THINKY

C3 PROZESS- UND ANALYSENTECHNIK

INDEX

Product Brochure

Rotation and Revolution

THINKY

THINKY CORPORATION

Our planetary centrifugal mixers are used in 67 countries around the world.

Since its founding in 1970, THINKY Corporation has developed original, never-before-seen technologies based on the theme of "Manufacturing that inspires."

Today, its "Planetary centrifugal mixers"," the world's first practical machine, is used in research and development fields all over the world and has an influential influence on manufacturing around the world as the de facto standard mixer in the field of advanced materials.

THINKY mixers are used in 67[*1] countries around the world, and a total of 50,000[*2] units have been sold.

*1 As of Feb. 2025 *2 As of Dec. 2024 (according to our own research)

Mixing technology for a wide range of advanced applications

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

Product Lineup

THINKY MIXER (Planetary Centrifugal Mixer)

Non-Vacuum type

…Mixing, dispersion, defoaming, and deaeration can be performed simultaneously

Page	Model	Max Jar Size	Max Weight	Optimal capacity
P. 7	ARE-312	300 mL	310 g	150 mL
P. 7	ARM-310	300 mL	310 g	150 mL
P. 8	ARE-400TWIN	300 mL	400 g×2	150 mL
P. 8	ARE-500	650 mL	1,100 g	323 mL

Vacuum type

…Vacuum depressurization function allows for submicron level air bubble removal

Page	Model	Max Jar Size	Max Weight	Optimal capacity
P. 9	ARV-310P	300 mL	310 g	150 mL
P. 9	ARV-501	550 mL	700 g	275 mL
P. 10	ARV-931TWIN	750 mL	930 g×2	375 mL
P. 10	ARV-5000	4 L	5 kg	2 L
P. 11	ARV-3000TWIN	4 L	5 kg×2	2 L
P. 11	ARV-10KTWIN	10 L	14.5 kg×2	5 L

Solder Paste Mixer

…For optimization temperature and viscosity preparations and dispersion and deaeration of solder paste

Page	Model	Max Jar Size	Max Weight	Optimal capacity
P. 8	SR-500	300 mL	680 g	150 mL

Syringe Charger

…Fill the syringe with the material that has been processed in the THINKY Mixer

Page	Model	Syringe Size	Max number of syringes
P. 12	ARC-40H	3 mL, 5 mL, 10 mL	4
P. 12	ARC-55H	30 mL, 50 mL	2

Nano Premixer

…Ultrasonic mixer that disperses nano-materials

Page	Model	Max Jar Size	Jar Size	Optimal capacity
P.13	PR-1	300 mL	5 mL Vial, 280 mL SUS	150 mL SUS

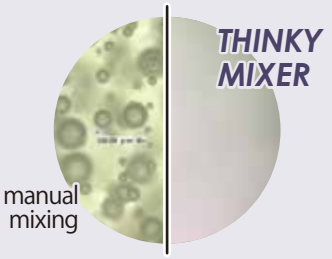
Accessories for Mixers › P. 12

Container/Adapter › P. 15

Examples of material processing

Mixing and defoaming of resin + resin

2-part Epoxy Resin



Polyimide

No bubbles. Uniformly mixed.

Mixing and defoaming of resin + powder

Silver Paste

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

Solder Paste (solder powder and flux)

Smooth surface.
No bubbles.

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

No lumps.
Uniformly mixed.

Epoxy Resin (base + hardener) **and Alumina Powder**

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

Resin + high specific gravity powder

Sealant for White LED (silicone resin and fluorescent material)

ARV-310PLED

Dispersion of orthosilicate fluorescent material (phosphor with about 15 μm particle diameter) and low viscosity silicone resin (3,000 mPa s) for LED.

The fluorescent material with high specific gravity is uniformly dispersed without sedimentation in low viscosity silicone.

Low viscosity liquid + powder

Nano Ceramics and Water 70 V% *(Slurry)*

ARE-310

Dispersion of ceramic powders.

Mixing and defoaming of pastes

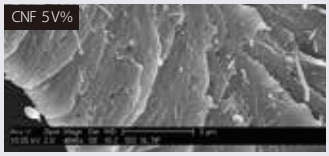
High viscosity materials that are difficult to mix manually can be easily processed.

