

Porvair Filtration Group

Porvair Filtration Group is an international leader in the development and supply of materials and products for applications in filtration and separation.

Porvair manufacture in both the UK and USA and have an extensive network of sales offices and distribution channels throughout the world. Our expertise is wide and varied and its products are used in markets such as:

- Aerospace and Defence
- Nuclear and Energy
- Chemical Process
- Industrial Process
- Water Treatment
- Printing
- Sciences and Laboratory

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 provide innovative new products that exceed the expectations of our customers in solving the challenges that they face.



Porvair Filtration Group is a major manufacturer and developer of sintered porous materials, offering optimum solutions in a wide range of applications.

Whether used in finished products or supplied for OEM manufacture, our materials span industries as diverse as pharmaceuticals, healthcare, chemical processing and engineering. Applications are also varied and include filtration, aeration of liquids, fluidisation of powders, vacuum table covers, support media in chromatography columns, sound attenuation and fragrance emanation.

Our extensive range of polymeric and metallic materials allows us to select the fit-for-purpose option gained through understanding the customers' requirements and our in-depth knowledge of the material's properties.

Our core materials are:

- **Sinterflo® sintered porous metal materials**
Mainly sintered porous stainless steel and bronze materials, sintered metal fibre and multilayer stainless steel meshes.
- **Yyon® sintered porous plastic materials**
Mainly sintered porous polyethylene and polypropylene materials.
- **BioVyon™ sintered porous plastic materials**
Specialised Yyon® materials manufactured for applications in the life science markets.



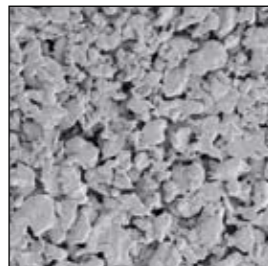
Sinterflo® sintered porous metal materials are ideal for applications that involve aggressive chemical environments, high temperatures and high pressures.

Available for OEM producers or as fabricated products designed to meet your needs, our advanced welding and assembly capability, supported by a high quality ethos, ensures total satisfaction.

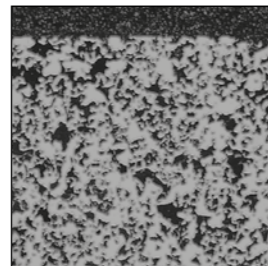
Both mechanically and chemically robust, these materials allow for effective cleaning for reuse thereby delivering cost-effective solutions for difficult applications.

The range of Sinterflo® sintered porous metal materials includes:

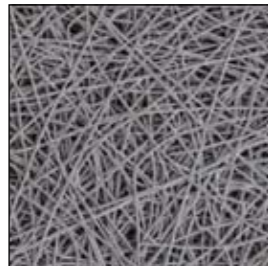
- **Sinterflo® P Sintered Metal Powder**
Mainly sintered porous stainless steel and bronze materials.
- **Sinterflo® PM Sintered Powder Membrane**
Mainly sintered porous stainless steel.
- **Sinterflo® F Sintered Metal Fibre**
Mainly sintered porous stainless steel.
- **Sinterflo® MC Sintered Metal Mesh**
Multilayer stainless steel mesh materials.



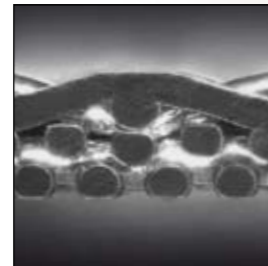
Sinterflo® P Sintered Metal Powder



Sinterflo® PM Sintered Powder Membrane



Sinterflo® F Sintered Metal Fibre



Sinterflo® MC Sintered Metal Mesh



Applications

The scope of applications for sintered porous metal materials is diverse and includes:

- General chemical processing
- Catalyst recovery
- Corrosive liquid and gas filtration
- Solvent filtration
- Nuclear processing and waste treatment
- Process steam filtration
- Polymer melt filtration
- Flame arresting
- Sensor protection
- Sparging and aeration
- Silencers for pneumatic tools
- Chromatography column supports
- Powder handling fluidisation

A robust material manufactured from sinter-bonded metal powders. Primarily produced in 316L grade for use in temperatures up to 540°C (1004°F), depending on process conditions, and offering resistance to most chemicals, Sinterflo® P media can also be produced in other grades of stainless steel and alloys such as Inconel®, Hastelloy® and Monel®.

