Porvair Filtration Group introduces:

BioVyon™ Solid Phase Extraction and Antibody Purification Products

New concepts in sample preparation and purification

The Porvair Filtration Group: *"Who are we and what do we do?"*

The **Porvair Filtration Group** is an acknowledged international leader in the development and supply of materials and products for filtration applications. **Porvair** manufacture in both the UK and USA and have an extensive network of sales offices and distribution channels throughout the world. **Porvair**'s expertise is wide and varied and its products are used in markets such as aerospace, chemical processing, nuclear, life sciences, pharmaceutical and food and beverage.




Our ongoing success is based on a dedication to technical excellence and superior customer service. Our future will be built on our investment in Research and Development to exploit innovative new products to exceed the expectations of our customers in solving the challenges that they face.

Further details on the **Porvair Filtration Group** can be found at *www.porvairfiltration.com*.

The **Porvair Filtration Group** is part of **Porvair plc** UK. Further details on **Porvair plc** can be found at *www.porvair.com*.

BioVyon™: *"What is BioVyon™?"*

The **Porvair Filtration Group** is a major producer of porous materials in both metals and plastics. Its Vyon™ range of sintered porous plastics are used in many varied applications including chemical, water and dust filtration, sound attenuation, aeration, fluidisation, fragrance release and venting.

These materials are produced by sintering together particles of polymeric material (primarily polyethylene and polypropylene) to form a porous structure. A typical sample of this material is included within the press pack. These materials can be produced in a wide range of thicknesses and pore sizes.

In recent years, **Porvair**'s range of proprietary sintered porous plastics has found new applications in the medical, pharma and life science markets. To meet the demands of the typically stringent regulatory environment in these target markets has lead to the development of a new range of materials: the "BioVyons".

Porvair's new BioVyon™ materials have set new standards in cleanliness and low levels of extractables. This has lead to their use in applications such as filtration for medical and pharma products, resin support in process chromatography columns and as support frits used in solid phase extraction columns.

Recently, based on customer feedback and market research, the **Porvair Filtration Group** has developed new BioVyon™ materials and products that open up exciting new possibilities in sample preparation and antibody purification.

These new materials were developed from our ActiVyon™ research program. Within this program we have looked at both physical and chemical modifications to the material surface or to incorporate active materials within the sintered porous structure.

By chemically modifying the surface of our BioVyon™ sintered porous plastics we have developed materials that can make specific separations such as purification of antibodies. We have also modified surfaces to make materials either hydrophilic or oleophobic. The latter is critical for the protein precipitation sample preparation products. We have additionally incorporated sorbent powders within the BioVyon™ material to make novel high performance solid phase extraction materials and products.

BioVyon™: *"Novel products that open up new applications & offer genuine benefits"*

BioVyon™ Solid Phase Extraction Products

The conventional arrangement used in solid phase extraction single columns or 96 well microplate formats is for the sorbent powder to be packed between two porous frits. Materials used for these frits are typically based upon sintered porous polyethylene. This arrangement works well for deep beds of sorbent powder such as between 50mg and 200mg, where the sample to be analysed can flow through the bed relatively slowly under vacuum and there is sufficient contact between the analyte and sorbent powder to allow adsorption/desorption processes to occur efficiently.

This traditional arrangement becomes less efficient for shallow sorbent beds necessary to get good recovery from smaller sample volumes.

Recent market surveys have shown that in a number of markets including biotechnology, pharmaceutical drug discovery and forensic science, there is a growing trend to preparing smaller volumes.

Three factors come into play when using a shallow bed of loose powder:

- The relatively open structure of the bed allows the sample solution to flow through too quickly. This reduces its time in contact with the sorbent and hence the recovery from the sample.
- Faster flow can also create preferential liquid channels, further reducing the efficiency of the process.
- Lastly, the hold-up volume associated with the inert support frits relative to the sorbent powder becomes significantly larger, which can also reduce the recovery of the SPE process.

