

Dispersing / Emulsifying / Mixing

Advanced Nano Technology Co., Ltd. "Nano Maker"

## ***Cavitation Mill Nano Dispersing System***

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System Integration / Design / Sales / Engineering Support / Powder Processing Service  
■ Nano Creating (Grinding / Dispersion / Emulsifying / Classification) Systems  
■ Powder & Particles Processing Equipment / Systems

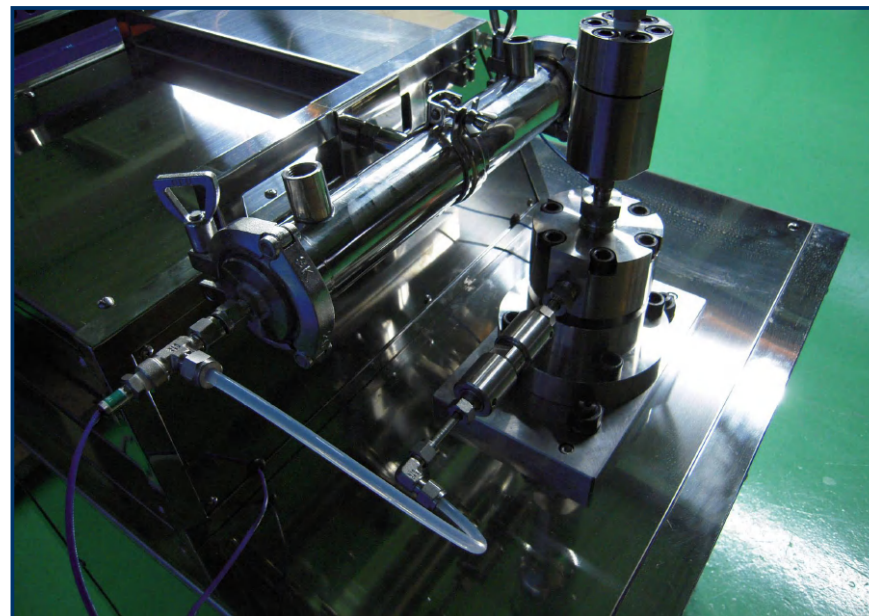


**FT Associates, Inc. (FTA)**

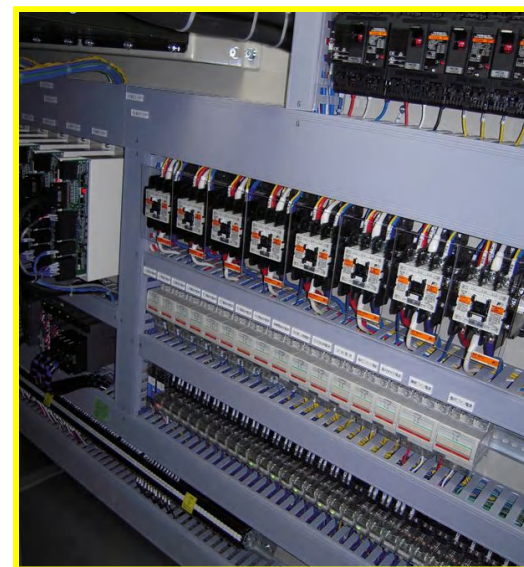
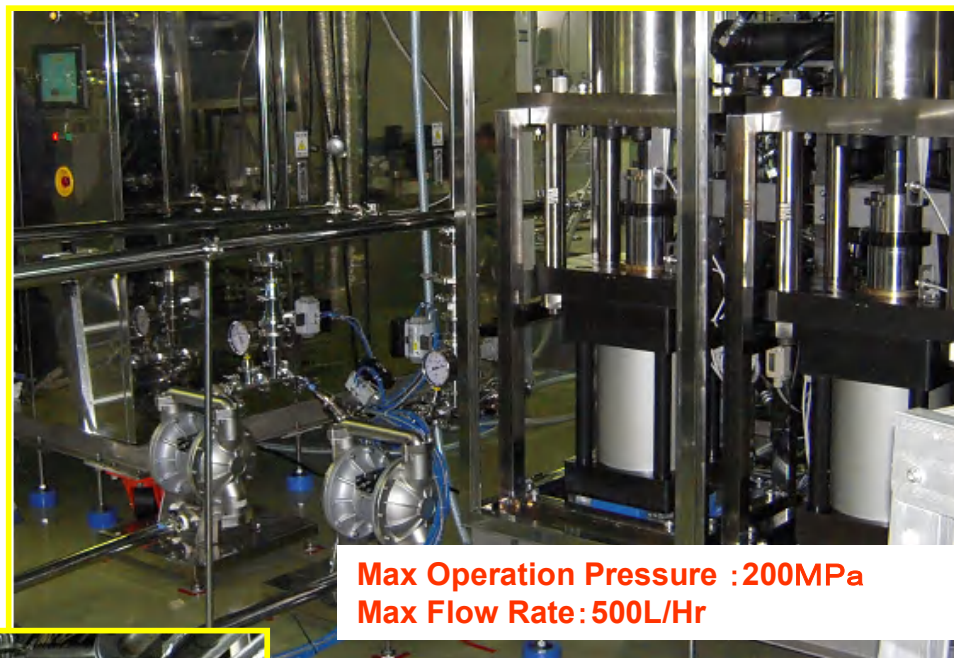
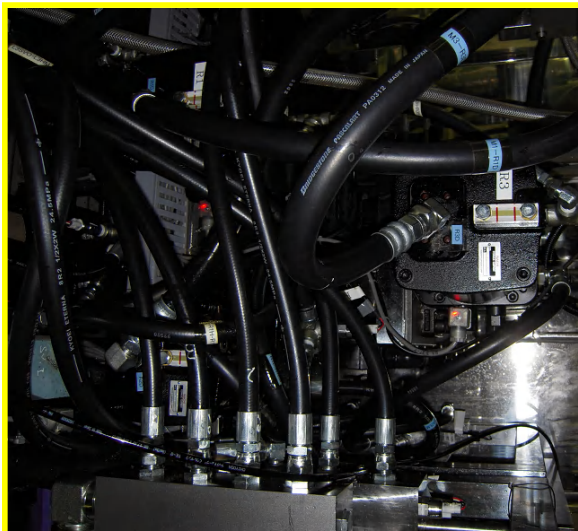
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Phone : +81-(0)4-2997-8070  
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E-mail : [sales@ftajapan.com](mailto:sales@ftajapan.com)  
URL : <http://www.ftajapan.com>

