



INTELLIGENT MICROWAVE DIGESTION SYSTEM

Intelligent Microwave Digestion System - ToronMD™-i3000

ToronMD™-i3000 Intelligent Microwave Digestion System is an expert-grade microwave digestion and extraction platform built for fast, consistent sample preparation across high-throughput and high-pressure workflows.

It combines focused microwave control with mid-infrared, non-contact temperature monitoring (through TFM vessels) and optical, non-contact pressure monitoring to scan and display real sample conditions in real time for safer operation and more reliable digestion results.

APPLICATIONS

Intelligent Microwave Digestion System - ToronMD™-i3000 Applications



Environmental Testing (Soil, Sediment, Sludge, Waste)

The ToronMD™-i300 supports microwave digestion workflows used to quantify metals and other regulated elements in complex environmental matrices. It helps labs break down solids efficiently so the final digestate is ready for techniques like ICP-OES/ICP-MS or AAS.

Water & Wastewater Monitoring

For drinking water, industrial water, and wastewater, the system prepares samples for elemental analysis by digesting dissolved and suspended materials into a stable solution. This supports routine compliance testing and trend monitoring where repeatable sample prep matters.

Food & Feed Testing

Food and feed samples often contain fats, proteins, and additives that can trap elements and complicate analysis. Microwave digestion helps release target elements into solution for accurate nutrition labeling checks, contaminant screening, and quality control verification.

Metals, Alloys, and Manufacturing Materials

For metals and alloys, digestion is used when labs need trace-element confirmation, contamination checks, or composition studies. The i300's temperature/pressure monitoring helps maintain stable digestion conditions when working with aggressive acids and reactive matrices.

Geological & Mining Samples (Ores, Minerals)

Ores and minerals can be difficult to dissolve and may require high-energy digestion conditions. The i300 is positioned for labs preparing geological samples for elemental profiling, exploration support, and process control sampling.

Petrochemical & Related Industrial Samples

Petrochemical samples can be challenging due to organic content and viscosity. Microwave digestion helps convert these samples into analyzable solutions for catalyst metals, impurity monitoring, and QC checks in production or R&D environments.

Plastics, Polymers, and Industrial Products

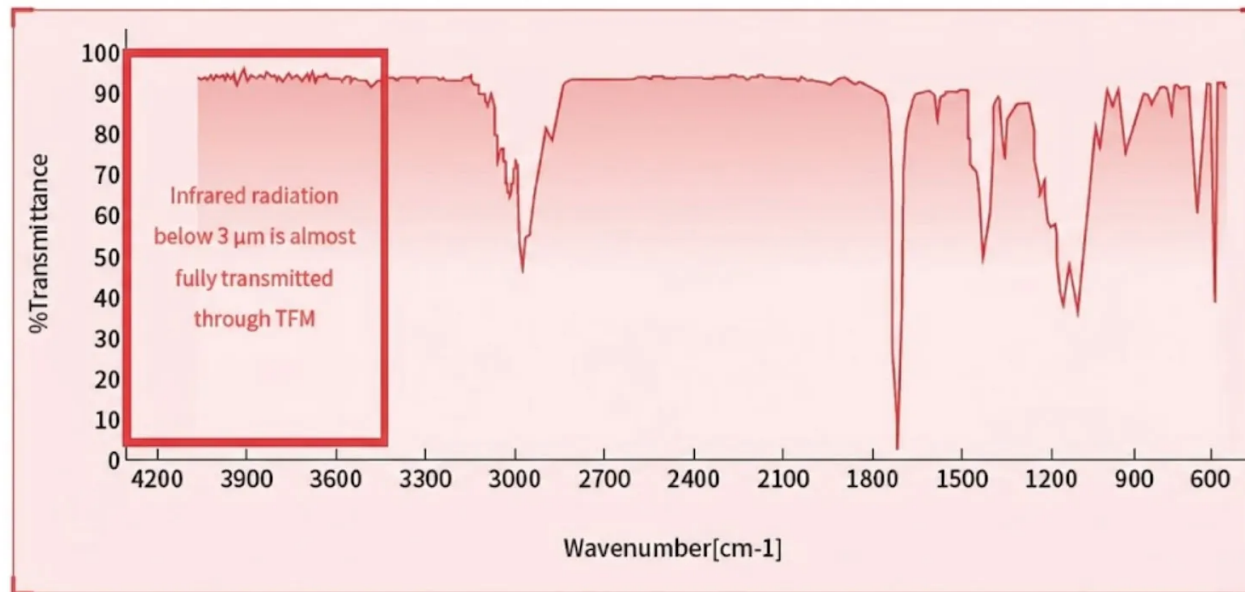
Plastics and polymer-based products are commonly tested for additives, fillers, and trace contaminants. Microwave digestion supports consistent breakdown of these materials so labs can quantify target elements for compliance, supplier qualification, or failure analysis.