Sinterflo® powder media can be manufactured in both disc format or in cylinder format. For cylinders, our isostatic pressing ensures greater media uniformity with no welds, leading to increased corrosion resistance.

Table 1 Sinterflo® P Standard Stainless Grades

Grade	Mean Pore Size (µm)	Viscous Permeability x10 ¹² M ²	Minimum Thickness (mm)	Nominal Removal Rating (µm) (Liquid)
Sinterflo® P S10	6	1.0	1.5	6
Sinterflo® P S20	10	2.0	2.0	10
Sinterflo® P S30	15	7.5	2.5	15
Sinterflo® P S40	30	25	3.0	30
Sinterflo® P S50	60	70	4.0	60

Other grades available on request

Features and Benefits

- **Resistant to high temperatures and corrosive environments**
Suitable for aggressive air and liquid filtration applications.
- **Strength and Robustness**
Ensures reliability and longer on-stream service life.
- **Excellent media uniformity**
Allows consistent filtration and effective loading.
- **Seamless structure**
No welds provide increased corrosion resistance.



Sinterflo® P Sintered Porous Bronze

A flexible, strong and aesthetically appealing material manufactured from pre-alloyed bronze. Sinterflo® P, available in any mouldable shape and offering resistance to temperatures of up to 300°C (572°F) with good chemical resistance, makes it the preferred medium for many filtration applications.

Table 2 Sinterflo® P Standard Bronze Grades

Grade	Mean Pore Size (µm)	Viscous Permeability X10 ¹² M ²	Nominal Removal Rating (µm) (Liquid)
Sinterflo® P B05	4	1.0	2
Sinterflo® P B10	7	2.5	6
Sinterflo® P B15	15	10	15
Sinterflo® P B20	20	15	20
Sinterflo® P B30	35	30	35
Sinterflo® P B40	60	180	85
Sinterflo® P B50	74	230	100

Other grades available on request

Features and Benefits

- **Inherent strength**
For long service life in arduous applications.
- **Resistant to high temperatures and corrosive environments**
Suitable for aggressive air and liquid filtration.
- **Controlled pore distribution**
Ensures optimum repeat performance.



Manufactured from randomly laid metal fibres, sinter-bonded to form a uniform high porosity filter medium, Sinterflo® F demonstrates a significantly low pressure drop, high permeability and excellent dirt holding capacity.

Moreover, sintered metal fibre may be pleated to increase the available filtration area of a filter element, thereby further increasing dirt holding capacity and so minimising maintenance and maximising on-stream processing.

With the feasibility to formulate metal fibres to meet specific application requirements combined with inherent durability, sintered metal fibre filters can be cleaned in-situ without interrupting process flow thereby providing the ultimate in process economics by reducing downtime to a minimum.

Available alloys include 316L stainless steel, Inconel®, Hastelloy® and Monel®.

A list of grades and specifications are available on request.

Features and Benefits

- **Resistant to high temperatures and corrosive environments**
Suitable for aggressive air and liquid filtration applications.
- **Can be cleaned in-situ**
Reduces downtime to a minimum providing excellent process economics.
- **Pleatable structure**
Offers higher surface area with excellent dirt holding capacity for longer on-stream life.
- **High void volume**
Provides high permeability combined with low pressure drop.



These multi-layer precision filter meshes are produced using a novel sintering process resulting in superior mechanically strong structures. Primarily made from 316L stainless steel, they are also available in Inconel®, Hastelloy® and Monel® materials for use in the most aggressive environments. Depending on atmospheric conditions, our stainless steel option can be used in temperatures up to 540°C (1004°F), with intermittent operating peaks up to 650°C (1202°F), and are resistant to most chemicals.

