

Amphenol Aerospace Offers Solutions for Hermetic Connectors

Modern aircraft require many sensors to fly reliably and safely, and that often involves hermetically sealed electrical connectors that meet MIL-DTL-38999 environmental and performance requirements.



Figure 1. A variety of electronic components — including hermetically sealed connectors — ensure commercial airplanes meet specific industry requirements. Image provided courtesy of [Pixabay](#).

This article reviews hermetic connectors and their applications, then discusses the Amphenol Aerospace 2M product line solution to aerospace (commercial and defense) needs.

HERMETIC CONNECTORS

Hermetically sealed connectors (sometimes called airtight connectors) can be crucial components in many systems and are specifically engineered to support system integrity. In applications relying on the performance and reliability of electrical connectors, these connectors play a vital role in ensuring the smooth operation and safety of the systems. Such applications — including many aerospace applications — require connectors with barriers that must be fluid-, liquid-, and gas-tight or are subject to high-pressure differentials.

Areas of application for hermetic seals include sensors, instrumentation, avionics, and guidance and control assets. More specifically, these connectors can be found in systems for fuel control, defrosting, turbine control, power distribution, primary and secondary power supply, attitude heading reference, ignition, lighting, and ventilation. They are also used with radio electronics, night vision, firewalls, and emergency turbines.

Finding the right rugged, high-quality hermetic connector is crucial, and Amphenol Aerospace has made the process easier.

AMPHENOL 2M HERMETIC MICRO-MINIATURE CONNECTORS

[Amphenol 2M Hermetic Micro-Miniature Connectors](#), manufactured by Amphenol Aerospace, are ruggedly engineered with an airtight seal and meet or exceed most MIL-DTL-38999 environmental and performance requirements.

Their sealing power stands out: 1×10^{-8} cc/sec helium sealing, 100% tested before shipping and made possible through a glass insulator fused to stainless steel shells and iron alloy contacts. They also provide excellent EMI protection.



Figure 2. Examples of Amphenol 2M hermetic micro-miniature connectors. [Source](#).

The 2M hermetic connectors were designed with size, weight, and power (SWaP) requirements in mind. These connectors have the same durability as other MIL-DTL-38999 connectors *but are less than half the weight and size* of similar solutions. Their overall size makes them ideal for SWaP-optimized designs and situations with limited physical space. In addition, these micro-miniature connectors have a high contact density along with low-profile shells for minimum box protrusion and shell standoffs for PC Board washout.

THE AMPHENOL AEROSPACE 2M PRODUCT LINE

The [Amphenol Aerospace 2M product line](#), shown in Figure 3, supports several coupling technologies, including bayonet (2M803), push-pull (2M804), tri-start (2M805), and dual start (2M801).

Unlike the others, the 2M803 is more general-purpose for light duty and is not rated for immersion — just splashproof. However, it possesses 50 milliohms of shell-to-shell resistance. The 2M803 offers good vibration performance: 37 g random and 300 g shock. Their mating cycle depends on the material used, with 1,000 cycles using Aluminum and 2,000 cycles using stainless steel. They are available with 1 to 55 contacts.



Figure 3. The Amphenol 2M product line. [Source.](#)

2M804 connectors, on the other hand, are engineered as push-pull breakaway connectors for tactical equipment and headsets. They have a gold-plated spring to ensure a long mating life and to provide superior EMI protection. These hermetic micro-miniature connectors are available with 1-85 contacts and are rated for 2,0000 cycles. They also offer good vibration resistance: 37 g random vibration and 300 g shock.

The 2M805, in particular, also comes with an "Anti-Decoupling" ratchet mechanism and ground spring for military airframes and avionics boxes. These micro-miniature connectors are available with 1 to 130 contacts, excellent vibration and shock resistance (43.9 g random, 60 g sin, and 300 g shock), and are rated for 500 mating cycles.

The 2M801 hermetic seal connector is among the fastest mating and has more rugged keys and threads. They can handle 43.9 g random, 60 g sin, and 300 g shock vibration. Regarding mating cycles, they offer 2,000 Cycles around 16 plugs and 500 cycles when using about 26 plugs. These connectors are available with 1 to 130 contacts.

LEARNING MORE ABOUT AMPHENOL'S CONNECTORS

Hermetically sealed electrical connectors are critical to many systems in aerospace applications, and Amphenol offers a solution that meets or exceeds MIL-DTL-38999 for performance and environment. [Amphenol Aerospace](#), a division of Amphenol Corporation, is one of the largest manufacturers of interconnect products for commercial and military aerospace applications worldwide, and it has many years of experience in developing connector solutions.

Contact Powell today for more information on the [Amphenol Aerospace 2M hermetic micro-miniature connectors](#).