

# THINKY

## An introduction to Planetary Centrifugal Mixers



# What is a THINKY mixer?

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- A THINKY Mixer **mixes, disperses** and **degasses** your materials in seconds to minutes within your own product container
- It can process materials with very low to very high viscosity up to 100 million centipoise (cP) or millipascals (mPa•s)



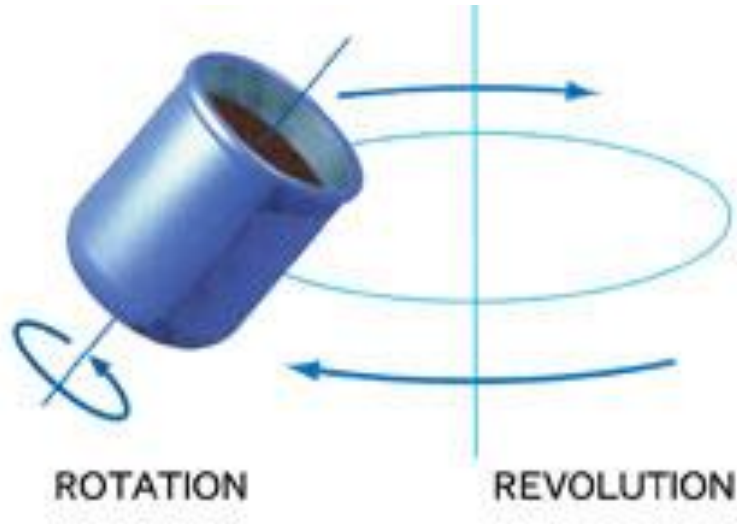
*Flux paste and solder powder 45 seconds*



# How does it work?

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- THINKY Mixers use a “planetary” mixing action
- A combination of
  - **Rotation**  
and
  - **Revolution**



# Planetary centrifugal mixer basics

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- The material container rotates at a 45° angle whilst it revolves in a set radius
- Intensive circulation of the material in the container under 400G of force results in quick mixing and air being squeezed out

## Oil Based Modelling Clay

Start



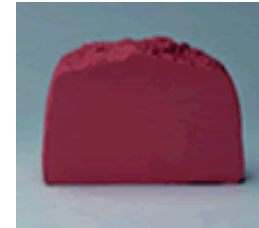
30 sec



2 mins



7 mins



# What can it mix?

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- Water-like liquids
- Pastes
- Powders
- Mixtures of liquids and solids
- Mixtures of high and low viscosities

And any combination of these!



# What can it mix?

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- Adhesives
- Inks
- Cosmetics
- Pharmaceuticals
- Sealants
- LED phosphors
- Nano-particles
- Precious metal fillers



# Controlling mixing results

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Different mixing results can be achieved by altering:

- The speed of **Rotation** and **Revolution**  
and
- The ratio between them

There are two standard modes which are used to achieve optimal mixing results

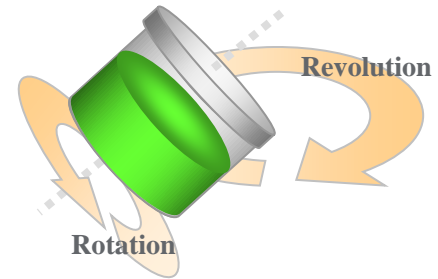
- **Mixing Mode**
- **Defoaming Mode/Degassing Mode**



# Two modes – 1) Mixing

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- The Mixing Mode has high speed **Rotation and Revolution**
  - On the **ARE-250**:
    - The ratio between them is 1:2.5
    - Typical speeds are 800rpm:2000rpm
    - With normal spin radius, this provides **400G of mixing force**
- The Mixing Mode achieves fast, homogeneous mix
  - This mixing action adds no air to the materials
  - In fact, it has a tendency to remove entrapped air

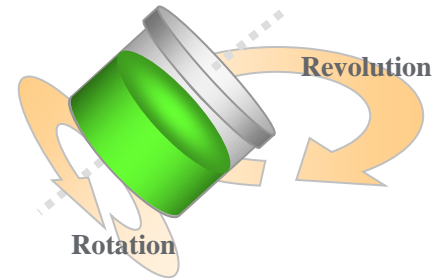




# Two modes – 2) Degassing

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- The Degassing Mode has high speed **Revolution**
  - On the **ARE-250**
    - The ratio between them is 1:36
    - Typical speeds are up to 60rpm:2200rpm
    - It is more similar to a simple centrifuge action
    - With normal spin radius, this provides **510G of force**
- The Degassing mode removes any remaining air
  - Too fast a rotation will separate the material like a centrifuge, although it degasses well



# Is it easy to operate?

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1. Load material into the container
2. Measure the gross weight & adjust the counter balance dial to suit
3. Set the time, speed & mode

