

High-Performance
Compound Dissolution,
Solubilization, and
Re-dissolution

Covaris C-series

high-throughput

in **chemical**, biomolecular,
and cell-based
screening, results
should come from a solvated
compound

... not a solvent



**control compound dissolution processes
... with Adaptive Focused Acoustic energy**

The active control of both primary dissolution and secondary re-dissolution of compounds for High-throughput screening has not been technically achievable ... until now. The first of the C-series instruments (C-2000) is designed for high-throughput fluidization, homogenization, mixing, solvation, and dissolution.

The instruments are powered by the Covaris **Adaptive Focused Acoustic (AFA)** technology. AFA, a proprietary computer controlled, focused energy process based on shock wave physics, delivers a precise and accurate acoustic energy packet to a fluidic sample for unsurpassed mixing control.

The benefits of AFA-enabled processes are perfectly suited to the high-throughput and high performance demands of Compound Management.

- Non-contact, isothermal processing
- Rapid transfer of non-ionizing energy
- Reduce false negatives with uniform solvation

Covaris

tools for analytical sciences

Covaris C-series

high-throughput and high-performance

are screening assay false negatives
from a solvent solution or a solute suspension ?

Adaptive Focused Acoustics (AFA)

developed by Covaris produces a controlled acoustic field inside a sealed vessel without touching the sample. The patented process is based on computer-controlled, focused acoustic energy technology. Previously, acoustic energy use in compound dissolution applications has been through low frequency probes. The known drawbacks with these systems are due to low frequency, long wavelength, unfocused, and uncontrolled energy output. Consequently, samples do not receive identical energy during the treatment and often overheat. More importantly, to obtain effective dissolution it is necessary for probe-type systems to physically contact the solution, which complicates automation.

AFA harnesses acoustic power without any of these drawbacks. Due to the focal nature of the high frequency acoustic transducer, the acoustic energy wavepackets are channelled into the sample through the vessel allowing a non-contact, isothermal controlled mixing.

The **Covaris C-series** instruments are designed specifically for the rigorous, demanding, and advanced needs of high-throughput environments.

Several benefits include:

- **non-contact** - samples can remain closed. No decapping necessary;
- **isothermal** - AFA delivers controllable energy ensuring isothermal mixing without degradation;
- **highly efficient** - poorly soluble compounds are quickly dissolved - within seconds;

Application areas include:

Primary Dissolution – The first step in the compound management process is to dissolve a solid in a volume of solvent. Compounds range in solubility from poorly to highly soluble. The AFA process has been tested extensively against a range of compounds including glues, gums, glasses, and powders. Results to date have shown the AFA process to be highly efficient and far superior to conventional techniques; and much quicker.

Compound Re-dissolution – Target compounds undergoing repeated freeze-thaw cycles are susceptible to precipitation. Until now it was very difficult to re-dissolve these solutes. The AFA process is ideally suited to the re-dissolution of these compounds quickly and efficiently.

Solvent Thawing – The majority of compound stores worldwide utilise DMSO as the primary solvent. As DMSO has a freezing point of 18 degrees C, thawing samples is a particular bottleneck requiring whole plates to be thawed to gain access to a small number of samples. The AFA process is unique in that it enables users to thaw a single well of a plate. A number of benefits are derived from this:

- **integrity** - compounds can be protected from multiple freeze-thaw cycles;
- **solubility** - reduced freeze-thaw cycles, reduces the precipitation risk;
- **speed** - a single well can be thawed in as little as 10 seconds.

The C-series may be configured for multiple, high-throughput applications which require fluidization, homogenization, mixing, dissolution, solvation, solubilization, and reaction control.

Model C-2000 designed for a high - throughput mixing, thawing, and homogenization environment:

- 384 standard 4ml vials (4 racks of 96 vials)
- 1,536 2D bar-coded tubes (16 racks of 96 tube multiwell plates)
- microplate blocks of both 96 and 384 wells
- other configurations available

Options include:

The modular system can be configured to specific needs. Some options include:

- acoustic, sample interrogation module (e.g., volume and suspension determination)
- three-axis robot for pick and place operations with vials, tubes, and plates;
- three-axis robot for AFA transducer movement;
- tube and vial drying station to remove residual water from the processed sample;
- temporary seal station for open tube or open plate mixing.

Specifications

Hardware The benchtop unit is available in 1.4m and 0.8m length bed sizes with 60cm depth and 60cm height. The unit requires a recirculating chiller.

Software The user-friendly, flexible software runs on Windows® XP. Plate scheduling tasks are enabled as well as individually addressable treatment conditions derived from a user generated work-list

Contact us for further specifications or application enquiries

see the benefits
Adaptive Focused Acoustic
energy has for your process

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