

Technical Specification for Microwave Digester

The instrument will be installed at JNPT, Mumbai, and NOT at the IIT Madras campus. The microwave digester must have the following minimum specifications.

Vendor eligibility criteria:

1. A list of at least 3 Institutions/R&D units/Industries where similar instruments have been supplied in India, including contact details (name of the person-in-charge, email, and phone number), should be provided.
2. The quoted model's three performance certificates in India's reputed institutions should be enclosed duly signed and stamped by the concerned scientist.

Microwave Oven:

1. The system should have two magnetrons with a total minimum output power of 1800 Watt or greater in un-pulsed mode over the whole power range for precise reaction control.
2. Cavity volume must be more than 60 liters or better to accommodate various accessories.
3. The system should be explosion-proof, offering the highest safety.
4. The system must have a built-in high-performance exhaust for cooling and fume removal.
5. The system must have a number of built-in optimized programs to digest a variety of samples.
6. The system must be equipped with all safety features needed to prevent over-pressurization, the temperature shoots up, leakage of microwave radiation, etc. during operation
7. During handling, there must be the provision to cool the vessels inside the oven after microwave digestion.
8. The system must have a built-in LCD touch screen display of a size minimum 7" or better for all routine operations, and the system should have built-in manuals and videos onboard. External displays are not acceptable.
9. The system should have the facility to accommodate user-defined programs to store, modify and recall custom programs for process runs. The system should have the functionality of exporting the run data in ASCII/Excel/Origin and other common formats.
10. The system must be upgradable for applications like oxygen combustion and UV digestion using microwave energy.

High-Pressure Multimode Rotor system

1. Rotor System must be capable of processing a minimum of 16 or more high-pressure vessels simultaneously.

Vessel Specifications (Qty. 12 or more):

1. Volume: 50 mL or more with a minimum filling volume of 8 mL or lower.
2. Operating temperature: 250°C or more for complete digestion of even the most difficult to digest samples
3. Max. Venting Pressure: 40 bar or above.
4. Venting duct and accessories have to be provided
5. Max. Vessel design temperature: 300°C or more
6. The maximum withstanding pressure of the vessel should be 100 bar or more.
7. Must have simple hand tightening closure and closing with special tools like torque wrench not acceptable.
8. The internal temperature of every vessel must be displayed digitally as well as graphically on the screen.
9. The reaction vessels must have controlled release of overpressure with metal springs temperature to avoid explosions in case of sudden exothermic reactions over an entire temperature range. An operation with plastic springs not acceptable due to dependency on sample weights and digestion temperature.
10. The venting must occur only above 40 bar in order to perform required high-temperature applications.
11. The material of construction of vessels: Vessels should be made of TFM/PTFE and supported with an aluminum rotor for high strength under high pressure.

Items to be quoted optionally

1. Additional vessels and other accessories have to be quoted separately.
2. Quote the necessary consumables to operate the instrument for another three years

Safety Features:

1. The system must have a (magnetically) resealing safety door for the safe release of overpressure.
2. Must have software safeguards for rotor identification and over-pressure settings.
3. Must have adequate protection for magnetron protection from reflected energy.

Warranty:

1. Minimum 3 years warranty with 2 years free service