

Bird Bellows



FOR INDUSTRIAL APPLICATIONS BELLOWS ASSEMBLIES, METALLIC BELLOWS & PRECISION FABRICATIONS FOR INDUSTRIAL APPLICATIONS BELLOWS ASSEMBLIES



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Bird Bellows





A COMPREHENSIVE GLOBAL RESOURCE FOR INDUSTRIAL BELLOWS APPLICATIONS

Senior is an international manufacturing group with over 5800 employees and operations in 12 countries. Structured in two divisions; Senior Flexonics and Senior Aerospace (Structures and Fluid Systems) Senior designs, manufactures and markets high technology components and systems for the principal original equipment producers in the worldwide aerospace, diesel engine, exhaust system and energy markets.



Senior Aerospace Bird Bellows is a world leader in the design and manufacture of metal bellows, bellows assemblies and aerospace products. As one of the most respected names in the industry, Bird Bellows is uniquely positioned to meet the demands of our customers for precision engineered and manufactured products.

Our development and product testing facilities are among the best available. Sophisticated analysis and design practices include:

- > Finite-element analysis (Ansys)
- > Stress analysis
- > Motion and load analysis
- > Flow and pressure drop analysis

- > Modal testing
- > Insulation and heat transfer analysis
- > Fatigue analysis
- > CAD/CAM
- > CATIA Version 5
- > 3-D modelling
- > EDI capability
- > Inventor

Bird Bellows technical staff utilise the most contemporary computer aided design programmes in the industry. We work with systems compatible with those of our customers to ensure efficient and accurate exchange of information between our facilities and off-site locations.

We believe that technological information is one of the most critical measures of excellence.



RESOURCES

- > Specialisation in pressurised duct systems and flexible duct joints
- > Design facility including systems engineering and stress analysis
- > Comprehensive manufacturing and non-destructive testing processes
- > Fully certified QA systems to EASA Part 21 and AS9100
- > Extensive product development facilities for future growth
- > Full materials capability
- > The total resources of Senior Aerospace in Europe and North America





DEDICATED SERVICES AND FACILITIES

Senior Aerospace Bird Bellows specialises in the design of bellows, bellows assemblies, gimbal bellows, flexible joints and aerospace bleed air ducting systems. Drawing on years of design experience, the latest in computer-aided design programmes, and finite-element analysis, our engineering team has the flexibility and speed required to respond to the needs of our customers.

DESIGN

Bird Bellows utilises AutoCAD 2000/3-D Modelling, FEA Ansys 6.0 and CATIA Version 5, allowing 2D and 3D realisation of products, and the preparation of detailed drawings and technical specifications. These design tools give us the ability to work in the computer environment best suited to our customers and to directly exchange electronic data with customers and suppliers worldwide.

A key element in the design process is our ability to develop innovative and cost-effective solutions to customer problems.

Design propositions will satisfy all international codes of practice.

ENVIRONMENTAL TESTING

Environmental testing is carried out to ensure that components will perform satisfactorily in service, the degree of testing being determined by the class of equipment and the performance testing required.

Continuous in-house research and development is carried out at Bird Bellows.

Environmental testing includes fatigue cycle life testing, proof and ultimate testing, at ambient and temperature if required.

MANUFACTURING

Bird Bellows has the most comprehensive manufacturing capabilities for bellows, bellows assemblies, gimbal bellows, and aerospace ducting systems.

The Company's manufacturing expertise includes bellows rolling, hydro-forming, tube manufacturing, various welding procedures, assembly, test and inspection operations.

Bellows forming technology at Bird Bellows is regarded as the latest state-of-the-art, and options exist in respect of mechanical forming, hydraulic forming and bulge forming.

Bellows are manufactured from longitudinally autogenously welded tube. Convolutions are thin wall and can be single or multi-ply bellows.

Bellows diameter ranges from 12mm up to 700mm, in thicknesses from 0.08mm.

Our experience encompasses processing all materials into bellows and finished assemblies, including but not limited to: Stainless Steel type 321, 316, 316L, Inconel 625, Inconel 625LCF, Inconel 600, Incoloy 825, Monel 400, Hastelloy C276, Hastelloy C22 and Titanium.

A complete, in-house metallurgical laboratory supports process control and failure analysis efforts.

Senior Aerospace Bird Bellows is fully committed to lean manufacturing and has a reputation for high quality craftsmanship which is maintained through continuous staff training and development. Quality assurance is integral at every stage of manufacture, and research and investment is ongoing into all production processes. With strict in-house procedures and tight control of our manufacturing processes we are able to meet delivery schedules and cost requirements.



A WORLDWIDE REPUTATION FOR QUALITY

Quality Assurance is fundamental to the ethos of Senior Aerospace Bird Bellows. Proven systems have been in place since the inception of the company.



Great emphasis is placed upon fully understanding the customer requirements and application. Our quality assurance systems are approved to ISO 9001 and EASA Part 21 Section A, Subpart G.

Good systems and procedures are important but the quality of personnel is vital. Senior Aerospace Bird Bellows enjoys the services of committed and highly motivated people in all areas. In particular the Quality Inspection Team is dedicated to the monitoring of all processes and to ensuring that only fully acceptable product is despatched to customers.

With our own radiography, dye penetrant and pressure test facilities, together with mass spectrometer leak detection and three-axis measuring resource, we are well equipped to perform all required tests and checks.

