REMmARKABLE EXTRACTION
SAMPLE THROUGHPUT

Microwave-assisted extraction decreases extraction times, reduces solvent consumption, improves extraction efficiency, and increases the productivity of your laboratory. The MARS™ is a cost-efficient extraction alternative providing excellent recoveries and reproducibility.

Fast
Reduce extraction time to less than 15 minutes for a batch of 40 samples. Microwave energy quickly heats solvents to elevated temperatures, reducing sample preparation by as much as 50 fold compared to Soxhlet.

Cost-effective
Perform over 500 microwave-assisted extractions with the same amount of solvent used for 32 Soxhlet extractions. A dramatic cost savings is realized from the reduced quantity of solvent.

High Throughput
Extract 40 samples per run to increase productivity.

Efficient
Sample stirring decreases extraction time and solvent consumption while improving analyte recoveries.

Automated
Simply load your samples, push a button, and completed samples are just minutes away.

Safe
A built-in solvent detector turns off microwave energy in the presence of flammable organic solvent and the safety back-up system turns off microwave energy if the exhaust system is not functioning properly.

Why is Microwave Assisted Solvent Extraction So Fast?
- Increased analyte capacity of high temperature solvent
- Accelerated desorption and dissolution kinetics:
  - For every 10 degree increase in temperature there is a two-fold increase in kinetics:

<table>
<thead>
<tr>
<th>Extraction Time (min)</th>
<th>Extraction Temperature (°C)</th>
</tr>
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<tbody>
<tr>
<td>30</td>
<td>0</td>
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<tr>
<td>20</td>
<td>20</td>
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<tr>
<td>10</td>
<td>40</td>
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<td>0</td>
<td>60</td>
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MARSXpress™
Our easiest-to use pressure vessels will help you get your samples run quickly! Process up to 40 samples simultaneously in vessels designed for temperatures up to 260 °C (Teflon® PFA) or 300 °C (TFM®) and self-regulating pressure control. MARSXpress vessels work in conjunction with CEM’s patented All-vessel Temperature Control™. No external pressure or temperature controls needed! Teflon® PFA liners available in 10-, 25-, 55- and 75-mL sizes. Some liners are also available in TFM®.

GreenChem™
Perform up to 14 reactions simultaneously at temperatures up to 200 °C or pressures up to 200 psi. These 100-mL vessels are available with Teflon® PFA, TFM® or glass liners.

SynergyPrep™
SynergyPrep software for the MARS and MARSXpress Systems provides documentable control of your reactions from your computer with unmatched ease.

Pollution Prevention
“The EPA has established a preferred hierarchy of environmental management techniques that places pollution prevention as the management option of first choice...Extraction of organic compounds using microwave extraction conforms with EPA’s pollution prevention goal. The volumes of solvent employed are smaller than with other extraction procedures.”
Excerpt from USEPA Method 3546

Filtration Solutions
Designed to directly fit a wide range of containers including TurboVap®, the LABXpress positive pressure filtration accessory is the perfect companion to optimize your high-throughput extractions.

1. Simply add your sample to the vessel and secure the cap.
2. Place the vessel in the turntable and place in the system.
3. Choose the pre-loaded method and push start.
4. Filter your sample.
**TYPICAL METHODOLOGY**

- **Total extraction time:** 20 minutes per batch
- **Samples per batch:** up to 40 samples can be run simultaneously
- **Extraction temperature:** 100 – 115 °C (110 °C recommended)
- **Sample size:** Normally 1-20 g

Environment Canada holds the patents for the Microwave Assisted Process (MAP™) and CEM is the exclusive licensed manufacturer of the technology.

**MARSxpress MEETS THE REQUIREMENTS FOR USEPA METHODS 3546, 3015, 3051, 3052 & NPDES.**

**SPECIFICATIONS - MARSxpress SYSTEM**

ISO 9001:2000 certifies that the CEM quality management system meets internationally accepted standards.

- **Emissions and Safety Approvals**
  - U.S. and Canada Emission & Safety: Complies with FCC part 18 (47 CFR part 18 Industrial, Scientific, and Medical Equipment) US ETL** approved to UL standard 3101 (Laboratory Equipment) Canada ETL** approved to standard CAN/CSA C22.2 No. 1010.1 (Laboratory Equipment)

- **European Community Emissions & Safety**
  - Conforms to EC standard EN 50111 (Emissions for Industrial, Scientific, and Medical Equipment) Conforms to EC standard EN0082-2 (Electromagnetic Compatibility – Part 1) Conforms to EC standard IEC 1010-1 (Safety requirements for electrical equipment for measurement, control and laboratory use – Part 1)

- **Overall Instrument Dimensions:**
  - 25” D x 20” W x 21” H (63.5 x 50.8 x 58.4 cm)

- **Weight:** 120 lbs. (without vessels)

- **Printer Port:** 25-pin, Epson and IBM-compatible

- **Sensors**
  1. IR Temperature control (recommended)
  2. Thermo-Optic Temperature Control System (optional)

- **Microwave Cavity:**
  - Heavy-duty, multi-layer fluoropolymer coating

- **Electrical Requirements**
  - 208/230 VAC (200-253 VAC), 60Hz, 15A @ 230 VAC
  - 220/240 VAC (202-250 VAC), 50Hz, 15A @ 240 VAC
  - Detachable power cord, IEC and UL approved. Variance in line voltage can affect microwave power output.

- **Power Output:** 1600 watts

- **Magnetron Protection:** Solid-state isolator (US patent 4,835,354) to protect magnetron from reflected energy, ensuring continuous, constant power output.

- **Patents:** CEM microwave systems and vessel designs may be covered by any one of the following US patents: 04835354, 04080168, 05369034, 04672996, RE034373, 05230865, 04672996, 05230865, 04672996, 05247741, Other patents pending.

*ETL, and UL are equivalent NRTLs (Nationally recognized Testing Laboratories)*

**REDUCES SOLVENT USAGE BY 90%!**

PERFORM 80 EXTRACTIONS AND FILTRATIONS IN LESS THAN 4 HOURS!

Semi-volatile organic compounds
Organophosphorus pesticides
Chlorinated herbicides
Phenoxyacid herbicides
Substituted phenols
PCBs
PCDDs/PCDFs
Total Petroleum Hydrocarbons
Oil/Lipid content of grains & cereals