EXTREME TEMPERATURE

- -65°C to +200°C

AIRTIGHT/VACUUM

- <1x10^{-7} cm^3/s @ 14.7 psi

ENVIRONMENTAL CONDITIONS

- Fluid resistance
- Corrosion resistance
- High vibration

APPLICATIONS

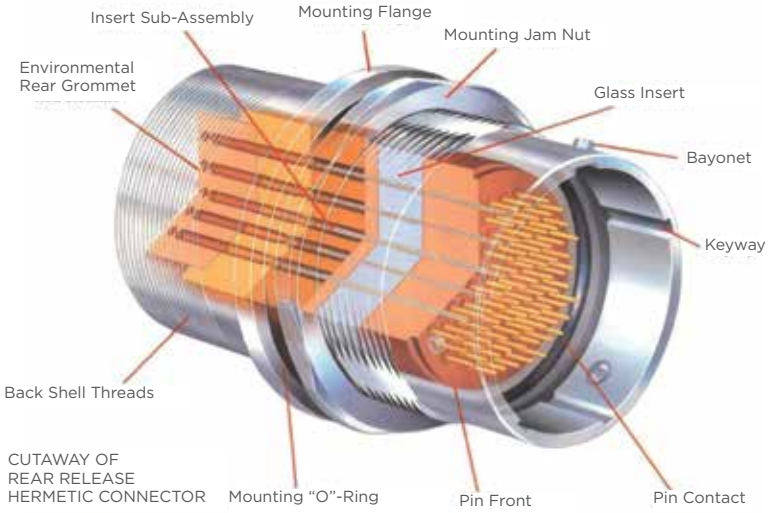
- Sensors
- Fuel tank systems
- Down-hole drilling equipment
- Electronic equipment
- Engine accessories
- Pyrotechnic equipment
- Vacuum chambers
- Optical devices
- Missiles
- Avionics
- Sealed environments

MIL-DTL-38999 Hermetic Connectors

Since the early 1960s TE Connectivity has been producing DEUTSCH hermetically sealed glass-to-metal connectors for applications where temperature, pressure, and environmental considerations render standard connectors unusable. Hermetic connectors are used to separate an inert atmosphere or vacuum on one side from wide-ranging high-pressure, high temperature, or corrosive conditions on the other. They are also used to maintain a pressure differential between the two sections. In short, DEUTSCH hermetic connectors are designed to help provide a continuously gas-tight seal while withstanding:

- High pressures
- Extreme temperatures
- High vibration

Hermetic connectors are also an excellent choice when you are not exactly sure of the conditions that will affect your connector's performance. Hermetic connectors may meet many of the most rigid environmental and electrical specifications, which is important when dealing with variables that are unknown.



Glass-to-Metal Sealing

Standard sealing techniques—such as epoxy potting—are useful in many applications, but they may not provide the degree of sealing that is offered by glass-to-metal hermetic seals. This is especially true of applications with high pressure differentials. Glass is a durable, high-strength material that resists extreme changes in temperature or pressure.

Our glass-to-metal seals create a bond between shell, insulator, and contacts by fusing the glass insulator to the metal components. The bond can maintain a helium leak rate of .01 micron ft^3/h at 14.7 psi. The hermetic bond helps provide enduring reliability, resists cracking that would compromise the performance, and helps withstand a wide range of harsh conditions.

MIL-DTL-38999 Hermetic Connectors

Compression vs. Matched Seals

DEUTSCH hermetic connectors are produced using both compression seals and matched seals. In a matched seal, the metal and glass have similar coefficients of thermal expansion (CTE). This reduces stress on the glass from thermal expansion and contraction.

In a compression seal, the metal has a higher CTE than the glass. During the firing process the metal expands more than the glass. As the glass and metal then cool, the metal contracts back onto the glass to form an extremely robust bond. Compression seals are used for high-pressure applications.

Controlling Quality from Start to Finish

We design and manufacture all the components in our hermetic connectors. Our shells are made with high-grade materials—from stainless steel bar stock to exotic metals like titanium. We use high-grade silica and binders for the glass and the elastomer materials are carefully matched to the required connector application. When fused with the contacts and the shell, the inserts produce a true hermetic seal. Pin or socket contacts are available with solder pot, eyelet, and extended pin terminations. Our contacts can be made from a variety of materials like nickel iron, Alumel, Chromel, and copper-cored nickel iron. An important consideration in material selection is the ability to withstand the high temperatures of the sealing process. All connectors are fully leak tested by TE to help ensure the integrity of the hermetic seal.

Materials

Standard materials for hermetic connectors include:

- **Shell:** Stainless steel
- **Insert:** Glass
- **Contacts:** Nickel iron (52 Alloy)

Other materials are used, depending on special requirements for:

- High current
- High voltages
- High pressures
- Extreme temperatures
- Severe corrosion conditions

Weight-Saving Aluminum Hermetic Connectors

DEUTSCH aluminum hermetic connectors use an aluminum alloy shell to create connectors that are 60% lighter than stainless steel counterparts—two aluminum connectors weigh less than a single stainless steel equivalent.

- Up to 60% lighter
- Higher conductivity: up to 250 A
- Lower contact resistance: less than half that of nickel-iron contacts
- Wide temperature range: -85°C to +300°C

A Full Range of Hermetic Choices

DEUTSCH hermetic connectors are available in a variety of military and commercial styles. Options include a choice of:

Pin or socket contacts: Available with solder pot, eyelet, and extended pin terminations

Rear-release crimp termination to help reduce costs by eliminating soldering processes and potting and by allowing use of standard crimp tools

Feedthroughs provide a single device that can be terminated on both sides

Hermetic assemblies with connectors pre-installed in a mounting fixture to reduce your manufacturing time and speed installation

Custom connectors and configurations for applications not easily accommodated by standard offerings. Hermetic connectors lend themselves well to short production runs.

MIL-DTL-38999 Hermetic Connectors

	Military Part No.	DEUTSCH Part No.	Mount Type	Mil Class	Contact Styles
Series I Scoop-proof bayonet coupling	MS27469	DJT10	Wall	H: Space grade Y: Electro-polished stainless steel	**Pins:** **P =** Solder cup **X =** Eyelet **C =** Feedthrough **Socket:** **S =** Solder cup **Z =** Eyelet **D =** Feedthrough
	MS27470	DJT14	Jam Nut		
	MS27471	DJT11	Solder		
Series II Non-scoop-proof, bayonet coupling, low silhouette	MS27475	DJL18	Wall	H: Space grade Y: Electro-polished stainless steel	
	MS27476	DJL10	Box		
	MS27477	DJL14	Jam Nut		
	MS27478	DJL11	Solder		
Series III Scoop-proof, triple start, self-locking, threaded coupling	D38999/21	DTS20	Box	H: Space grade N: Nickel plate over stainless steel Y: Electro-polished stainless steel	
	D38999/23	DTS24	Jam Nut		
	D38999/25	DTS21	Solder		
	D38999/27	DTS23	Weld		
Series IV Scoop-proof, breech coupling	D38999/41	DIV40	Box	H: Space Grade N: Nickel plate over stainless steel Y: Electro-polished stainless steel	
	D38999/43	DIV44	Jam Nut		
	D38999/45	DIV41	Solder		