



**INDIAN INSTITUTE OF TECHNOLOGY BOMBAY**  
**MATERIALS MANAGEMENT DIVISION**  
Powai, Mumbai 400076.

Ref. PR No. 1000050845

Rfx. No. 6100002498

Item Description – **High Energy Ball Mill (Qty: 1)**

<b>Sr. No</b>	<b>Item Description</b>	<b>Detailed Technical Specification</b>	<b>Technical Compliance (Yes / No)</b>	<b>Additional Information (if any )</b>
1	High energy ball mill	High energy planetary Nano ball mill. The grinding jar will be mounted off-center on a sun wheel, both rotating in opposite direction with each other. The mechanism releases high dynamic energy to quickly produce fine particles of the sample with uniform particle size.		
2	Mounting	Bench-top		
3	Grinding stations	Two		
4	Feed material	Hard, medium-hard, soft, brittle and tough		
5	Material feed size	5 mm or smaller		
6	Final fineness	Should be less than 0.1 micrometer (100 nm) or less		
7	Grinding duration capacity	72 hrs. continuously or longer		
9	Grinding environment	Dry or wet without material leakage		
10	Grinding jars	<ul style="list-style-type: none"><li>i. Number of jars: Two.</li><li>ii. Tungsten carbide. It should be possible to use grinding jars of different materials like agate, sintered corundum, silicon nitride, zirconium oxide, hardened steel, and tungsten carbide.</li><li>iii. Jar should be compatible with</li></ul>		

		<p>aeration lids</p> <p>iv. Between 70 ml and 90 ml</p> <p>v. Auto lid closing with auto positioning and locking of grinding jar with balance detection for safety</p> <p>vi. Jars should be compatible with RFID detection of jar material.</p>		
11	Mill speed	<p>i. Jar rotation speed 0-2200 rpm with up to 1100 rpm of the sun wheel and maximum centrifugal acceleration of 95 g's or higher</p> <p>ii. Sun wheel diameter of 140 mm or larger.</p>		
14	Rotational Modes	Clockwise and anticlockwise with automatic direction reversal		
16	Sealing rings	Replacement sealing rings (four numbers) should be provided		
17	Grinding balls type	Tungsten carbide		
18	Dimension of the grinding balls	Assorted 5, 7 and 10 mm, diameter balls, total 1 kg		
19	Programmable Operation	<p>Programmable display to control grinding time (hh:mm:ss), pause time with spin direction reversal in alternate cycles. Programme should be able to retain current operation settings in case of power failure and should resume it from where it was interrupted</p> <p>Number of cycles that can be programmed 0-99</p> <p>Provision to save twenty programmes</p> <p>Jar (bowl) material detection using RFID</p> <p>Interval operation with automatic direction reversal</p> <p>Colour touch-screen LED display with 7" size or larger, with full function digital setting of all grinding parameters</p> <p>RS 232 interface or WiFi interface (specify).</p>		
20	Storage of SOP's	The mill should have a provision for storing SOP's		
24	Electrical	Should work with standard Indian		

	requirement	electrical supplies, single phase (220-240 V, 50Hz).		
25	Sound level	Less than 70 dB		
26	Upgrade compatibility	Mill should have compatibility with future upgrade to a facility of measuring continuous temperature (inner side) and pressure inside the grinding jar (bowl).		
27	Standards	CE certificate/ISO 9001:2015 certificate/IP66 protection (certificates to be enclosed with technical bid).		
28	Safety	Should have features like self-lock without any additional clamping, automatic shutoff function if an imbalance occurs, prevention of impermissible grinding setting, automatic (RFID) detection of inserted grinding jars and optimization of rotation speed.		
29	Model line-up	The model offered from the current serial production range of the manufacturer. Custom made or one-off manufactured models will not be considered.		

### Terms & Conditions:

1. **Brochure and Manuals:** Manuals and Brochure should be supplied along with the system. Detailed user instruction, maintenance and service manual and troubleshooting manuals to be submitted with delivery
2. **Maintenance:** The supplier should provide an uninterrupted maintenance check on yearly basis.
3. **Upgradation:** The supplier should supply software (if any) for the instrument whenever they are upgraded free of cost.
4. **Installation, Commissioning and Training:** Installation and commissioning should include demonstration of grinding a sample to 100 nm size. Training should be done at the site by factory-trained engineer free of cost, for 4 users in one day.
5. **Warranty:** At least 24 months from the date of successful installation.
6. **Delivery:** 10 weeks from the date of receipt of PO.