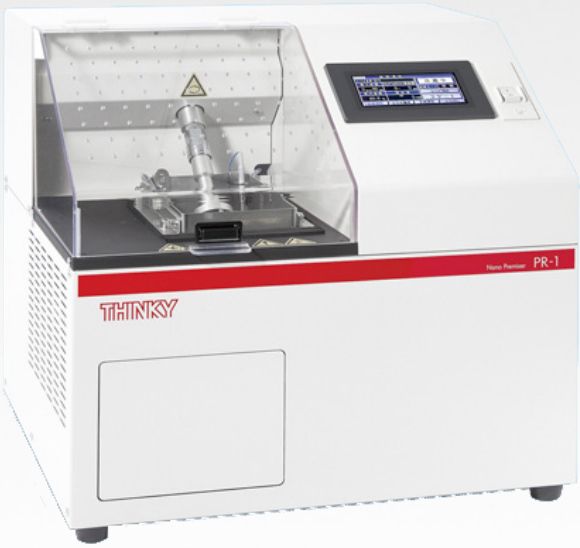

NANO PREMIXER PR-1

THINKY MIXER

POLY DISPENSING SYSTEMS
SYSTEMES DE DOSAGE INDUSTRIEL

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Nano Premixer PR-1

Features

- Highly Reproducible Dispersion
- Safe Operation in an Enclosed Container
- Water Temperature
- Control Using
- Cooling Unit
- Low Running Cost
- Contamination-free
- Unique Dispersion Technology (Patented)

Accessories

Standard container

Test tube-shaped vial
(Maximum capacity : 5 ml)

Option

SUS container
(Maximum capacity : 150 ml)

PR-1 is a premixer developed to meet customer needs for the dispersion of nano-materials in a safe and reproducible manner.

Nano-materials including carbon nanotubes (CNTs) are considered difficult to disperse due to their strong aggregation.
For several years, we have been working on the development of a mixer that provides highly reproducible dispersion of CNTs, while operating safely by keeping the sample in an enclosed container.
We have successfully invented a next-generation, ultrasonic mixer that surpasses any conventional ultrasonic equipment.

A new technology that meets the needs

For nano-material researchers, the deagglomeration of agglomerated fillers is an essential process. Many researchers desire simple but highly reproducible deagglomeration. However, even if the dispersion of filler is achieved, deagglomeration with existing ultrasonic equipment comes with issues regarding the process. For example, a probe sonicator creates strong cavitation which could lead to shortening of material, changing of material property due to heat, and contamination caused by abrasion from the tip. An ultrasonic bath creates non-uniform dispersion, due to the random position of samples inside the bath.
To solve these technical issues, THINKY has developed the Nano Premixer PR-1, which combines ultrasonic technology with container rotation based on over 30 years of experience in mixing and defoaming technologies.

Next-generation ultrasonic dispersion technology

PR-1 is designed to rotate the container at a high speed while ultrasonic irradiates from the bottom and side of the ultrasonic bath.
This unique technology prepares uniform and highly reproducible dispersion samples. In addition, PR-1 has the capability to cool the water of the ultrasonic bath so as to control sample temperature.
Moreover, deagglomerating with PR-1 and mixing with THINKY MIXER achieves a homogeneous dispersion of filler in a high viscose material.

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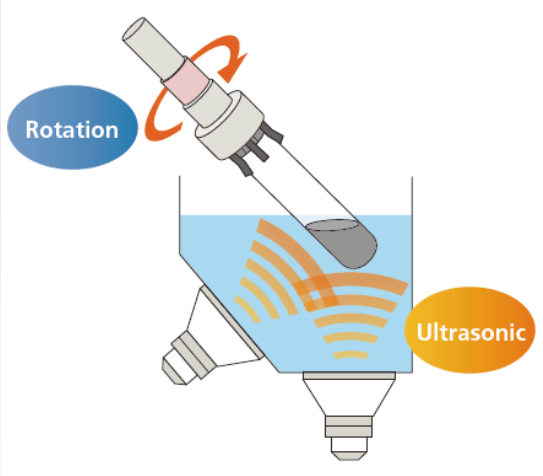
Dual-sonic technology (patented)

