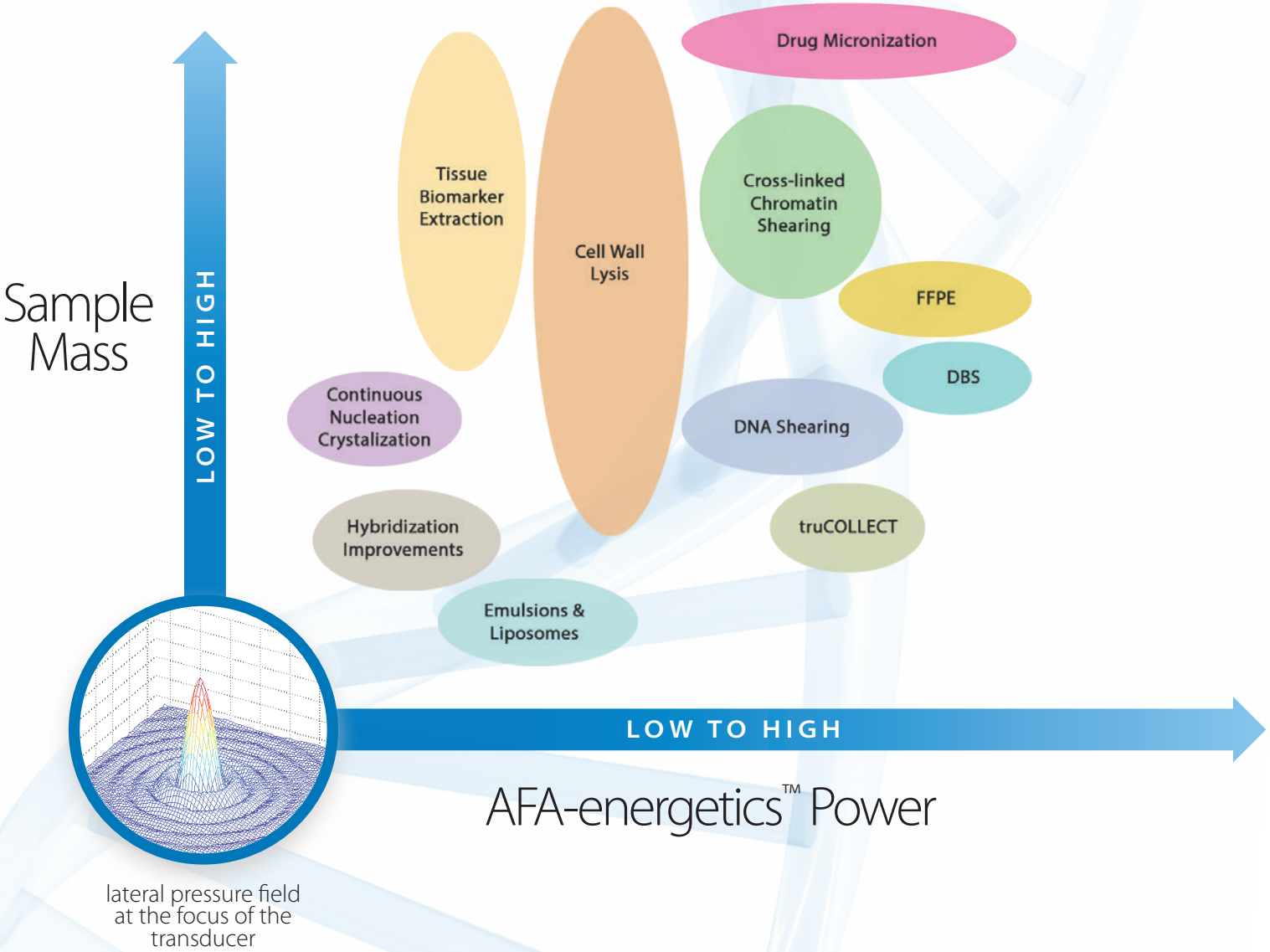
M-Series
Focused-ultrasonicators

PRECISE | ACCURATE | ROBUST



lateral pressure field at the focus of the transducer

Covaris®
the pre-diagnostic advantage

M-Series Focused-ultrasonicators

Fully-integrated benchtop sample preparation systems

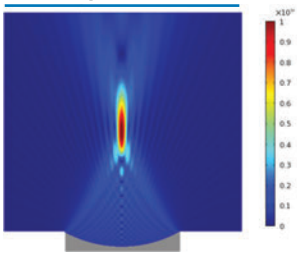
…based on Adaptive Focused Acoustics® (AFA™) technology

Highly efficient and controllable, AFA enables standardization of pre-diagnostic sample preparation applications by improving sample recovery, increasing processing reproducibility, and eliminating operator-induced variability.

