

Hermetic Solutions For Extreme Environments

Rectangular DC Connectors



SOURIAU PA&E's hermetically-sealed rectangular DC connectors exceed most mil-spec requirements and are designed for use in military and commercial applications, where environmental conditions require an extremely rugged and reliable hermetic seal. The uniquely-controlled CTE characteristics, chemical bonding properties and polycrystalline structure of Kryoflex[®] allows SOURIAU PA&E to manufacture these hermetic connectors with 304L stainless steel shells and gold-plated beryllium-copper contacts to maintain excellent electrical performance and environmental characteristics.

RF/Microwave Connectors



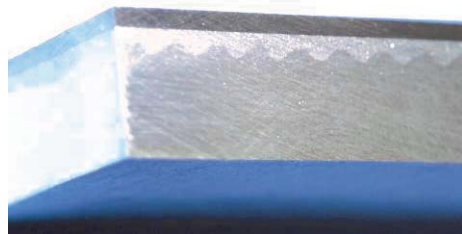
SOURIAU PA&E's 50 Ohm hermetic RF/Microwave connectors are designed for use in military and commercial applications where environmental conditions require an extremely rugged and reliable hermetic seal. Low-loss Corning 7070 glass is used for dependable electrical performance. SOURIAU PA&E manufactures these hermetic RF connectors from a variety of compatible shell and contact materials, in both laser weld and solder-in styles, which provide excellent electrical and environmental performance characteristics.

Ceramic EMI Filters



SOURIAU PA&E's military-qualified Filter Products Group specializes in the design and manufacture of high-reliability low-pass EMI filters. Utilizing multi-layer ceramic discoidal capacitors and ferrite inductors, SOURIAU PA&E's engineering staff are experts at designing EMI filtering solutions for electronic circuits operating in hostile EMI environments. In-house manufacture and testing, in accordance with MIL-PRF-28861, Class B (QPL) and SOURIAU PA&E class H, are standard practice.

Bonded Metals



SOURIAU PA&E has been the innovative leader in the explosive metal working field for over 30 years. Our customers have access to some of the world's most exciting metal working technologies, such as: Explosive Metal Bonding, Explosive Metal Forming, Explosive Shock Hardening and Dynamic Powder Metal Compaction. These high-strain rate technologies offer unique metal working advantages that can help our customers achieve the "impossible."

SOURIAU PA&E

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ISO 9001:2008/
AS9100

Esterline
Connection Technologies

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HERMETIC WINDOWS

SOURIAU PA&E

Hermetic Waveguide & Sight Windows

- ✓ Laser weldable into Al, Ti and iron nickel alloys
- ✓ Variety of glass options available
- ✓ Ceramic, braze, solder sealing options



Hermetic windows from SOURIAU PA&E are reliable in the extreme conditions space & defense-related LADAR, laser designation/acquisition systems and medical endoscopic tools must operate in.

Esterline
Connection Technologies

SOURIAU PA&E

Our hermetic windows offer engineers additional advantages beyond high hermetic performance. They are designed to be laser welded to a range of metals, including aluminum, titanium and iron/nickel alloys and accommodate a variety of optical glasses such as sapphire, quartz and BK10.

SOURIAU PA&E also offers a number of window sealing options including: proprietary active braze sealing; a patented direct sealing process; standard braze sealing solder sealing and a patented ceramic sealing process.



Window Type	Window Material	Frame Material	Sealing Method
Optical	BK10	Iron/Nickel Alloy	Solder*
Optical	Corning 7056	Iron/Nickel Alloy	Direct Seal
Optical	Sapphire	Titanium	Active Braze™
Optical	Sapphire	Titanium	Kryoflex®
Laser	Sapphire	Titanium	Active Braze
Laser	Sapphire	Titanium	Kryoflex
Laser	Fused Silica	Iron/Nickel Alloy	Solder*
Infrared (IR)	Sapphire	Titanium	Active Braze
Infrared (IR)	Corning 7070	Iron/Nickel Alloy	Direct Seal

SOURIAU PA&E hermetic window configuration examples

*Metallization required

The Kryoflex Advantage

SOURIAU PA&E has pioneered the use of ceramic-to-metal sealing technology to manufacture hermetically sealed windows for optical, laser and infrared applications. The unique bonding properties and polycrystalline structure of SOURIAU PA&E's Kryoflex material now allow the company to produce sight or wave-guide windows that maintain the highest levels of hermetic integrity under the extreme environmental conditions. This new product is particularly well suited for space or defense-related LADAR, laser designation/acquisition systems and medical endoscopes.



Ceramic-sealed hermetic windows require no metallization.

SOURIAU PA&E's ceramic-sealed hermetic windows offer engineers additional advantages beyond high hermetic performance. Because Kryoflex seals at relatively low temperatures, they can now choose from a variety of optical glasses such as sapphire, quartz and BK10.

Windows produced with this new process are extremely robust and reliable because a key point of failure – solder joint fatigue – is eliminated. They provide a leak rate equal to or less than 1×10^{-9} cc/sec helium at 1 atmospheric differential pressure, even when subjected to extreme thermal and mechanical shock and, in medical applications, will maintain integrity after repeated (1,000+) autoclave sterilization cycles. SOURIAU PA&E's ceramic-sealed windows have passed cytotoxicity testing so the materials are proven safe for use within the human body.

Unlike solder- or braze-sealed windows, SOURIAU PA&E's ceramic-sealed hermetic windows do not require metallization. Eliminating this step can reduce costs and processing time and allows anti-reflective coatings to be applied after the sealing process, ensuring that the critical A/R coating is not impacted by subsequent processing.

Laser Welding for Robust Reliability

SOURIAU PA&E utilizes the latest state-of-the-art Lasag laser welding systems to integrate windows using the radiation from a focused, energy-dense, beam of infrared light. This non-contact welding process minimizes thermal and mechanical stresses, and provides an extremely small heat-affected zone, ensuring components or electronic packaging are exposed to the least-hostile welding environment possible.

Our welding systems are completely computer controlled including all laser parameters and motion systems axes. This, in combination with an extensive document control system, assures you consistency and repeatability from the first component today through the last component years down the road.



Waveguide window laser welded into aluminum housing

SOURIAU PA&E's experienced engineers are consistently developing the latest material combinations to offer customers all the advantages of laser welding a connector/window/electronic packaging design. Further, SOURIAU PA&E also provides welds that produce hermetic seals as small as .009" nominal spot size for your micro requirements or up to .047" nominal for the largest requirements designers may have.