

Specification for Vario Planetary Mill

Vario Planetary Mill should be equipped with different grinding bowls and balls of different materials such as tungsten carbide, tempered steel, stainless steel, agate, silicon nitride etc. to avoid contamination of sample caused by unwanted abrasion of grinding components.

- Grinding bowl capacity: 12ml to 500 ml
- Maximum feed particle size ≤ 10 mm
- Feed quantity up to 2 x 225 ml
- Final fineness $< 1 \mu\text{m}$
- Electrical details 400 V/ 3 phase, 50-60 Hz, 9000 W
- Capability of adjusting independently the rotational speeds of grinding bowls and supporting discs
- RS232 interface for programming and to transfer grinding parameters to the PC.
- Latest Laptop to be integrated with Vario planetary Mill with 8 GB RAM, 500 GB hard disk configuration, CD/DVD writer, 15" LED monitor, printer, scanner, Windows 7 operating system
- PC-programmable grinding and break times as well as grinding cycles
- Real-time display of the speeds to monitor the grinding process
- Reversing option
- Forced-air-ventilated grinding chamber
- High-performance drive belts for long service life
- Safety interlock of the grinding chamber with downtime monitoring
- Overload protection through adaptation to speed of rotation
- Variably adjustable pressure on sample (friction and/or impact)
- Simultaneous grinding of up to 4 samples

Grinding Bowls

Grinding bowls made of agate with steel casing, zirconium oxide, hard metal tungsten carbide with steel casing of 250 ml and 80 ml capacity. 1 nos each should be supplied.

One nos of Glass Lids with additional seal rings for 250ml and 80 ml bowls.

Grinding Balls

Suitable size grinding balls (15mm – 100 nos each, 10mm – 200 each, 5mm – 2500 nos each) of hard metal tungsten carbide, hardened and tempered steels, stainless steel, agate, silicon nitride, sintered corundum etc should be quoted.

GTM – gas pressure and temperature measuring system

Continual monitoring of gas pressure and temperature to enable thermal effects and physical and chemical reactions (pressure increase or decrease) to be monitored "in situ" in the grinding bowl.

Grinding in an inert atmosphere

Capability of grinding material in inert atmosphere. Details to be provided.

Additional lock-system should be provided for transport of the filled grinding bowl to a glove box.

Operating & instruction manuals and maintenance & service manuals – 3 copies each

Installation & commissioning and demonstration of its functioning in BHEL laboratory to be arranged.

The suppliers should mandatorily provide the list of various organizations (including in India) with their contact addresses, where similar equipment has been supplied. Photographs and catalogues related to every item of the mill should be enclosed.

Address of the Indian agent along with appropriate certificate from the Principal Supplier should be provided.

The supplier should ensure that the spares are made available for the next 10 years and certificate to that effect should be furnished. Essential spares required for trouble free operation for 5 years should be quoted.

The supplier shall provide 24 months warranty from the date of commissioning.

Only reputed manufacturers with ISO 9001 certificate need to quote.

After the delivery to BHEL R & D, if the Vario Planetary Mill is installed in existing R & D building it has to be shifted to the new building (Center for Nanotechnology and Applications) within 9 months from the supply of the equipment. This has to be done by the supplier and related expenses should be specified.

For any Technical Clarification, please contact :

Shri K Venugopal, AGM(CNT) at E-mail ID : venugopal@bhelrnd.co.in