**Max Operation Pressure :200MPa**  
**Max Flow Rate: 10L/Hr**

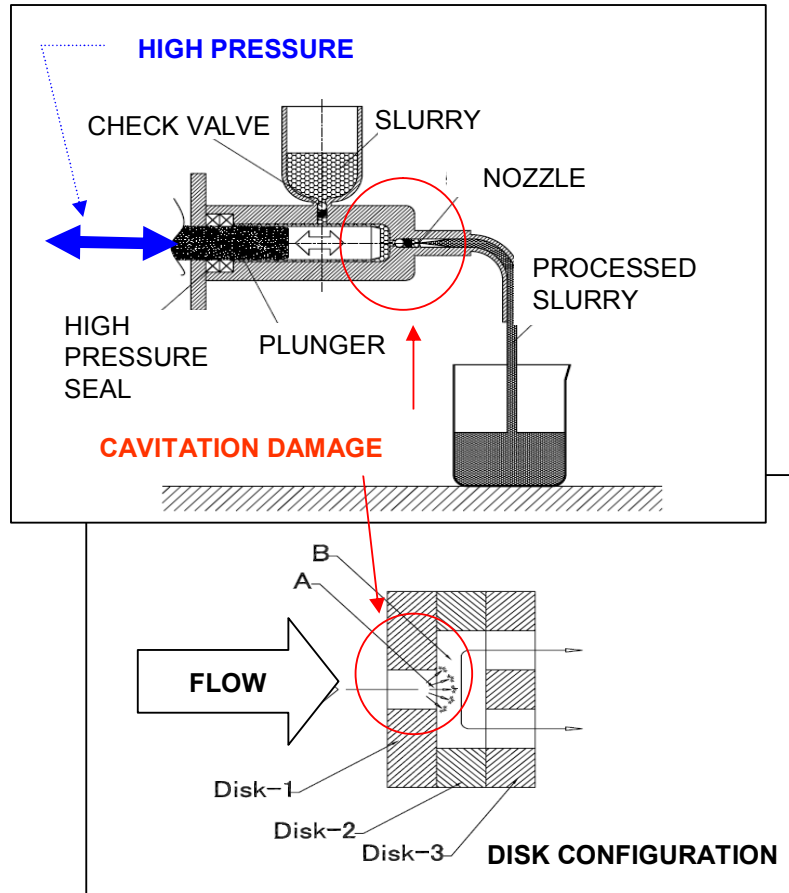
**Max Operational Pressure:200MPa**  
**Max Flow Rate: 15L/Hr**







## ■ PRINCIPLE



CAVITIES ARE EFFECTIVELY **GENERATED** THROUGH THE **SEPCIAL DESIGNED DISKS AND NOZZLE** CONFIGURATION, AND THEN RAPIDLY **COLLAPSED**, RELEASING **VERY HIGH ENERGY** OVER THE PARTICLES.