COMSOL-Modeled Pressure and Thermal Fields

Pressure Profile

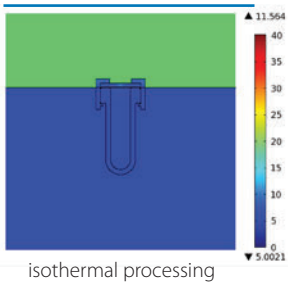
Power required 0.8 Watt



to create cavitation 2 MPa

Thermal Profile

Covaris microTUBE at 2 MPa



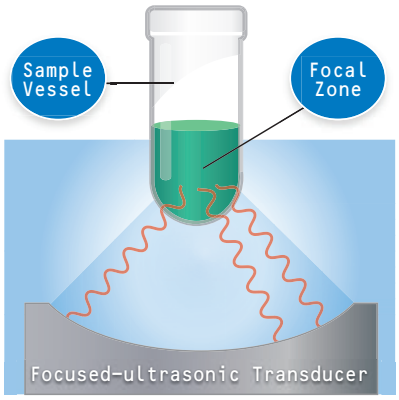
isothermal processing

Optimized Pre-diagnostic Applications

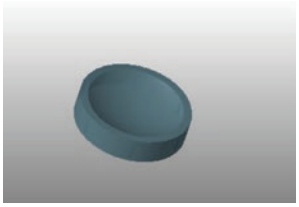
- **Mechanical Shearing for Next-Generation Sequencing (NGS)**
  Enable Precision Medicine with Clinical-grade Nucleic Acid Preparation
- **DNA/RNA Extraction from Formalin-Fixed, Paraffin-Embedded (FFPE) Tissue Samples**
  NGS-grade DNA and RNA from FFPE Tissue
- **DNA Extraction from Dried Blood Spots (DBS)**
  Extract NGS-grade DNA from Standard Card Punches
- **Extract DNA for NGS from Whole Blood**
  Collect, Dry-stabilize, Transport, and Extract with truCOLLECT
- **Chromatin Mechanical Shearing for ChIP-Seq**
  Improve Reproducibility, Increase Sensitivity, Obtain Unbiased Results
- **Biomarker Extraction for Research and Clinical Microbiology**
  Extract, Sequence, Identify, and Characterize

AFA-energetics™ Technology

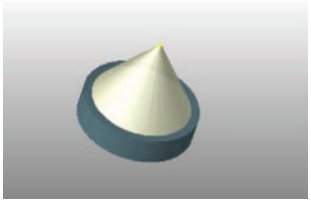
Adaptive Focused Acoustics™ (AFA) technology was developed exclusively by Covaris and is used in all of our Focused-ultrasonicators. Our patented approach combines the integration of proprietary high-performance control electronics, medical-grade transducers, and custom-engineered acoustical cuvettes. Together, these components reproducibly convert focused high-frequency acoustic energy into mechanical force, delivered within a tightly-defined region within the sample tube. This process, defined as AFA-energetics™, uses controlled bursts of high-power acoustic energy to process samples in a temperature-controlled, non-contact, and closed vessel environment. Uniquely, all AFA Focused-ultrasonicators are calibrated to NIST traceable standards, ensuring highest quality and standardized results.



