High-Performance Photochemistry Tools For Batch and Flow

Robust • Accurate • Flexible • Safe

Asynt

Batch Photochemistry

Lighthouse LED Photoreactor

www.asynt.com

The Asynt Lighthouse is a specialised photochemistry reactor designed to safely provide efficient, reproducible photochemical experiments whilst enabling simultaneous magnetic stirring and heating or cooling.

Lighthouse is an easy-to-use yet highly sophisticated photoreactor. Its unique quartz light pipe injects the photons directly into the heart of your reaction mixture with minimal loss.

Its simple yet sophisticated design allows you to make additions and take samples whilst under an inert atmosphere. Near-perfect solution temperature control is achieved from -30 °C* to +150 °C.

As with all of our photochemistry tools, there is a safety interlock to prevent the radiation of high intensity photons to the user. As standard, Lighthouse comes as a single position unit, however we also have an alternative base to mount three units at the same time on one hotplate stirrer. Easily interchangeable light units are available from 365 nm all the way to 940 nm.

*For sub-ambient temperatures a separate cooling circulator will be needed.

Batch Photochemistry

Illumin8 Parallel Photoreactor

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The Illumin8 parallel photoreactor is ideal for safe, parallel benchtop photochemistry. Working closely with some of our key customers, we took their “go to” tool for parallel screening, our DrySyn OCTO parallel reactor, and developed a high powered LED photo array to complement it. Illumin8 is a no-compromise, safe, well-engineered module based on the DrySyn OCTO MINI 8-position reaction station with magnetic stirring and optional heating via any standard hotplate stirrer.

With 8 × 10 W LED chips positioned closely to each corresponding OCTO Mini reaction tube, the Illumin8 efficiently delivers an even photon flux to each sample.

Compact in design, the module includes safety interlocks to ensure light-tight operation. Built-in air cooling prevents excessive heating during irradiation. Optionally a circulator can be attached to reach sub-ambient temperatures down to -10 °C.

The Illumin8 has easily interchangeable light modules for flexible use in different photochemical reactions with a wide range of wavelengths to choose from, ranging from 365 nm to 940 nm.

Other key features include magnetic stirring, inert atmosphere, sampling during synthesis and low-cost, readily replaceable consumables.

Batch Photochemistry

Solstice Parallel Photoreactor

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Solstice is a parallel 12-position LED photoreactor. Designed to enable parallel photochemical method development with precise temperature control, this 12-position reactor tube holder fits onto a standard (135 mm dia. top-plate) magnetic stirrer. It is ideal for catalyst screening, optimisation of reaction conditions and for preparing small focused compound arrays.

Easy to set up, the tube reactors are fitted with septa and can be inerted and pre-loaded with reagent solutions or loaded/degassed in situ.

The individual tube reactors, 12 x 8 mL (max.) are magnetically stirred and their temperatures can be conveniently controlled by connecting to an external thermoregulating recirculator. For reactions close to room temperature, a cold (or mixed cold/hot) water supply provides an effective low-cost alternative. An internal temperature probe accurately measures reaction temperatures. Optional inserts are available to create thin films under vortex stirring conditions to maximise light absorption. Recommended reaction volumes are 0.5 – 5 mL per tube.

Solstice uses the Asynt Borealis LED light source. Standard options are 365 nm, 385 nm, 405 nm, 420 nm, 455 nm or 525 nm. The LED lamps are available in both 180 W and 120 W versions. The symmetrical design ensures that all tube reactors are subject to an identical photon flux thereby allowing direct comparison between reactions.

Batch Photochemistry

Solstice MAXI Parallel Photoreactor

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The Solstice MAXI from Asynt is a parallel 12-position LED photoreactor with 12 x 20 mL reactor tubes. Designed to enable parallel photochemical optimisation at increased working volumes, with precise temperature control, Solstice MAXI is a 12-position reactor tube holder that fits onto a standard (135 mm dia. top-plate) magnetic stirrer. It is ideal for catalyst screening, optimisation of reaction conditions and for preparing small focused compound arrays.

Easy to set up, the tube reactors are fitted with septa and can be inerted and pre-loaded with reagent solutions or loaded/degassed in situ.

The individual tube reactors are magnetically stirred and their temperatures can be conveniently controlled by connecting to an external thermoregulating recirculator. For reactions close to room temperature, a cold (or mixed cold/hot) water supply provides an effective low-cost alternative. An internal temperature probe accurately measures reaction temperatures.