*or*

3. Recall a previously saved program or recipe
  4. Press the start button
- Mixing profiles or recipes can be stored and recalled
  - See our **'Getting Started'** video to find out more



# What is multi-step mixing?

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- Allows you to process up to nine continuous steps in a batch
  - Mix -> degas -> mix -> degas etc.
  - Is very effective for powder applications, heat- or shear-sensitive materials or reactive materials



*Mixing talc into a viscous silicone*



# Example: powder mixing

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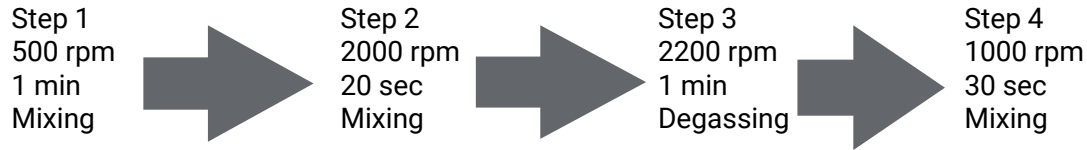
- Problem of mixing hard-to-wet powder into a liquid
  - Once some of the powder starts wetting, the rest tends to wet as well
  - To trigger this wetting, the mixer starts at a slow speed akin to mixing by hand
  - Then, mix at full speed
  - Degas
  - Re-mix again to make sure any dense particles which might separate in degassing mode are mixed and the material is fully homogenous
- Dynamic speed change from slow to fast, or vice versa, gives “shaking” effect to the materials which can result in better mixing quality
- Speed adjustments in a cycle can increase or decrease shear, which can change the material viscosity, etc



# Example: powder mixing

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- Program all steps to one memory slot
  - Batch time - two minutes and 50 seconds total
  - Stages proceed automatically



# THINKY ARE-250

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- Our most popular mixer
- Use for the majority of materials
- No vacuum
  - But usually no bubbles >  $\text{\O}1\mu\text{m}$
- Processes 0.5ml – 300ml
  - 310 grams gross



# THINKY ARE-312

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- Updated version of our popular ARE-250 mixer
  - **Faster mixing and defoaming** power with a new high torque, low temperature motor
  - **PC connectivity** via RS232 for control, monitoring, traceability, and programming
  - **20 memory** “recipe” slots with 10 program steps in each slot
- Use for the majority of materials
- No vacuum
  - But usually no bubbles >  $\text{Ø}1\mu\text{m}$
- Processes 0.5ml – 300ml
  - 310 grams gross



# THINKY ARV-310P

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- Same capacity as ARE-250
- Includes integral vacuum capability
- Used where even micro-bubbles cannot be tolerated
  - <  $\text{Ø}1\mu\text{m}$  bubbles
- See our Technical Bulletin - [Vacuum Mixing & Degassing](#)





# THINKY ARM-310

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- Use for the majority of materials
- No vacuum or degassing modes
- Processes 0.5ml – 250ml
  - 310 grams gross



# THINKY ARE-400 Twin

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- Mixes 2 x 250ml containers
- USB connectivity for control and data-logging
- Stores up to 20 programmed recipes
- No vacuum
  - But usually no bubbles >  $\text{\O}1\mu\text{m}$



# THINKY ARE-500

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- Mixes up to a 0.5l container
- Can mix up to 1.1kg of material
- Stores up to 5 programmed recipes



# THINKY ARV-501

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- Mixes up to a 0.5l container
- Can mix up to 700g of material
- Stores up to 20 programmed recipes
- Vacuum mixing possible through optional stand or your own external vacuum pump source.



# THINKY ARV-931Twin

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- Includes integral vacuum capability
- Max 0.5l in 0.75l container x 2
- 1 litre overall mixing capacity
- Can apply 670G when using defoam mode



# THINKY ARV-5000

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- Includes integral vacuum capability
  - A full vacuum can be achieved in 30 seconds
- Up to 4L or 5kg mixing
- Stores 10 recipe profiles
- Equipped with an air cooling mechanism



# THINKY ARV-10K Twin

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- Includes integral vacuum capability
  - A full vacuum can be achieved in 30 seconds
- Up to 20kg mixing, 10kg containers x 2
- Stores 20 recipe profiles



# THINKY SR-500

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- Designed to bring solder paste up to optimal mixed quality and temperature in a few minutes
- Standard 500g solder paste containers can be conditioned without repackaging
- Stores up to 10 programmed recipes





# Containers

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- Mixing quality and speed is optimised by using a suitable container
- Ideal containers have rounded internal corners and no gaps on the container wall surfaces
  - This allows no particles to be trapped in sharp corners or gaps
- Stocked containers include
  - 90ml PP
  - 150ml HDPE
  - 240ml PP
  - 300ml HDPE
- Containers are also available in capacities from 12ml to 4L