THE PROCESS, “CAVITATION DAMAGE”, ENFORCES THE **DISPERSING**, & **EMULSIFYING** TO CREATE SUCH FINE NANO PARTICLES.

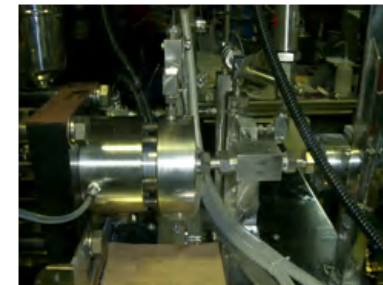
“**ULTRA HIGH PRESSURIZED FLOW**”, “**BEST FORMATION OF DIAMOND DISK**”, & “**EFFICIENT NOZZLE ARRANGEMENT**” ENSURE THE PERFECT DEVELOPMENT AND COLLAPSE OF CAVITIES, DISCHARGING SUCH HIGH ENERGIES (CAVITATION DAMAGE), AND IMPROVE THE BASIC FUNCTIONS, CRUSHING, DISPERSING, EMULSIFYING, BY SUCH A HIGH EFFICIENT CAVITATION DAMAGE PROVIDE LONGER PARTS LIFE

LSU-2010/P16



DSU-2515/P16

High Pressure Pump





## ■ FEATURES

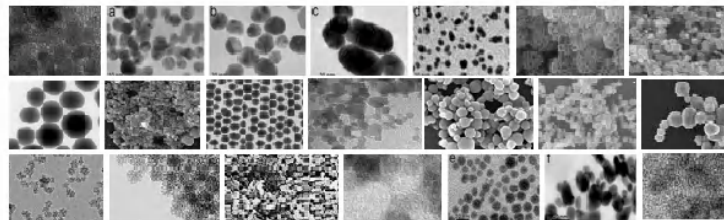
NOT TO DAMAGE **CRISTAL & SURFACE FORMS**

TO IMPROVE THE **SHARP PARTICLE DISTRIBUTION**

TO ENSURE **CONTINUOUS OPERATION**  
UNDER VERY SIMPLE PROCEDURE

TO PRODUCE **PURE MATERIALS**  
**WITHOUT CONTAMINATION**

TO CREATE VARIOUS RANGE OF  
PARTICLES WITH ADJUSTABLE  
**PRESSURE RANGE**



## ■ APPLICATIONS

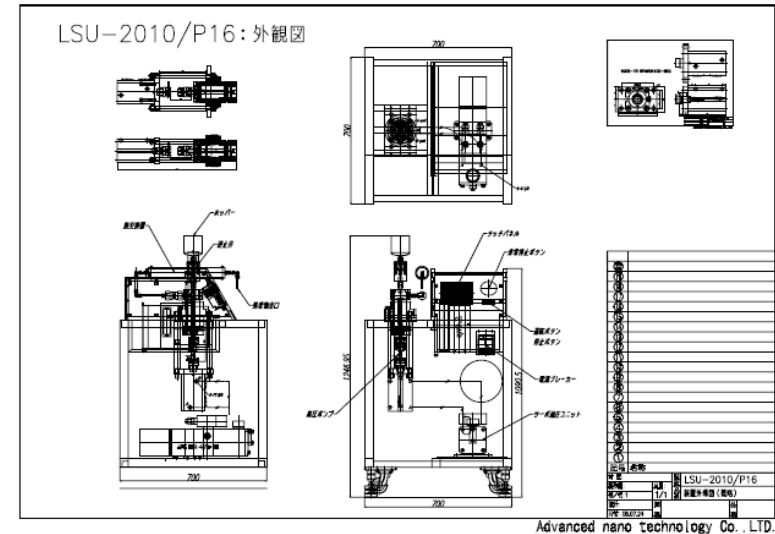
### NANO DISPERSING OF THE ADVANCED FUTURE MATERIALS FOR

- FPD (FLAT PANEL DISPLAY) COATING,
- SYSTEM ON FILM,
- ELECTRONICS DEVICES,
- HYBRID INJECTION MOLDING &
- OTHER APPLICATIONS

