MiniBlock® and MiniBlock® XT
Configured to Suit Your Needs

MiniBlock®	Set Quantity	Package Quantity
MiniBlock® Synthesizer	2	6
Shaking and Washing Station	1 Compact	1 High Capacity
Heat Transfer Block	2	2
Vacuum Collection Base	1	2
Tall Tube Extender	2	4
Recirculator Manifold	1 (2-position)	1 (6-position)
Counterweight for Shaking Station	1	4
Air Push Assist Device	1	1
Inerting/Purging Manifold	-	2
Transfer Adapter	-	2
Resin Dispenser	-	1
Consumables Kit	Small	Large

MiniBlock XT™	Set Quantity	Package Quantity
Inerting/Purging Manifold	1	2
Reactor Frame	1	2
Removable Vessel Rack	1	4
Refluxing Layer	1	2
Vessel Rack Removal Tool	1	2
Sealing Gaskets	5	10
Inner/Piercing Septa	5	10
Top Plate	1	2
Multi-layer Septa, Pre-scored for Top Plate	5	10
IKA Hot Plate Stirrer (115V/60Hz or 230V/50Hz	1	1
Stir Bars	*	*
Reaction Vessels	*	*

*Applicable Reaction Vessels and Stir Bars Included

www.mt.com/MBFamily

For more information

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Email: autochem@mt.com

Subject to Technical Changes **7-1-001**

Synthesis and Screening

MiniBlock®

Flexible

Efficient

Compatible

Maximize Productivity

with Parallel Synthesis

METTLER TOLEDO

Synthetic Chemists
Your Choice for Synthesis

- **Solution Phase Synthesis**
- **Solid Phase Synthesis**
- **Peptide Synthesis**
- **Parallel Purification**

MiniBlock®
The MiniBlock® is a flexible, easy-to-use tool that maximizes productivity for synthetic chemists. MiniBlock® is the only compact parallel synthesizer that enables synthesis via solid or solution phase as well as purification to be carried out on the same platform.

Today more chemists choose MiniBlock® to increase productivity than any other similar tool.

Originally designed by chemists at Bristol-Myers Squibb Company, the MiniBlock® has been further developed by METTLER TOLEDO to address a wide range of chemistry methodologies.

www.mt.com/MiniBlock

Since using MiniBlocks®, our labs report a **400% increase** in new drug candidates and a 40% reduction in development time.

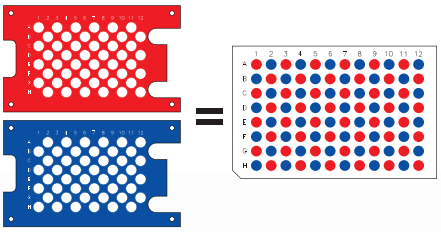
MiniBlock® is so widely accepted by our medicinal chemists that 70% of all current programs now use high–throughput chemistry.

Dr. Harold Weller, Research Fellow
Bristol-Myers Squibb

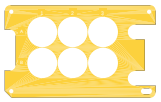
Inert Conditions
Continuous inert gas flow enables air/moisture sensitive reactions. Easily add reagents through the septum layer.

Agitation and Resin Washing
Customized two- and six-position shakers result in precision vortex mixing of reactions. Built-in washing capability enables rapid preparation of resins or efficient washing of products while reaction blocks remain on the shaker.

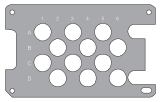
Heating and Cooling
Modular heat transfer jackets facilitate precision heating to 120°C and cooling down to -20°C. Temperature uniformity and reproducibility is within 1°C at 80°C.



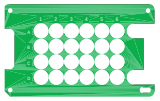
One Platform Flexibility
Red and blue MiniBlock® combine to produce 96 compounds



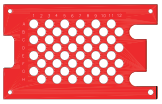
40mL
6 Vessels



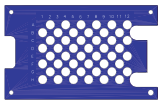
20mL
12 Vessels



10mL
24 Vessels



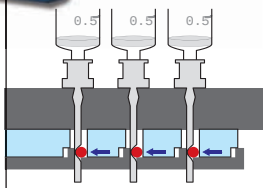
4mL
48 Vessels



4mL
48 Vessels

Configure MiniBlock® to Suit Your Needs
MiniBlock® can synthesize compounds in individual vessels ranging in size from as small as 4ml up to as large as 40ml - all delivered into racks with microplate footprints. This flexibility provides a smooth, seamless workflow from synthesis to screening.

With the Turn of a Key,
collect products from MiniBlock® cleanly and efficiently.



Unique Built-In Valve
Provides rapid bottom filtration - no need to invert or disassemble the reactor. Saves time and prevents cross contamination.