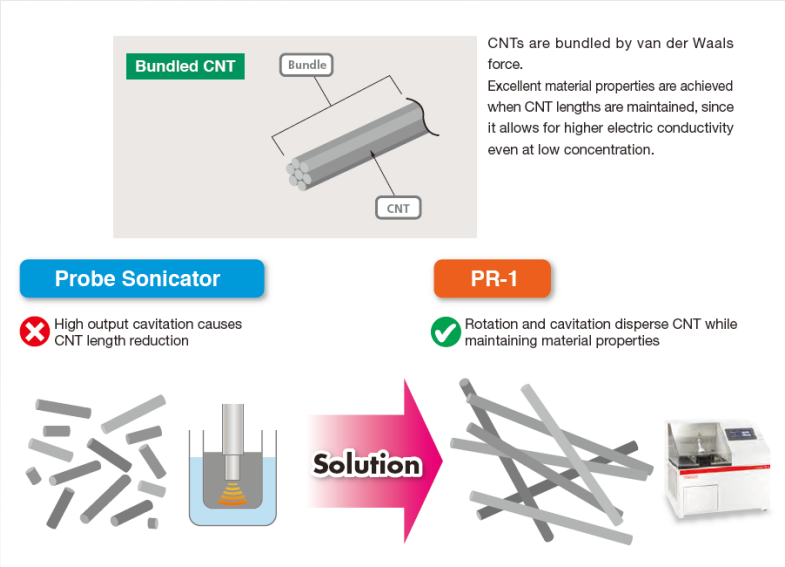


PR-1 is designed to rotate the container at a high speed while ultrasonic irradiates from the bottom and side of the ultrasonic bath. Rotating the container at an angle of 45°causes convection in the materials, and thus ultrasonic irradiates the entire sample.

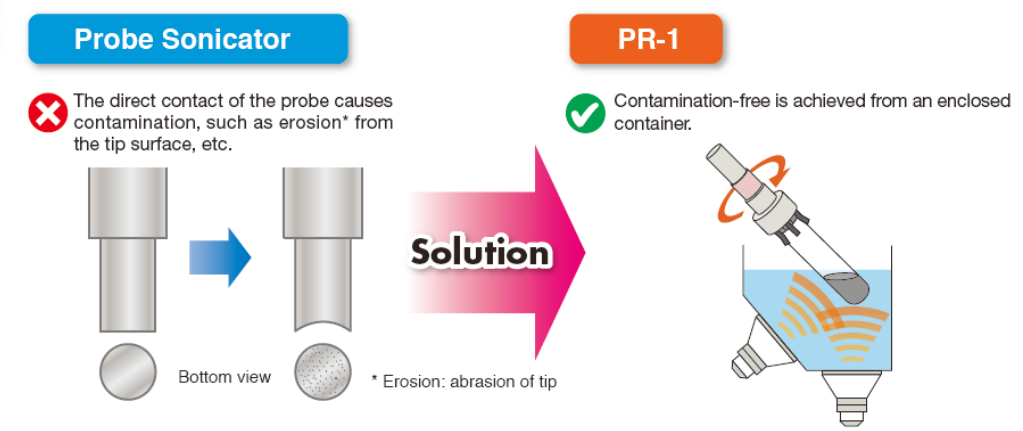
DATA SHEET

Nano Premixer PR-1

Dispersion while maintaining fiber length



Contamination-free dispersion (Ultrasonic dispersion in an enclosed container)