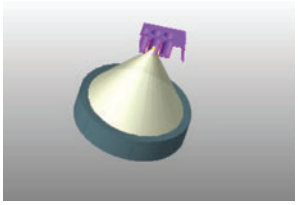
Focused Acoustics Powered by AFA

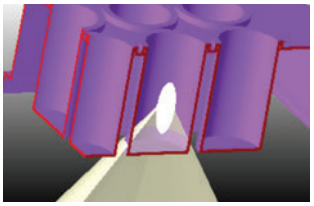


AFA Transducer



Focused Acoustic Field





Acoustic Energy Applied to the Sample

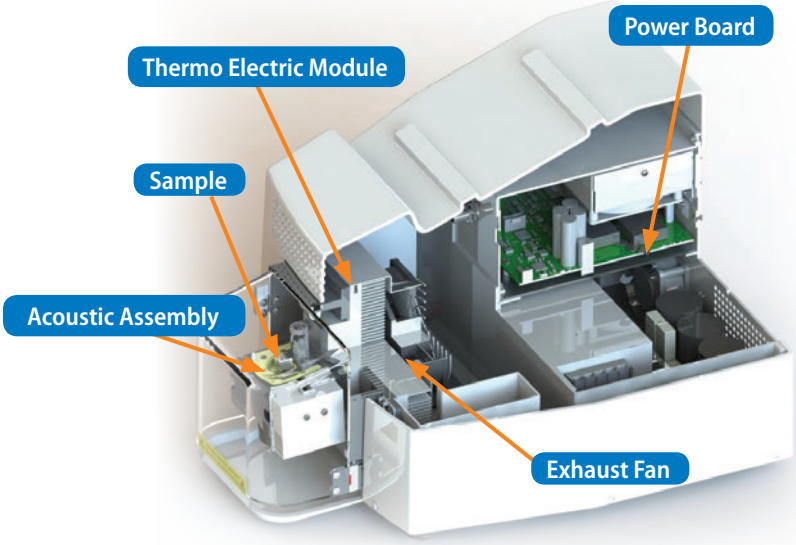
M220 Focused-ultrasonicator™

...single sample processing at the benchtop

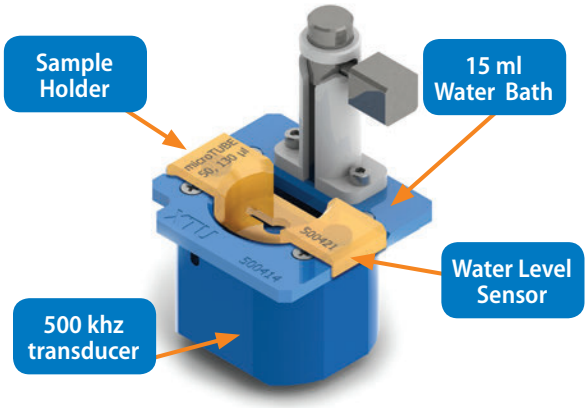
- The "Scientist's Standard" in a compact, easy-to-use system
- Precise and accurate results with AFA-energetics™
- Proven gold standard used in genome centers worldwide
- Less than one minute start-up time
- Integrated chiller
- Optimized pre-loaded mechanical DNA shearing protocols for fragment sizes of 150 to 5,000 bp

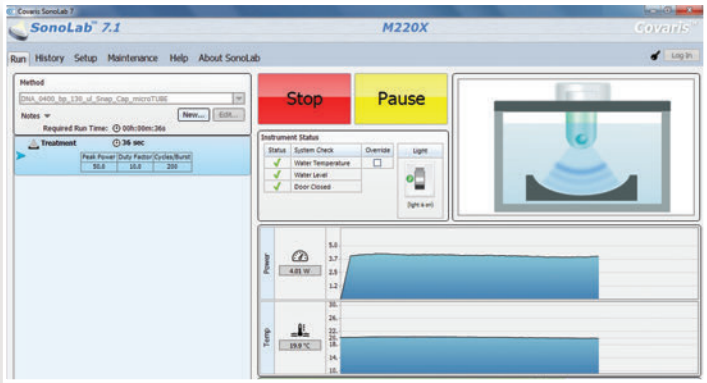
AFA technology in the M220 eliminates operator-induced variations, improves recoveries, increases efficiency, and provides standardized results.

Single Box Design



Focused-ultrasonicator Assembly





- **Real-time monitoring and integrated Quality Control with SonoLab software**
- **Integrated engineered design**
- **Custom Class D, high-efficiency electronics**
- **Calibrated to NIST traceable standards**

ME220 Focused-ultrasonicator™

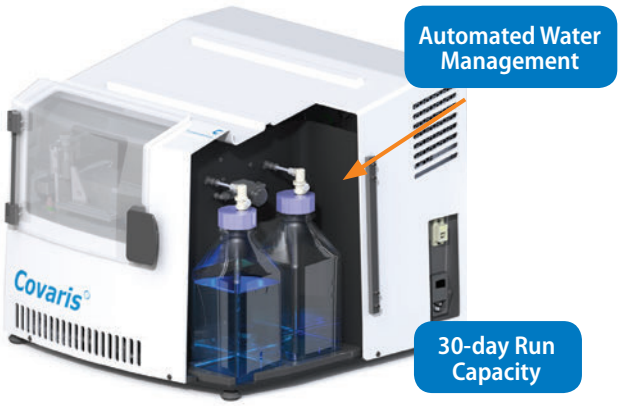
...1 to 8 sample batch processing at the benchtop

- The "Scientist's Standard" in a compact, easy-to-use system, formatted for batch-processing
- Precise and accurate results with AFA-energetics
- Integrated chiller and automated water management
- Powerful SonoLab software with preloaded protocols
- Less than 2 minute start-up time