Cosmetics and Consumer Products

Cosmetics can contain pigments and mineral-based components that require controlled digestion for trace metal screening. The system supports repeatable prep for safety and compliance-focused elemental analysis.

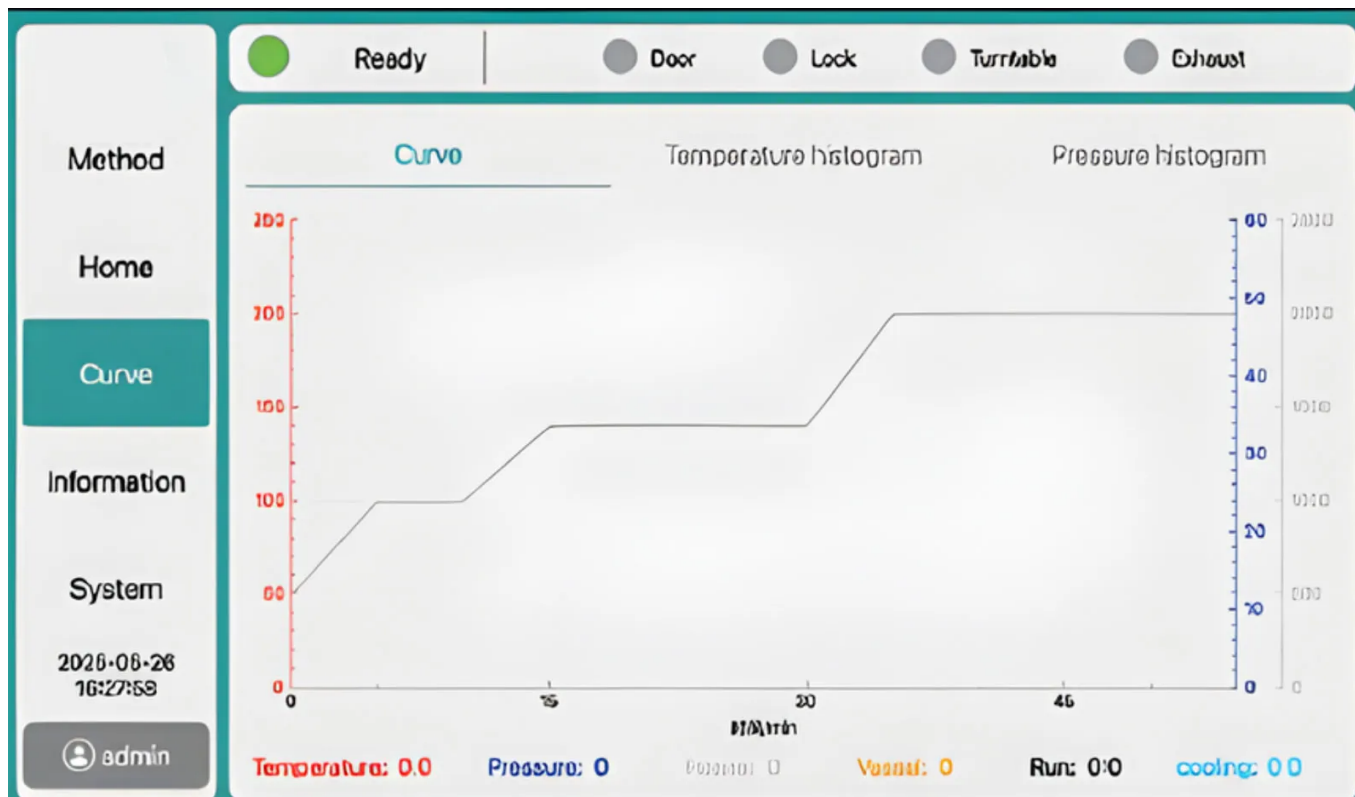
Chemicals, Ceramics, and Other Complex Matrices

