DRAVYA SHAKTI

ECOTYPE ALPHA

HIGH POWER NANO GRINDING MACHINE

The Next-Gen Dual Drive Planetary Ball Mill for Innovative Nano particles Production & Synthesis in Research Lab and industry

DRAVYA SHAKTI MECHANOCHEM PRIVATE LIMITED

Email: info@dravyashakti.in **Website:** www.dravyashakti.in

Dravya Shakti
CREATING MATERIALS N MORE

DRAVYA SHAKTI

ECOTYPE ALPHA

The Workhorse of Mechanochemistry

Nanomaterials with Precision

A machine thoughtfully made for mechanochemistry using the highest standards of technology and deploying fundamentals of physics and principles of DEM (Discrete Element Method), could be a state-of-the-art mechanochemical machine designed to enable precise and controlled mechanical reactions and processes.

The machine has advanced data visualization and analysis tools to help researchers interpret and extract valuable insights from the experimental results.

Successfully running at various prestigious institutes for material sciences

Precision Grinding Innovation

Generating Ultra-Fine Micro & Nano Powders from Metal Alloys, Ceramics and Composite Materials

Controlled Nano Material Synthesis

Advancements in Mixing, Dispersion, and Homogenization though variable Transmission Ratio

Green and Sustainable

By optimizing the milling process it reduces energy consumption

Very efficient Service Network

High Quality Machined Parts, Spares & Accessories and low maintenance costs

FOR MORE INFORMATION
+91-9628124000

www.dravyashakti.in

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The Innovative Dual Drive Planetary Ball Milling Machine – EcoType Alpha

Its ability to break down barriers, accelerate processes, and contribute to sustainability positions it as a game-changer in both materials science research and Industry.

DravyaShakti is focused on helping researchers, research institution and industries harnessing the true potentials of materials science for their objectives, through its assets & collaborations. Our machines have been instrumental in publishing six patents & various papers in international journals, related to material science. This background gives us the confidence to help you with your objectives in the least possible timeframe.

Advantages of EcoType

Discrete Element Method (DEM)

The machine utilises the principles of DEM to model the interactions and behaviour of discrete particles during mechanochemical reactions

Multi-Directional Forces

EcoType Alpha has the capability to apply mechanical forces in multiple directions

High-Precision Motion Control

To ensure accurate and reproducible experiments, the machine allow researchers to precisely set and adjust mechanical parameters

Data Visualization and Analysis

To ensure accurate and reproducible experiments, the machine allow researchers to precisely set and adjust mechanical parameters

Customizable Vessel Configurations

variety of vessel configurations and sizes to cater to different experimental requirements

Features of the ECOTYPE ALPHA

- **Rapid Grinding Capability:** Achieves ultra-fine scale grinding up to nanometer precision in minimal time.
- **Energy Efficiency:** Demonstrates a power-efficient design to optimise resource consumption.
- **Maximum Nano powder Yield:** Ensures the highest yield of nanopowders among equipment in its category.
- **User Programmable:** Allows up to 10 users to work simultaneously, offering flexibility in operation.
- **Variable Transmission Ratio:** Users can program the transmission ratio according to the specific materials being processed.
- **Leakproof Jars:** Designed for liquid alloying and grinding, preventing any leakage during operations.
- **Intuitive Touch-Based Controls:** Equipped with user-friendly touch controls for ease of operation.
- **Indigenous Design and Manufacturing:** Completely designed and built in India
- **Stringent Quality Assurance:** Each unit undergoes robust testing before being delivered to the customer.
- **Failsafe Mechanism:** Incorporates a failsafe electro-mechanical lock mechanism to prevent accidental mishaps during the grinding process.
- **FREEDOM FROM IMPORTS**

Manufacturing Unit
Sai Complex, Wazirpur Road, Faridabad,
Haryana (India) PIN -121002

+91-9628124000

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DRAVYA SHAKTI MECHANOCHEM PRIVATE LIMITED

Low CAPEX

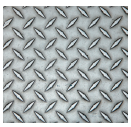
Low Cost of Ownership

High-Quality Parts & Spares

Experience Robust Service Assurance

Minimal downtime and uninterrupted operations

Designed for excellence



Outer Shell

Made from high-quality MS sheets with advanced laser cutting, this product undergoes a thorough seven-step powder coating to prevent corrosion. It is extensively tested for stability.

