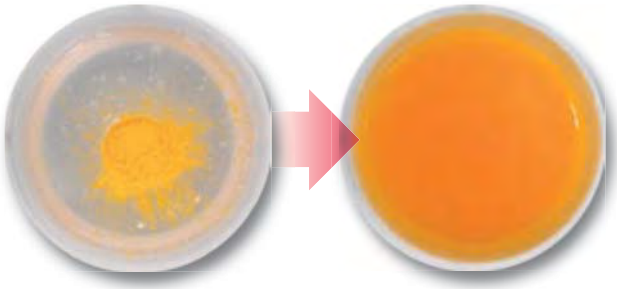
Sample-3 Cosmetic Foundation (wax and three types of iron oxides)

Four types of materials are uniformly mixed to a smooth cream consistency. Air bubbles are eliminated, giving vibrant color and a very smooth feel.

Sample-4 Ointment
(zinc oxide simple ointment and acrinol powder)

Yellow acrinol powders are uniformly dispersed to create a solid yellow color cream with a smooth feel when applied.

Sample-5 Low-Viscosity Silicone Resin and Silicate Fluorescent Material



The fluorescent material is uniformly dispersed with no sedimentation throughout the low-viscosity silicone resin (about 3 Pa s (3,000 cP)).

Early phase　　Progressive phase　　Completion of operation

THINKY Mixer Material Processing Example—2

Comparison: manual mixing vs. THINKY Mixer / Solder Paste Mixer

Sample-1 Solder Paste
(solder powder and flux)

Manual mixing

Solder Paste Mixer

Smooth surface. No bubbles.

Sample-2 Sealant for White LED
(silicone resin and fluorescent material)

Manual mixing

THINKY Mixer

Fluorescent powders with a higher specific gravity are uniformly dispersed without sedimentation in a low-viscosity silicone.

Sample-3 Polyimide

Manual mixing

THINKY Mixer

No bubbles. Uniformly mixed.

Sample-4 Silicone Resin and
Calcium Carbonate (volume ratio 1:5)

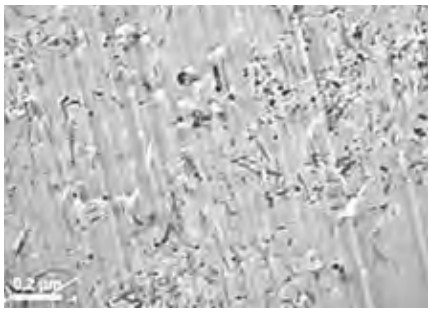
Manual mixing

THINKY Mixer

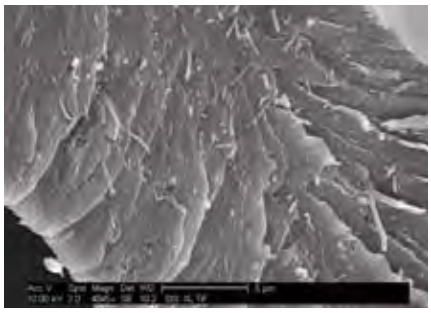
No lumps. Powders turn into a uniformly mixed paste.

THINKY Mixer Material Processing Example—3

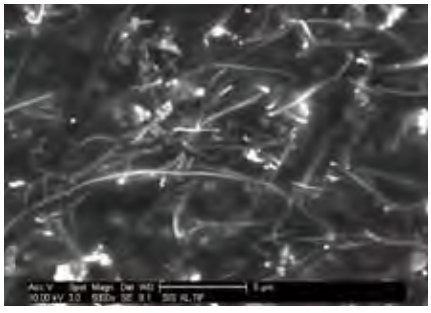
Uniform dispersion of ultra-fine powders and high performance nanomaterials



←MWNT
■ARE-310
MWNT is uniformly dispersed throughout two-part thermosetting resin.
(TEM photo by Dr. J. H. K.oo University of Texas at Austin)

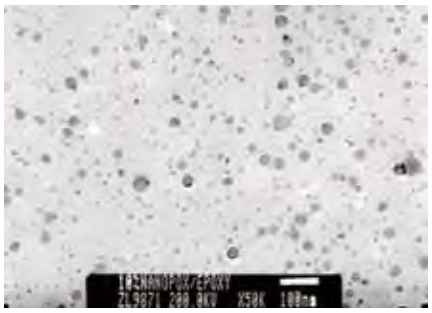


←CNF 5V%
■ARE-250*
Carbon nano fiber is uniformly dispersed throughout epoxy.
(SEM photo by George Hansen, Metal Matrix Composites Company)