Optional inserts are available to create thin films under vortex stirring conditions to maximise light absorption. Recommended reaction volumes are 0.5 – 5 mL per tube.

The Solstice MAXI uses the Asynt Borealis LED light source. Standard options are 365 nm, 385 nm, 405 nm, 420 nm, 455 nm or 525 nm, with other wavelengths available on request.

Photochemistry In Flow

*f*Reactor PhotoFLOW LED Photoreactor

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The *f*Reactor PhotoFLOW module was developed by the University of Leeds in conjunction with Asynt and enables scientists to rapidly expand their flow chemistry capabilities to include photochemical transformations. The Asynt *f*Reactor Flow Chemistry platform is manufactured in the UK and available in a wide range of wavelengths to suit your requirements. Our most popular models are:

460 nm (Blue) 10 W LED
365 nm (UV) 10 W LED

Available to purchase individually, each *f*Reactor PhotoFLOW module is positioned over the desired *f*Reactor position in your set-up with easy-to-use "plug-and-glow" technology.

With a fully customisable configuration possible, you can choose to use just one of these compact Photo modules on one of the five *f*Reactor CSTRs, or add further photo modules for up to five positions running simultaneously.

You can run all five of these from just one power supply using optional splitter leads. Each module includes an individual cooling fan to ensure temperature control to the contained CSTR.

*f*Reactor™
...one for every lab

Photochemistry In Flow

PhotoSyn High-Power 700 W flow reactor

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PhotoSyn has been designed to provide scientists with a high-power LED light source for continuous flow applications.

Available with a selection of different LED arrays, the unit provide outputs up to 700 W from the dedicated programmable power supply. Customised units (e.g. 385 nm, 420 nm) are available on request.

The curved, water (or gas) cooled LED arrays focus the available light on the central coil reactor to maximise the photon intensity.

The PhotoSyn has been thoughtfully engineered to completely prevent potentially hazardous light emissions from the unit, and is protected with interlocks that that automatically deactivate the light source if the cover is removed during operation. In addition, a fan both prevents the build-up of static hot air within the lamp unit and removes any vapour that may accumulate over time.

Photochemistry In Flow

Borealis

www.asynt.com

The Borealis is a high intensity LED lamp unit, available in a range of fixed wavelengths that converts the existing ColdCoil standalone coil reactor module into a flow reactor for photochemical applications.

The complete Borealis system comprises:

- Borealis LED lamp unit.
- A 15 mL FEP coil reactor (with an internal temperature sensor).
- The ColdCoil standalone reactor module.
- A programmable power supply (PSU).
- Both the LED lamp and the reactor module require independent liquid cooling using either a piped water supply or a closed-loop recirculator.

Borealis LED lamps of different wavelengths are automatically detected and configured when connected to the power supply.

The complete system is fully light-tight and fitted with a safety interlock.

The Borealis LED lamps also work with the Solstice multi-position batch photoreactor.

Photochemistry In Flow

PhotoChip Flow Reactor

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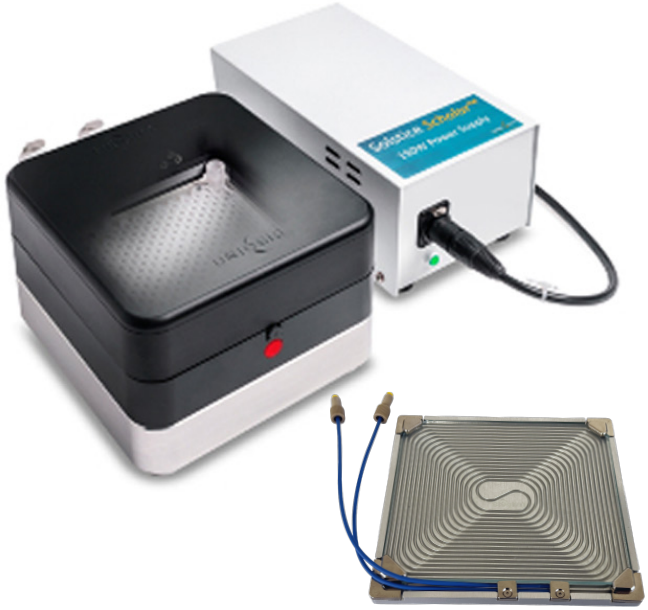
PhotoChip is an LED photoreactor for glass static mixing reactor blocks and our PTFE Tube-in-Plate reactor blocks. Simple to use, powerful and effective, the PhotoChip provides an attractive and flexible solution for performing photochemistry with the benefits of both temperature control and efficient mixing in glass mixer/reactor blocks (chips).