Ultimate Flexibility
One Platform – Four Volumes

- **Parallel Synthesis**
- **Reaction Screening**
- **Catalyst Screening**
- **Reflux and Inerting**

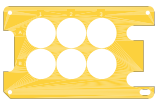
MiniBlock® XT
The MiniBlock® XT is an easy to use reaction block designed for synthesis and screening reactions. Applications include synthesis of small organic molecules, optimization of critical process parameters, and screening for optimal reaction conditions.

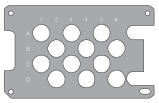
The MiniBlock® XT is widely used by chemists working in biopharma, chemical, petrochemical, and polymers. The MiniBlock® XT has a flexible and modular design that fits easily into your workflow, and is ideal for applications supported by statistical design of experiments (DoE).

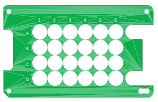
MiniBlock® XT enables reactions to be run under stringent conditions allowing complete freedom to choose a synthetic route. Also designed by the discovery and development team at Bristol-Myers Squibb, the MiniBlock® XT has been further developed and enhanced by METTLER TOLEDO to be compatible with the MiniBlock® product line.

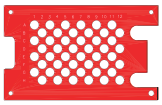
▸ **www.mt.com/XT**

Inert Conditions
Continuous inert gas flow enables air/moisture sensitive reactions. Easily add reagents through the septum layer.


55mL
6 Vessels


25mL
12 Vessels


10mL
24 Vessels

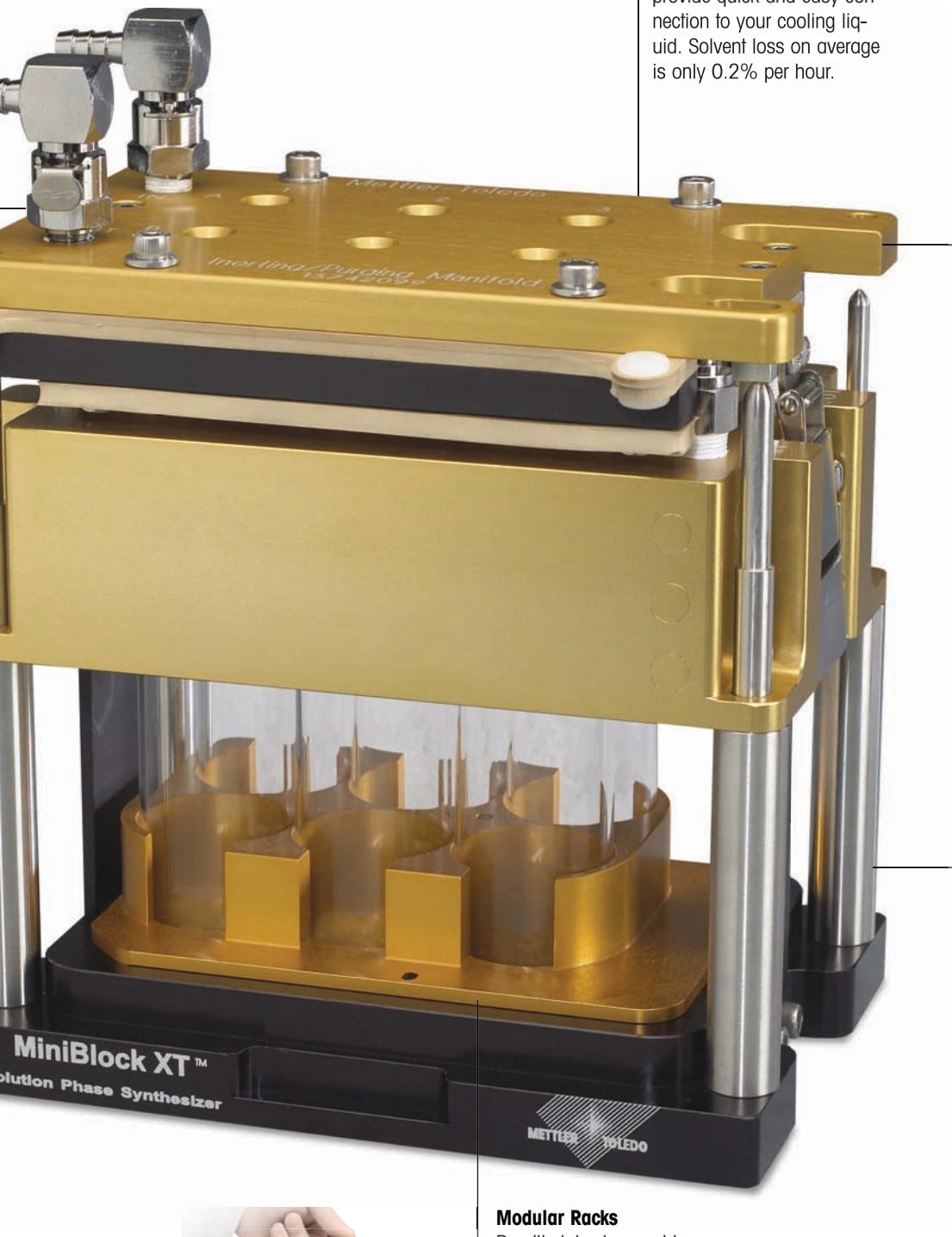

3mL
48 Vessels

Configure MiniBlock® XT to Suit Your Needs
Easily configure the MiniBlock® XT to the scale and number of experiments based on project requirements.

