

# MARS 6 SYNTHESIS

MICROWAVE REACTION SYSTEM  
SYNTHESIS MADE SIMPLE



**CEM**

## Features

### 1800 WATTS DELIVERED ENERGY

Highest available power for rapid heating of reactions regardless of the number of vessels in the cavity

### LARGEST MICROWAVE CAVITY

Allows for the greatest range of reaction vessels

- Up to 36 pressurized vessels
- Up to a 5 L open flask

### RUGGED, HIGH-GRADE 316 SOLID-STEEL CAVITY

Multi-layer Teflon® coating provides maximum protection against corrosion

### HEAVY-DUTY, SPRING-MOUNTED, PRESSURE RELIEVING DOOR WITH SAFETY INTERLOCKS

### SOLVENT- AND IMPACT-RESISTANT COMPOSITE SHELL

Superior system protection from a laboratory environment than painted metal wraps

### SPECIALLY DESIGNED CAVITY & WAVEGUIDES

Ensures uniform distribution of microwave energy without need of a mode stirrer

### HIGH-RESOLUTION, FULL COLOR TOUCHSCREEN WITH SPEAKERS

No need for a laptop or external controller

### INTUITIVE SOFTWARE CONTROL

Quickly program new methods, load existing methods, and recall run data

### FIBER OPTIC AND IR TEMPERATURE CONTROL AVAILABLE

### SAFETY CONTROLS

Sensor and feedback monitoring to prevent vessel events for maximum operator safety

### 8 GIGABYTE MEMORY

Ample data storage space

### CONNECTIVITY

Available ports: 5 USB, 1 USB-B, 2 Ethernet, and 1 RS-232

### ONBOARD TRAINING VIDEOS

Learn how to properly assemble vessels and operate a MARS 6



### Direct Fiber Optic Temperature Measurement of the Reference Vessel

The fiber optic temperature probe is the gold standard in temperature measurement. Unlike metal thermocouples, which can self-heat in the microwave and give imprecise readings, CEM's fiber optic temperature probe provides accurate measurement every time. An optional NIST-traceable fiber optic temperature probe is also available.

Vessel Options for the MARS 6 Synthesis System

Vessel Type	Max. number of vessels per run	Volume	Max. Temp. (°C)	Material of Construction
Open flask	1	Up to 5 L	Reflux	Glass
GlassChem™	24 or 36	20 mL	180	Glass
GreenChem™	14	100 mL	200	Teflon or Glass
EasyPrep™	12	100 mL	300	Teflon

Visit our website at [www.cem.com/mars6-synthesis-vessels](http://www.cem.com/mars6-synthesis-vessels) to learn more.

## SOFTWARE CONTROL & FLEXIBILITY

The MARS 6 can be controlled using the onboard touchscreen interface.



### Simple Method Programming

MARS 6 allows you to run one of the preloaded methods or quickly develop a program that contains your unique method parameters.

### Easily Manage System Settings

The Tools and Settings menus can be easily accessed from anywhere in the software. Set up Administrator and User login privileges, check and calibrate the temperature sensor and customize your MARS 6 by selecting from seven language settings.

### Data Management

Data management is easy with the MARS 6. Import or export methods, instrument settings, and data using any of the 6 USB ports or print results and reports by connecting to an external printer.

### Graphical Output

The large, high-resolution, full color touchscreen provides a convenient, built-in interface. Easily monitor an active run from the graphical output of the touchscreen. Navigate between screens to view temperature and microwave power, or view the relative temperature of all vessels with the temperature viewer.

### Onboard Help and Training Videos

Have a question about your MARS 6 or vessel assembly? Watch detailed training videos right on the touchscreen of the MARS 6.

### Atmospheric Pressure Vessel Kit

Each kit includes a 3 L and a 5 L vessel, extenders, adapters (specific to each vessel) and a vessel stand. The adapters' side port allows for placement of the temperature probe in the reaction vessel to control the reaction conditions.

### GlassChem Vessels

The **GlassChem™** vessels are engineered with a simple screw cap design for ease of use while still providing the temperature and pressure capabilities necessary to perform the full range of experiments in the CEM lab manuals.

Reinforced composite sleeves surround individual vessels, protecting the cavity and user for maximum safety. A Teflon® turntable shield ensures vessels are properly seated and secured.

This simple to use vessel permits reaction conditions of up to 180 °C and 200 psi. It is designed for undergraduate teaching as well as research. These vessels are available in starter kits of 8, 16, 24, or 36 vessels. Each kit includes a control vessel to provide precise control of reaction conditions. Teflon vessel sets are available for nanomaterial, zeolite, and other inorganic syntheses.

### Enhanced stirring for homogenous sample mixing.





## SPECIFICATIONS

<b>Overall Instrument Dimensions</b>	63.5 cm (25 in.) height x 53.3 cm (21 in.) width X 63.5 cm (25 in.) depth
<b>Weight</b>	63.6 kg (140 lbs.)
<b>Touchscreen</b>	7" (800 x 480) TFT-LED glass capacitive touchscreen display
<b>Ports</b>	5 USB, 1 USB-B, 2 Ethernet, 1 RS-232
<b>Languages</b>	Software available in English, German, French, Italian, Spanish, Chinese, and Japanese.
<b>Turntable Design</b>	PerfectCircle™ design provides absolute radial symmetry. Turntable operates in alternating or continuous mode.
<b>Microwave Cavity</b>	Heavy-duty 316 solid steel cavity with multi-layer Teflon® coating
<b>Electrical Requirements</b>	200/208/230 VAC (200-253 VAC), 60 Hz, 15A @ 230 VAC 220/240 VAC (202-250 VAC), 50 Hz, 15A @ 240 VAC
<b>Magnetron Frequency</b>	2455 MHz
<b>Power Output</b>	1800 W – Continuous power available at all power levels to provide more control for reactions.
<b>Magnetron Protection</b>	Solid-state isolator (US patent 4,835,354) to protect magnetron from reflected energy, ensuring constant power output.
<b>Speakers</b>	8 Ω, 2 W, 86 dB
<b>Printer</b>	Onboard thermal printer and USB-B compatible printer port
<b>Safety Features</b>	Three independent door safety interlocks, including an interlock monitoring system plus three independent thermal switches, are used in each instrument to prevent instrument operation and microwave emissions in case of improper door closure or misalignment. The instrument complies with HHS standards under 21 CFR, Part 1030.10, Subparts (C)(1), (C)(2) and (C)(3). Reactiguard continuously monitors the cavity and disables the magnetron if disturbances occur inside the cavity.
<b>Emissions and Safety Approvals</b>	Conforms to Globally Harmonized EN61010-1 Standard for Safety Requirements for Electric Equipment for Measurement, Control, and Laboratory Use Part 1: General Requirements (CAN/CSA-C22.2 No. 1010.1-1992).
<b>Patents</b>	CEM microwave systems and vessel designs may be covered by any one of the following US patents: 5,443,795 5,620,659 6,281,484 6,307,190 6,373,040 6,084,226 6,288,379 5,988,877 8,480,981 6,136,276 6,287,526 6,863,871 7,144,739 7,829,040 Other patents pending.

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## Service & Support

All CEM Systems are backed by our experienced applications support team and award-winning service department. CEM's factory-trained field technicians and in-house service team are well known in the industry for their prompt response and problem-solving capabilities.



CEM has been an ISO-certified facility since 1994.

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