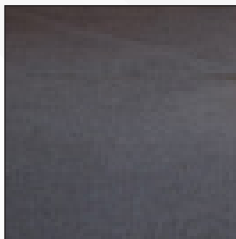
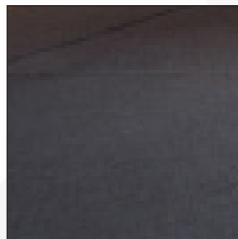
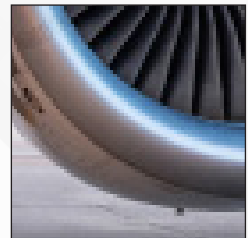
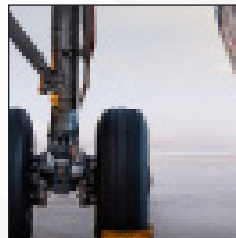
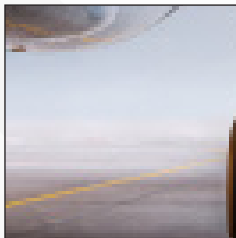
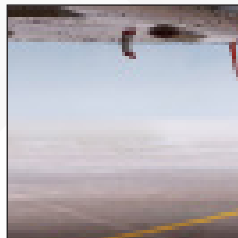
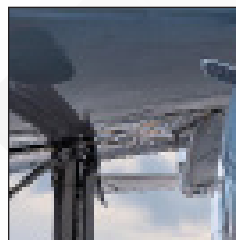
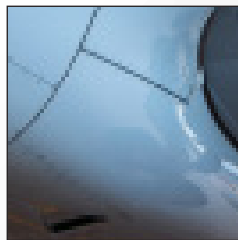
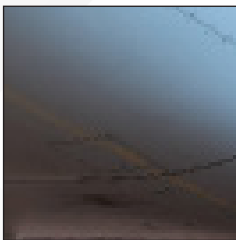
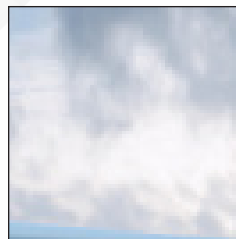
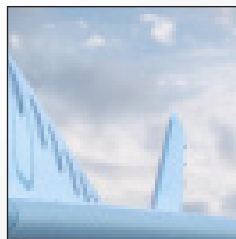
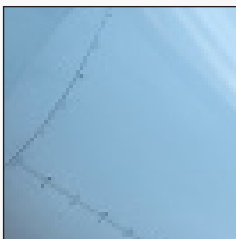


# Filtration Solutions Aerospace and Defence

Hydraulic, Fuel, Lubrication, Power Control,  
Coolant and Environmental Systems



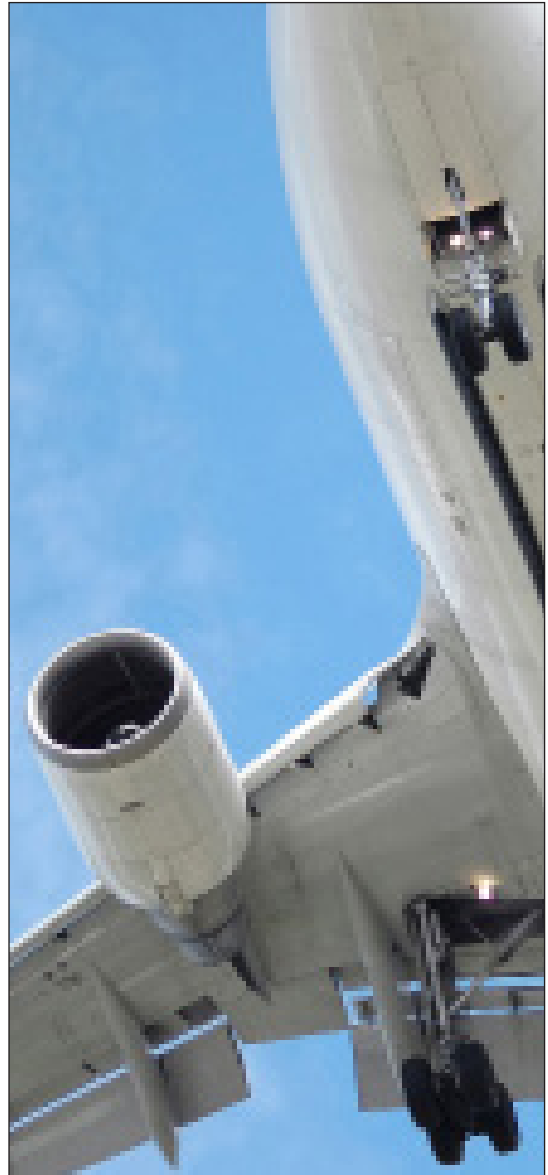
## Porvair Filtration Group

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

Porvair manufactures in Europe, UK and USA and has an extensive network of sales offices and distribution channels throughout the world. Our expertise is broad and deep, with products used in markets such as:

