

Microwave device with power control for precise material heating

Description/Parameters

The microwave system serves as a scientific instrument for both direct and indirect heating of materials in the temperature range of 0–1100 °C. Materials can be heated under various atmospheres, such as inert, oxidative, or reductive, depending on the investigated processes. The system is equipped with a power-controlled microwave generator with an output of at least 1 kW, ensuring a homogeneous environment at a frequency of 2.45 GHz. It includes an IR sensor for accurate temperature measurement and recording.

A large working cavity (>50 L) allows processing of larger sample volumes, enabling the study of material decomposition or treatment processes at an increased scale. The microwave unit is fitted with a flange opening of at least 30 mm in diameter, allowing part of the apparatus to be positioned outside the microwave field. This configuration increases experimental flexibility and enables sampling of gaseous products.

This is a unique microwave system that is not commercially available.

- Microwave cavity volume: >50 L
- Magnetron power: >1 kW
- Quartz reactors with volumes of 100–1000 mL
- Temperature measurement via IR sensor
- Power control based on set temperature
- Flange opening in the chamber with inner diameter >30 mm
- Direct and indirect material heating

Utilization/Services

Microwave pyrolysis / chemical recycling of materials into high-value products. Application in microwave-assisted catalytic decomposition processes under precisely controlled temperature conditions.