Cosmetic Foundation (wax and three types of iron oxides)

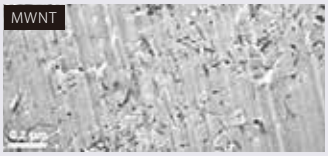
Four types of materials are uniformly mixed to a smooth cream consistency.Air bubbles are eliminated, giving vibrant color and a smooth feel.

Processing nano materials

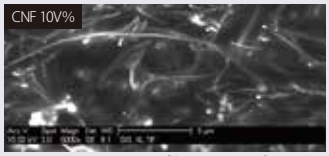
ARE-310



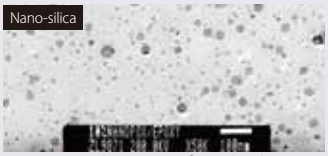
★a Carbon nano fiber is uniformly dispersed in epoxy.



★b MWNT is uniformly dispersed in 2-part thermosetting resin.



★a Carbon nano fiber is uniformly dispersed in polymer.

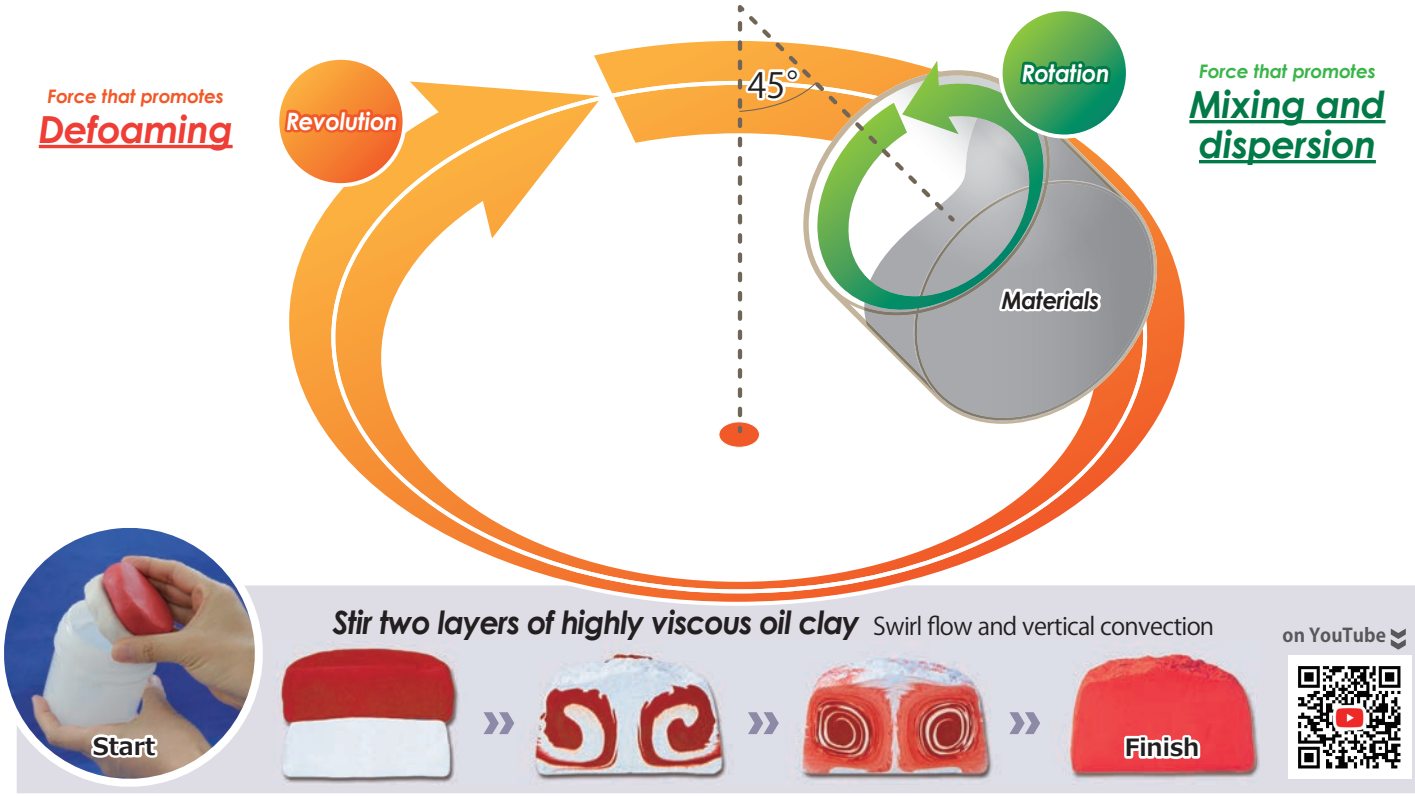


★b Nano-silica is uniformly dispersed in epoxy resin.