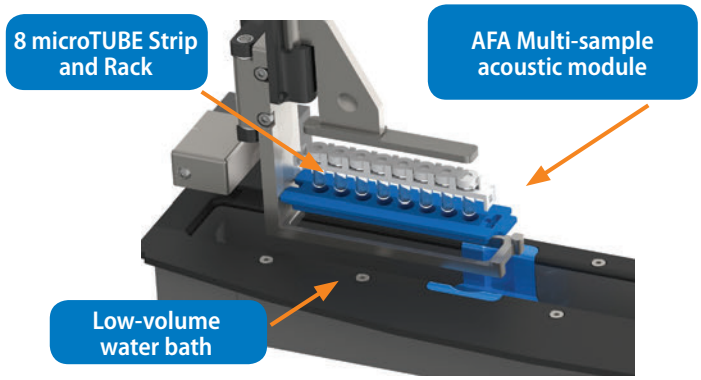
The automated water management system provides a 30-day run capacity, making it virtually maintenance-free.

The ME220 Focused-ultrasonicator is the multi-sample, multi-application benchtop sample preparation solution for every lab.

Single Box Design



Focused-ultrasonicator Assembly



- **Real-time monitoring and integrated Quality Control with SonoLab software**
- **Integrated engineered design**
- **Custom Class D, high-efficiency electronics**
- **Calibrated to NIST traceable standards**

Key Features	Benefits
Isothermal process	**No heat-induced bias, high sample recovery**
Small, compact footprint	**Fits on any benchtop**
Non-contact, closed vessel	**No cross-contamination, aerosols, or clean-up**
Flexible sample processing volume	**15 µl to 1 ml**
Highly reproducible results	**Minimal post-process QC required**
Automatable	**Sample vessels compatible with liquid handling robots**
Sample tracking with 2D barcoded consumables	**Traceable sample identification**
Operates at 500 kHz (Ultrasonic Range)	**Beyond audible range. - no discomfort to operators**
Calibrated to NIST traceable standards	**Optimized protocols available and transferable**

Model	M220	ME220
Description	Focused-ultrasonicator - single-sample process Included: dedicated notebook computer, SonoLab™ software, and integrated chiller	Focused-ultrasonicator – 1 to 8 sample batch process Included: dedicated notebook computer, SonoLab software, integrated chiller, and automated water bath control
Part Number	PN 500295	PN 500506
Treatment Power	2.5 to 75 Watts Peak Incident Power 0.1 to 20 Watts Average Incident Power	
Dimensions	12"W x 17" D x 10" H (30 cm x 43 cm x 25 cm)	17"W x 14" D x 19"H (43 cm x 35 cm x 48 cm)
Weight	Approximately 22 lbs. (10 Kg)	Approximately 40 lbs (19.1kg)
Power Requirements	100-240 VAC 500 VA, 50-60Hz	
Operating Environment	15 to 32° C	
Regulatory Labeling	CE, ETL Mark (for Product Safety), WEEE	
Safety	Complies with Low Voltage Directive 2006/95/EC. Certified to IEC/EN/ANSI/UL 61010-1:2010 and CAN/CSA C22.2 No. 61010-1, "Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory Use, Part 1: General Requirements"	
Water Bath	Requires 15 ml of AFA-grade Water	Automated waterbath management, AFA-grade Water
Bath Temperature Set Point	Programmable +6.0° C to +40.0° C	
EMC	Complies with Class A Industrial/Scientific/Medical (ISM) equipment under EN 61326-1 for EU EMC Directive 2014/30/EU. Also FCC Part 15 Class A radio emissions requirements for the USA and ICES-003 Class A for Industry Canada.	
Operating System	Includes: Notebook computer interface via USB with Microsoft Windows and Covaris SonoLab™ Operating Software installed.	
Data Input	Keyboard, Touchpad	
Chiller	Integrated solid state chiller for heating and cooling (built-in) 0 - 48 Watts	

		Number of samples	
		M220	ME220
microTUBE™ • 15 to 500 µl sample volume range • DNA shearing <1.5 kb fragments • Up to 3x10^6 cells chromatin shearing • truXTRAC™ FFPE and DBS		1	1 to 4
8 microTUBE Strip • 15 to 130 µl sample volume range • DNA shearing <1.5 kb fragments • Up to 3x10^6 cells chromatin shearing • truXTRAC FFPE and DBS		NA	8
miniTUBE™ • 200 µl sample volume • DNA shearing to 2, 3, or 5 kb		1	1 to 4
milliTUBE™ • 1 ml volume • Up to 3x10^7 cells chromatin shearing • Tissue biomarker extraction		1	1 to 4
t-PREP™ • Up to 10 mg tissue samples • Tissue biomarker extraction		1	1 to 4

Covaris®

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