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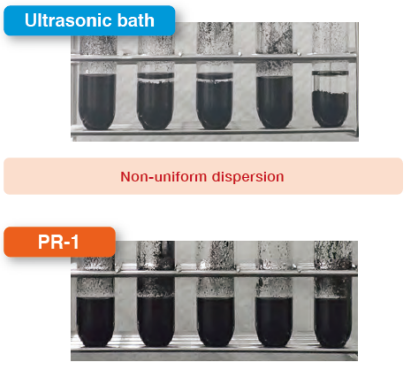
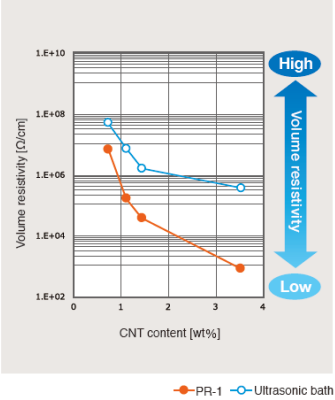
Dual-sonic dispersion

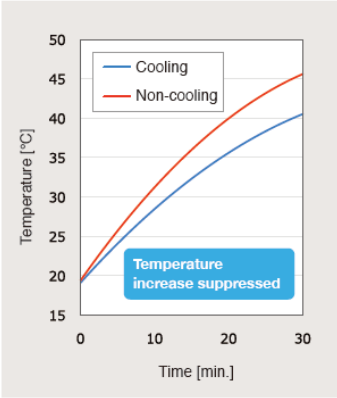
Comparison of dispersion



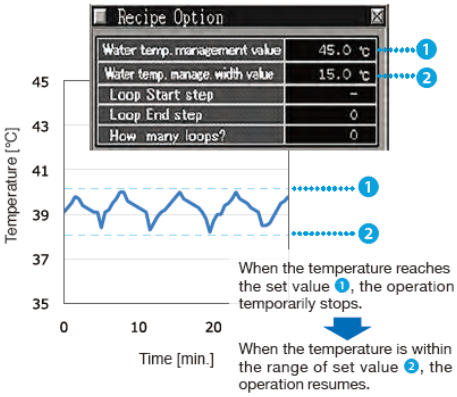
Volume resistivity comparison



Water temperature control of the ultrasonic bath water



Temperature increase suppressed by a built-in cooling unit

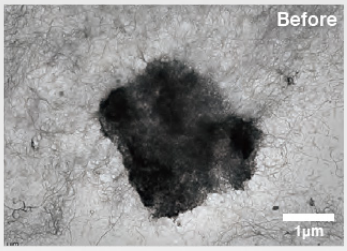


Water temperature control program

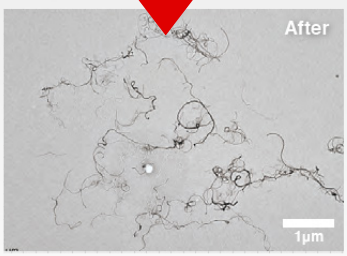
DATA SHEET

Nano Premixer PR-1

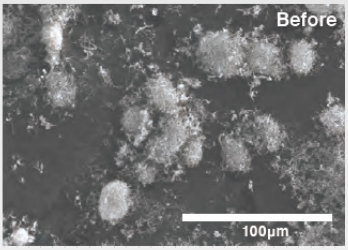
Carbon nanotube (MWNT)



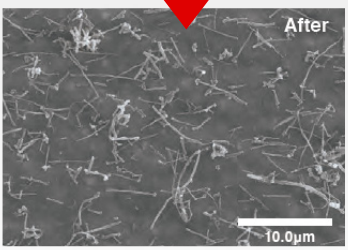
Diameter: 10-12 nm, average fiber lenght: 10 µm



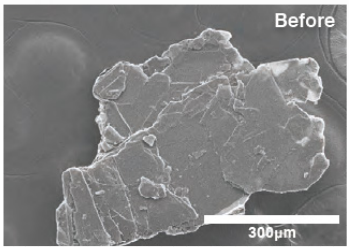
Carbon nanofiber (VGCF®)