SEM Photo by：★a George Hansen, Metal Matrix Composites Company ★b Dr. J.H.Koo, University of Texas at Austin

Planetary Centrifugal System

Mechanism of Planetary Centrifugal Mixer



8 Features

- Significant time savings
- Simultaneously processes mixing, dispersion, and defoaming
- Compatible with materials with high viscosity and high specific gravity
- Redaction of material degradation
- Easy operation and reliable reproducibility
- Non-contact/in-container processing "Cup holder vacuum system"
- Adapters compatible with all container shapes and forms
- Equipped with communication functions for traceability and IOT

3 Foundations

- Over 30 years as a pioneer in the industry
- Outstanding reliability represented by the highest record of adoptions in the world
- Thorough technical support before implementation

A premium mixer equipped with advanced features for more demanding applications

ARE-312

- Long-term operation of up to 30 minutes is possible even with highly loaded materials
- Safety has been improved with the addition of a shock sensor
- Uniform dispersion of fine particles is also possible
- High viscosity materials can be processed in minutes with two mode settings: "stirring" and "defoaming"
- Suppresses the temperature rise of the main unit and allows temperature measurement inside the device
- Maximum capacity is 310 g, Optimal material amount is 150 mL with 300 mL container
- Equipped with "remote control" and "traceability" functions using IOT
- VA (Vertical Alignment) panel with intuitive IF and high visibility and contrast
- Available CE, SGS (UL) certified model

Unit Dimentions	H390 × W300 × D340 (mm)
Unit Weight	Approx. 21 kg

User-friendly & highly versatile standard type

ARM-310

Option Cooling System *ENs-10CE*

- The 2 modes of mixing and deaeration achieve dispersion and deaeration of high-viscosity materials in a small amount of time
- Supports a wide range of materials, including high-viscosity materials and nano fillers
- Cold-insulated, heat-resistant adapter enables support of various material characteristics
- Memory and step-operation functions for controlling and executing operating conditions
- Unique air-cooling system
- Maximum capacity is 310g, Optimal material amount is 150 mL with 300 mL container

- Highly competitive price
- Supports a wide range of materials, especially low-mid viscosity materials
- Cold-insulated, heat-resistant adapter enables support of various material characteristics
- Memory and step-operation functions for controlling operating conditions
- Maximum capacity is 310 g, Optimal material amount is 150 mL with 300 mL container
- Available CE certified model

Unit Dimentions	H390 × W300 × D340 (mm)
Unit Weight	Approx. 21 kg

Longtime seller, medium-sized general-purpose model that excels in the uniform dispersion of high-specific-gravity materials

ARE-500

Option Stand ST-50X

- Supports upgrading from smaller models
- High-durability drive system suitable for production
- Maximum capacity is 1.1 kg, Optimal material amount is 325 mL with 650 mL container
- Available CE certified model

Unit Dimentions	H692 × W500 × D500 (mm)
Unit Weight	Approx. 95 kg

THINKY Solder Paste Mixer

Dedicated mixer for SMT applications. Our best-selling solder paste mixer

SR-500

- Prepare for SMT line ready to go in just a few minutes cold stored solder paste
- By optimizing the mixing recipe, viscosity preparation and temperature preparation for solder paste is easy
- Removes large air bubbles in the paste, which are considered the cause of solder paste defects
- Handles commercial 500 g solder paste containers as is
- Restirs and redisperses solder paste that has been used
- Supports solder paste in syringes by using the optional adapter
- Available CE certified model

Unit Dimentions	H390 × W300 × D340 (mm)
Unit Weight	Approx. 18 kg

Uniform mixing and submicron level air bubbles removal : Standard vacuum mixer with touch panel and communication function

ARV-310P

- Simultaneous mixing, dispersion, and submicron-level air bubble elimination
- Deaeration of high-viscosity materials difficult to be processed by a centrifugal separator
- Reduced processing time and improved deareation performance compared to the atmospheric type mixer
- Maximum capacity is 310 g, Optimal material amount is 150 mL with 300 mL container
- Available CE certified model
- Equipped with "remote control" and "traceability" functions using IOT