For ceramics, compounds, and specialty chemicals, digestion enables elemental characterization and impurity testing. The system is useful where samples vary widely and labs need programmable methods to standardize prep across different material types.



Standards

- ISO 9001 – Quality management system standard; supports consistent manufacturing and process control.
- EPA 3051A – Microwave-assisted acid digestion for sediments, sludges, soils, and oils (commonly used for metals prep prior to ICP/AAS).
- EPA 3052 – Microwave-assisted acid digestion of siliceous and organically based matrices (more aggressive digestion for difficult samples).
- EN 13657 – European method for digestion of aqua regia-soluble fractions in environmental samples (often for metals in soils/waste).
- ISO 15587 – International guidance for digestion of water samples for elemental analysis (prepping for ICP/AAS-type techniques).



FEATURES

Intelligent Microwave Digestion System – ToronMD™-i3000 Key Features

High efficiency and workflow speed

- Focused microwave emission + high-power delivery to support rapid digestion cycles.
- Optimized operating parameters to support energy consumption management.
- Up to 42 samples per batch with compatible vessel options for higher throughput.

Smart, user-friendly operation

- Intuitive interface with customizable digestion methods.
- Smart detection automatically identifies rotor type and vessel count.
- Status light indicator for quick visual monitoring.

Precise monitoring and control

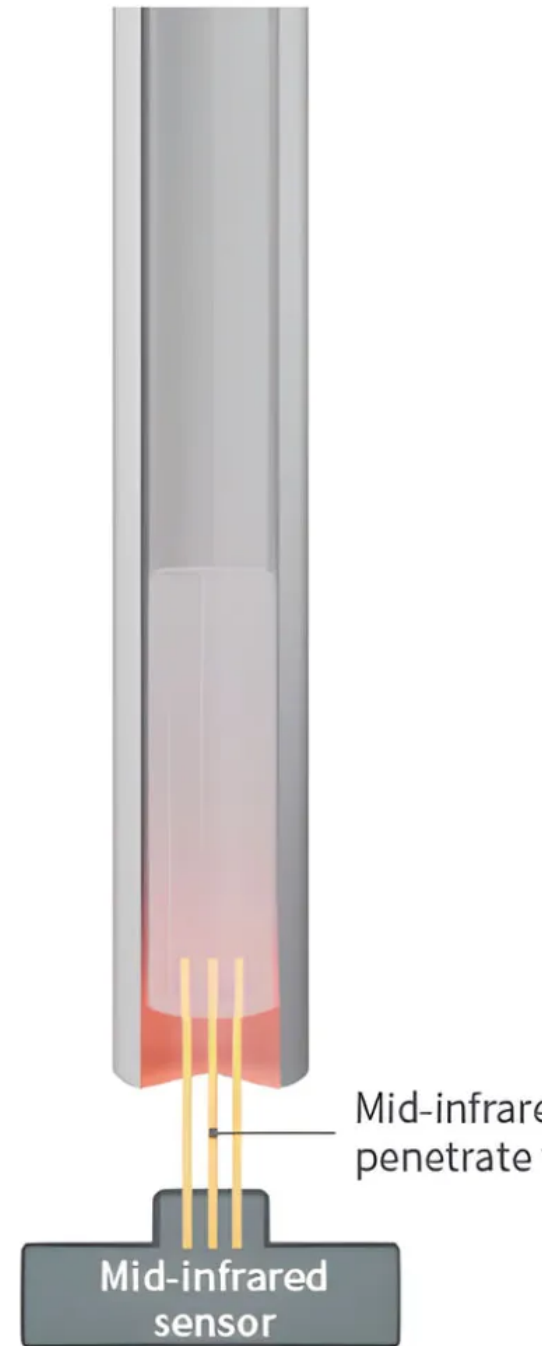
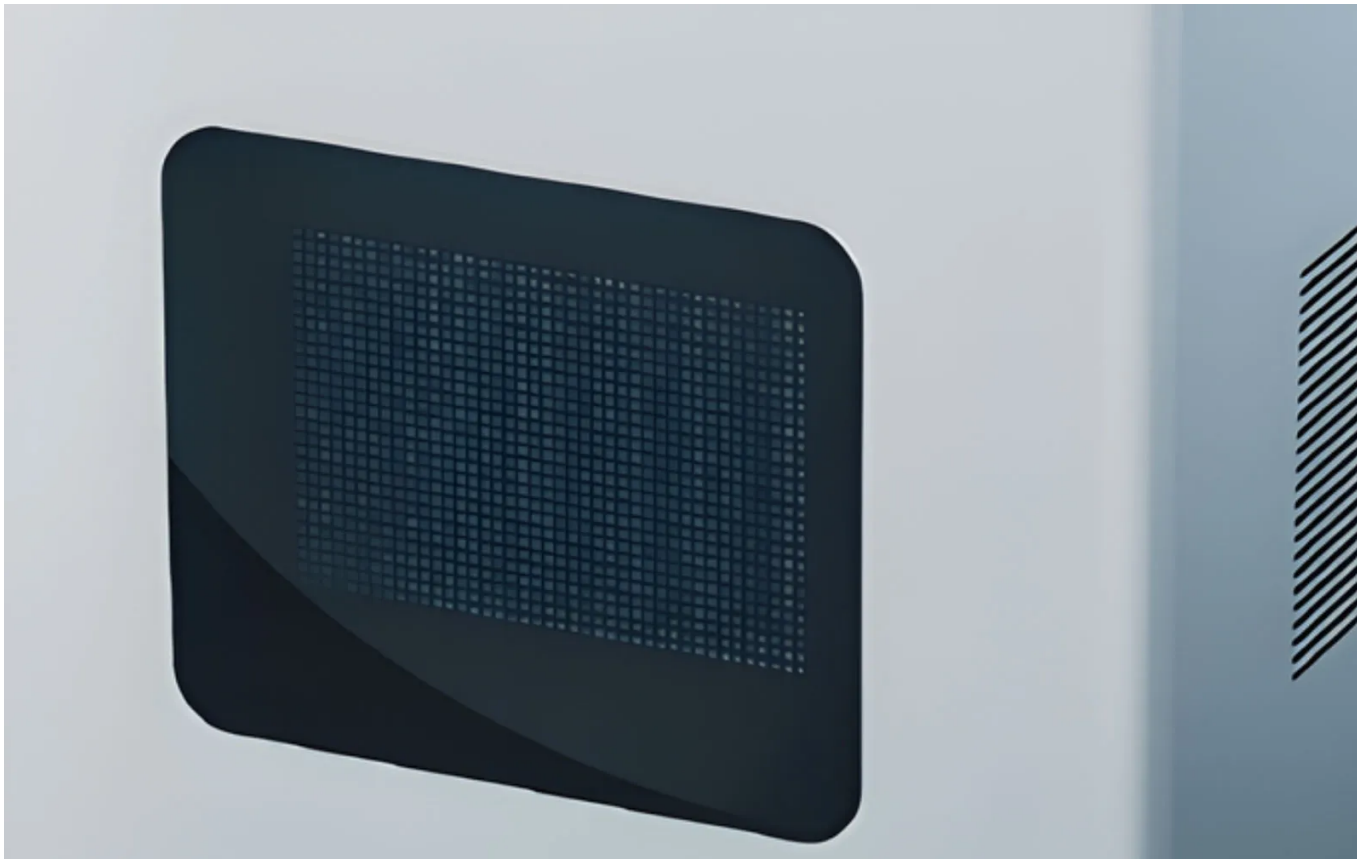
- Mid-infrared temperature monitoring scans and displays the actual temperature of all samples in real time, using mid-infrared penetration through TFM.
- Real-time pressure monitoring and display of sample pressure.
- Real-time display of temperature, power, and digestion progress.