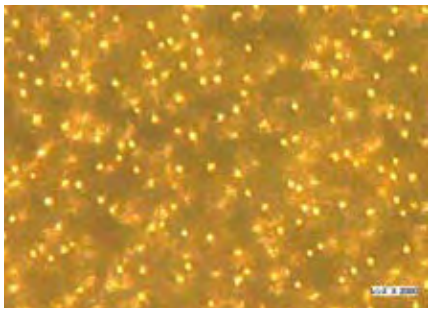


←CNF 10V%
■ARE-250*
Carbon nano fiber is uniformly dispersed throughout a polymer.
(SEM photo by George Hansen, Metal Matrix Composites Company)

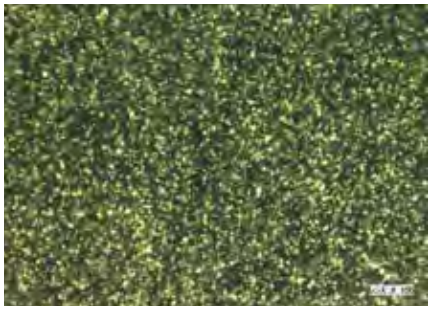
←Nano Ceramic and Water 70V%
■ARE-250*
Dispersion example of ceramic powders



←Nano-silica
■ARE-310
Nano-silica is uniformly dispersed throughout epoxy resin.
(SEM photo by Dr. J. H. K.oo University of Texas at Austin)



←Au Ball
■ARV-3000TWIN
Dispersion example of Au powders (3μm) and LCD sealant (400 Pa s (400,000 cP))



←YAG Fluorescent Material
■ARV-310
Dispersion example of YAG fluorescent material and silicone resin (10 Pa s (10,000 cP))

←Silicate Fluorescent Material
■ARV-310LED
Dispersion example of orthosilicate fluorescent material (phosphor with about 15μm particle diameter) and low-viscosity silicone resin (3 Pa s (3,000 cP)) for LED

*ARE-250 is discontinued in Japan. Next model ARE-310 is now available in the series.

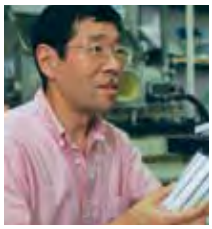
Introduction Examples

THINKY Mixer has changed our research work.

To carry out the next-generation of solar cell research on dye sensitized solar cells we need uniformly mixed nano-level titanium dioxide.

Problem: Ensure uniform dispersion of nano-level titanium dioxide particles in an airbubble-free paste.

Solution Example: The excellent dispersion of nanoparticles and deaeration capability ensured that the required paste was produced.

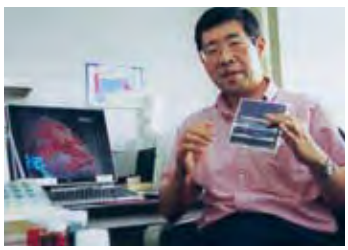


Tsutomu Miyasaka, PhD Engineering
Professor & Dean of Graduate School of Engineering, Toin University of Yokohama

A dye sensitized solar cell is the next-generation of solar cell, and many enterprises are engaged in research and development; one of the cell's characteristics is that without using such hard substrates as glass and silicone they can be made on a plastic film. They are light, flexible, easy-to-carry, and hard-to-break, and it is possible to generate electricity even when they are bent. Our solar cells can be made using an ordinary printing method and mass production is easy. Compared to conventional silicone solar cells, production costs can be reduced to about 10%. The problems to be tackled are to improve durability and power generation efficiency.

The key points are the ratio of water and alcohol when making a titanium paste, the type of dye, and the electrolytic solution ratio; all of these factors must be carefully balanced. Particularly the most important is to skillfully turn 20 nm titanium oxide particles into a milky liquid so as to create a level of viscosity suitable for coating plastic. To achieve this goal the THINKY Mixer is an absolutely essential piece of kit. Without the THINKY Mixer, we would be unable to make the precise titanium oxide paste that is fundamental to the technology. If we stretched ourselves technically and used a different method, we could just about make a paste with the required specifications, but it would take more than 10 times as long and costs would increase.

