Hermetic Solutions

- Air Conditioning & Refrigeration
- Industrial

Product Information

FUSITE™

About the Fusite Brand

When an application demands a robust electrical or signal connection to bridge an inert atmosphere or vacuum on one side and a high-pressure, high-temperature or corrosive condition on the other, Fusite hermetic solutions have helped our customers achieve mission success for more than 75 years.

Founded during World War II, the company introduced a one-piece hermetically sealed electrical feedthrough which provided all-weather protection to sensitive military equipment. The technology was soon adopted by the Air Conditioning and Refrigeration (AC/R) compressor industry, where the name Fusite became synonymous with the compressor's electrical feedthrough. Fusite hermetic solutions are now found in numerous applications for AC/R, processing industries, energy storage, defense, aerospace and telecommunications, to name a few.

A global brand, Fusite's manufacturing footprint includes plants in USA, Europe and Asia. In addition to sealing glass to metal, Fusite also is vertically integrated with plating, brazing, soldering and welding, as well as manufacturing of copper core conductor pins and glass.

The company employs a broad range of engineers with technical expertise in materials engineering. Engineering facilities house state-of-the-art equipment to conduct material system analysis, mechanical/electrical design and testing, thermal imaging, shock/cycle testing, burst testing and finite element analysis.

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Compressor Feedthroughs

Fusite manufactures premium glass-to-metal (GTM) hermetic seals, connectors, feedthroughs, and related components for air conditioning and refrigeration applications.

When high reliability throughout the lifecycle of a compressor or pump is needed, Fusite is one of the world's most trusted sources, ensuring consistent quality no matter what size the order.

In environments where refrigerants or other compressed materials are contained in a sealed system, our GTM hermetic feedthroughs allow a secure and reliable means to pass electrical power from an outside source to the motor inside.

We produce feedthroughs for everything from fractional 1/4 horsepower electric motors (up to 300 volts), all the way up to large 40 horsepower commercial integral motors (up to 600 volts).

Primary Applications

As a worldwide leader in glass-to-metal hermetic seals for refrigerator, freezer, and air conditioning compressor applications, Fusite manufactures hundreds of millions of compressor feedthroughs each year. Our feedthroughs are also used in vending machines, heat pumps, and other pressurized systems.

Other Application Areas

In addition to feedthroughs that meet a variety of commonly used refrigerants (such as R22, R134a, R410a), Fusite has developed products for higher pressure applications such as CO_2.

Typical Specifications

- Hermeticity: < 1 x 10^{-7} standard cc/sec helium
- Insulation resistance: > 10,000 megohm @ 500 VDC
- Dielectric voltage: Min. 2500 volts @ < 0.5 mA leakage
- Burst pressure: Typical GTM seals meet or exceed 2,250 psi pressure test, but should be verified in customer specific applications.
- Regulatory: UL Recognition

Customization

We also custom design compressor and pump feedthroughs for a variety of
applications, with specialized features such as:

- Solid pin and high-conductivity copper core pins (produced in-house by Fusite)
- Molded silicone rubber for outside electrical over-surface
- Heavy duty ceramic insulators for inside electrical over-surface
- Glass pre-forms are produced from Fusite's proprietary custom smelted glass
- Straight pin, flags, and connector block connections
- Single-pin and multi-pin configurations
- Resistance-welded and bolt-on attachment styles

Semi-Hermetic Electric Feedthroughs

Fusite offers Plate models and Power Bolts, which provide a means for compressor manufacturers to make service connections for power.

Fusite's high-amperage and power-bolt feedthroughs utilize state-of-the-art glass-to-metal (GTM) sealing technology and insulating properties to accommodate high-amperage applications.

These feedthroughs are available in single-pin or multi-pin configurations which can be directly sealed or threaded into a mounting plate.

Applications

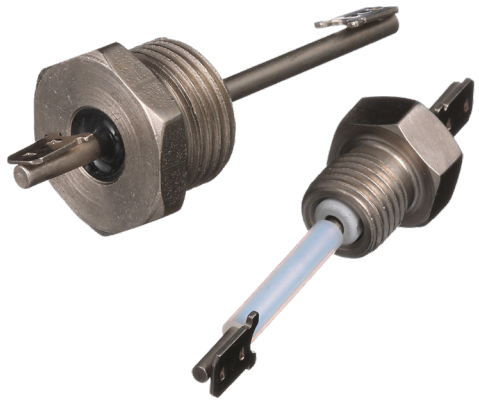
Our high-amperage feedthroughs are used in commercial air conditioners, pumps, large chillers, screw compressors, and other high-amperage applications.