MiniBlock® performance has been outstanding even under the most stringent reaction conditions. Many of these require completely inert and anhydrous conditions at temperatures as low as -70°C.

Prof. Dieter Enders, Head of the Institute of Organic Chemistry, Aachen University of Technology (RWTH), Germany

Efficient Reflux
Single reflux jacket cools all vessels. No need for individual condensers. Fittings provide quick and easy connection to your cooling liquid. Solvent loss on average is only 0.2% per hour.



Precise Temperature Control
Controller displays temperature and regulates heating. Working temperature range: -70°C (with ice bath) to 160°C.

Easy Reaction Setup
A single septum seals all vessels with a single layer and allows easy access to reactions.

Modular Racks
Readily interchangeable reaction vessel racks enable simple conversion between 6, 12, 24, and 48 position arrays. The 24 and 48 position vessel racks are compatible with parallel centrifugal evaporators.

Chemistry Applications

Reactions

Acylation	Enolate formation	Metallation	Sulfonylation
Alkylation	Grignard reaction	Reduction	Stille reaction
Biaryl coupling	Heck reaction	Reductive amination	SnAr
Diels-Alder reaction	Heterocycle formation	Saponification	Suzuki coupling

Reagents

Acid chlorides	Borohydrides	Hydroxides	Mercaptans
Alkyl halides	Grignard reagents	Isocynates	nBuli
Amines	Tetrakis	LDA	TFA
Boranes	MS4	LiAlH4	DDQ

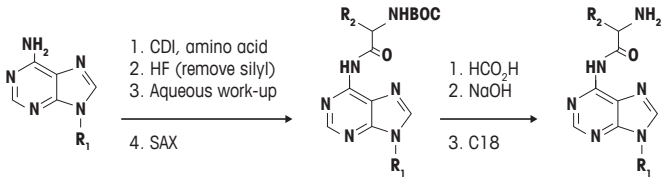
www.mt.com/MBFamily for more application information

Parallel Purification

MiniBlock® is ideal for post-synthesis cleanup using solid phase extraction (SPE), solid liquid extraction (SLE), and resin capture. This is achieved by transferring reaction products from the synthesis block to a second MiniBlock® containing pre-loaded cartridges, or by passing through an SPE filter plate.

SPE Purification Using Anion Exchange and C18

In the following example, Anion Exchange was used to remove by-products. The final product was then retained on C18. 48 parallel purifications were carried out in just 15 minutes. Other sorbents investigated include SCX, Diatomaceous Earth and Silica Gel.



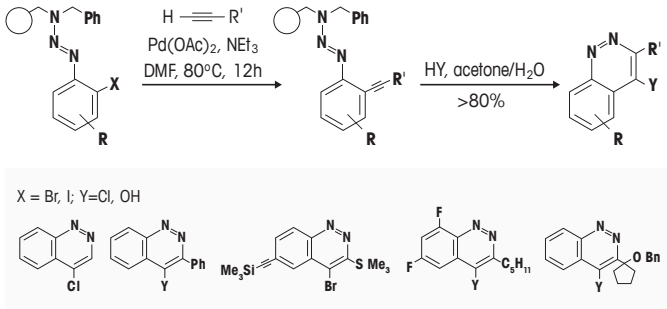
Source: M. Young, H.Weller, J. Roberge and W. Ruediger, ISLAR `98, Boston, MA, 18-21 Oct.1998.

Solid Phase Synthesis

The MiniBlock® has fritted reaction vessels and combined with its patented built-in valve make solid phase synthesis easy and elegant: tedious resin washing steps can be performed by simply opening/closing the valve in order to remove and add solvents. Vortex mixing ensures thorough agitation of resins.

Synthesis of Cinnoline Derivatives: The Richer-Cleavage

In this example, the reaction required precision heating at 80°C, followed by a cleavage step, which included additional diversity elements in the cleavage cocktail. The same authors reported a series of novel amidation reactions requiring completely inert conditions, resulting in >95% yields.