If our dye sensitized solar cells are put to practical use, they will soon be easily accepted by the general public as unbreakable solar cells. For example, they can be incorporated into curtains, or attached to a bag; I am always looking for further ways to use them.



THINKY Mixer is vital to deaerate polyimide ink, a revolutionary material for flexible printed-circuit boards.

Problem: Air bubbles in polyimide ink.

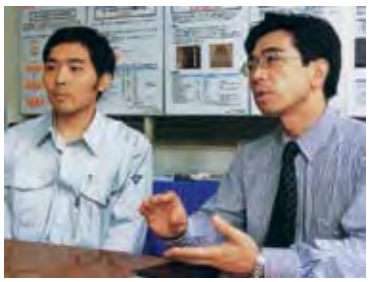
Solution Example: Deaeration time was reduced by 75% while maintaining excellent dispersibility.

Mr. Maw-Soe Win
Director in charge of Development & Sales Dept.
PI R&D Company., Ltd.

Polyimide ink is employed on the latest flexible printed-circuit boards that only recently have been used in electronic devices. Compared to conventional products, PC boards incorporating polyimide can be compact with no film loss, and are environmentally-friendly. Conventional polyimide material requires frozen storage and we had to allow a day for defrosting, but our polyimide ink can now be stored at normal temperatures, and used straightaway; this is a great advantage.

However, we have to be very careful about air bubbles in the polyimide ink; air bubbles may create problems on the PC board. And now the THINKY Mixer has solved this problem. When producing polyimide ink for ink product packaging we use the THINKY Mixer in the finishing process.

The viscosity of the ink is very high and a regular deaerator used to take as long as an hour to deaerate a batch; with a THINKY Mixer it now takes only 15 minutes. Polyimide can be uniformly dispersed to meet product specifications, and even deaeration can be carried out in a short time, resulting in cost reductions. The product package can be used as a processing container and therefore, we can ship products immediately after processing; this is also very convenient. We can say that THINKY Mixers have been useful for improving efficiency in many areas, such as process management, operation, and quality control. In the research stage, we are using the THINKY Mixer to analyze small quantities of dispersion samples and find the optimal state for a product. Without THINKY Mixers, it would be impossible to develop the new flexible PC boards.



Without our THINKY Vacuum Mixer it is virtually impossible for us to make precision resin stamps for microcontact printing.

▶ **Problem:** To improve the standard of thermosetting resin deaeration and the efficiency of the whole process.

▶ **Solution Example:** Simultaneous mixing and deaeration significantly increased workability, and the vacuum model's efficient deaeration improved the standard of forming.

Dr. Hirobumi Ushijima, Group Leader,
Bio-Photonics Group, Photonics Research Institute,
National Institute of Advanced Industrial Science and Technology

We are investigating the micro-contact printing method for fabrication of printed electronics devices. This method is different from nanoimprinting technique; it is a very simple nanoprint technology making use of the same principles found in relief printing. The process can be broadly broken down into three stages: 1) make a silicone rubber stamp; 2) apply ink to the stamp; and 3) press the stamp on the area to be printed. The THINKY Mixer is used in the first stage of stamp making.

For example, in the case of a transistor, individual stamps are made for each electrode or semiconductor pattern, and overprinting is carried out. If the size of the interconnect section is 10 µm or less, accurate printing is essential, and the presence of bubbles will cause a defect; therefore, we were seeking for a solution to remove bubbles. In addition, because of the material s thermosetting properties, we cannot generate much heat during mixing. Even a rise of 10 degrees is enough to start hardening with a consequent decline in workability. When we were tackling these problems, one of our regular dealers introduced us to THINKY Mixers, and immediately after, we decided to try them out.

At present, according to the stamp size and purpose, we are using the standard THINKY Mixer (ARE-250*) or Vacuum Mixer (ARV-310). Because of the short mix and deaeration time, the time the material is exposed to heat has been reduced. In patterning with several µm or less it is important to ensure the material reaches into every part of the mold and its viscosity has a great effect on formability. If the material is not adequately deaerated beforehand, then the longer time taken for post-deaeration leads to more cross-linking, and the failure to make a high-quality stamp. Before the hot molding stage we need to shorten the time taken for mixing of the pre-polymer and the cross-linker.