Formats available include flat sheet, custom shapes, welded cones and welded cylinders, and the materials can be manufactured in a variety of layer combinations depending on your specific application. Standard material combinations can include perforated plates for additional support.

Sinterflo® MC is available in a range of filtration grades from 2 micron and up.

Features and Benefits

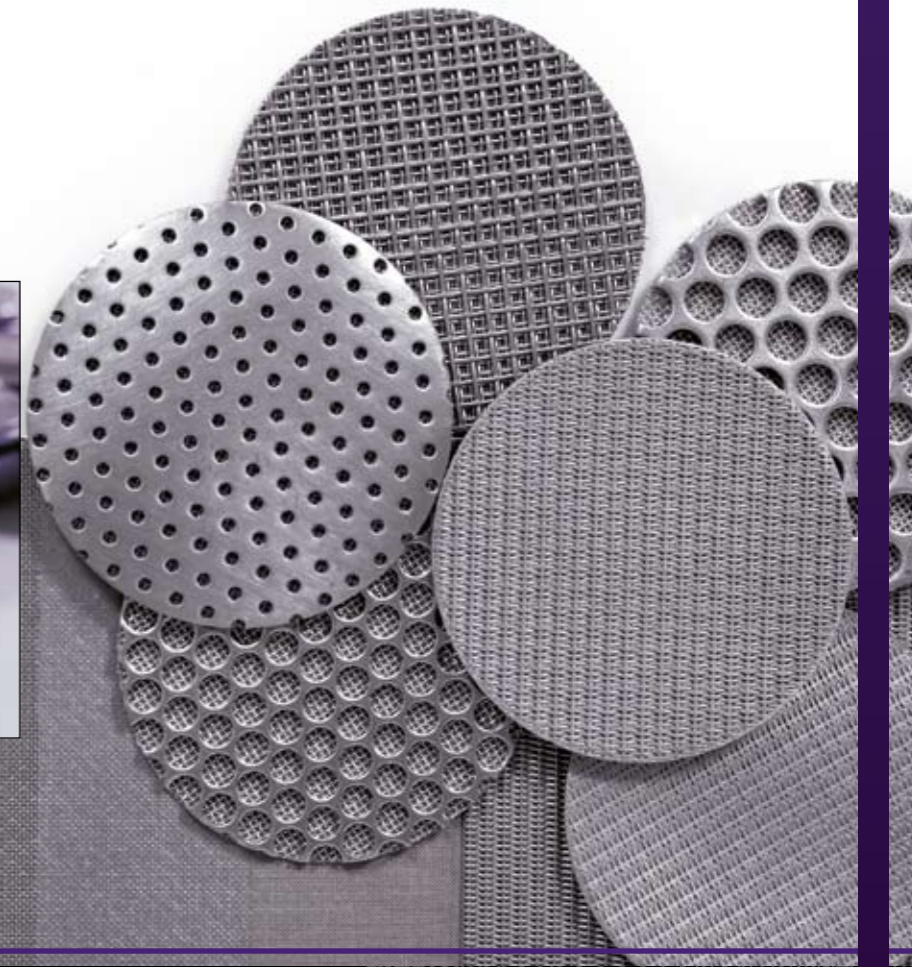
- **Fabricated shapes without expensive support structures or joining strips**
Offers robust and self-supporting structures.
- **Can be cleaned repeatedly**
Suitable for reuse; providing an economical choice.
- **Non-shedding media**
Provides resistance to mechanical abrasion.
- **Easily custom-engineered**
To meet required specifications of materials, strength, flow requirements, thickness, micron rating and environment.

Sinterflo® PM Sintered Powder Membrane

An advanced patented metallic filter media that combines the strength of the sinter bonded metal powder with the levels of filtration efficiency associated with membranes.

Features and Benefits

- **Inherent strength**
Suitable for long service life in aggressive environments.
- **High filter efficiency**
Ultra-thin layer of fine, narrow distribution metallic, carbide and/or ceramic powder provides high levels of filter efficiency.
- **Controlled pore size distribution**
Micronic and sub-micronic pore structures ensure optimum repeat performance.
- **Uninterrupted operation**
Ideal when combined with pulse jet blowdown cleaning operations.



