



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

**Ref No.(PR No. 1000037699)**

**(Rfx No. 6100001640)**

**Technical Specifications of High Energy Planetary Ball Mill. Qty : 1 No.**

Technical Specifications	Compliance (Yes/No)
<p>1) <b>a) High energy Planetary mill with:</b></p> <ul style="list-style-type: none"><li>i. At least- two grinding stations that can hold bowls of various sample capacities.</li><li>ii. Rotational speed of the main disk should be 150 – 1100 rpm or better,</li><li>iii. Relative rotational speed of grinding bowls up to 2200 rpm</li><li>iv. Effective diameter of the disc: 140 mm</li><li>v. Transmission ratio of planetary disc to grinding bowl: 1: –2 relative to the main disk.</li><li>vi. G value= 90g or higher</li><li>vii. Rotational modes: Forward and reverse</li><li>viii. Milling duration: 72 hrs continuously or higher</li><li>ix. Grinding: Dry and Wet</li><li>x. Maximum feed particle size: 5 mm or smaller</li><li>xi. Final fineness: 0.1 <math>\mu</math>m or lesser</li><li>xii. Usable sample volume:1 - 8 mL</li><li>xiii. Provision to perform Grinding in an inert gas environment</li><li>xiv. Provision to measure Gas pressure and temperature</li><li>xv. Digital logging facility</li><li>xvi. Mill should have a programmable interval and break times</li><li>xvii. The mill should have the capability of running with one grinding bowl and one counterweight.</li><li>xviii. Mill should have a compensation mechanism to compensate for the unbalance of all grinding bowls.</li></ul> <p><b>b) Bowls and Balls Materials:</b></p> <ul style="list-style-type: none"><li>i. 4 Bowls: grinding bowls made of Magnesium stabilized</li></ul>	

Zirconium oxide with steel casing. Zirconium oxide (ZrO<sub>2</sub>, Elemental share ZrO<sub>2</sub> = >94%, Magnesium oxide MgO – 3.5%)

- ii. The Capacity of the bowls should be: 20 ml
  - iii. Balls: Zirconium oxide (ZrO<sub>2</sub>), 10 mm (Atleast Nos.20), 5 mm (Atleast Nos. 200)
  - iv. Seal Rings: minimum 10 replacement seal rings
  - v. One counterweight for grinding bowls of 20 mL capacity
  - vi. Fast exchange of Bowls, Simultaneous comminution of up to 2 samples
- c) Reproducibility:** Automatic parameter checks before each grinding guarantee exact reproducibility
- d) Safety:** Should have safety features like self lock without any additional clamping, blocking of the mill in the event of impermissible operating states, Automatic shutoff function if an imbalance occurs, Prevention of impermissible grinding settings due to automatic detection of inserted grinding bowls and optimization of rotation speed
- e) Electrical Requirement:** Should work with standard Indian electrical supplies. (220-240 V, 50-60 Hz, etc.) and should be CE-certified.
- f) Manuals:** The following manuals in English should be supplied free of cost along with the system: Detailed user instruction, maintenance and service manual and troubleshooting manuals.
- g) Training:** Free of cost at the site by factory-trained engineer.
- h) Maintenance:** The supplier shall provide an uninterrupted supply of spares and accessories for a period of 10 years after warranty.
- i) Up-gradation:** The supplier shall supply software (if any) for the instrument whenever they are upgraded free of cost
- j) Warranty:** On-site Comprehensive Warranty for 1 Year or more from Installation and commissioning. Down-time call attendance should be within 48 hrs. In case the Equipment / System remains non-operational for more than 7 days then the warranty period will be extended for the equivalent period for which the Equipment/System remained non-operational. Warranty extension in such case shall be done without prejudice to any other Terms and condition of the contract.