R230 Focused-ultrasonicator

Revolutionize a Liquid Handler with an On-deck AFA-Revolution

The AFA-Revolution is a new class of Covaris Focused-ultrasonicator that can now be fully integrated on-deck in a liquid handler. The unique high-throughput sample processing capabilities of AFA-energetics® with AFA-TUBE™ plates, revolutionizes sample prep using precise tuneable energy in two modes: a conventional AFA indexing mode and a new proprietary AFA scanning mode. Scanning mode enables rapid sample batch treatment in Covaris-qualified 96, 384, and 1536 plate formats. Powered by the Gold Standard Adaptive Focused Acoustics® (AFA®) technology, the R230 was designed to integrate onto many liquid handling platforms including Dynamic Devices, Hamilton, Tecan, PerkinElmer, Beckman Coulter, and Agilent.

Significant time, money, and resources are invested into developing innovative automation workflows to increase throughput and improve analysis. Use the Covaris R230 AFA-Revolution to create new "best practices" performance standards for liquid handlers.

Feature	Benefit
Powered by AFA-energetics	Controlled, non-contact processing
Direct on-deck integration	Compatible with most liquid handlers
Isothermal energy delivery	Maintains optimal sample integrity
Automation compatible with integrated RFID	Sample tracking and reduced human error
Automated water management	User-defined scheduling for system set-up maximizes laboratory efficiency
Eliminates columns and centrifugation	Higher recovery, lower cost, and faster turn-around-time (TAT)

Supported Applications:

- DNA shearing
- Mammalian cell lysis
- Low mass sample extraction: FFPE, tissue, and whole blood
- Compound screening
- Hit validation
- Target ID & validation
- Bead mixing/pellet resuspension

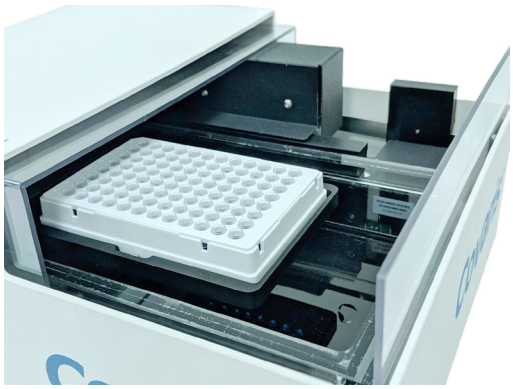

Figure 1. 96 AFA-TUBE TPX Plate (Covaris-qualified consumable) on R230 with safety cover partially closed.

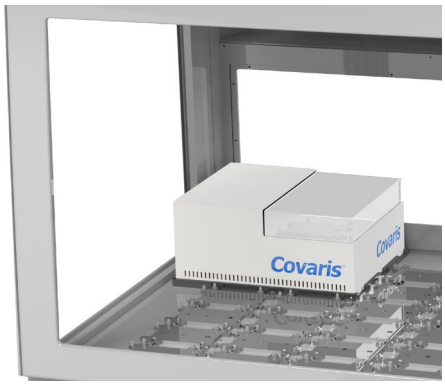

Figure 2. On-deck R230 Focused-ultrasonicator with safety cover completely closed positioned on a liquid handling platform.

Figure 3. Off-deck WCS 3.0 and EB 1.0 (The integrated water conditioning system includes a chiller, UV lamp, and particle filter and the electronics module is integrated to the WCS 3.0).

Because of the Covaris advantages, the total application costs are lower and results superior to other methods.

Marchal, Claire, et al. "Genome-Wide Analysis of Replication Timing by Next Generation Sequencing with E/L Repli-Seq." Nature Protocols, vol. 13, no. 5, 2018, pp. 819–839., DOI: https://www.nature.com/articles/nprot.2017.148" 10.1038/nprot.2017.148.

Comparison of Mechanical vs. Enzymatic DNA Fragmentation

	R230	Enzymatic Optimization	
BP Size	Time (per 96 well plate)	Average Time	Optimization Range
500	6 min	7 min	3 to 10 min
350	6 min	12 min	5 to 20 min
250	8 min	20 min	10 to 25 min

Table 1. Treatment time comparison of DNA shearing in the 96 and 384 AFA-TUBE TPX Plate (10 µL) to varying fragment sizes using AFA versus enzymes. When using the R230, there is no optimization time required and fragmentation time is not dependent on sample input concentration nor inhibitors, making processing on the R230 faster than enzyme optimization and fragmentation. In scanning mode, processing time for 96 and 384 is equivalent.

