



senior
Flexonics

FLUID CONVEYANCE SOLUTIONS

Extensive Tubing Solutions for all Land Vehicles:
I.C.E., Hybrid, and Electric Vehicles



www.seniorflexonicsUSA.com



Senior Flexonics designs, engineers, validates, and manufactures thermal management components and systems for electric and hybrid vehicles, power and energy markets.

Senior Flexonics offers unparalleled product design, development, testing and manufacturing capabilities. Bartlett is the primary North American design and development center for thermal management, fluid conveyance, heat exchangers and flexible connectors. Housed in a dedicated sales, research, development and prototyping site Senior Flexonics' program of continuous improvement and innovation has enabled the delivery of cost effective, high performance products for the rapidly developing marketplace.



FLUID CONVEYANCE

Senior Flexonics is a global leader in the supply of Fluid Conveyance products in the land vehicle market. We design and manufacture tubes for a variety of applications, which are used across all powertrain variants. We specialize in thin wall steel tube manipulation, creating bent and corrugated tubes using in-house hydro-forming techniques. Our knowledge and technical expertise allow us to provide our customers with products that are lightweight, compact, and highly durable.

Product Range and Applications

- » Coolant tubes for all land vehicles: I.C.E., Hybrid, and Electric Vehicles
- » Oil lubrication tubes
- » EGR cooling tubes
- » Transmission tubing
- » High pressure tubing
- » Metallic, Composite, Rubber & Plastic tubing applications
- » May be used in conjunction with our heat exchange plates

Hybrid and Electric Vehicles

We provide our customers with solutions to the most complex problems using a variety of metallic and composite materials. Our Fluid Conveyance products are used to provide essential coolant to Battery Modules, Electric Motors, Power Electronics and Range Extenders.

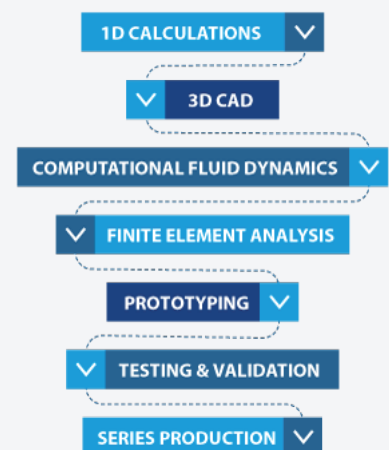


OUR CAPABILITIES

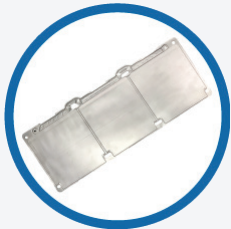
We pride ourselves on our innovative approach to solving technical problems, which we have used to develop trusted partnerships with customers and suppliers around the world.

Product Validation Capabilities:

- » CFD for performance and boiling
- » FEA for vibration NRFs
- » Rig performance measurement
- » Gas side and coolant side pressure pulsation
- » Thermal shock
- » Shaker vibration durability
- » Acceleration data acquisition on vehicle

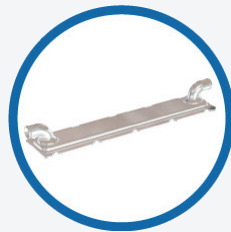


Whether it's combustion, hybrid or electric drive-trains, battery cooling or fuel cell applications, we use our knowledge and expertise to meet our customers requirements.



Battery Thermal Management

Manufactured in a range of materials including stainless steel, aluminum, copper, and plastics, our systems are designed to maximize power density, while minimizing package space, weight, coolant pressure drop, and cost.



Electronics Cooling Plates

The main component inside the inverter is the IGBT (Insulated Gate Bipolar Transistor), and it generates heat. An effective method of cooling the IGBT is through a liquid cooled heat sink.



EGR Cooler

Senior Flexonics provides a wide range of EGR Heat Exchangers, including Shell & Tube, Plate & Fin and our patented Co-axial Cooler. Our heat exchangers are used in HEV engine systems and have up to 95% efficiency, are highly resistant to fouling and are scalable to match performance requirements.



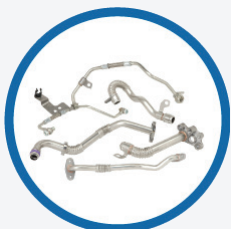
Flexible Connectors

We are an industry leading supplier of flexible connectors. We design, engineer and manufacture both long/soft and shorter self-supporting flex design options to meet customers unique platform requirements.



Hydrogen Thermal Management

Senior has developed high-efficiency condensers, recuperators, and cathode air pre-heaters capable of operating at extreme temperatures for prolonged periods of time.



Fluid Conveyance

Senior Flexonics has a long history of manufacturing tubing for a variety of fluid transfer applications. Used in isolation such as for an oil drain or fuel lines, or combined with our heat exchange plates, we offer expertly balanced and optimized systems to ensure customer needs are met.



KEY BENEFITS

- » Full service supplier.
- » Full collaboration with customers to provide products.
- » A fully engineered solution, from design concept through to high volume manufacture.
- » Global production facilities, 30 operations in 13 countries.
- » Extensive range of thermal management solutions.
- » Programs managed using APQP framework.
- » Comprehensive fleet of FEA and CFD software.
- » Fully equipped test lab for validation testing.
- » Performance and durability test equipment.
- » ISO 9001 / 14001 and IATF 16949 certification.



LOCATIONS

- » **Bartlett USA:** Sales, Engineering & Manufacturing
- » **Cape Town SA:** Manufacturing
- » **Crumlin UK:** Sales, Engineering & Manufacturing
- » **Kassel GERMANY:** Sales, Engineering & Manufacturing
- » **New Delhi INDIA:** Sales, Engineering & Manufacturing
- » **Olomouc CZE:** Sales & Manufacturing
- » **Saltillo MEXICO:** Manufacturing
- » **Tokyo JAPAN:** Sales
- » **Wuhan & Tianjin CHINA:** Sales & Manufacturing

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