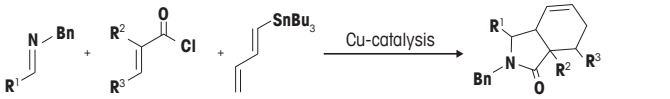
Source: S. Brase, S. Dahmen, J. Heuts, Tetrahedron Left. 1999, 40, 6201-6203.

Solution Phase Synthesis

MiniBlock® XT is extremely useful for complex, multi-step synthesis protocols in a variety of reaction conditions. Ideal for reactions run at reflux and under inert conditions, MiniBlock® XT uses a flexible reactor. The result - MiniBlock® XT handles multiple-step synthesis protocols that require a wide range of reaction scales and arrays.

Solution-Phase Parallel Synthesis of Hexahydro-1H-isoindolone Libraries

In this example, parallel solution phase synthesis of a series of libraries involving the synthesis of hexahydro-1H-isoindolones was performed exploiting a novel "tactical combination" of Cu-catalyzed three-component coupling and Diels–Alder reactions. Three distinct libraries consisting of 24, 60, and 32 members were constructed. Additional sub-libraries of isoindolone scaffolds were prepared in a one-pot/two-step process and further diversified via Pd-catalyzed Suzuki cross-coupling reactions with boronic acids at two different diversification points.

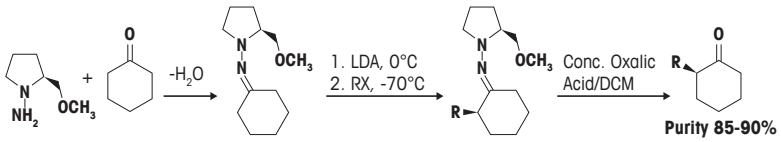


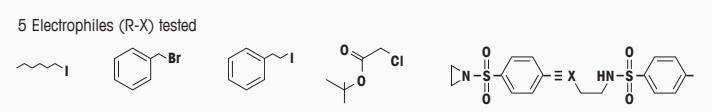
Libraries I-III (116 Compounds)

Source: Zhang, Lushington, Neuenswander, Hershberger, and Malinakova. J. Comb. Chem.,10 (2), 285-302, 2008. University of Kansas Department of Chemistry, Center for Chemical Methodologies and Library Development.

α-Alkylation of SAMP-Hydrazones

Reactions can be carried out in round bottom or fritted vessels in a variety sizes. Purification and cleanup are simple: fritted reaction vessels, combined with the unique built-in valve, allow reaction products to be passed through scavenging resins in seconds. The following SAMP reaction required strictly anhydrous conditions at -70° in the presence of corrosive reagents. The reactions were successfully carried out using MiniBlock® fitted with inert atmosphere manifolds. The investigators repeated this reaction sequence in solid phase using a novel SAMP resin, resulting in comparable yields.



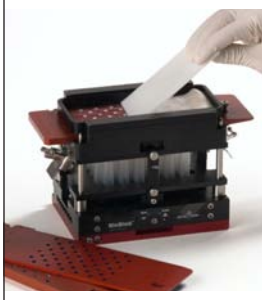


Source: Prof. D. Enders, J. Koebberling RWTH Aachen, Germany.

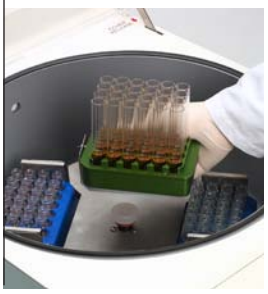
Expand Your Capabilities

MiniBlock® Accessories

Parallel Purification
MiniBlock® is ideal for post-synthesis cleanup using Solid Phase Extraction (SPE) and techniques involving scavenger resins. Applications include removal of excess reagents and reactants, scavenging of metals, and removal of catalysts.



Resin Dispensing
Resin loading is made simple with the MiniBlock® resin dispenser. Pre-determined amounts of resins and powders are delivered to all the desired reaction positions in seconds, saving time and reducing errors.



Parallel Evaporation
Microtiter plate design enables compatibility with commercially available parallel evaporation systems and eliminates the need for reformatting.

MiniBlock® XT Accessories

MiniBlock® XT Plus
Enables heating and cooling with common laboratory recirculators for chemists who desire more elaborate temperature control. Heating or cooling liquid circulates through the XT frame and conducts to the reaction vessel rack.

Low Temperature Bath
Efficiently cool MiniBlock® using a solvent/dry ice mixture. Insulated ice bath maintains dry ice/acetone mixture up to four hours.

Orbital Shaking
MiniBlock® shaking stations allow controlled agitation of reactions using vigorous vortex mixing. Built-in washing capability permits rapid addition and removal of solvents for resin washing steps. Heating and cooling is enabled via a recirculator manifold.