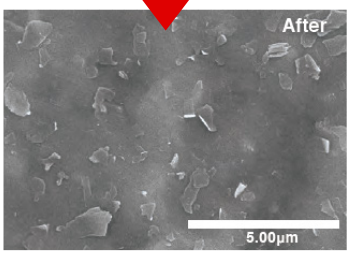
Average diameter: 150 µm, average fiber lenght : 6µm10-30 µm



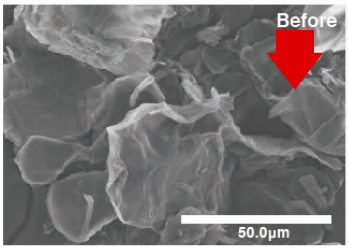
Graphite



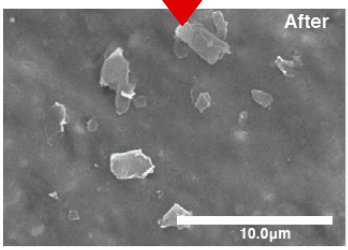
Average particle diameter: <20 µm



Graphene oxide



Average particle diameter: 10-30 µm



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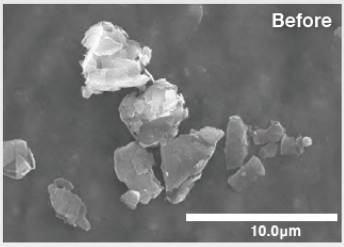
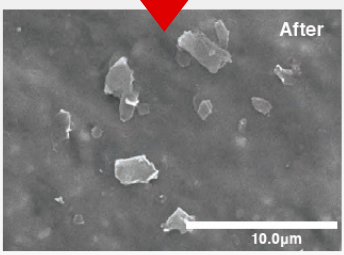
Nano Premixer PR-1

