

# High Pressure, High Temperature Connectors

## Overview

The Hermetic Solution Group's high pressure, high temperature connectors and feed thrus are widely used in the energy industry on LWD (logging while drilling), MWD (measuring while drilling) and other applications where absolute reliability is a must.

## Technical Description

### General Specifications

- Feedthru operational temperature: -50°C to +300°C
- Feedthru rated operational pressure: 0 to 30 KPSI
- Leak rate:  $1.0 \times 10^{-9}$  cc He/sec at 1 atmosphere
- Design safety factor at ambient: 5 to 2.0
- Design safety factor at operating temperature: 2.5-3.0
- Hydrophobic and moisture-resistant
- Embedded anti-vibration sealing mechanism
- ISO 10423 (API 6A, 16D & 17D) compliant
- NACE MR0175 compliant metallic elements
- FEA modeling and HPHT design expertise
- Design lifetime: 10, 15, 25 years
- Quality system registered to ISO 9001:2008 AS9001/C

### Electrical Specifications

- Feedthru operational voltage: 5 to 20 KV
- Operating Current: 1.0A to 20A
- Custom designs for >20A high power feedthru
- Ambient insulation resistance: >100 TΩ @500VDC
- Insulation resistance at 200°C: >100 GΩ @500VDC
- Insulation resistance at 300°C: >5,000 MΩ @500 VDC
- Resistivity of sealing material:  $1.45 \times 10^{19}$  Ω-cm

### Header Material Options

- Inconel alloys (600, 625, 718, and X750)
- Stainless steel (SS304L, SS316L, 17-4PH, Nitronic)
- Kovar, titanium



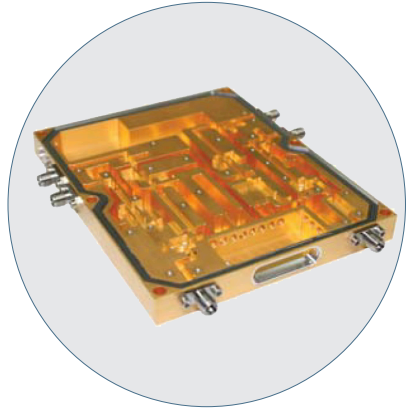
### Pin Material Options

- Inconel alloy X750, Kovar, Alloy 52
- BeCu, CrCu (high-power)
- Ti-alloy and Pt/Ir alloy (non-magnetic)
- Gold and nickel plating
- 30 AWG to 10 AWG wire sizes

### Lab Testing Service Options

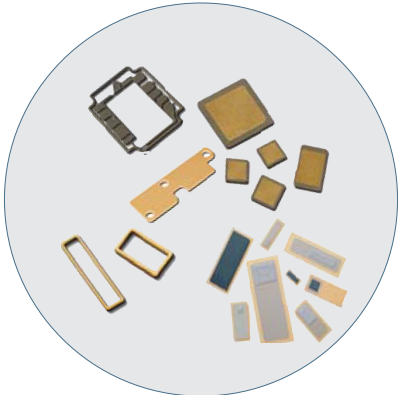
- Testing fluid: water or oil
- Feedthru testing pressure: 20, 25, 30, 35 KPSI
- Feedthru testing temperatures: 200, 260, 300°C
- Pressure shock testing: 10 cycles from 0 to Pmax
- Thermal shock testing: 10 cycles from -55°C to 200°C
- Pressure shock testing temperature: ambient and Tmax
- Testing duration at Pmax/Tmax: 24, 48, 100 hours

## OTHER PRODUCTS & SERVICES:



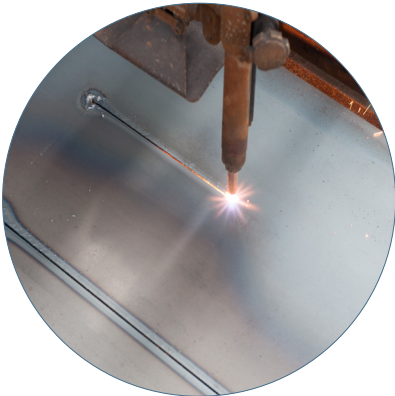
### Hermetic Electronic Packaging

We bring customers' hermetic electronic package designs to life and use unique materials and manufacturing processes to help optimize for weight savings, footprint reduction, thermal transfer and more. Our precision machining capabilities allow us to meet very tight tolerances for Kovar, aluminum and titanium housings. We deliver the standard and custom packaging solutions that ensure the electronics within those devices are unaffected by whatever extreme environmental condition they operate in.



### Enabling Components

There's more to a reliable hermetic package solution than a box and connectors and we manufacture components to ensure a module's long term viability. We produce: getters to prevent build-up of contaminants; solder preforms that aid in attaching electronic circuitry; ring frames that become integral side walls of a hermetic package; and custom thermal spreaders that ensure heat from a chip or substrate is efficiently dissipated. To top things off, we also manufacture package lids.



### Laser and Integration Services

We provide high-speed laser welding, sealing and marking with consistent accuracy. Our laser welding expertise also extends to the manufacture of custom designed/build laser welding, cutting & sealing systems for customers who wish to bring those capabilities in house.

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