Our Vyon® sintered porous plastic materials offer excellent chemical compatibility, exceptional strength and are resistant to most acids, bases, many organic chemicals and temperatures up to 110°C (230°F).

Produced in both sintered porous polyethylene and polypropylene, materials are available in roll, sheet, cut shapes and moulded formats. The materials can also be fabricated into cylinders, cones and other three dimensional shapes.

Table 3 Vyon® Media Grades

Name	Material	Filtration Grades	
		Liquids	Gases
Vyon® D	HDPE	10µm	6µm
Vyon® PPD	Polypropylene	5µm	1µm
Vyon® F	HDPE	40µm	25µm
Vyon® PPF	Polypropylene	20µm	10µm
Vyon® HP	Polypropylene	70µm	50µm
Vyon® PPHP	Polypropylene	60µm	40µm
Vyon® Porvent	HDPE	15µm	5µm
Vyon® Porvent PP	Polypropylene	15µm	5µm
Vyon® T	UHMWPE	10µm	2µm



Features and Benefits

- **Strong lightweight and self supporting**
A versatile material that can be manufactured in a variety of shapes and sizes.
- **Narrow Controlled Pore Size Distribution**
A very efficient and effective filtration material.
- **High and Even porosity**
Low pressure drop and even flow.
- **Chemically inert**
Resistant to many chemicals making it suitable for many applications.

Applications

- Domestic water filters
- Activated carbon filters
- Chemical filters
- Air and dust filters
- Fluidisation and aeration of bulk solids
- Battery vents
- Pneumatic silencers
- Water and effluent aeration
- Fragrance emanators
- Vacuum platens and cones



Porvair Filtration Group has developed a revolutionary new range of porous BioVyon™ materials, designed specifically to meet the demands of the life science and analytical markets.

BioVyon™ standard sintered porous plastic materials are manufactured in ISO cleanroom areas in accordance with cGMP practices and achieve a variety of quality approvals including USP Class VI. These highly regulated materials are continuously developed for use in diverse applications within industries such as pharmaceuticals, medical and healthcare.

In addition to the benefits of the Vyon® materials, such as excellent chemical compatibility and strength, our BioVyon™ materials benefit from lower bio-burden, ultra-low extractables and minimal particle shedding.

Applications

- **Solid phase extraction and chromatography column frits**
Our vast range of frit options, using BioVyon™ ultraclean, nanoclean, hydrophilic and oleophobic materials, provide optimum solutions for SPE sample preparation devices and process chromatography columns.
- **Solid extraction and chromatography resins**
BioVyon™ composites incorporate the resins within the sintered porous polymer to eliminate the use of frit supports.
- **Medical device filtration**
Using BioVyon™ manufactured to cGMP processes.
- **Personal Healthcare and pharmaceutical vents**
BioVyon™ is used in pharmaceutical liquid dispensers and aspirators such as nasal sprays.
- **Diagnostics**
BioVyon™ hydrophilic and laminates are used as a filter and a wick.
- **Catheter Vents**
Using a BioVyon™ composite, incorporating a cellulosic material within the sintered porous material, that expands and shuts off the air flow if in contact with liquid such as blood.
- **Antibody Purification**
The BioVyon™ functionalised grade for antibody purification, offers the stability and robustness of our BioVyon™ materials and additional benefits compared to the traditional sepharose technology.

Features and Benefits

Continuous material development has resulted in an unique range of BioVyon™ materials each exhibiting different properties critical to these progressive markets.