Unit Dimentions	H450 × W555 × D645 (mm)
Unit Weight	Approx. 90 kg

A mid-size vacuum mixer equipped with advanced features for more demanding applications

ARV-501

Option Stand with Built-in Vacuum Pump **PU-501**

- THINKY' s original cup holder vacuum method minimizes the vacuum space and significantly reduces the vacuum reaching time and atmosphere releasing time
- THINKY original defoaming mode is available as standard
- Dedicated stand with the built-in vacuum pump enables to save the footprint
- Ease of condition set on the touch panel
- PC communication enables to manage the traceability
- Available CE certified model

Unit Dimentions	H815 × W500 × D595 (mm)
Unit Weight	Approx. 100 kg

A manufacturing vacuum mixer with dual cup holder. Max. gross weight of 930 g x 2

ARV-931TWIN

- Mixing mode + acceleration of up to 670G and vacuum, simultaneous processing of Mixing and defoaming
- Achieves submicron level air bubble removal
- The rotation speed can be adjustable, and the optimum setting can be made according to the properties of the material
- It is a wide-range compatible machine that is suitable for making small samples as a scale-up machine that inherits the performance of ***ARV-310P***(P. 9)
- Maximum capacity is 930g x 2, Optimal material amount is 375 mL with 750mL container each
- Available CE certified model
- Equipped with "remote control" and "traceability" functions using IOT

Unit Dimentions	H960 × W660 × D670 (mm)
Unit Weight	Approx. 260 kg

High durability model that handles large capacity of maximum 3L and achieves deaeration at the submicron level

ARV-5000

- Maximum capacity is 5kg, Optimal material amount is 2L with 4L TOSLON container
- Optimal setting according to materials is possible by changing the number of rotations
- Excellent operability with a touch panel
- Equipped with cooling function by rotation
- Various containers are supported
- Available CE certified model

Unit Dimentions	H1,540 × W1,050 × D865 (mm)
Unit Weight	Approx. 550 kg

Complete deaeration at the submicron level with the even larger capacity of 3 liters twin cup

ARV-3000TWIN

- Contribute to streamlining of overall mixing and deaeration processing such as increase of processing amount, standardization of work, quality stabilization, reduction of material loss
- Maximum capacity is 5kg×2, Optimal material amount is 2L with 4L TOSLON container each
- Available CE certified model

Unit Dimentions	H1,600 × W1,330 × D1,015 (mm)
Unit Weight	Approx. 770 kg

It stably supports production of up to 20L capacity, and achieves the performance of the laboratory model

ARV-10kTWIN

- The vacuum pressure reduction mechanism provides submicron-level deaeration
- By means of the in-cup-holder vacuum pressure reduction mechanism, pressure reduction and air release time are drastically reduced
- Maximum capacity is 14.5kg×2, Optimal material amount is 5L with 10L SUS316 container each
- Available CE certified model

Unit Dimentions	H1,250 × W1,900 × D1,370 (mm)
Unit Weight	Approx. 1,500 kg

A power cooling fan that helps reduce heat accumulation. Helps preserve heavly used mixers

ENs-10/ENs-10CE

- Reduces mixer system temperature by approximately 10 degrees
- Suppresses mixer system temperature increase due to heat generated by material
- Realizes enhanced efficiency in repeated operations due to shortening of cooling down interval time
- Compatible models : ***ARE-312CE***(P.7) ***ARM-310***(P.7)、***SR-500***(P.8)

Unit Dimentions	H145 × W310 × D320 (mm)
Unit Weight	Approx. 7 kg

Real-time thermometer + rotation speed meter

MS-150ML / MS-300ML / MS-550ML *Multi Sensor*

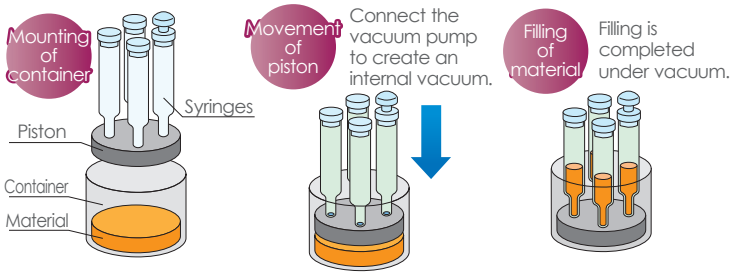
- Thermometer + automatic speedometer that can monitor the mate rial temperature during stirring in real time and is effective for optimizing materials
- Data logs can be collected via Bluetooth® connection
- The rotation speed can be monitored, which is useful for equipment maintenance
- It is a radiation thermometer (real-time thermometer) method
- Equipped with a gyro sensor (automatic speedometer)
- Compatible OS: Windows7/8/10 (32/64 bit)
- Display: temperature, angular speed, automatic rotation speed, trend graph, remaining battery power
- Compatible models