Grinding Jar

We offer various liner jars including options like Tungsten carbide and Agate. Different material combinations can be customized as per specific requirements to meet your needs.

Balls

The key component for nanomaterial production is the rotating balls, which, at high speeds, exert significant force on the materials, This process creates intriguing lattices for innovative materials. Different ball types such as high chrome steel, yttria-stabilized, zirconia, tungsten carbide, are used with corresponding liners.

Advanced Automation

EcoType, with its advanced automation, seamlessly integrates jar chemistry for heightened efficiency. The incorporation of new-age touch mechanisms, along with tailored programs for computation analytics, proves to be a valuable asset for R&D staff and production managers. Additionally, machine customization allows adaptation to specific industry or institutional requirements, seamlessly integrating with their main servers through high-level encryption for enhanced data security.

APPLICATIONS

PHARMACEUTICALS

AGRICULTURE

PAINT & COATING

COSMETICS

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ECOTYPE Specification Data	
Model	EcoType Alpha
Applications	Pulverizing, Homogenizing, Colloidal milling, Mechanical alloying, Amorphisation ,Mixing
Grinding material	Dry or Wet (Soft, Fibrous, Hard, Brittle)
Material feed size	<10 mm (Less than 10 Millimeter)
Final fineness	<500 nm (<0.5µm)
No. of Grinding Jar	2 Nos.(2 samples simultaneously)
Grinding Jar Volume (Each)	50 ml , 125 ml, 250 ml, 500 ml
Grinding Jar Casing	Stainless Steel - SS316
Grinding Jar Liner Material	Tungsten Carbide (WC-Co), Yttria stabilized Zirconia (YSZ), Hardened/Tempered steel, Stainless Steel (SS316), Sintered Alumina
Gasket Ring	Silicon O-Ring for gas proof, dust proof and leak proof operation
Ball Diameter	5mm, 8mm, 10mm, 12mm,15mm, 20mm
Jar Speed (Customizable)	0-1250 RPM
Sun wheel speed (customizable)	0-600 RPM
Sun wheel diameter	180 mm
G-force* /Force Field	up to 70g
Transmission ratio	The transmission ratio is variable to infinite possibilities with clockwise and anti-clockwise directions: 1:-2, 1:-2.5, 1:-3 or any can be achieved within the above jar or sunwheel speed range.
Plane of rotation	Planetary action of Jars with vertical plane of rotation and revolution
Axis of rotation	Axis of rotation and revolution are horizontal
Spin	Able to give same transmission ratio at both spin directions (clockwise & anti-clockwise) with respect to gyration arm
Gas Purging Facility (GPF: Optional)	For controlled atmosphere/ inert grinding
GTM System (Gas Pressure & Temperature Monitoring)	Real time monitoring and logging of pressure and temperature data, for all above mentioned liner materials jar
Coupled GTM with GPF (Optional)	Unique combination to control grindings under wide range of atmospheric ambience and pressure conditions
Power Supply	3-Phase /440V/50Hz
Power consumption	~ 3000 W
W x H x D closed (mm)	700 x 825 x 720
Net Weight	
Operating Parameter Control	
Set Grinding time / Set Interval operation /Set Interval time /Set Pause time /Set Protection code / Energy consumption Meter	Yes
Programmable Operating Time & Spin control	Programmable touch display mounted on machine to control Run, Pause time (hh:mm:ss) with option of spin direction reversal in alternate cycles, up to 99:99 hh:mm. Program retains current operation settings in case of power failure and has an option of resuming it from where it was interrupted.
COMPUTER INTERFACE	Optional
Data Capture & Control (OPTIONAL)	RS 232/ RS 485/ USB (Optional), Suitable GUI with data logging and programming the process parameters
IoT enabled	Optional
Programming Features	• Supervisor Restricted Access Password control • Up-to 10 individual users • Up-to 5 materials & balls information for individual users • Electromechanical failure reset/memory operation • Virtually Infinite transmission ratio
SAFETY FEATURES	
Safety Machine Cover	Mild steel housing with cover closing and opening for user protection & safety
Door Lock / Door open prevention	Mechanical lock / Auto off - when door is open
USER-SPECIFIC CUSTOMISATION	
Mechanical	• Jars can be customised internally for any specific need / requirement (Parabolic / Ellipsoidal) • Wheel spin can be bi-directional (β-Model / range) • Temperature module in each jar • Pressure module in each jar • Temperature & Pressure can be measured over internet