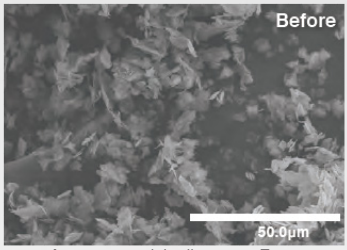
Re-dispersion of graphene dispersion



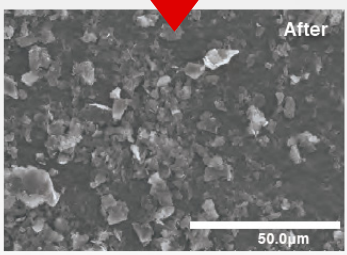
Average particle diameter: 2-4 µm



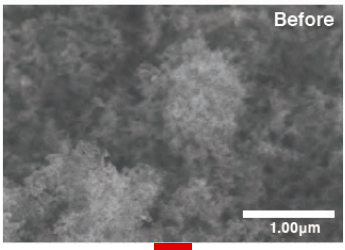
Talc

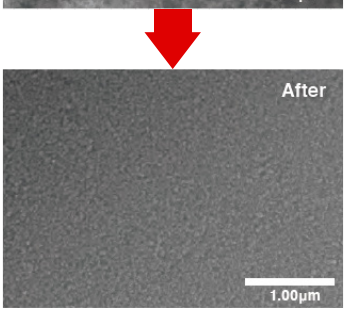


Average particle diameter: 5 µm

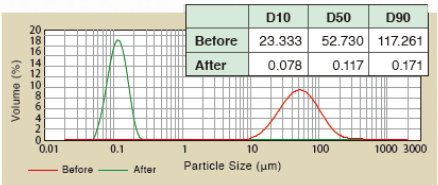


Silica



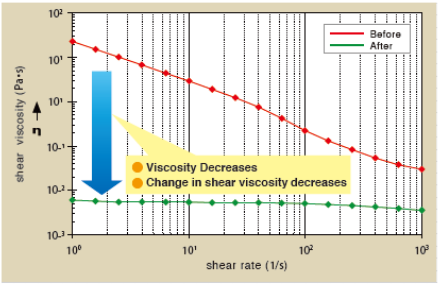


Particle size distribution



	D10	D50	D90
Before	23.333	52.730	117.261
After	0.078	0.117	0.171

Rheometer



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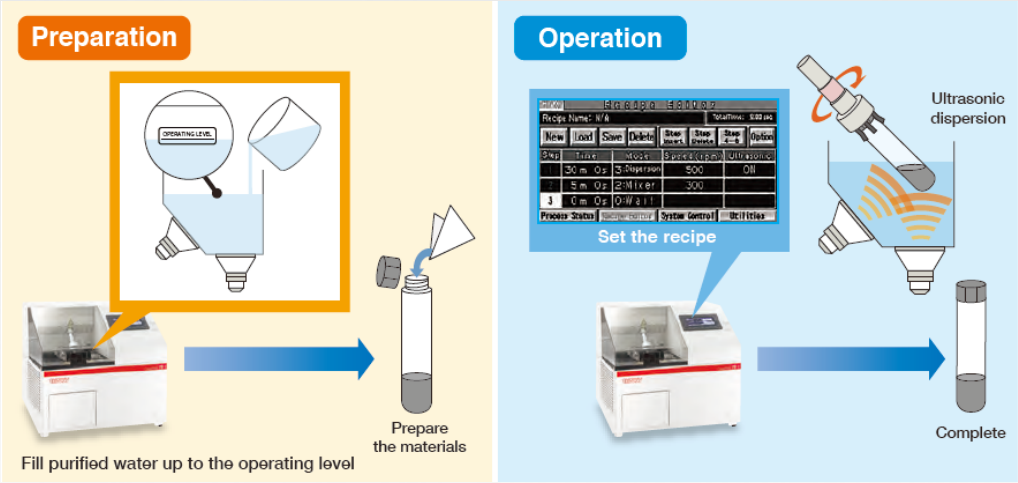
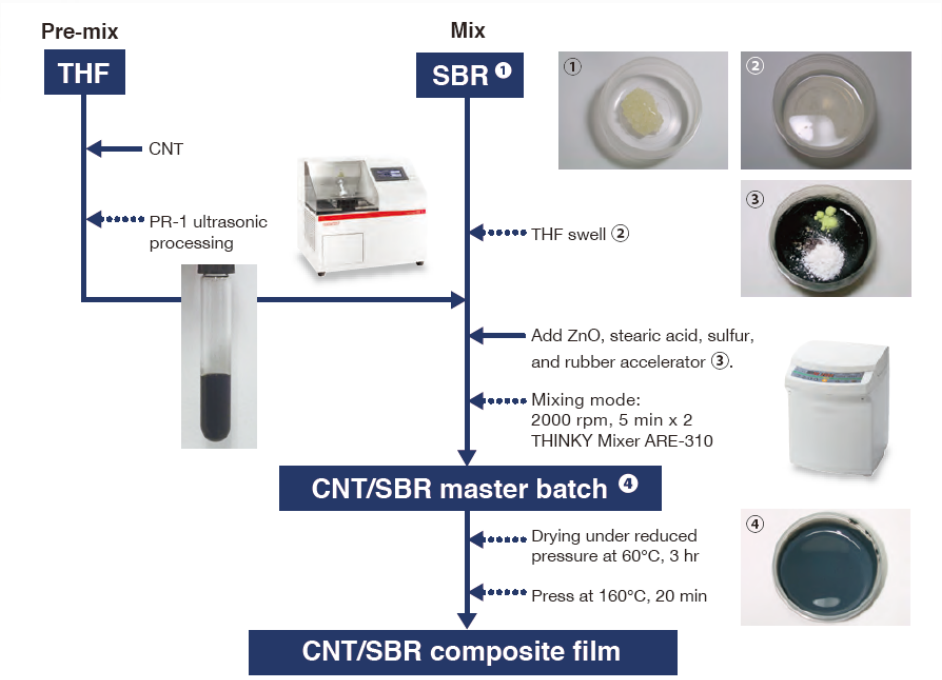
Dispersion