# Adapters

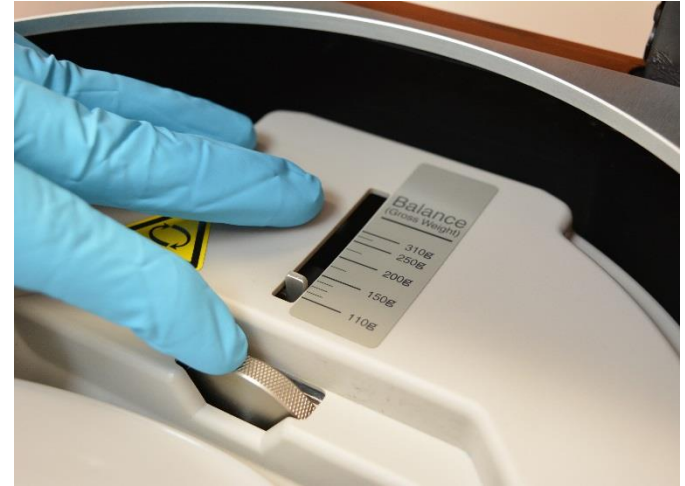
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- THINKY Mixers hold a small container with an optional adapter
- You can use various sizes of jars, syringes and cartridges. We also can make adapters for your container needs
- The cooling adapter has a freeze gel function that keeps the material cool throughout the mixing process
- The heat insulation adapter allows you to process heated materials up to 130°C



# What is a counterbalance?

- All THINKY mixers are equipped with balance adjusters
- High speed spins of the single containers requires a counter dummy weight to spin in balance
- Unbalanced spins cause heavy vibrations of the mixing unit
  - Like a wobbling washing machine



# Why THINKY?

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- There are many engineered materials which are
  - Hard to mix
  - Hard to de-aerate or de-gas
  - Hard to wet, or get dry powders into liquids
- They can be
  - High and/or low density materials
  - High SG metallic powders
  - Pasty, viscous materials
  - Fine particles

**THINKY Mixers are effective for effortless, homogeneous mixing of all types of engineered compounds. The precision can be simply confirmed when examined under a microscope.**



# Benefits of using THINKY mixers

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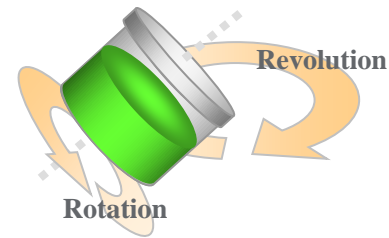
- For high viscosity, materials with different densities
- Simultaneous mixing & degassing in one batch
- Process in your own container
  - jar, barrel, cartridge, syringe
- Remove voids and re-disperse filled materials already packed in syringes
- Non-invasive processing ends the risk of cross contamination between batches
- Process from 0.5ml - no waste of expensive materials
- Re-mixing of separated materials to prolong shelf life
- No volatile constituent loss with vacuum-less processing
- No material damage unlike processes involving rollers, mixing blades or propellers
- No unit cleaning between batches



# Benefits of using THINKY mixers

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- Saves time and cost significantly
- Improves yield rate
- Reduces production cycle time in seconds to minutes
- Improves productivity
- Production on demand reduces material stock
- Improves and produces consistent quality, regardless of operator skills, with digitally controlled processing



# Our customers

- Our selection of [customer case studies](#) showcase the importance of achieving consistent, homogeneous mixes during production.

## CASE STUDY

**intertronics**  
adhesives, coatings, sealants & equipment  
for your manufacturing and technology applications

**Preci-Tip™**  
Precision  
Dispensing Tips

**THINKY**  
**ARM-310**  
Engineering  
Compounds Mixer



[Improving mixing accuracy and repeatability for 3D printed bioelectronics research](#)

## CASE STUDY

**intertronics**  
adhesives, coatings, sealants & equipment  
for your manufacturing and technology applications

**THINKY ARV-310**  
mixer  
Industrial non-contact  
"planetary" vacuum  
mixer



[Degassing times reduced by up to 90%](#)

## CASE STUDY

**intertronics**  
adhesives, coatings, sealants & equipment  
for your manufacturing and technology applications

**THINKY ARM-310**  
Engineering  
Compounds Mixer  
Industrial non-contact  
"planetary" mixer



[Production of a homogeneous feedstock for LMM 3D printing process](#)



**intertronics**

# Find out more

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- Thank you for your interest in the THINKY Mixers
- **Visit our website** for more information, technical specifications and a product videos:

[www.intertronics.co.uk/thinky](http://www.intertronics.co.uk/thinky)

- **Come and see a THINKY Mixer!** We welcome you to our Technology Centre for a demonstration
- **Call us** to discuss your application on +44 (0)1865 842842