- Aerospace and Defence
- Food and Beverage
- Gasification
- Microelectronics
- Nuclear
- Pharmaceutical
- Porous Media and OEM Materials
- Printing
- Process
- Transportation
- Water

Our ongoing success is based on a dedication to technical excellence and superior customer service. Our future will continue to 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 they face.



**Porvair** designs and manufactures specialist filtration components and assemblies to meet demands of the aerospace and defence industry for contamination control.

Our filters protect vital systems such as flight controls, fuel management, thermal control, environmental, power control, fuel tank inerting and air intakes in aircraft, advanced air mobility, helicopters, military vehicles, missiles and spacecraft applications.

**Porvair** has quality approved design, manufacturing assembly and test facilities in the UK and USA for its aerospace products.

Our cellular production layout covers key operations in the manufacture of our products, including:

- assembly and test
- filter cartridge assembly
- machining
- welding
- inspection
- qualification and development testing

We manufacture to customers' designs and specifications. Our key areas of expertise include:

- Experience of integration
- Filters into aerospace systems
- supply chain management of parts
- component assembly
- testing to customer specifications
- products include: screens, filter elements, assemblies, differential pressure indicators, valves and manifolds.
- Industrialisation



## Last Chance Filters, Screens and Filter Elements

### Last Chance Filters and Screens

Designed to provide critical protection these filters and screens come in a multitude of forms. They can be built into a variety of fittings and valves.

#### Materials of construction

- Sintered woven wire
- Sintered metal powder
- Sintered metal fibre
- Stainless steel or nickel-based alloys

#### Methods of construction

- Resistance welding
- Fusion welding
- Electron beam/laser welded
- Vacuum and silver brazing

#### Laser Machined Screens

Laser drilled or trepanned screens offer a robust, single piece design giving optimised performance without any joints or seams to provide improved collapse and/or burst strength.



### Filter Elements

To provide system level cleanliness Porvair offers a variety of filter element types with performance and construction tailored to specific operating conditions whilst optimising for life weight, space envelope and cost.

Porvair has experience in typical requirements for each aircraft system to help advise customers.

#### Polymeric or resin-impregnated cellulose

Moderate dirt-holding capacity and light-weight. Offer a cost-effective solution for low pressure and temperature lubrication and fuel filtration applications.

#### Glass fibre

Reduced pressure drop, increased dirt-holding capacity (life) and can withstand greater pressures and temperatures.

#### Sinterflo® F - Sintered metal fibre

Unparalleled performance with extreme of temperature. Operational studies indicate a superior resistance to release of captured contamination increasing component life and reducing through life operating costs.

#### Sinterflo® M - Sintered metal mesh

Elements can also be constructed from sintered metal mesh.



## Differential Pressure Indicators (DPIs) and Switches (DPSs)

'On condition' maintenance is a feature of modern fluid power technology. Our DPI's provide a signal to show the extent of filter blockage by sensing the differential pressure across the filter element, thus reducing operating costs, maintenance time and costs by eliminating unnecessary filter element change.

We can provide DPIs with many special features, including:

- Visual and/or electrical indication
- Thermal lockout device
- Flow surge suppression
- Non-reset function.

## Filter Manifolds

Designed to integrate a variety of filtration components within a single manifold, including:

- filter elements
- impending and actual blockage indicators
- anti-drain valves
- by-pass, check, shut off and pressure relief valves
- pressure transducers
- temperature sensors
- water separators (air systems)
- inlet strainers
- system integration features



## Filter Assemblies and Housings

**Porvair** manufactures filter assemblies for hydraulic, coolant, fuel, lubrication, thermal management and air systems. Applications include:

- hydraulic pressure, return and case drain
  - pressures up to 10,000psi.
- thrust reverser actuation systems
- fuel supply for both main engine and APUs
- fuel inerting systems
- gearbox lubrication and cooling
- battery and fuel cell cooling
- power control systems