When we did not have a THINKY Mixer, the process was as follows: mix materials by hand, deaerate and pour the mixture into a mold, and deaerate once again, and then put a lid on and heat. Since using the ARE-250*, the first deaeration and mixing process can be carried out simultaneously, shortening the time, and we have been able to take more time for pouring the mixture into a mold and ensure no bubbles. Moreover, we took up the challenge of making larger stamps, and we introduced the Vacuum Mixer (ARV-310) to make sure we had enough time for the process. This is the only product we could find that enabled short-time simultaneous mixing and high-precision deaeration without excessive heat.

The minimum line width we have reached is currently 0.8 µm, and as a challenge we are considering 50 nm of line and space. I believe that in the future by making use of such a simple method as stamp printing in the manufacturing process of electronic devices and sensors, this technology will contribute to produce an active matrix liquid crystal display that is thin, lightweight and unbreakable even when dropped. I expect THINKY Mixers will play an even more active part in this development.

Viscosity measurement after mixing materials has been simplified; two types of THINKY Mixer have reduced the time and labor for making samples.

▶ **Problem:** To mix resin material and silica powder uniformly in a short time.

▶ **Solution Example:** Both work efficiency and reproducibility were improved. A vacuum model removed submicron air bubbles.

Mr. Masanori Ae, Manager, Engineering Dept.
Micron Company., Ltd.

Previously, when mixing epoxy resin and silica powder we mixed by hand and then measured the viscosity of the sample; this method took a lot of time and the materials were not mixed evenly. But after we introduced the AR-250**, we dramatically improved our work efficiency and reproducibility. However, when we carried out special viscosity measurements, microscopic air bubbles were an obstacle, and even with the AR-250** we spent a lot of time to ensure complete deaeration. But when we introduced the ARV-200***, this enabled excellent deaeration in just minutes. We can now obtain accurate data, and provide samples with more confidence than before.

**ARE-250: No longer available (Next model ARE-310) **AR-250: No longer available (Next model ARE-310) ***ARV-200: No longer available (Next model ARV-310)*

THINKY Mixer: Our Secret Story of Development

Taking on a challenge so difficult everybody thought it was impossible

R&D, Executive Hiroshige Ishii

The entire process, from the beginning of development to the completion of the first product, took a full 13 years. The development leader talks about the journey before the release of the THINKY Mixer.

Who can resist a challenge?

The trigger for the project was something I had heard from a dentist about making fillings and false teeth. For fillings and false teeth, the accuracy of the initially-formed tooth shape is extraordinarily critical and the success of the outcome is determined by that accuracy. Up to the present a material called alginate has been used as an impression agent to take on the shape of the tooth. Alginate starts out as a powder, is dissolved in water to form a paste, and then the paste is pressed against the tooth. It hardens in just 2 or 3 minutes. Whether used to make fillings or false teeth, it has an extraordinarily short pot life (usable time); therefore, it must be mixed as quickly as possible with no air bubbles. Twenty years ago, when we began developing our mixer for dental offices, it was said by dental office personnel, " You are only fully qualified when you can mix alginate.‡ This was such difficult work that it became a standard criterion for judging the technical level of dental hygienists. Even then, there were devices that mixed alginate; however, there was no big difference from manual mixing and eventually, they would not to be used very often. Future customers of our mixer told me, "If you could make such a machine, it would sell at any price.‡ If you hear that sort of thing, I think you will agree that as a manufacturer you want to take on the challenge. For that reason, we launched a development project.

Breakthrough from zero

We didn't have any knowledge about mixing and deaeration, and started from zero. First we decided to apply conventional methods and tried propeller type stirrers. However, the end result was even worse than kneading by hand; full of bubbles. It was also difficult to clean the machine after use. For deaeration we thought of using the vacuum deaeration method, but we found that in practice the mechanism was not easy, so we gave up the idea. In those days, to be honest, we often became pretty disillusioned and we felt we were banging our heads against a brick wall.
However, through repeated experimentation, we noticed that if we could knead without a propeller or spatula, this would be better, and if we could deaerate at the same time as mixing, this would be more efficient. The target was to knead alginate within 30 seconds, so we thought mixing and deaeration at the same time would lead to time reductions as well. At such a time, our R&D eyes came to rest on the possibility of the centrifugal deaerator. When we took alginate that had been mixed into a paste using a spatula and tried to just deaerate it with a centrifugal deaerator, it did take too long and the alginate may have hardened, but the bubbles were successfully removed. I thought that if there was some way to accomplish mixing within the centrifugal deaerator container, it might be possible to mix and deaerate both simultaneously and quickly. That thought became the root of the image I formed in my mind of the THINKY Mixer. What I imagined for providing the mixing force was a mechanism like a "planetary gear." Just like planets rotating while revolving around the sun, I thought that imparting rotation forces to the section of the mixer where the container is mounted on the centrifugal deaerator might make mixing possible. At first, we were anxious about how it would turn out, but we decided to utilize this design structure.