Unit Dimentions	Standard container height + 27 mm
Unit Weight (Approx.)	MS-150ML : 100 g (150 mL Standard container weight included) MS-300ML : 130 g (300 mL Standard container weight included) MS-550ML : 155 g (550 mL Standard container weight included)

A streamlined system for material transfer into small syringes

ARC-40H (3-10 mL) / ARC-55H (3-55 mL)

- Up to 4 syringes can be charged at one time effectively
- Capable for materials from low to high viscosity
- The process from mixing and defoaming to charging is integrated by THINKY products



- * Please contact us separately for customization of syringes (70 and 100 mL syringes, 170 and 340 mL barrels) etc.

Unit Dimentions	H570 × W240 × D200 (mm/within Handle)
Unit Weight	Approx. 6.6 kg

Unit Dimentions	H650 × W240 × D200 (mm)
Unit Weight	Approx. 6.7 kg

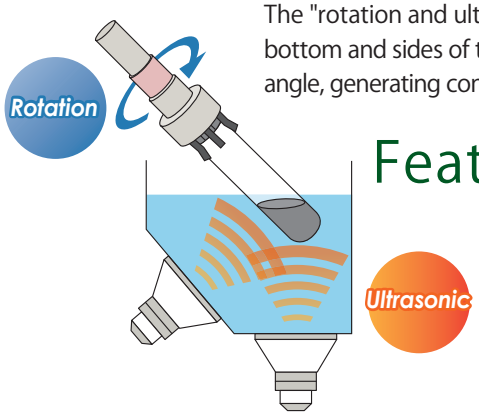
The next generation ultrasonic mixer that disperses nano-materials in a safe and reproducible manner

PR-1 Nano Premixer

- Highly Reproducible Dispersion
- Unique Dispersion Technology Patent
- Water Temperature Control Using Cooling Unit
- Low Running Cost
- Contamination-free
- 【Research and development needs】
  Carbon nanotubes (CNT), multi-walled carbon nanotubes (MWNT), carbon nanofibers (CNF), vapor grown carbon fibers (VGCF), graphite, graphene oxide, talc, silica

Unit Dimentions	H400 × W450 × D380 (mm)
Unit Weight	Approx. 25 kg

Uniform dispersion of strongly aggregated materials



The "rotation and ultrasonic dispersion principle" is a structure in which ultrasonic waves are irradiated from the bottom and sides of the ultrasonic bath while the container rotates at high speed. The container is rotated at a 45 ° angle, generating convection in the material, and ultrasonic waves are irradiated to the entire material.

Features

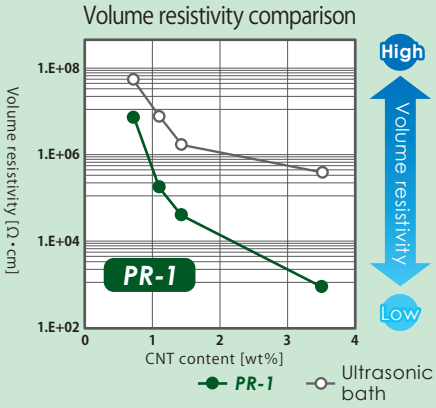
1 Dispersion effect by Dual-sonic technology

Patent Advantages over existing ultrasonic devices
(comparison with CNT dispersion immediately after dispersion)

PR-1

Conventional ultrasonic bath

Volume resistivity comparison

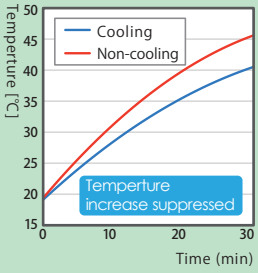


2 Safe processing possible in a sealed container

3 Less prone to uneven dispersion caused by directivity and standing waves

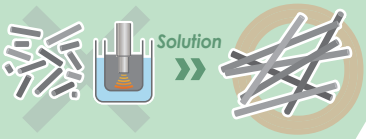
4 Water temperture control of the ultrasonic bath water

The temperature rise is suppressed and the temperature inside the tank is controlled by a water temperature management program.



