



Aerospace Case Study 07/2014

Company: Porvair Filtration Group

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[Porvair Filtration Group](#), an international leader in the supply of high performance, innovative materials and solutions for applications in filtration and separation, recently identified the need for a CNC Coordinate Measuring Machine that could satisfy a list of challenging requirements. The answer to the company's exacting needs was provided by an [Aberlink Axiom too CMM](#), fitted with an advanced [Renishaw PH20 5-axis touch-trigger system](#). Ideal for Porvair's needs, the PH20's unique 'head touches' allow measurement points to be taken by moving only the head rather than the CMM structure.

Porvair manufactures in both the UK and USA and has an extensive network of sales offices and distribution channels throughout the world. The Group's expertise across a wide range of media and the dedication of its design, manufacturing, sales, test and research teams ensure it remains at the forefront of filtration technology. For nearly 50 years Porvair has delivered world class performance to the most demanding of industries, including the Aerospace and Defence, Nuclear, Energy, Chemical Process, Industrial Process, Water Treatment and Life Sciences sectors.

Based in Fareham, Hampshire, Porvair's impressive UK design and manufacturing facility produces specialist filtration components and assemblies to meet the challenges of the global Aerospace and Defence industries for contamination control within hydraulic, fuel, lubrication and air systems.

The company's filters protect vital sub-systems in aircraft, helicopters, military vehicles, missiles and spacecraft, including primary and secondary flight controls, fuel management, fuel tank inerting, power generation, air intakes, lubrication and environment control. Effective filtration within aircraft and military equipment is vital to ensure that all relevant systems are free from contaminants and to guarantee safety, long service life, reliability and cost effective operation.

Given the safety critical nature of the company's products and the sectors they are used in, Porvair is qualified to aerospace standards ISO9001, AS9100 and EASA Part 21 Subpart G and component quality remains central to all activities.

Prompted by ever increasing demand for its products, recent investments have boosted the Fareham site's manufacturing capacity. To ensure that increased production volumes do not cause hold-ups in the company's inspection department, a recent search was made for a Coordinate Measuring Machine that could accommodate Porvair's demanding accuracy specification. In addition, the new CMM needed to have rapid CNC operating characteristics, to enable it to keep pace with production volumes.

After witnessing demonstrations and receiving quotes relating to several CMMs, the answer to Porvair's inspection needs was found in a recently installed advanced Axiom too Coordinate Measuring Machine from Aberlink Innovative Metrology.

After an Axiom too training course, Porvair's quality personnel soon became familiar with the machines controls and software. Having now written part programmes for many company components, operators are able to recall the relevant programme, load either a single part, or several components on to the Axiom too's component support and undertake accurate, inspection routines in a rapid, fully automated CNC mode. In addition, Aberlink's software also allows informative inspection reports to be generated.

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Available in [manual](#) and [CNC](#) variants in various capacities, with multiple probing and fixturing options, the cost effective Axiom too is the best selling CMM from the largest UK owned Coordinate Measuring Machine manufacturer. Aberlink's popular Axiom too CMM can truly be described as the complete Inspection Centre; high measuring accuracies are achieved through the use of the latest metrology techniques and advanced in-house manufacturing methods. The Axiom too boasts an all aluminium bridge resulting in a very low thermal mass, rendering the machine ideal for use either in controlled environments or within less than perfect shop-floor conditions. Thanks to the innovative CMMs use of advanced materials, the machine's reduced inertia results in class leading speed of operation. For increased accuracy air bearings of optimised stiffness are employed on all axes, whilst a granite Y Beam allows preloading of bridge bearings in both directions. Borrowed from the Aerospace industry, the CMM's sturdy component support consists of an advanced granite/aluminium honeycomb construction, this technology, provides natural damping and further improves the machine's thermal properties. Despite the Axiom too's generous measuring volume 640x600x500 or 640x900x500, the machine's compact design occupies a relatively small footprint, with the controller and all peripherals housed within the Axiom too's workbench.

Equally rewarding when used by the novice or an experienced CMM operator, the easy to use Axiom too utilises Aberlink's famous, intuitive 3D software, ensuring greater user productivity and profitability. A welcome bi-product of any Aberlink CMM inspection routine is that a simultaneous picture of the measured component is created on the computer screen. Dimensions between the measured features, mirroring those that appear on the component drawing, are then picked off as required. In essence this 'smart' software represents an intelligent measuring system that is able to automatically recognise and define the various features being measured. [Aberlink 3D is the easiest to use CMM software currently available](#), as a result a complete novice is usually able to perform relatively involved measurement routines after just 5 minutes training.

Chris Davies Aberlink Sales Manager added. "As the largest UK owned CMM manufacturer, Aberlink's comprehensive series incorporates 23 standard sizes of CNC and manual CMM variants. This all-embracing range enables the precise measurement of components from the smallest of parts to articles of over 3 metres long and up to 6 tonnes in weight. To enable customers to receive CMMs that precisely match their specific needs, they are able to choose from a wide range of probing and non-contact measurement choices and various on-machine fixturing options. This wide range of available solutions allows Aberlink to offer high quality CMMs to suit all applications and budgets.

"When informed of Porvair's specific requirements, we were able to specify a best-selling Axiom too CNC, CMM 600 fitted with a Renishaw PH20 5-axis touch-trigger system. The PH20's unique 'head touches'; allow measurement points to be taken by moving only the head rather than the CMM. Using only the rapid rotary motion of the head, points can be taken faster, and with improved accuracy and repeatability. Furthermore, 5-axis motion eliminates time spent indexing the head. Together these speed increases typically result in a 3-fold improvement in throughput when compared to conventional systems.

"Enabling the PH20's advantages to be fully utilised, Porvair's CMM was supplied with the latest version of Aberlink's famous, intuitive inspection software. In addition to discrete point touch-probe and vision measurement, the recently released Aberlink 3D, Mk IV now enables extremely accurate, rapid scanning of features and profiles, and delivers a host of innovative new user advantages."

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