Safety and reliability

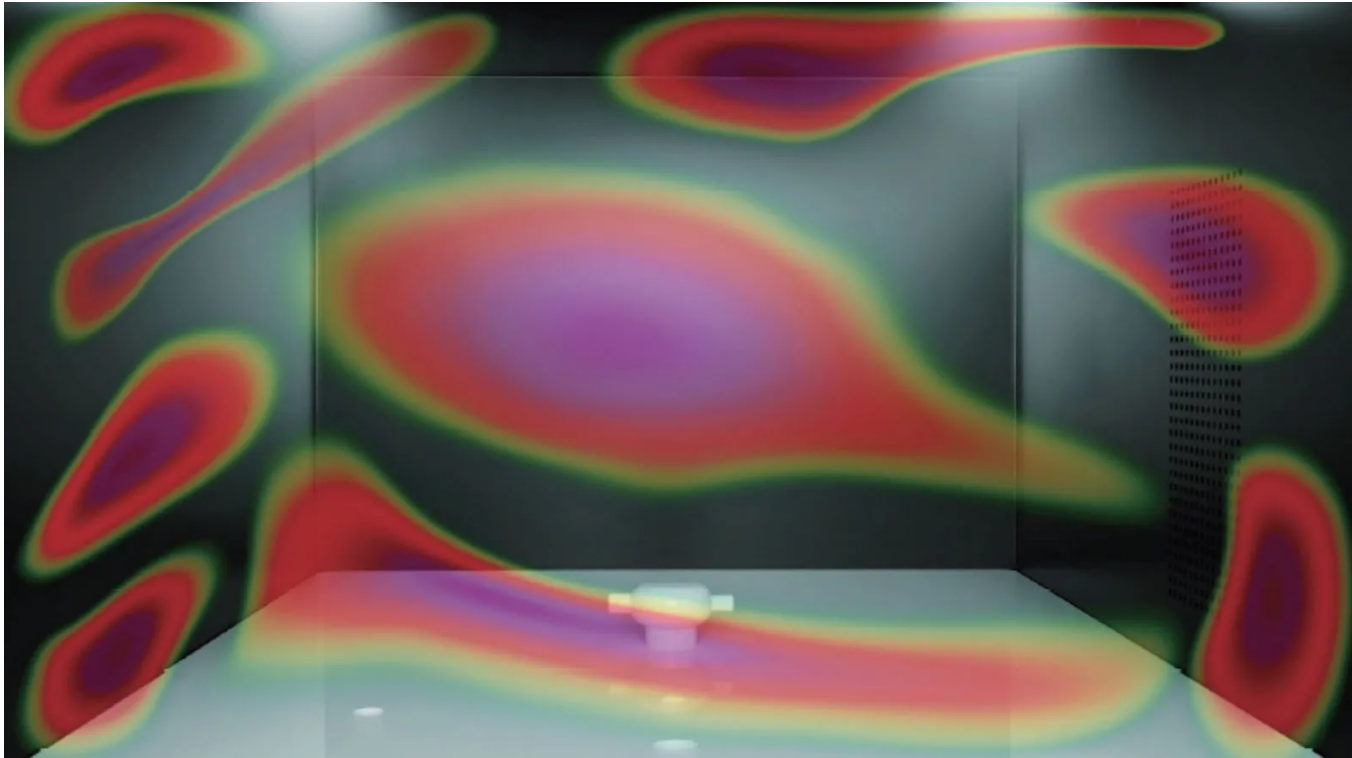
- Designed with multiple active and passive safety protections (brochure notes up to 10 functions).
- High-strength explosion-proof door with side-opening pressure release and buffering design.
- Corrosion-resistant ventilation design for airflow and cooling support.