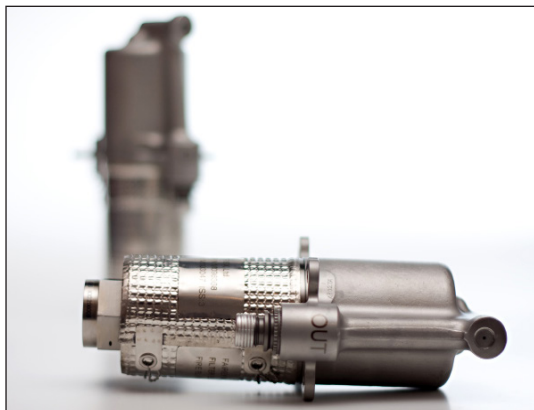
### Filtration Accessories

- **Anti-drain valves** prevent loss of system fluid or ingress of air during element change. A special feature can also prevent fluid flow should the element not be fitted.
- **By-pass and by-pass indicating valves** allow fluid flow should the element block during service.
- **Pressure relief valves** protect sensitive equipment by relieving over-pressure conditions.
- **Water drain valves** for use on fuel system filters.
- **Water separators** to extract free water from system air supply.
- **Check valves.**
- **Self-seal coupling** for rapid connection to service equipment.

### Filter Kits

For customers wishing to integrate filtration accessories into their valve body or manifold, we supply kits of parts, which can include:

- filter elements and bowls
- element condition indicators
- bowl locking mechanism
- valves
  - anti-drain
  - bypass
  - pressure relief
  - shut-off



### Air Filtration

We supply a range of equipment to condition air for systems, including engine air intake, crew comfort and protection of electronic equipment.

- Air Particle Separators provide high efficiency air/particle separation in highly contaminated environments.
- Air conditioning panels are designed to remove moisture, odour, VOS's and particulate contamination from air flows.
- Fuel Cell Air Filtration to protect cell membrane electrode assembly from particulate matter and harmful chemicals.

### Fuel Inerting Filters

The elimination of flammable fuel vapours in commercial aircraft fuel tanks is an airworthiness priority. Lightweight onboard aircraft fuel tank inerting systems address this issue and can easily be fitted within existing aircraft and new designs.

The systems reduce oxygen from its source of engine bleed air, delivering nitrogen-enriched air into the aircraft fuel tanks reducing the risk of fuel tank flammability. Our filtration system ensures that the source of engine bleed air delivered to the sensitive air separation modules in the inerting system is free from both liquid and particulate contamination.

These devices can also incorporate catalysts to remove other contamination challenges.



## Production Innovation

We have a policy of continuous improvement in all areas of our business. Listening to 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 multidisciplinary teams, both within our company, and in partnership with our customers.

This continuous development of products and materials is vital to enable us to offer new and better solutions.

We have a fully equipped test house and laboratory, and our experienced design engineers use the latest technologies to give full structural assurance capability.

## Research and Development

Development plays a fundamental part in our operations and has resulted in us developing a number of custom designed products based on our established porous polymeric materials (Vyon®) and sintered metal media (Sinterflo®).

We operate across many filtration and separation markets and there is significant interaction between each division in terms of product research and development.

Our 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.



## Manufacturing

Our manufacturing and assembly capabilities are continually evolving to incorporate the latest advanced technologies, drive cost efficiencies, and maintain our position at the forefront of industry standards. We offer comprehensive production services, including full element and cartridge construction, as well as complete housing and assembly builds. Our facilities are equipped with state-of-the-art machining technologies, such as modern five-axis CNC milling systems and enhanced metrology.

Across our global manufacturing sites, we apply specialist fabrication techniques.

## Engineering

From initial design concept through to manufacture and validation to in-service support, our highly experienced team of dedicated engineers work to develop the optimal filtration solution. Our knowledge and strong ethos of working closely with our customers, ensures that we supply filtration solutions that meet specific market requirements.

## 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 achieving continual improvement in our skills, systems, processes and performance.

Our experienced team of quality professionals brings extensive expertise in developing, implementing, and maintaining quality management systems that comply with a wide range of industry standards. This commitment to quality is embedded throughout our organisation, supported by a strong culture of excellence and a top-down philosophy of 'getting it right the first time.'

## Project Management

Our teams at Porvair have adapted advanced product quality management for the industrialisation of product when appropriate to manage and industrialise through the complete project life cycle.



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