CARBON BLACK, RARE METALS, NICKEL, ALUMINA, ZIRCONIUM, CARBON NANO TUBE, COSMETIC MATERIALS, CERAMICS, FERRITE MIX POWDER, ALUMINUM CHLORIDE, CARBON MATERIAL, DRUG MATERIAL, METAL POWDER, GRAPHITE, SILICA, FOOD ADDITIVES, INDIUM, COBALT, ZINC OXIDE, TITANIUM OXIDE, MAGNETIC FLUID (MSG-W11), CALCIUM MILK BAKING, ZIRCONIUM, CALCIUM CARBONATE, SOY LECITHIN, NICKEL, COPPER PHTHALOCYANINE

### OTHER MAJOR EXAMPLE:

SILICA FOR CPM SLURRY (SEMICONDUCTOR POLISHING)  
 SILICONE OIL FOR COSMETICS, LUBRICANTS  
 ORGANIC AND INORGANIC PIGMENTS FOR FPD INK FOR COLOR FILTERS AND SOLAR CELLS, CARBON, LITHIUM, NICKEL FOR ELECTRODE MATERIAL FOR RECHARGEABLE BATTERIES ZINC OXIDE, TITANIUM OXIDE FOR PHOTOCATALYTIC, OPTICAL RECORDING MATERIALS BARIUM TITANATE FOR CONDENSER OTHER ELECTRONIC MATERIALS  
 PHARMACEUTICAL MATERIALS FOR DRUGS  
 SOY LECITHIN POWDER SOY: EMULSIFICATION / FOOD, LIQUID FOOD, HEALTH FOOD  
 YEAST FOR FRAGMENTATION (THE EXTRACTION OF CONTENTS)



## ■ High Pressurized Nano Dispersing / Emulsifying Lab System

**Model LSU-2010/P16 · LSU-2010/P14**

Ultra high pressurized (up to 200MPa) slurry flow design, with **the best formation of diamond disks**, & **efficient nozzle arrangement** based on long established experience, and know-hows over 400 production and lab systems delivery in the past 20 years.

- ensure the perfect development and collapse of cavities, discharging such high energies (Cavitation Damage)
- improve the basic functions, dispersing, emulsifying, by such a high efficient cavitations damage
- **Easy set-up, cleaning, and maintenance** is realized
- **Best interface** between man-machine is achieved.
  - \* Pressure Control System keeps **stable continuous pressure**
  - \* **Operation parameters** (pressure level, slurry flow condition, temperature, and others) can be **observed simultaneously** on touch panel
  - \* **Operation parameters** can be **input on easily from the touch panel**
  - \* Process **failure diagnosis system** can tell, and show the operator the inadequate operation factors.



LSU-2010/P16



DSU-2515/P16



## ■ TEST RESULTS

MATERIALS	BEFORE PROCESSING		SOLVENT	AFTER PROCESSING		REMARKS
	D50( $\mu$ m )	D90( $\mu$ m )		D50( $\mu$ m )	D90( $\mu$ m )	
ALUMINA	3.41	5.10	WATER	1.98	3.40	150MPa / 1pass
INDIUM	0.34	2.12	ETHANOL	0.08	0.12	130Mpa / 3pass
CARBON BLACK	25.13		WATER	0.98		130Mpa / 2pass
COBALT	6.72	11.80		1.73	2.98	150MPa / 3pass
ZINC OXIDE	3.60	6.70	WATER	0.45	1.32	100MPa / 3pass
TITANIUM OXIDE	19.20			0.23		100MPa / 3pass
MAGNETIC MATERIAL (MSG-W11)	0.38			0.08		100MPa / 5pass
ZIRCONIUM	26.80		WATER	0.46		100MPa / 3pass
CALCIUM CARBONATE	0.45	1.51	WATER	0.18	0.24	150MPa / 3pass
NICKEL	0.88	4.47		0.41	0.52	150MPa / 3pass
$\gamma$ -HEMUTITE	2.00			0.43		100MPa / 3pass
LITHIUM ALUMINATE(LiAlO <sub>2</sub> )	19.78			0.32		100MPa / 3pass