Vessel and monitoring technologies

- High-throughput digestion vessel with automatic pressure-release structure; simple construction for easier assembly.
- High-pressure digestion vessel supports more complex samples, with optical, non-contact pressure measurement and real-time pressure display.

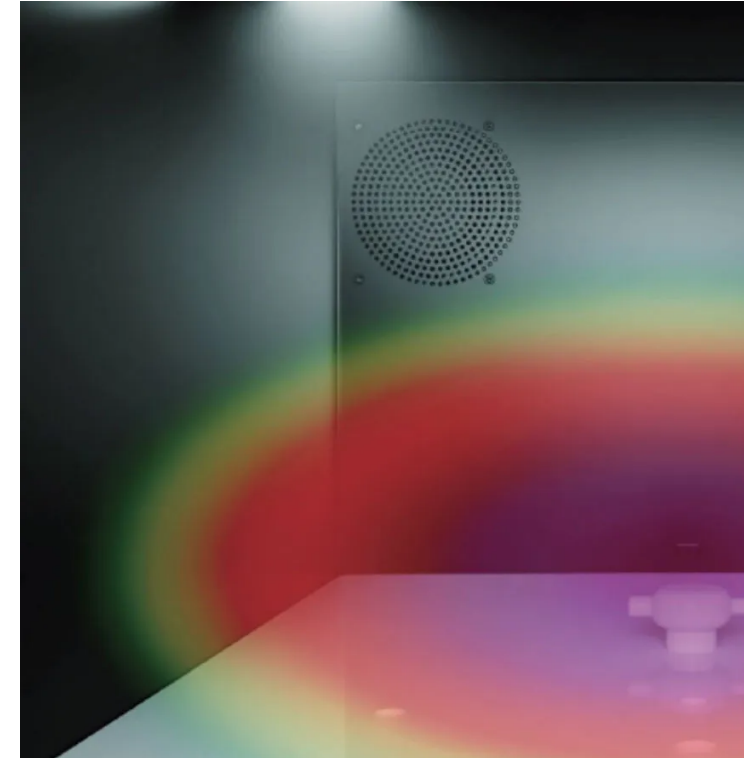


High Efficiency & Rapid Processing

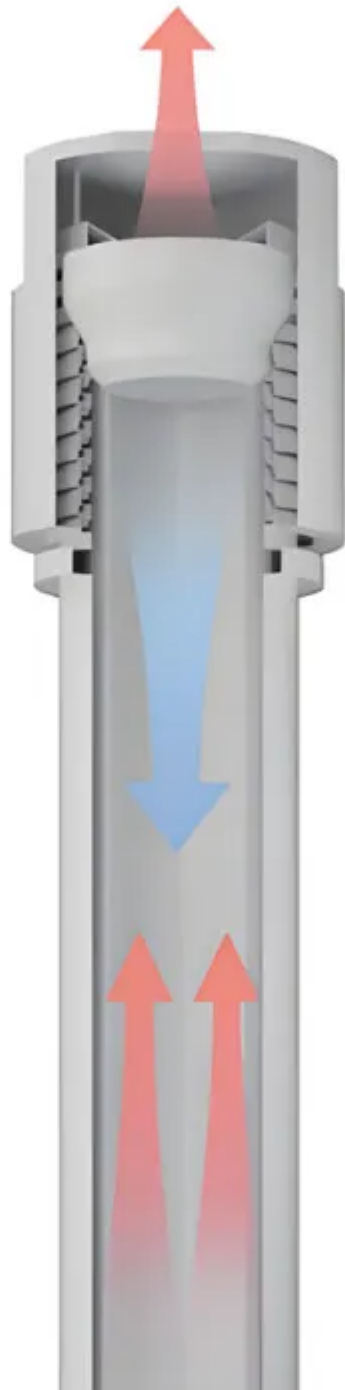


Schematic Diagram of Microwave Field Intensity Distribution of a Conventional Microwave Digestion System

