



Anton Paar

Monowave 300

Microwave Synthesis
for Research & Development

::: Excellence in Microwave Synthesis



Synthesis to the Power of 3

Monowave 300 provides a completely new and sophisticated approach towards microwave synthesis, turning previously unachievable reliability and performance into three-dimensional fact.

Extended operation limits up to 300 °C and 30 bar (435 psi) open up unforeseen opportunities for method development and optimization.

Due to its high field density, the instrument provides rapid heating – even in 30 mL vessels and for low absorbing solvents. A state-of-the-art, ruby-based fiber optic sensor ensures immediate feedback, approaching the peak of precision in temperature measurement.



A new dimension of microwave synthesis

From microwave generation and sensor technology to stirring efficiency – every issue has been thoroughly developed and designed for this new generation of microwave synthesis instrumentation.

Monowave 300 provides an advantageous internal temperature sensing system. Knowledge of the real reaction temperature in combination with the built-up pressure allows optimum control of chemical transformations.

The integrated hydraulic pressure sensor additionally monitors the reaction progress, allowing reactions up to 30 bar (435 psi) for experiments far beyond common limitations.

A high-performance magnetic stirring device provides excellent agitation at any time, enhancing the quality of chemical transformations.

Just imagine

Apply reagents and solvents under conditions you could never achieve before. Develop methods with exceptional limits to investigate the influence of enhanced temperature and pressure on reactivity and reaction progress.

Process the first microwave reactions with effective stirring and standardized internal temperature measurement. Paper doesn't blush, but seeing is believing ...

Take home your advantage

- ▶ Rapid and uniform heating
- ▶ Simplified internal temperature measurement
- ▶ Utmost accuracy and reproducibility
- ▶ New dimensions of method development
- ▶ Powerful stirring for beneficial agitation
- ▶ Extended scope of microwave synthesis
- ▶ User-friendly intuitive software
- ▶ Built-in touchscreen controller



New Dimensions in Chemistry

Reliable mate

Monowave 300 - your trustworthy workhorse in Student Education, Drug Discovery, Life Science, Nanotechnology and many, many more.

The basic instrument opens up pathways to new reaction routes for a broad variety of applications. Reliability, scalability and reproducibility are proven in great detail.

Any chemistry, any scale, anyone, anywhere!

R&D at its best!

- ▶ Extended scope for method development
- ▶ Maximum pressure and maximum temperature conditions
- ▶ Sequential optimization of protocols
- ▶ Knowledge of the REAL reaction conditions
- ▶ Comprehensive data acquisition and storage
- ▶ Recall beneficial methods at any time

Want more?

- ▶ Scalability of optimized protocols guaranteed
- ▶ Perform first-grade scale up with 30 mL vials
- ▶ Multigram amounts of products in one shot

Scale up!

Methods developed with Monowave 300 can be easily transferred to Anton Paar's large scale microwave reaction system Synthos 3000.

With its parallel rotors utilizing 100 mL vessels reactions can be extended to the molar range. Direct scalability of your optimized methods from Monowave 300 leads to as much as 250 g of product in a single run with Synthos 3000.

Valued partner for numerous applications

Pharmaceutical Research:

- ▶ Method Development & Optimization
- ▶ Building Block Synthesis
- ▶ Scaffold Decoration

Organic Chemistry:

- ▶ Heterocycle Synthesis
- ▶ Metal Catalysis
- ▶ Bond-forming Reactions
- ▶ Condensations
- ▶ Cycloadditions
- ▶ Solid Phase Synthesis

Biomedical Science:

- ▶ Derivatizations
- ▶ Peptide Synthesis

Material Science:

- ▶ Preparation of Nanoparticles
- ▶ Zeolite Synthesis
- ▶ Polymer Synthesis

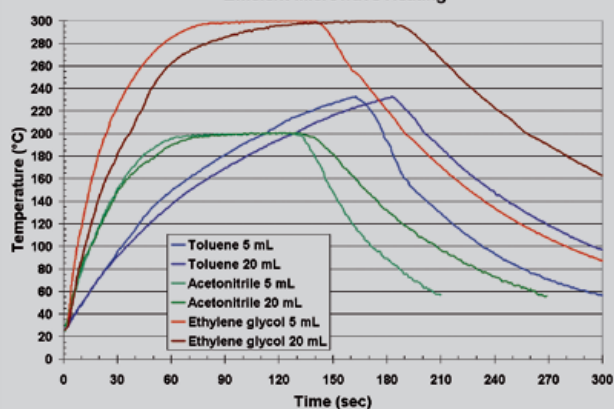
Prepared to React

Easy-handling ruby thermometer

- ▶ Reliable immersing temperature sensor for beneficial combination of internal temperature measurement and pressure sensing
- ▶ Measuring the decay time of the luminescence of a ruby crystal
- ▶ Does not interfere with the electromagnetic field and ensures accuracy across the whole range
- ▶ Calibration-free Plug and Play system, all-time GMP compliant



Efficient Microwave Heating



Unrivalled field density & heating rates

- ▶ Highest available field density allows rapid heating even of low absorbing solvents
- ▶ Efficient and rapid heating of large sample volumes
- ▶ Scalability from 2 to 20 mL – protocol remains unchanged, regardless of the applied volume

Individual reaction vials

- ▶ Borosilicate glass vials with easy-handling snap caps
- ▶ Sealed with PTFE-coated silicon septum
- ▶ Available as 10 mL standard vials and 30 mL large vials for first-grade scale up
- ▶ Optionally equipped with a special seal with immersion tube for use of the ruby thermometer



Standard vial 10 mL

Large vial 30 mL

Vial material

Borosilicate glass

Borosilicate glass

Reaction volume

2.0 - 6.0 mL

6.0 - 20.0 mL

Max. temperature

300 °C

300 °C

Max. pressure

30 bar (435 psi)

30 bar (435 psi)

Features and Technical Specifications



Unrivalled features

- ▶ Extended reaction conditions up to 300 °C and 30 bar (435 psi)
- ▶ 850 W installed microwave power
- ▶ Highest microwave field density
- ▶ Outstanding heating rates (3-9 °C/sec)
- ▶ Efficient magnetic stirring device
- ▶ Self-tuning cavity for effective heating of any solvent in any applicable volume

Attend to reaction parameters

- ▶ Integrated hydraulic pressure sensing device enabling enhanced operation range
- ▶ Built-in Infrared sensor for standard temperature measurement
- ▶ Optional immersing ruby thermometer - sophisticated technology for precise control of reaction temperature
- ▶ Simultaneous internal and external temperature measurement



Touchscreen control

- ▶ Intuitive software with logical touchscreen navigation
- ▶ Bright and big icons for simplified operation
- ▶ Varied authorization levels for different users
- ▶ Establishing simple flash heating procedures as well as enhanced multi-step protocols
- ▶ Priority function for important samples

Comprehensive data management

- ▶ Colorful reaction graphs with all relevant parameters
- ▶ Zoom-in function for detailed plot
- ▶ Methods library for up to 1000 experiments
- ▶ Data export via USB storage device
- ▶ In-situ printing of reaction reports in pdf format





Fotos: Croce & Wir



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Instruments for:

Density & concentration
measurement

Rheometry & viscometry

Sample preparation

Microwave synthesis

Colloid science

X-ray structure analysis

Refractometry

Polarimetry

High-precision temperature
measurement

Specifications
subject to change
without notice.

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