Narrow Size Distribution of DNA Fragments from gDNA

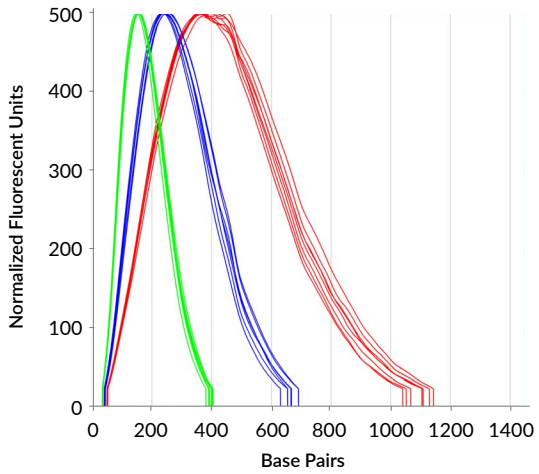

Figure 4. Electropherogram showing narrow size distribution obtained from 50 µl of gDNA on the R230 in logarithmic scale for 96 samples. Green: 150 bp (300 sec), blue 250 bp (90 sec), and red 350 bp (40 sec).

Non-contact SPRI* Bead Mixing

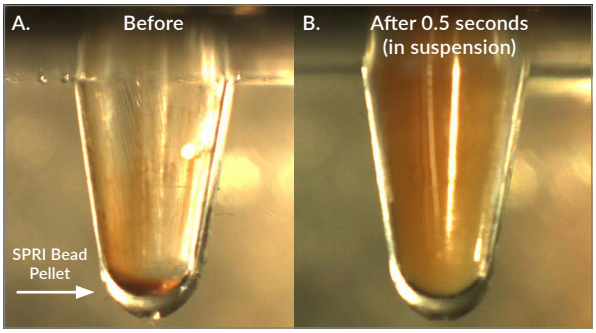

Figure 5. SPRI Bead mixing with AFA-TUBE: A - Before AFA treatment. B - After 0.5 seconds of AFA treatment. In scanning mode, processing time less than 1 minute for 96 samples.

Specifications	
Part Number	500620
Treatment Power	2.5 to 450 Watts peak incident power, 0.1 to 135 Watts average incident power
Dimensions (on-deck)	36 cm (width), 29 cm (depth), and 15 cm (height)
Dimensions (off-deck, includes WCS 3.0 and EB 1.0)	37 cm (width), 40 cm (depth), and 37 cm (height) • EB 1.0 adds 13 cm to the height
Power Requirements	100 to 240 VAC 500VA, 50 to 60 Hz
Operating Environment	Ambient temperature: 19 to 25 °C (66 to 77 °F) Relative humidity: 30 to 70%
Operating Temperature	10 to 30 °C
Regulatory Labeling	CE, ETL Mark (for Product Safety), WEEE
Operating System	Includes: Notebook computer interface via Ethernet with Microsoft Windows and Covaris SonoLab™ 10 Operating, Software installed
Chiller	WCS 3.0 included (The integrated water conditioning system includes a chiller, UV lamp, and particle filter)
Sample Processing Capacity	Sample Processing Capacity 8 tubes at a time simultaneous processing; 96 tube capacity
Sample Volumes (dependent on protocol)	• DNA shearing up to 50 µL • NGS up to 200 µL • High Molecular Weight DNA Extraction/Cell Lysis up to 50 µL
Recommended Batch Size	96 to 1536 samples
Covaris-qualified Consumables	• 96 AFA-TUBE TPX Plate (with RFID) • 384 AFA-TUBE TPX Plate (with RFID) • 1536 AFA-TUBE TPX Plate (with RFID)
Integration with Lab Automation	Yes: Sonolab 10 API

Ordering Information

Part #	Product Name	Description
500620	R230 Focused-ultrasonicator	• On-deck R230 Focused-ultrasonicator module (O.D. 1.0) • SonoLab 10 Software • WCS 3.0 module • Electronics module (E.B. 1.0 (The electronics module is integrated to the WCS 3.0))

*SPRI is the registered trademark of Beckman Coulter

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