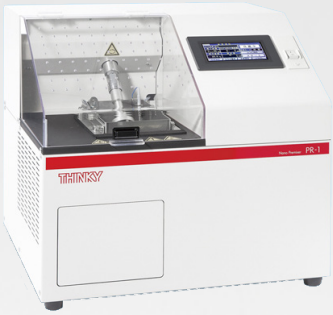
Processing with PR-1 and THINKY MIXER (mixing of rubber)



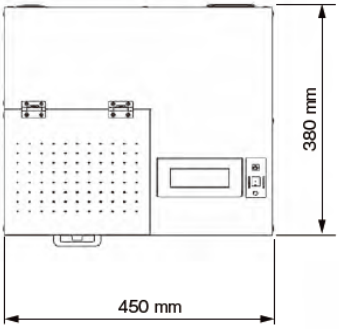
DATA SHEET

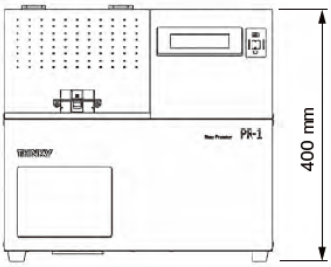
Nano Premixer PR-1

Product Specification



Product		Nano Premixer
Model		PR-1
Method		Dual-sonic system
Timer Setting Range		0 hour 00 min.00 sec. to 2 hours 00 min. 00 sec (Max. 2 hours run / Setting in the unit of 1 sec.)
Rotation Speed		Max.600 rpm (0 rpm and 80 - 600 rpm)
Method of Operation		4.3-inch monochrome liquid crystal touch panel
Step / Recipe		6 steps / 20 recipes
Ultrasonic Wave	Transducer Output	Max. 70w x 2 transducers (side and bottom)
	Frequency	40 kHz
	Modulation Mode	frequency-modulation
Standard Container		Test tube-shaped vial (capacity 5 ml)
Maximum Processing Volume		Approx. 5 ml, 150 ml SUS container (option)
Noise		At standby: 50 dB During operation: Max. 64 dB
Power Source	Voltage	Single-phase AC85V - 265V (47Hz - 63 Hz)
	Power Consumption	At standby: 50 VA During operation: 500 VA (Excl. start time)
Working Environmental Condition		• 10 - 35 °C, 35 - 80 % RH (without condensation) • Altitude: within 2,000 m
Storage Conditions		• 10 – 35 °C, 35 – 80% RH • Excessive vibration or impact must be avoided. • Keep away from the rain, dust and other fine particles, or chemicals.
External Dimensions		400 mm (H) × 450 mm (W) × 380 mm (D)
Weight		Approx. 25 kg





* Product specifications are subject to change without prior notice.

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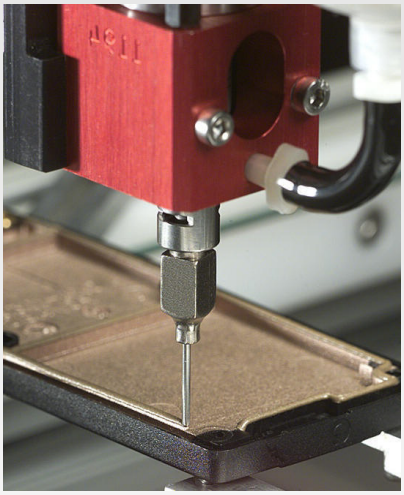

PDS S.A.S is a french company that commercializes a wide range of dosage equipments, proven and effective.

Distributed in over 20 countries around the world, these equipements provide tailored solutions to many users in order to improve technically their manufacturing and reduce their productions costs.

Our collaborators and sales engineers all have a strong technical competences. They are able to answer your questions and offer you, after analysis, the right solution for your particular need.

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