MAJOR QUALITY APPROVALS

AS9100

BS EN ISO 9001

ISO 14001: 2004

EASA Part 21 Section A, Subpart G

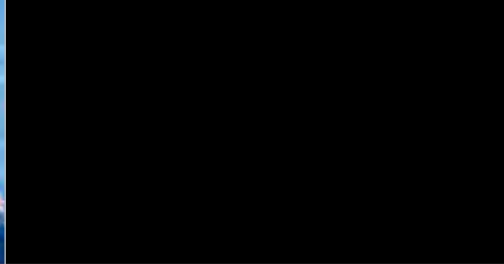
Performance Review Institute AS7110 (Nadcap) for Welding

Performance Review Institute AS7114 (Nadcap) for Non-destructive testing

Additionally, Senior Aerospace Bird Bellows has been approved by the following customer organisations:

Rolls-Royce; BAE Systems; Airbus UK; Airbus France; Airbus Deutschland; Pfalz Flugzeugwerke; Westland Augusta; Honeywell Normalair Garrett; Dresser; Tyco Flow Control; Curtiss Wright Flow Control.





BELLOWS FOR VALVE AND OTHER APPLICATIONS

Bird Bellows is a world leader in design and manufacture of bellows for any valve application.



Bellows units and assemblies are used in mechanical seals for marine applications such as pumps and propulsions units, chemical, food and beverage, mining and minerals, oil and gas, pharmaceutical and power generation. We specialise in the design and manufacture of high quality units used for equipment and product protection. Products are developed in conjunction with our clients' engineers to ensure that all customers' needs are fully met.

We have the versatility and expertise to satisfy the most stringent of design conditions and extreme environments. Bellows are custom designed to suit your application and can be designed to accommodate a wide variety of environments whilst achieving critical design criteria such as spring rate, effective area and fatigue life expectancy.

Balanced bellows for safety relief valves are used to provide satisfactory valve performance when the developed back pressure becomes excessive. The balanced bellows design ensures that valve characteristics such as lift and relieving capacity are maintained. Additionally, the bellows serves to isolate the guide, spindle, spring and other parts contained in the bonnet chamber from corrosive fluids or media such as highly viscous fluid or slurry which could render the relief valve inoperative. The inclusion of bellows in the valve design enables the use of lower cost materials than would otherwise be required.

High quality bellows assemblies are supplied for valve applications worldwide. Bellows are produced by roll forming thin wall autogenously welded tube. Construction may be single or multi-ply, in thicknesses from 0.08mm upwards, and materials



supplied include all grades of stainless steel, nickel alloys and titanium. Bellows sizes from diameter 12mm upwards to 700mm.

As part of our total commitment to the supply of bellows for valve applications there is continuous investment in machinery and personnel at Bird Bellows. In order to meet the increasing demands of our customers we have implemented a lean manufacturing cell totally dedicated to bellows for valve applications.

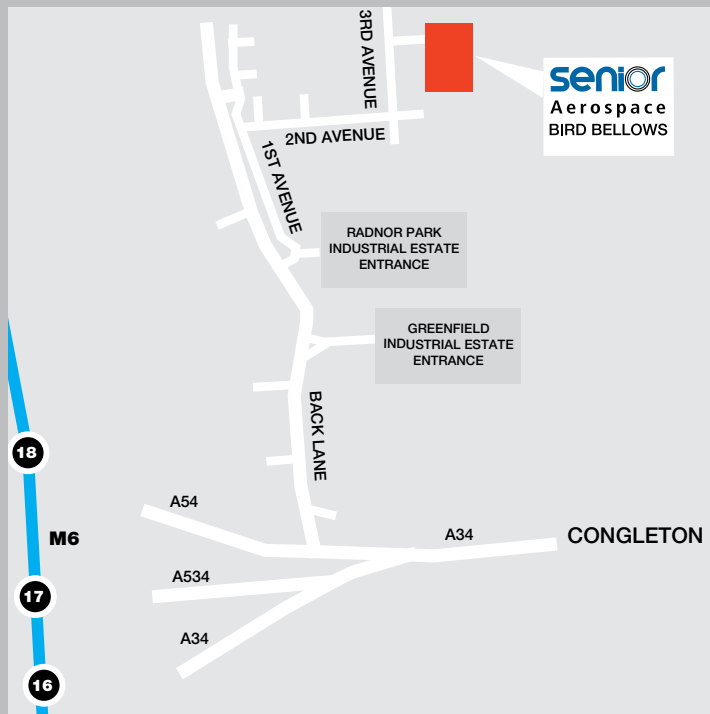
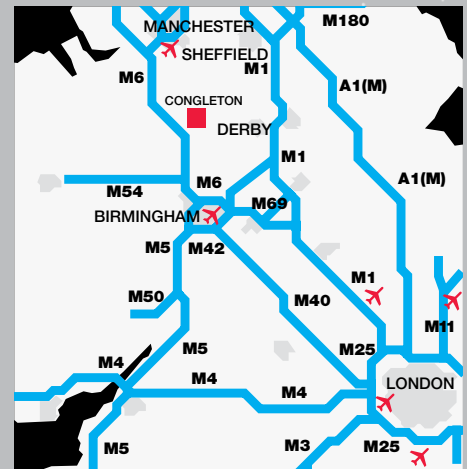


SENIOR AEROSPACE GLOBAL OPERATIONS



WHERE TO FIND US

From M6 J18, A54 to Congleton, Radnor Park Estate is signposted on the left, via Back Lane.
From M6 J17, A534 to Congleton, Radnor Park is signposted on the left via Box Lane, turn right onto A54 and then left to Radnor Park Estate via Back Lane.



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