- **BioVyon™ Ultraclean**
Our standard materials exhibit very low extractables.
- **BioVyon™ Nanoclean**
Proprietary techniques deliver high purity materials with trace extractables.
- **BioVyon™ Hydrophobic and Oleophobic**
A permanently oleophobic treatment preventing BioVyon™ from wetting-out in many organic solvents.
- **BioVyon™ Hydrophilic**
A permanently hydrophilic treatment for instant water wettability.
- **BioVyon™ Laminates**
Used as a support for membranes, extending the filtration range to 0.1 micron for the retention of microorganisms.
- **BioVyon™ Composites**
Incorporating active substances within the sintered porous material such as chromatography resins, carbon and celluloses.
- **BioVyon™ Functionalised**
Chemically or biologically active sintered porous material functionalised with amines, carbonyls, carboxylic acids, linker chains or ligands.



Porvair Filtration Group has a policy of continuous improvement in all areas of its business. Listening to the customers' present and future requirements is a vital part of our operations and a key part of driving change.

We understand that product development involves building multidiscipline teams, not only within the company, but often in partnership with our customers, improving project efficiency and ensuring complete customer satisfaction. This continuous development of products and materials is vital, to enable us to offer new and better solutions to applications. **Porvair** has implemented various methodologies to drive out waste and process variance across the company to achieve the ultimate goal of zero defects.

We have a dedicated team of scientists, engineers, production and quality professionals working towards the best possible filtration solutions for our customers. We have a fully equipped test house and laboratory, and our experienced design engineers use the latest AutoCAD® technology, with 3D solid modelling, integrated with a finite element analysis system to give full structural assurance capability.

Quality is at the heart of every stage of our operation and a fundamental part of our culture. We are ISO9001 approved at a number of our manufacturing facilities and hold many other accreditations for the various industries we serve.

Research and Development

Continuous development of products and materials are vital to enable **Porvair** to offer new and better solutions to applications. Development plays a fundamental part in our operations and, as a result, we have developed a number of new bespoke products based on our established porous polymeric materials (Vyon®) and sintered metal media (Sinterflo®).

Although we operate across many filtration and separation markets there is significant interaction between each division in terms of product research and development. The new product development team is drawn from scientists and engineers from across all divisions encouraging new ideas and new solutions. The success of this approach has been in the interaction of chemists and engineers working together to find practical solutions to some extremely complex scientific challenges identified in the chosen market areas.

Engineering

From initial concept design through manufacture and validation to in service support, our highly experienced team of dedicated engineers work to develop the optimal filtration solution. Our team utilises the latest engineering tools of 3D AutoCAD®, Finite Element Stress Analysis, Computational Fluid Dynamics (CFD) and bespoke pressure vessel design software (PD5500, ASME VIII, EN13445). This is combined with over 30 years of proven experience and a knowledge and strong ethos of working closely with our customers, ensuring filtration solutions that meet customers requirements.

Manufacturing

Porvair Filtration Group produce filters and filtration systems, as well as a range of porous materials based on sintered polymers and metals, at production sites within the UK and the USA. We manufacture for a wide variety of industrial, pharmaceutical and biomedical applications, as well as supplying filtration solutions for extreme conditions of temperature, pressure and corrosion for the aerospace and nuclear markets.

Our production capabilities include the complete element or cartridge construction, along with the build of entire tubeplate and vessel assemblies. We boast specialist fabrication skills and techniques in all of our manufacturing sites around the world as well as extensive ISO certified cleanroom facilities.

Testing and Laboratory

Our dedicated test, development and laboratory services underpin our design and development activity, from filtration media and material characterisation, product verification testing to customer systems simulation trials and in service performance evaluation. Our capabilities include filtration characterisation, environmental testing and analysis.

Quality

Our policy is to provide products and services that consistently satisfy the commitments made to our customers by complying with their requirements, working together as a team and by achieving continual improvement in our skills, systems, processes and performance.

We have a dedicated team of quality professionals with many years experience in definition, implementation and maintenance of quality management systems meeting multiple industry requirements. This extends across the workforce through a strong quality culture and a philosophy of 'getting it right first time' driven from the top of the organisation.

Our quality management systems are regularly audited internally and by customers and regulatory bodies. We hold ISO9001 at a selection of our manufacturing sites along with, EN 9100 and EASA Part 21 Subpart G at our Segensworth facility. We are NQA1 capable subject to specific project requirements.





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