Flying apart — the struggle against G-force has just started

The most serious problem was the incredible G-force generated by the centrifugal force. Deaeration required an acceleration of at least 200 Gs, and this is almost 30 times the load for a space shuttle launch. With a regular centrifugal separator, the container is fastened securely, so it withstands high G-forces, but if the container were to be rotated, a drive section would also be required. When we tried incorporating drive mechanisms in the prototype, as soon as rotation began, the drive mechanism broke down and parts came flying out; many times we were nearly injured. I frequently asked major companies to help us with our designs, but they'd hear our idea and just say no. In the end, we realized we would have to do it ourselves. It took about a year from

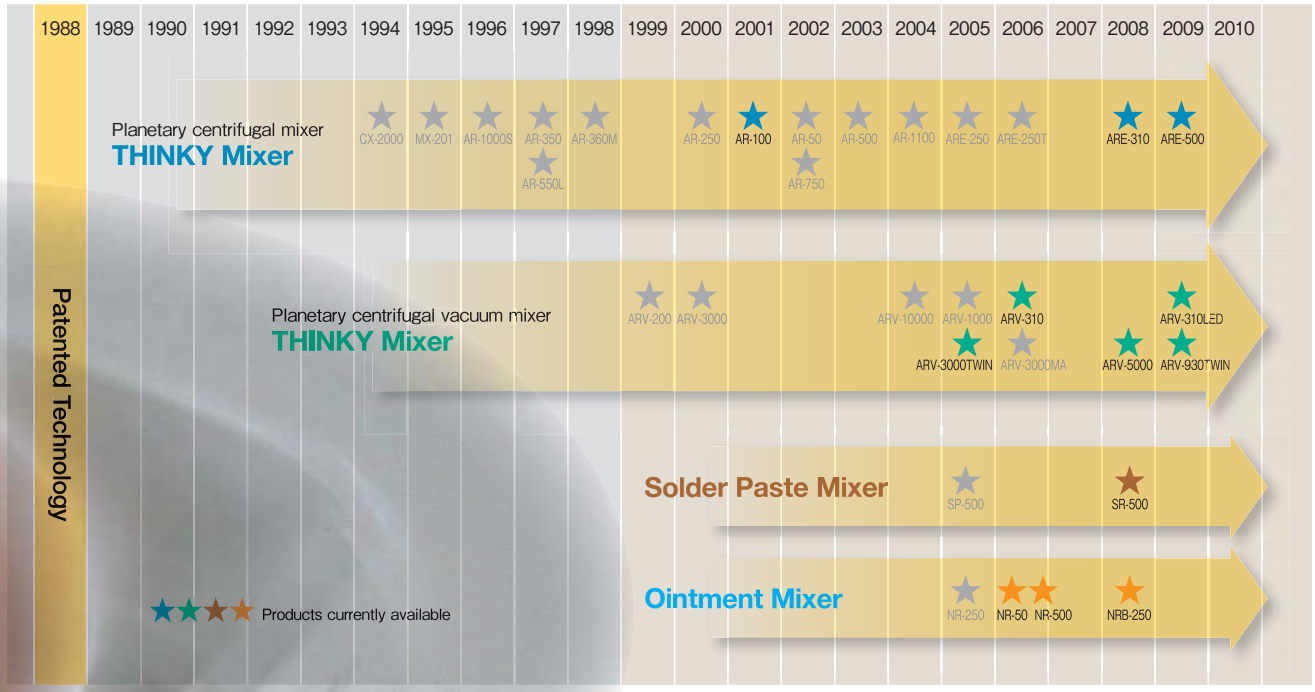
the project start until we reached the rough outline of the design mechanism, and it took another two years to get the angles of the container side and the joint section for transmitting the rotation just right, and to complete a prototype ready for evaluation that could mix and deaerate simultaneously.

