

PRODUCT DATA SHEET

MTECH20 ADVANCED R&D SYSTEM



The MTECH20 is a versatile development-scale solid-state microwave vacuum processing system designed for product development, process optimisation, extended trials and advanced research applications. Combining low-temperature vacuum processing with patented solid-state microwave control, the system delivers rapid, energy-efficient and highly controllable processing while preserving the quality, functionality and structure of heat-sensitive materials.

Suitable for food ingredients, natural extracts, microbial biomass, biotechnology products, agricultural materials and advanced materials research, the MTECH20 provides an ideal platform for process development, validation and early-stage scale-up trials.

KEY FEATURES

- Automatic frequency and phase sweeping technology
- Dynamic frequency tuning throughout processing to match changing dielectric properties
- Low-temperature vacuum processing from as low as 25°C
- Automatic microwave power modulation for precise process control
- Multi-frequency capability available in 2400–2500MHz, 900–930MHz or 425–475MHz configurations
- Installed peak power of approximately 7kW, with average power consumption typically 40–50% lower due to dynamic real-time power adjustment
- Siemens PLC with touchscreen HMI interface
- Real-time monitoring of temperature, vacuum and microwave performance
- Manual and fully automated operating modes
- Food-grade 304 stainless-steel construction
- Integrated vacuum and condensation system
- Increased development capacity with industrial-grade performance
- Comprehensive safety interlocks and process protection systems

TYPICAL OPERATING CONDITIONS

- **Processing temperature range:** 25-80°C, enabling both gentle low-temperature drying and more intensive thermal processing applications.
- **Most heat-sensitive products processed at:** 35-45°C, helping preserve organoleptic, nutritional and structural product properties.
- **Typical batch duration:** 1-4 hours, depending on the product, moisture content and desired final specification.

TYPICAL APPLICATIONS

- Food & ingredient development
- Functional mushrooms & botanicals
- Alternative proteins
- Microbial biomass & fermentation products
- Natural extracts
- Agricultural materials
- Biotechnology research
- Process development & optimisation
- Process validation & scale-up trials
- Extended product and process trials

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TECHNICAL DATA

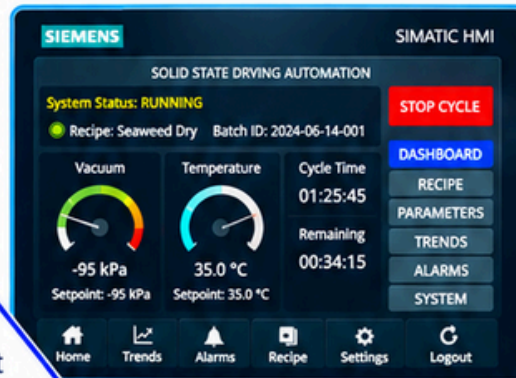
Parameter	Specification
Machine type	Development-scale solid-state microwave vacuum processor
Chamber	304 stainless-steel vacuum chamber
Chamber dimensions	700 × 700 × 800mm
Overall machine dimensions (W × D × H)	Approx. 1600 × 900 × 1850mm
Microwave frequency band	2400–2500MHz, 900–930MHz or 425–475MHz
Microwave generators	2 × 1kW solid-state generators
Installed microwave power	2kW
Installed peak power	Approx. 7kW
Mains supply	230 V, 32 A, 50/60Hz
Vacuum level	Up to -95kPa
Condenser	Integrated vapour condensation system
Temperature control	Infrared temperature sensing with PLC regulation
Frequency control	Automatic frequency & phase sweeping every minute
Cooling system	Closed-loop water cooling
Operation	Batch process, manual tray loading
Tray capacity	Up to 8 × GN trays
Maximum wet load	Up to 15–20kg depending on product density and loading configuration
Control system	Siemens PLC with touchscreen HMI
Safety	Full safety interlocks, reflected power protection, temperature and vacuum protection, emergency shutdown
Machine weight	Approx. 550kg

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HMI Control System

Operate the entire process through the intuitive Siemens touchscreen HMI. Simply select your temperature, vacuum and process parameters, and the system automatically manages the processing cycle.



Tray Loading System

Accommodates up to eight gastronorm trays, providing a flexible platform for larger trials, process development and scale-up testing.



Multi-Frequency Operation

Available in 2400-2500 MHz, 900-930 MHz or 425-475MHz frequency configurations, enabling optimisation for a wide range of materials and processing requirements.



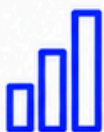
Vacuum Chamber

304 stainless-steel vacuum chamber designed for low-temperature processing, uniform energy delivery and superior product quality retention.



Vacuum Seal & RF Choke

Industrial vacuum seal and RF choke assembly enabling safe microwave operation under vacuum while ensuring reliable process performance.



Increased R&D Capacity

Larger chamber volume and increased tray capacity provide greater flexibility for extended trials, process development and scale-up testing.



Industrial Mobility

Heavy-duty lockable casters provide excellent manoeuvrability while maintaining stability during operation.