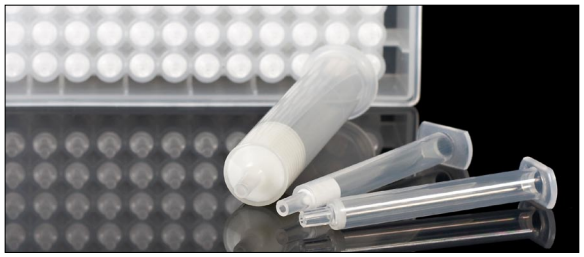
An elegant solution to these problems, developed by **Porvair**, is to immobilise the sorbent powder within the porous BioVyon™ matrix, thus allowing a greater degree of control over the porosity, which in turn helps to control the liquid flow rate through the bed. The immobilised sorbent powder cannot form liquid channels and also does not require inert porous polyethylene frits to support it. The combination of these attributes has enabled development of a novel shallow bed SPE product with low sorbent load. This technology is enabling; low sample volumes previously infeasible due to the flow dynamics of loose powder sorbent beds are now possible with high recovery and improved consistency. This yields economy as the sample can be expensive.

The new BioVyon™ SPE product provides:

- A shallow bed column that works consistently.
- Higher recovery of valuable samples.
- Reduced use of organic solvents enabling shorter dry down times and lessened environmental impact.

Launching at Pittcon 2009 the initial range of **Porvair** BioVyon™ SPE products** incorporates either C8 or C18 silica sorbent powders for reverse phase extraction of non polar to moderately polar compounds. The applications that will benefit from these exciting new products include extraction of antibiotics, drugs, water soluble vitamins, dyes fungicides, herbicides and pesticides.

- **BioVyon™ C18 50mg 1cc columns**
- **BioVyon™ C18 25mg 1cc columns**
- **BioVyon™ C18 12.5mg 1cc columns**
- **BioVyon™ C18 10mg 96 well**
- **BioVyon™ C8 10mg 96 well**



BioVyon™ Antibody Purification Products

Most currently used antibody purification or separation processes are based on agarose gels, functionalised with protein A to provide an effective tool for purification of IgG from sera containing a mass of other proteins. The gel is chemically altered to allow it to attach specific types of biomolecule. In the case of IgG, protein A is attached to the gel via a linker molecule.

Whilst agarose gels have been the long standing material of choice for this type of separation, the gel format has limitations:

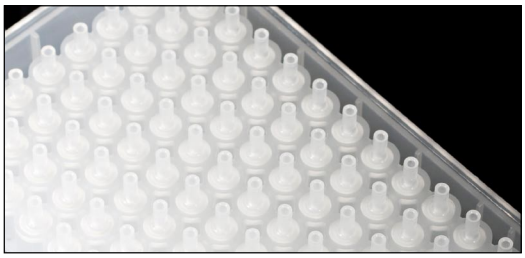
- The beads must be re-suspended in the purification column before use and great care must be exercised when pouring reactants and buffers onto the bed in order not to disrupt it.
- The sensitivity of the bed to disruptions caused by fluid flow also means that separations must be carried out slowly and are difficult to automate.
- Typically protocols are lengthy and therefore costly to use.

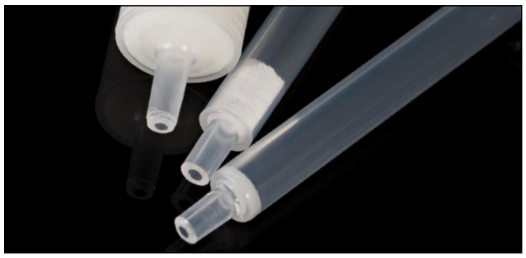
Through chemically modifying BioVyon**™**, a rigid sintered porous polyethylene structure, with Protein A, **Porvair** have produced a unique material for protein purification experiments that eliminates the problems associated with agarose gels. This allows for:

- Simpler Protocols
- Faster, more consistent purification
- Increased productivity as setting up automated screening is now easy.

At Pittcon 2009, **Porvair** is launching the following range of BioVyon™ antibody purification products:

- **BioVyon™ Protein A 96 well plate**
- **BioVyon™ Protein A 1ml Micro Column**
- **BioVyon™ Protein A 10ml Mini Column**





BioVyon™ Protein Precipitation Products

To complement the already successful 96-well protein precipitation microplate product marketed by our sister company **Porvair Sciences**, the P3 plate, at Pittcon 2009 we are launching a new 1ml BioVyon™ P3 column product.

This product incorporates a frit made from our new high performance ActiVyon™ oleophobic porous sintered plastic material.

Biological samples often contain proteins that interfere with downstream analysis. Using the oleophobic BioVyon™ frit these proteins can be precipitated out using acetonitrile prior to filtering by vacuum.

BioVyon™: *" The Future"*

Porvair are continuing to develop new products to extend the range of SPE and antibody purification products.