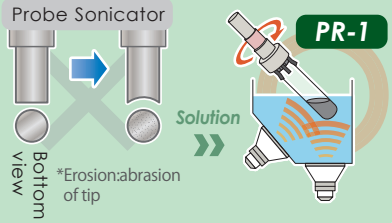
5 Dispersion while maintaining fiver length

Rotation and cavitation allow CNTs to be dispersed while maintaining their fiber length.



6 Contamination-free dispertion

Processing in a sealed container minimizes the effects of *erosion.



*Erosion:abrasion of tip

Users' voice

※The contents of these interviews were taken in 2014.

Effective mixing of specialist glass powders with a high viscosity acrylic resin

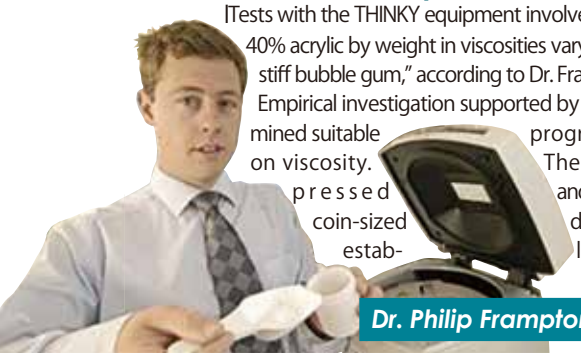
Encounter with the ARE-250CE

James Kent (Ceramic Materials) Ltd had relied for many years on a manual mixing system for their research and quality control of specialist glass powders, but embarked on a search for a process solution that would be more effective, more consistent, quicker and simpler.

The glass powders produced by James Kent Ltd are tailored to customer need – primarily for dental fillers and restorers, they vary from 0.5 to 10 microns average particle size. For testing purposes, the glass powder needs to be mixed with a high viscosity acrylic resin monomer to check for high transparency and low discolouration – but the manual process, while well understood, continued to give problems of non-homogeneity and air inclusion, both of which preclude colour checking of the glass.

The search for an improved system led Dr. Philip Frampton to the **THINKY ARE-250CE**, which incorporates both planetary mixing and centrifugal degassing in one unit.

How ARE-250CE improved the mixing process



Tests with the THINKY equipment involved mixing 60% glass with 40% acrylic by weight in viscosities varying from "thick honey to stiff bubble gum," according to Dr. Frampton.

Empirical investigation supported by our advice rapidly determined suitable program parameters based on viscosity. These samples were then pressed and cured into standard £ 2 coin-sized discs for comparison with established colour standards.

Comments from Dr. Frampton

"James Kent are one of probably only 4 or 5 companies in the world operating at the top level in this technology and we were looking to improve the mixing stage as a first step to overall improvement of our glass grinding process.

Intertronics'* expertise and supply of the THINKY mixer has allowed us to achieve that initial goal in a single operation.

Now that we have a reliable quality control process, we can move to purchase of a spectro-photometer. This will enable us to refine our operation further toward development of an even cleaner and finer grinding process."

The mixing of glass and ceramic powders into resins is a perfect job for a THINKY mixer!

* Intertronics is Thinky's distributor in U.K.

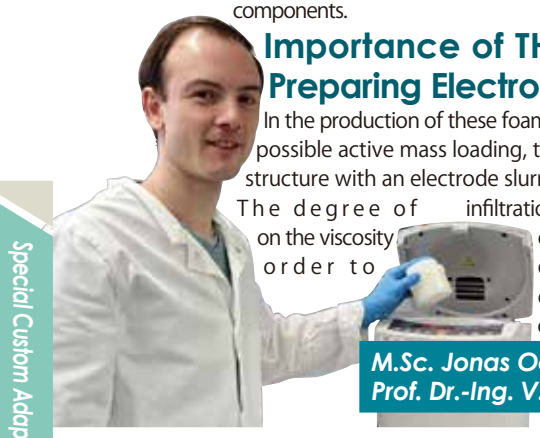
Dr. Philip Frampton James Kent Ltd England, United Kingdom

Production of high-energy cathodes for lithium-ion batteries with novel electrode structure

Research Outline

Due to the increased demand for mobile, rechargeable batteries with ever higher energy and power densities, intensive research is being conducted into modifying the electrode structure in order to increase the active mass loading. One possible approach is a three-dimensional structuring of the electrodes by using a cellular structure (e.g., a metal foam), which acts as a current collector. Due to the cellular structure, an electrically conductive structure is present within the active mass. This can increase the electrical conductivity of the electrode while increasing the integrity of the active mass layer. This should make it possible to increase the electrode thickness while reducing the amount of inactive components.