A tough struggle before finally releasing the product onto the market

When we thought our mixer was complete, and we tested the prototype for 5 to 10 minutes, there were no problems; but when we ran it for 2 to 3 hours, smoke came pouring out from the rotation section, and finally it broke down. The cause was friction on the joint section. The oil film applied to the bearing completely dispersed due to the powerful centrifugal force. When we disassembled the joint section, we found that it was completely dry as though the section had been washed clean. As a result of this discovery, we created a structure that located the bearing in a sealed container full of oil and similar to a soup bowl; we continued carrying out test operations and learning through trial and error. Finally, we abandoned the joint section and adopted V belts for the first generation of the THINKY Mixer.

We managed to make a prototype and mixed epoxy resin and hardener; the moment we opened the container the contents at the bottom were so transparent, and free of air bubbles that for an instant we had the illusion that it had all leaked out somewhere. After we introduced our machine to the market, we diligently worked on addressing any teething problems and suggestions from customers and made repeated improvements, which are now incorporated in the present THINKY Mixers. If 200 Gs of acceleration acts on 100 grams of material, a load of about 20 kilograms is applied to the drive section. We worked quite hard to reach the point where the drive section could withstand that sort of weight and generate a usable centrifugal force; I'll be honest we are more than a little proud of our achievement.

Product History



THINKY Material Solutions

For all kinds of material processing +deaeration, we offer the best advice and guidance.

About 20 years has passed since the introduction of the first THINKY model onto the market, during which we have built up our own material processing know-how and continued technological development to improve the processing efficiency of THINKY Mixers and thus raise processing quality. Concerning any research, development or mass production projects that you are currently dealing with or plan to start, if you have a material processing problem, please feel free to contact us.

If you have any problems with your material processing, please feel free to contact us.

Why introduce a THINKY Mixer ? Material examples

【Mixing＋Deaeration】

- Two-part resin materials (e.g. epoxy, silicone, urethane)
- UV ink
- Foundations, lipsticks, lotions

【Dispersion ＋ Deaeration】

- Functional adhesives
- Conductive pastes, insulating pastes
- Metal pastes, e.g. gold, silver, platinum
- Glass pastes
- Ceramic pastes
- LCD sealants + spacers
- Pharmaceuticals, cosmetics

【Dispersion (Crushing) ＋ Deaeration】

- Inorganic nanomaterials
- Metallic nanomaterials
- Carbon nanomaterials
- Fluorescent materials

【Emulsification ＋ Deaeration】

- Food products
- Cosmetics
- Inks

【Pulverizing/Dispersion ＋Deaeration】

- Water-insoluble compounds, e.g. phenitoin, indomethacin, nifedipine (preparation of suspensions)
- Aluminum oxide
- Titanium oxide

【Antifoaming】

- Quality inspection of medical fluids
- Dispensing, formulation

Please contact THINKY Corporation

Phone:+81-3-5821-7455

THINKY Search

http://www.thinky.co.jp/en/

1 —[Before introduction] Demonstration with an actual machine and evaluation testing is always available.

