



PRODUCT DATA SHEET

MTECH50 PILOT & COMMERCIAL PROCESSING SYSTEM MILDTECH UK LTD

The MTECH50 is Mildtech's highest-capacity standard solid-state microwave and vacuum processing system, designed for pilot-scale processing, process validation and early-stage commercial production. Combining low-temperature vacuum processing with intelligent solid-state microwave control, the system delivers rapid, energy-efficient and highly controllable processing while helping preserve the quality, functionality and structure of heat-sensitive materials.

Suitable for food ingredients, natural extracts, microbial biomass, biotechnology products, agricultural materials and other high-value materials, the MTECH50 provides a flexible solution for applications where product quality, process consistency and increased batch throughput are important.

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 and reduced energy consumption
- Multi-frequency capability available in 2400–2500MHz, 900–930MHz or 425–475MHz configurations
- 6 × 1 kW solid-state microwave generators providing 6 kW installed microwave power
- Installed peak power of approximately 17kW, with average power consumption typically much 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 chamber and frame construction
- Integrated vacuum, vapour condensation and water-cooling systems
- Rotary carousel system accommodating 16 removable trays
- Batch capacity of approximately 50kg wet product, depending on material and loading configuration
- 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 production
- Functional mushrooms & botanicals
- Fruit, vegetable and plant-based ingredients
- Alternative proteins
- Microbial biomass & fermentation products
- Natural extracts and bioactive ingredients
- Agricultural materials
- Nutraceutical and functional ingredient processing
- Commercial process validation
- Early-stage commercial production

PRODUCT DATA SHEET

MTECH50 PILOT & COMMERCIAL PROCESSING SYSTEM



TECHNICAL DATA

Parameter	Specification
Machine type	Pilot and early-stage commercial solid-state microwave and vacuum processing system
Chamber	Food-grade 304 stainless-steel vacuum chamber
Overall machine dimensions (W × D × H)	Approx. 2300 × 2300 × 2300mm
Microwave frequency band	2400–2500MHz, 900–930MHz or 425–475MHz
Microwave generators	6 × 1kW solid-state generators
Installed microwave power	6kW
Installed peak power	Approx. 17kW
Mains supply	400 V, 3-phase, 50 or 60Hz
Vacuum system	Rotary-vane vacuum pump, up to -95kPa
Condenser	Integrated vapour condensation system
Temperature control	Dual infrared temperature sensing with PLC regulation
Frequency control	Automatic frequency & phase sweeping and tuning every minute
Cooling system	Industrial water cooling, approx. 15L/min
Operation	Batch process, manual tray loading
Tray capacity	16 removable trays on rotary carousel
Tray material	PTFE
Tray dimensions (L × W × H)	Approx. 650 × 270 × 60mm
Maximum wet load	Approx. 50kg, 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, condenser level protection and emergency shutdown
Machine weight	Approx. 2500kg

MTECH50 PILOT & COMMERCIAL PROCESSING SYSTEM



MILDTECH UK LTD



Vacuum Chamber

Food-grade 304 stainless-steel vacuum chamber designed for low-temperature processing and superior product quality retention.



Solid-State Microwave System

Six independently controlled 1kW solid-state microwave generators provide precise, responsive energy delivery and enable automatic frequency and phase sweeping throughout the process.



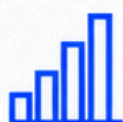
Integrated Condensation & Cooling

Integrated vapour condensation and industrial water-cooling systems support efficient operation and reliable thermal management during extended production cycles.



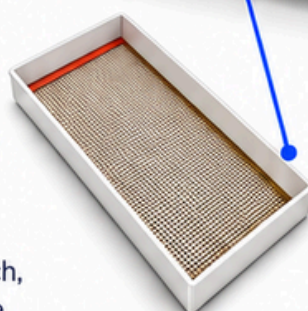
HMI Control System

Operate the entire process through the intuitive Siemens touchscreen HMI. Select automated processing recipes or manually set temperature, vacuum, power and process parameters as required.



PILOT & COMMERCIAL BATCH CAPACITY

Designed for commercial-scale batch processing, with a typical wet product capacity of approximately 50kg per batch, depending on product density, moisture content and loading configuration.



Rotary Tray Carousel

The integrated rotary carousel accommodates 16 removable PTFE trays, helping provide consistent exposure and uniform processing throughout the batch.