How to choose a THINKY mixer

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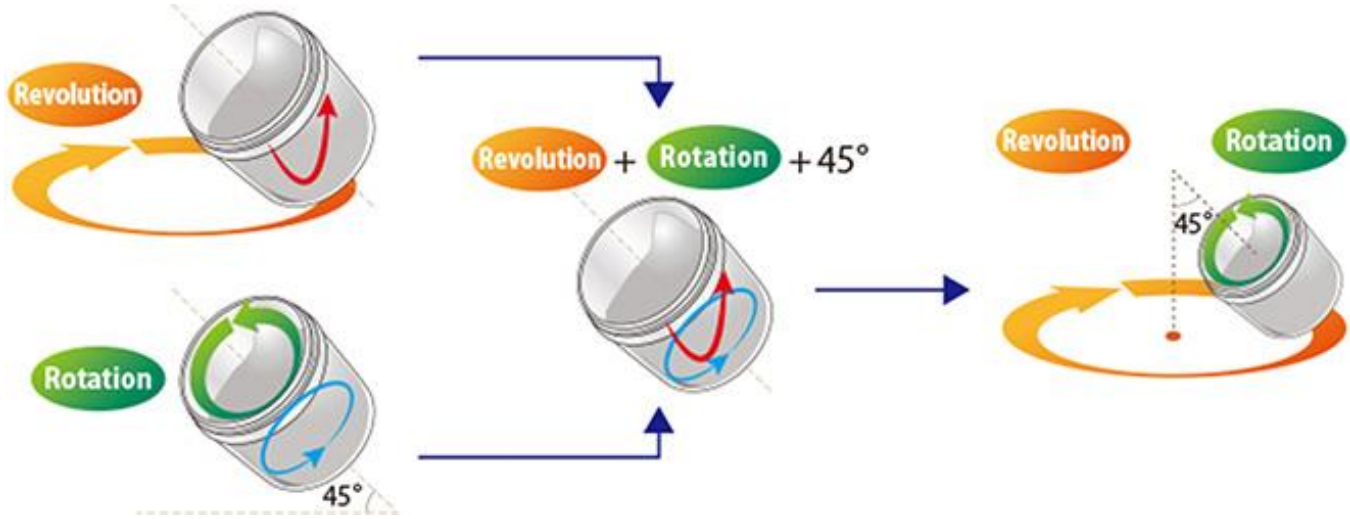
Our THINKY Mixers have three types of function or capability to help you mix your liquids, pastes and powders, with complete uniformity and without air bubbles.

1) **Planetary mixing**
2) **Degassing**
3) **Mixing under vacuum**

Choosing the correct mixer with the right capabilities will often depend on the materials you need to mix – how prone are they to retain air (perhaps due to high viscosity), how much air is already trapped in them, how much air is brought into the mix from the powders you are adding, etc. A simple blend of low viscosity liquids may very well mix easily with no visible air bubbles. More complex mixes involving differing viscosities and/or powders will be more difficult to achieve an air-free mix without extra help. For critical applications, where even micro-bubbles are unacceptable, then mixing under vacuum may be required.

The mixing principle

The fundamental and common technology of all the THINKY range is “planetary centrifugal mixing”. This mixing action does not use blades, paddles or other invasive tools. The technique involves rotating containers around their central axis, at a 45° angle, whilst at the same time revolving them around a central point; similar to the way the earth moves around the sun, giving us both days and seasons. In the THINKY, these rotations and revolutions are very fast; ~1,000’s of RPM. This generates mixing forces of about 400G, giving powerful material movement in the container. The ratio of revolution to rotation is critical to providing the optimal mixing forces.



The technology results in a fast, fully homogeneous mix and, unlike machines that rely on the insertion of paddles or impellers into the material, no air is introduced; in fact, the shear forces finely disperse any entrapped air, and there is a tendency for it to be removed (“squeezed out” to the surface).

1) Planetary mixing

Planetary mixers, including the **THINKY ARM-310**, offer significant productivity improvements over typical hand mixing techniques. Able to homogeneously disperse engineering compounds such as adhesives, sealants, lubricants, cosmetics, or pharmaceuticals in seconds to minutes, they provide consistent mixing results every time.

Example of modelling clay which has been mixed using the planetary principle.

Mixing takes place in removeable containers, meaning there is no mess to clean up after a mixing process, thereby saving valuable time and avoiding cross contamination.

2) Degassing

While the mixing revolution and rotation action will not add any air to your materials during mixing, and in fact is likely to remove them, it is possible for entrapped air to remain after a normal mixing step. Models such as the **THINKY ARE-312** have an additional "defoaming" or "degassing" mode, where the ratio of revolution to rotation is altered to favour the revolution component, generating high centrifugal forces on the materials - up to 510G. The lowest density contents, air bubbles, rise to the surface of the liquid and are destroyed by shearing forces of the slower rotation. Typically, this process removes most visible bubbles - only bubbles less than several hundred microns in size are left behind, hardly visible to the human eye. After this degassing step, a further standard mixing process is often carried out to recombine the materials evenly.

3) Mixing under vacuum

In some circumstances, mixing under vacuum is needed to get the required air-free result. Examples include higher viscosity materials which are reluctant to give up their bubbles, or when added powders keep air trapped, or for nano-particles, or for some critical applications where even micro-bubbles cannot be tolerated (perhaps an optical product).

In these cases, the planetary mixing is done under a vacuum, in mixers which have integral vacuum pumps – the **THINKY ARV-310P** is a popular example. The mixing container undergoes the revolution and rotation process in a vacuum chamber. The vacuum causes bubbles to expand and move towards the surface, move from higher pressure to lower pressure, and causes air in solution to come out, improving the mixers' ability to extract them from the material. Mixing and degassing are achieved simultaneously, in a hands-free fully automated and repeatable process. There is a very high degree of deaeration, materials are left devoid of micro-bubbles, homogeneously mixed and ready for the next step in manufacture.

To suit your requirements
With their ability to quickly transform multiple parts of liquids, pastes and powders into homogeneous, ready to use materials, planetary mixers form an integral part of a repeatable mixing process.

Numerous sizes and configurations are available, allowing mixers to be selected with attributes which best suit a processes requirement. Here are our three most popular models in order of increasing degassing capability.

Model	Degassing mode	Vacuum mixing capable	
THINKY ARM-310	No	No	
THINKY ARE-312	Yes	No	
THINKY ARV-310P	No	Yes	

To help with specifying a mixer, our product specialists would be happy to discuss your application to determine which might be most suitable. **Contact us** for further information and assistance.

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