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News and updates  
from HEL Group

# Process Chemistry News

## FACT FILE

PolyBLOCK Fast Facts

- ◇ Designed to **maximise your laboratory's productivity**, this system is an easy to use and flexible multi-reactor system.
- ◇ **Consists of 4 or 8 fully independent reactors** running at the same time.
- ◇ Wide range of **interchangeable vessels** (Low pressure ranges from 2ml to 500 ml and high pressure from 16ml to 300ml).
- ◇ **Wide temperature range** (-60°C to +225°C)
- ◇ **Excellent agitation** of liquids and slurries, using mechanical stirrers.
- ◇ **Expansion capability**, including liquid dosing, pH, solubility and calorimetry.
- ◇ Dimensions (cm)  
PB 4 = 23(L) x 36(W) x 19(H)  
PB 8 = 19(L) x 36(W) x 19(H)

## APPLICATION IN BRIEF: HEL-Better Heating Faster!

Many processes require not only high temperature but achieving high temperatures as fast as possible. The majority of these processes take place under pressure in metal pressure vessels. There are a number of different strategies to achieve this in a screening environment where the different effects of temperature, pressure, agitation and chemistries can be analysed. The HEL PolyBLOCK and Automate parallel screening platforms provide effective, simple tools for performing many such experiments quickly. However, heating multiple metal pressure vessels in a controlled way provides unique challenges. To meet these challenges various strategies can be employed:



Run 4 separate experiments at once with HEL's PolyBLOCK and increase your productivity in the lab to obtain results faster

- ⇒ Additional heating. The systems have in-built electrical heating that allows temperatures up to 500°C. To achieve a faster heat ramp, internal heating coils can be used.
- ⇒ Preheating reactors. The reactors can be preheated to a set temperature and the chemistry can then be added.
- ⇒ Preheating reactor zones. The reactor zones can be preheated and the reactors containing material placed directly into the hot zones. Since the systems are completely automated, the software controls the temperature set points and prevents overshoot.

The strategy chosen depends on the chemistry but by using those mentioned above we have achieved max heat rates of 28°C/min and average rates of 10°C/min (target temperatures 200°C).

## PRODUCT IN BRIEF: MicroNOTE- Reactor Control and Data Capture

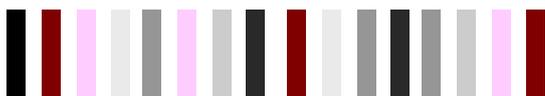
With the need for improved data recording and the increasing use of electronic lab notebooks it is important to adopt systems that capture data directly from the equipment. Traditionally many reactors have not only been manually controlled but also the data generated from them is manually recorded. Furthermore, the actual usage of reactors is not normally logged. By logging the use of reactors scientists and managers can understand utilisation of equipment better and make more informed decisions when determining future investments and maintenance needs. The MicroNOTE is widely used to provide accurate record of data generated by batch reactors.

Control all existing batch reactors and interface direct with electronic notebooks.

- ⇒ Control the reactor
- ⇒ Data monitoring
- ⇒ Keep records of all data and the recipes used
- ⇒ Monitor the usage of equipment thereby allowing informed judgements over resource allocation

Please contact us today to find out more.





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better chemistry – faster

**TECHNOLOGY ABSTRACT: Scale up of Heterogeneous reactions in continuous flow systems**

In recent years flow techniques have entered the R&D laboratory. These have been small bench top units that enable the chemist to quickly and safely perform three-phase reactions and develop routes that were not possible due to the limitation of batch reactors.

Another important advantage of flow is it has been possible to improve stereo selectivity. Due to the very high relative catalyst loading there is rapid and complete reduction, resulting in a better selectivity of enantiomers, as compared to batch.

For any route to be commercially successful it must be scaled from R&D (mg/day) through optimization (100g/day) to kilo scale (1000g/day) and eventually to pilot plant and production (>10<sup>4</sup>g/day).

Many flow techniques are well suited to scaling, to produce more material the system can be run for a longer period of time, multiple systems can be run in parallel or the system can be increased in size.

Technique

There are three main designs of a three phase flow reactor, fluidized bed, packed bed and trickle bed. These all share some advantages over batch:

- ⇒ Increased safety due to low material inventory and small pressurized volume.
- ⇒ Long runs possible without need for dismantling/cleaning.
- ⇒ Allows for study of different operating conditions without user intervention.
- ⇒ Relatively high conversion for amount of catalyst used.

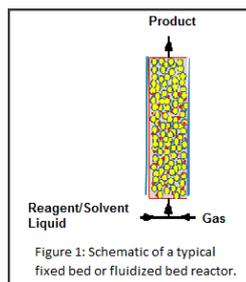


Figure 1: Schematic of a typical fixed bed or fluidized bed reactor.

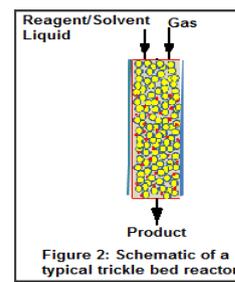


Figure 2: Schematic of a typical trickle bed reactor

**For the full article please email us at [marketing@helgroup.com](mailto:marketing@helgroup.com)**

**COMING EVENTS:** visit <http://www.helgroup.com/events>

**We will be exhibiting at the following events this year:**

- 4th April, Dial-a-Molecule, next generation reaction platform, Brunel University, United Kingdom
- 17th April, Supercapacitors Europe, Berlin, Germany
- 24th April, AFACT 13, Cheshire, United Kingdom
- 4-7th August, 6th International Conference on Green and Sustainable Chemistry, Nottingham University, United Kingdom
- 1-6th September, European Congress on Catalysis, Lyon, France
- 24-25th September: 2nd Symposium on Continuous Processing and Flow Chemistry, Horsham, UK

**HEL Road Show USA**

HEL will be hosting a road show in San Francisco in May. Learn and explore how HEL automates a range of chemistry applications at the HEL Road Show on May 1st and 2nd at Hilton Garden Inn, **South San Francisco, CA. This is a free event but pre-registration is required.**

**HEL Road Show**

Wednesday, May 1 & Thursday, May 2, 2013  
Hilton Garden Inn | South San Francisco, CA

Come experience how HEL can engineer a solution for your chemistry.

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