# **■ NANO MAKER MAJOR SYSTEM SPECIFICATIONS**

model	LSU-2010P16	DSU-2515P16	PU-2 **** P ***
Explosion-proof / Non-explosion-proof	Non-explosion-proof	Non-explosion-proof	Explosion-proof / intrinsically safe instrumentation can be designed
Drive system	Servo-hydraulic unit	Servo-hydraulic unit	Hydraulic unit
Pump type	constant plunger pump	constant plunger pump	constant plunger pump
Performance	Double acting / single rod	Double acting / single rod	Double acting / single rod
Plunger No.	1	1	1 to 3
Plunger diameter (mm)	16	16	14-100
Stroke (mm)	100	100	100
Plunger material	Zirconia / HIP process	Zirconia / HIP process	Zirconia / HIP process
Maximum number of sliding (regular use)	16	16	15-20
Maximum pressure (MPa) (regular use)	200	250	Max.250
Maximum capacity (L / hr) (regular use)	Ten	Fifteen	15-500
High-pressure seal shape	Forming U-seal / made to order	Forming U-seal / made to order	Forming U-seal / made to order
High-pressure seal material	Solvent-resistant resin	Solvent-resistant resin	Solvent-resistant resin
Materials of slurry contact part	SUS316 / zirconia ceramic / metal carbide / resin solvent-resistant polyethylene polymer / sintering diamond / diamond single crystal	SUS316 / zirconia ceramic / metal carbide / resin solvent-resistant polyethylene polymer / sintering diamond / diamond single crystal	SUS316 / zirconia ceramic / metal carbide / resin solvent-resistant polyethylene polymer / sintering diamond / diamond single crystal
Dimensions (mm)	600 (W) × 700 (D) × 1300 (H)	700 (W) × 700 (D) × 1300 (H)	Specifications may vary
Control / power cubic box	AC 200V / 3 phase power 1.7KW	AC 200V / 3 phase power 2.5KW	AC 200V / 3 phase power, control / power board in place by self-explosion-proof areas
Estimated body weight (Kg)	120	140	450

**Inquiry Sheet**

Please fill your requirement / Information &amp; return to us.

Customer	Company			Dept. Position				
	Address			Phone				
	Name			E-Mail				
Required System & Request	Category	A) Grinding B) Dispersing / Emulsifying C) Classification / Sifting D) Feeding / Transportation E) Separation / Concentration F) Drying G) Others						
	System	A) Cavitation Mill Dispersing System B) Beads Mill Ultra Fine Grinding System C) Jet Mill Ultra Fine Grinding System D) Grinding Mill Powder Pulverization System E) Super Micro Sieve F) Hydro-Cyclone Classification System G) Vibration Sifter H) Micro Powder Air Classifier I) Constant Micro Feeder J) Others						
	Request	A) Sales Material B) Proposal C) Test D) Process Service E) Rental F) Others						
Materials & Target	Name			Properties Y or N	Bulk Density		Moisture	
	Condition	A) Powder B) Particle C) Solid D) Others			Hygroscopic		% if Yes	
					Abrasiveness		Aggregation	
	Particle Shape	A) Spherical B) Unspecified C) With Protrusion D) Single Particle E) Aggregates F) Unknown		Solvent	Viscosity		Adhesion	
					A) Water B) Ethanol C) IPA D) MEK E) Acetone F) Toluene G) Xylene H) Ethyl Acetate I) Others			
	Size	Original Powder	Required	Slurry	Density wt%		Viscosity cps	
	D <sub>50</sub>							
	Top							
	Others				Detergent			
	Test & Work	Required Volume	Test sample			Production		
Test / Work Schedule					Attendance			
Remarks								

Excel version is available at <http://www.ftajapan.com/inquiry.xls> , if required.

## ■ Major Systems & Services offered by FTA



### Grinding / Crushing / Dispersing / Emulsifying

**Dispersing / Emulsifying / Mixing** Wet Operation  
Cavitation Mill Nano Dispersing System

**Nano Grinding / Crushing / Dispersing / Mixing** Wet Operation  
Beads Mill Nano Grinding System

**Grinding / Crushing** Dry Operation  
Jet Mill Ultra Fine Grinding System

**Dispersing / Emulsifying / Mixing** Wet Operation  
Ultrasonic Processor Nano Forming System

**Grinding, Crushing** Dry Operation  
Grinding Mill Powder Pulverization System



### Classifying / Sifting

**Classification / Sifting** Dry & Wet Operation  
Super Micro Sieve & Screen

**Classification/Separation/Concentration** Wet Operation  
Hydrocyclone Classification System

**Sifting / Screening / Classifying** Dry & Wet Operation  
Powder & Particles Vibration Sifter

**Classifying** Dry Operation  
Micro Powder Air Classifier



### Other Powder Processing Systems & Services

**Concentration**  
Screw Decanter Concentration System

**Constant Feeding**  
Powder & Particles Constant Micro Feeder