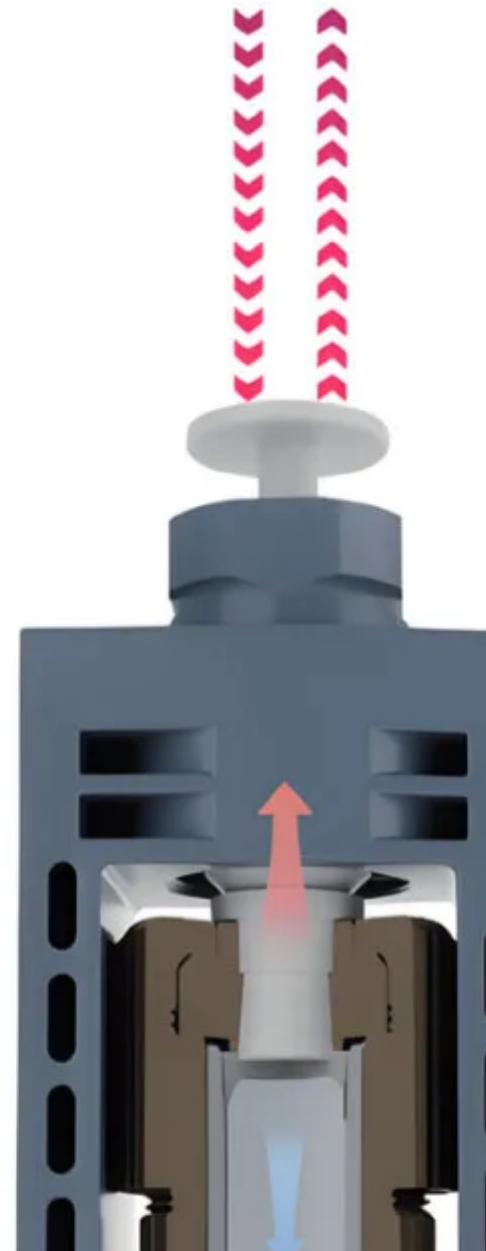
High-precision Real-time Temperature Feedback Technology



Schematic Diagram of Microwave Field Intensity Distribution



Top-mounted Optical S



High-throughput Digestion Vessel

High-pressure Digestion Vessel

TECHNICAL SPECIFICATIONS

Intelligent Microwave Digestion System - ToronMD™ -i3000 Technical Specifications

Parameter	
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Model



Number of
Digestion
Vessels

42

Circles

2



42

2

Volume	55 mL	75 mL
Digestion Vessel	High-throughput	High-throughput
Microwave Supply	2450 MHz, variable-frequency magnetron high-energy microwave field emission	
Microwave Cavity Material	316L stainless steel resonant cavity, multi-layer Teflon coated	
Microwave Cavity Volume	65L	
Door / Safety Design	High-strength safety explosion-proof door, side-opening with floating buffer design	
Temperature Measurement	Mid-infrared contactless sensor	
Control System	Full touchscreen operation with real-time display of parameters & status	
Ambient Operating Conditions	0–40°C / 15–80% RH	
Digestion Vessel Type	Independent high-pressure digestion vessel	
Batch Capacity (Rotor Options)	16 positions / 42 positions	
Inner Vessel Material	TFM	

Outer Vessel Material	PEEK or aerospace composite materials (optional)
Microwave Power	2400 W nominal
Input Power	3000 W
Safety Protection	Multi-level active + passive system
Cooling System	High-efficiency, corrosion-resistant exhaust
Voltage	AC 220 V $\pm$ 10 %, 50 / 60 Hz (110V is also available)
Dimensions (approx.)	600 × 650 × 755 mm
Weight	70 kg



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