Importance of THINKY MIXER for Preparing Electrode Slurry



In the production of these foam electrodes with the highest possible active mass loading, the infiltration of the cellular structure with an electrode slurry is a decisive process step. The degree of infiltration depends to a large extent on the viscosity of the electrode slurry. In order to determine the optimum slurry composition for a given solids composition (e.g. 84 wt.% NMC, 8 wt.% conductive carbon black + graphite, 8 wt.% binder), three different cathode slurries with different solids contents were prepared using the **THINKY ARM-310 planetary centrifugal mixer** via a multi-stage process. The viscosity curve of the three slurries in Fig. 1 shows that the viscosity increases with increasing solids content. Fig. 2 shows the active mass loading of 1000 µm thick NiCr foam rounds (Ø 10 mm, 450 µm cell size) after infiltration and drying with the different slurries. With increasing solids content, the active mass loading increases. With further increase of the solid content in the slurry, an inhomogeneous infiltration of the slurry is to be expected due to the increasing viscosity. With the **THINKY ARM-310 planetary centrifugal mixer**, various slurries with different compositions could thus be produced in a very short time and a suitable composition was identified.

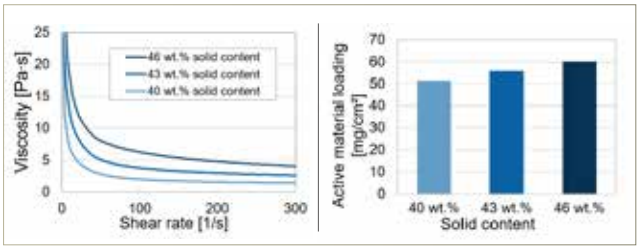


Fig. 1: Viscosity of differently NMC cathode slurries with a solid content composition of 84-8-8 (wt.%, NMC, conductive additive, binder) and various solid contents.

Fig. 2: Active mass loading of 1000 µm thick NiCr foams (10 mm) after infiltration with the slurries having different solid contents.

M.Sc. Jonas Oehm, Prof. Dr.-Ing. V. Knoblauch Aalen University of Applied Sciences, Institute for Materials Research, Germany

Special Custom Adapter Design

THINKY provides original containers and adapters to fit the characteristics of the material

The number of customized adaptors has reached 1,500

We are more than happy to customize an adaptor so that the container that customers are currently using can be set in our mixer as is.
Our professional team considers the material characteristics, customer issues and the operating environment in order to design and supply you with custom-made adapters for your materials.
By leveraging our wealth of experience and ideas as a manufacture who has dedicated itself to developing planetary centrifugal mixer over many years, we will propose what is truly helpful for our customer.

Production flow of custom-made adapters

We provide excellent customer support with our total support system

For safer and more convenient usep

For the total life cycle of your THINKY MIXER, our customer service team will respond to your requests. We listen to your requirements,purpose and conditions of use, and then suggest the optimal model. As a part of our service, not only do we ask you to evaluate our unit with your material, but we also help develop recipes suitable for the material and our technical experts offer advice on operation.
THINKY is firmly committed to our original pioneering spirit, and continues to make every effort to develop customeroriented products and strengthen our customer service system. We look forward to hearing your opinions and requests concerning our products and services.

Our Fivefold Support System Enables Safer and More Convenient products Use

1 A wide variety of dedicated adaptors

Supply us with a sample of an actual container and we make an adaptor for it.

2 A global distribution network and an extensive product lineup

With our business bases in California, U.S.A., and Shenzhen, Shanghai, and Beijing in China, we have established a network of distributors in more than 50 countries around the world. We also offer CE-compliant models for the European Union (EU).

3 Offering useful information

We offer useful and timely technical information for customers from the THINKY Library on our website.

4 PC connections and online connectivity possible

For product traceability at manufacturing sites, we offer consultations regarding PC connections or online connectivity at factories.

5 After-sales service

Our service department at the head office works with our worldwide distributors to offer services so that customers may be able to use our devices with no worries no matter where they are.

Rotation and Revolution

THINKY CORPORATION

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