PhotoChip is a compact LED photoreactor module that is compatible with all of our Glass Static Mixer reactor blocks (GSMs) and Tube-in-Plate reactors. Based upon the ColdChip temperature-controlled GSM reactor module, it can accommodate either 1 x LARGE format or 2 x COMPACT format Asynt GSMs with total volumes from 0.27 mL to 20 mL, or one 7 mL TubePlate reactor.

The high-power LED lamp unit uses single LEDs with a total power rating of either 150 W or, optionally, 180 W (150 W version shown). Both versions are available in a wide range of wavelengths (365 nm, 385 nm, 405 nm, 420 nm, 455 nm or 525 nm) and are powered by variable intensity power supplies.

Temperature control: Connection to a thermostat allows heating and cooling with the ability to perform photochemistry down to -20 °C.

The PhotoChip lamp unit is fitted with an interlock which prevents exposure to high intensity light by cutting power to the LEDs if any attempt is made to remove the light unit whilst switched on. A thermal switch protects the LEDs against overheating if cooling is not connected.



Photochemistry

Batch Photoreactors Comparison

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	Lighthouse	Illumin8	Solstice	Solstice MAXI
Number of Vials	1 / 3	8	12	12
Cell Capacity (mL)	18	8	8	20
Electronics Cooling	Fan	Fan	Circulator	Circulator
Sample Temperature Control	Hotplate / Circulator	Hotplate / Circulator	Water Supply / Circulator	Water Supply / Circulator
Temperature Range	-30 to 80 °C	-30 to 80 °C	-30 to 80 °C	-30 to 80 °C
LED Power	10 W	10 W	120 W / 180 W	120 W / 180 W
Wavelengths (nm)	365, 390-395, 410, 460, 523, 490, 623, 740, 850, 940, Cool White	365, 390, 405, 450, 470, 525, 595, 625, 660	365, 385, 405, 420, 455, 525	365, 385, 405, 420, 455, 525
Variable Intensity	No	No	Yes	Yes
Interchangeable Wavelengths	Per Vial - single wavelength module	Yes - one wave-length module for all positions	Yes - one wave-length module for all positions	Yes - one wave-length module for all positions
Sampling / Additions During Operation	Yes	Yes	No	No
Inerting	Per Vial	Per System	Per Vial	Per Vial

Photochemistry In Flow

Flow Photoreactors Comparison

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	*f*Reactor & *f*Reactor MAXI	Borealis	PhotoChip	PhotoSyn
Platform Type	Continuous Stirred Tank Reactor	Coil Reactor	Glass Static Mixer Reactor	Coil Reactor
System Capacity (mL)	8.8 / 37.5	4.3 / 15	2 x 0.27 / 2 x 2 / 10 / 20	2.5 / 5 / 10 / 20 / 53
Lamp Cooling	Fan	Water Supply / Circulator	Water Supply / Circulator	Water Supply / Circulator
Sample Temperature Control	Hotplate / Circulator	Circulator / Polar Bear Plus	Circulator / Polar Bear Plus	Circulator / Polar Bear Plus
Temperature Range	-30 to 55 °C	-80 to 150 °C	-80 to 180 °C	-80°C and 150°C
Maximum Pressure (bar)	6.89	20	10, 20, 30, 35	20
LED Power	10 W	120 W / 180 W	150 W / 180 W	700 W
Standard Wavelengths (nm)	365, 390-395, 410, 460, 523, 590, 623	365, 425, 440, 465, 525	365, 385, 405, 420, 455, 525	365, 455, 530
Variable Intensity	No	Yes	Yes	Yes
Interchangeable Wavelengths	Yes - each individual lamp module	Yes - via changing the Borealis lamp	Yes - via changing the PhotoChip lamp	Via keypad selection
Gas Purging	No	No	Yes	Yes
Mechanical Safety Interlock	Yes	Yes	Yes	Yes

More information

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Asynt Ltd. (UK Headquarters)

Hall Barn Road Industrial Estate
Isleham
Cambridgeshire
CB7 5RJ

Telephone
+44 (0)1638 781 709

Technical Enquiries
enquiries@asynt.com

Accounts
accounts@asynt.com

Orders
sales@asynt.com

Asynt Inc. (US Headquarters)

Alameda
California
USA

Telephone
+1 502-593-0726

Technical Enquiries
rob.maddox@asynt.com

Customer Support & Accounts
info@asynt.com

Orders
orders@asynt.com