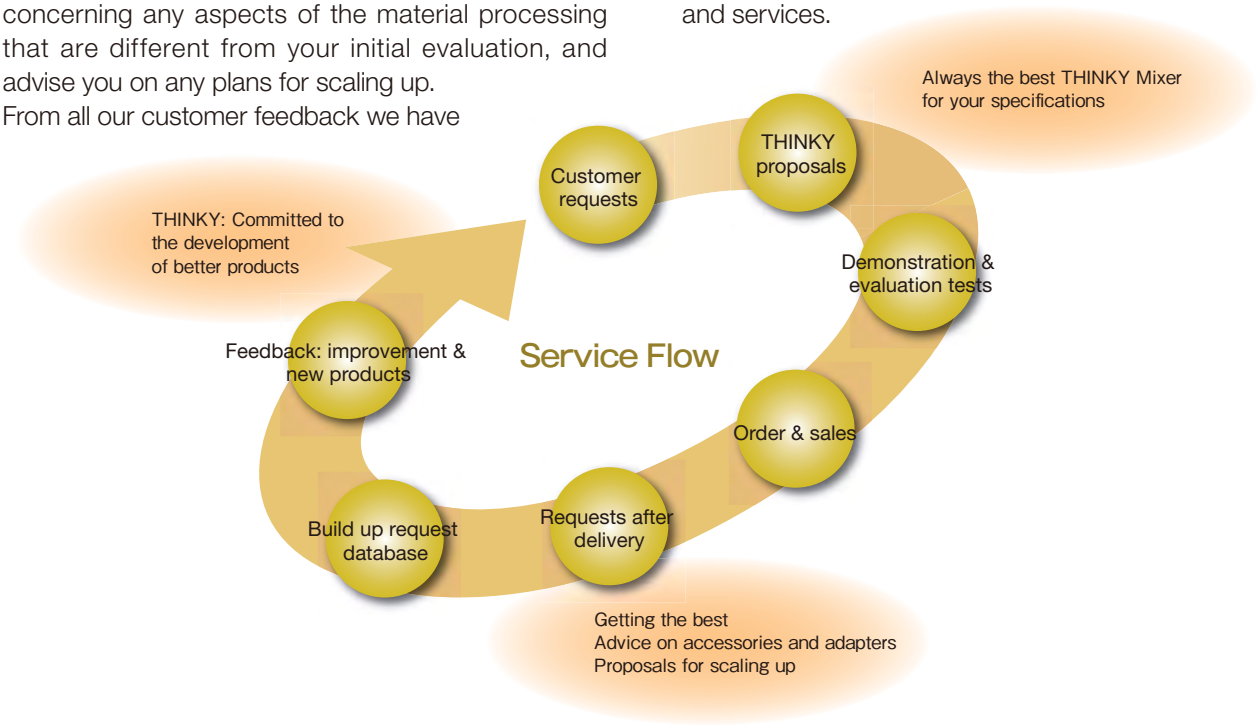
If you are considering introducing a THINKY Mixer, the first step is for you to have a demonstration and evaluate just what it can do for you. It is only after you have seen and understood just how your materials can be processed and feel absolutely confident that the THINKY mixer will meet your specifications, that we would advise you to choose a model and place your order.

We can arrange to lend and transport a model up to middle-size (processing volume 500 ml-class). If you want to try several models at the same time, or evaluate a large-size model, we would be grateful if you would bring material samples to our office. Please feel free to contact us with your queries.

Our Service System

With our reliable service system, we provide excellent customer backup.

For the total life cycle of your THINKY mixer our customer service team will respond to your requests. We first listen to a detailed breakdown of your requirements, purpose and conditions of use, and then suggest the optimal model. As a part of our sales service not only do we ask you to evaluate an actual machine with your material, but we also help develop recipes suitable for the material, and our technical experts offer advice on operation. After introduction of your THINKY mixer we welcome any queries and comments. We can also offer in-depth advice concerning any aspects of the material processing that are different from your initial evaluation, and advise you on any plans for scaling up.
From all our customer feedback we have created a database which is invaluable in the development of new products and improvements to existing models. The database also provides us with a wide range of technical data from which to draw upon and improve our response to customers and deliver increased customer satisfaction.
THINKY is firmly committed to our original pioneering spirit, and continue to make every effort to develop customer-oriented products and strengthen our customer service system. We look forward to hearing your opinions and requests concerning our products and services.



2—[After introduction] We will offer advice and guidance concerning changes to the materials and processing.

We know that the demands of business are never static; changes to materials or specifications since you evaluated the mixer, or a recipe that is no longer suitable are all everyday business problems that we can help you with. Or the purpose of the original introduction has changed e.g. scaling up, or you want to graduate from resin mixing alone to dispersion of nanopwders. On such occasions, please do not hesitate to contact THINKY. Our planetary centrifugal THINKY Mixer database incorporates decades of knowledge concerning not only mixing and deaeration, but also dispersion, crushing, pulverizing, minimizing to nano-level and the emulsifying of powders. Even after your materials and specifications change, our technical backup continues.

3—[After-sales service] In case of a rare unit failure, a substitute mixer can be arranged.

In the rare event of a malfunction we ensure your peace of mind by either repairing on the spot, or arranging an identical model replacement. Our after-sales service is second to none, and we always have backup machines on standby. Please feel free to contact us with your queries.

THINKY Mixer Series

Our versatile range ensures we meet our customer needs.

The planetary centrifugal THINKY Mixer Series is divided into two groups: a Standard type that provides simultaneous processing of mixing, dispersion, and deaeration; and a Vacuum type that demonstrates submicron-level deaeration performance with a vacuum pressure reduction function. Each type has a lineup of models with different processing volumes and functions; you can select the perfect mixer for your requirements.
We also offer a sister Solder Paste Mixer Series for processing solder pastes, and Syringe Fillers that allows syringe filling while maintaining the quality of the mixed and deaerated material.