Typical Specifications

- Hermeticity: < $1x10^{-7}$ standard cc/sec helium
- Insulation resistance: >10,000 megohm @ 500 VDC
- Dielectric voltage: 5000 volts @ < 0.5 mA leakage utilizing ceramic insulators or rubber over molding
- Current carrying capacity: Up to 400 A with terminal pin materials such as solid stainless, stainless with copper core, and carbon steel
- Operating pressure: Up to 1450 psi or to our customers' specification
- Regulatory: UL Recognition on select models

Single Pin Feedthroughs

For limited space conditions, Fusite offers a full range of standard single-pin feedthroughs with durable hermetic seals, with typical power and sensor applications up to 20 A continuous. Both weld-in and threaded style designs are available in various pin materials.



Typical Specifications

- Hermeticity: < 1 x 10^{-7} standard cc/sec helium
- Insulation resistance: > 10,000 megohm @ 500 VDC
- Dielectric voltage: Min. 2500 volts @ < 0.5 mA leakage
- Burst pressure: Typical GTM seals meet or exceed 2,250 psi pressure test, but should be verified in customer specific applications.
- Regulatory: UL Recognition on select models

CO_2 Compressor Feedthroughs

Because of Fusite's long history of glass-to-metal experience, we understand the complexities of CO_2 compressors, including the type of specialized materials required for this application. As GTM experts, we are able to design electrical feedthroughs for CO_2 compressors that allow for higher operating pressure required by CO_2 refrigerant.

Typical Specifications

- Hermeticity: < 1 x 10^{-7} standard cc/sec helium
- Insulation resistance: > 10,000 megohm @ 500 VDC
- Dielectric voltage: Min. 2500 volts @ < 0.5 mA leakage
- Burst pressure: Typical GTM seals meet or exceed 8,000 psi pressure test, but should be verified in customer specific applications.
- Regulatory: UL Recognition on select models

Sight Glasses

Fusite uses its leading-edge glass-to-metal (GTM) sealing process to create highly compressed seals for hermetic sight glasses that are used as windows for visual level and flow indicators in high-pressure or vacuum applications. We offer a variety of bolt-on, weld-in, and threaded configurations. Standard models include single port glasses for simple level checking and multiple port glasses for more complex systems.

Applications

Fusite sight glasses can be used to check liquid levels in pumps, compressors, or other components requiring visual level or flow checks. Typically sight glasses utilize thread and hexagon bodies for flat gasket seals, with flange-type bodies for bolt mounting for O-ring seals, and also for solder mounting and resistance welding.

Typical Specifications

- Hermeticity: <1x10^{-7} standard cc/sec helium
- Burst pressure: Up to 15,000 psi, or to our customers' specifications
- Regulatory: Recognized by global regulatory agencies (such as UL, TUV, and GL) on select models

Customization

Fusite has broad capabilities to develop customized sight glasses to meet customer-specific requirements. The customization options we offer include:

- Housing material: Low/mild carbon steel, stainless steel
- Solder mounting and resistance welding versions
- Various plating finishes: Nickel, trivalent chromate, tin
- Customized viewing areas: Recessed prism, annular/round prism, waffle prism, and clear sight
- Thread and hexagon bodies for flat gasket seals, with flange-type bodies for bolt mounting for O-ring seals

Connector Blocks

Fusite offers connector blocks, which provide a means for compressor manufacturers to make service connections for power.

Sensor Feedthroughs

Fusite's extensive glass-to-metal (GTM) experience solves the toughest of sensor feedthroughs production and performance challenges, especially in process instrument applications where there is an inert atmosphere or vacuum on one side and wide-ranging high-pressure, high-temperature, or corrosive conditions on the other.

Fusite increases sensor feedthroughs performance with its hermetic sealing capabilities that ensure enduring reliability.

Applications

Fusite hermetic sensor headers, sensor feedthroughs, and multi-pin connectors are used in a variety of process instrument applications including pressure, vacuum, flow, oil and gas, petrochemical, and thermal sensors, as well as other sensor applications.

Customization

Fusite has broad capabilities for developing customized hermetic sensor feedthroughs, headers and connectors, with these options:

- Hermetic sealing to various metals including CRS, stainless steel, high temperature alloys, copper and titanium
- Hermetic sealing of all standard materials brazed assemblies, including components such as tubes and pins
- Specialization in process development with the ability to scale up from manual low-volume assembly to fully automated high-volume production
- Expertise in custom assembly and test fixture designs
- In-house plating: Nickel and gold plating (soft and hard) to customer specifications
- Capability to test hermeticity to 1 x 10-9 std. cc/sec helium

Typical Specifications

- Hermeticity: < 1 x 10^{-8} std. cc/sec helium
- Insulation resistance: > 10,000 megohm @ 500 VDC
- Dielectric voltage: 600 volts @ < 0.5 mA leakage
- Burst Pressure: Up to 25,000 psi, depending on the application
- For any application requiring hermetic signal feedthroughs, electronic packages, or sensor housings, headers, and packaging

Pump Feedthroughs

Fusite designs and develops custom glass-to-metal (GTM) feedthroughs for use in the industrial and commercial pump industry to meet the specific application requirements of our customers. Our feedthroughs stand up to harsh environments and meet the durability and high reliability requirements of major pump OEMs around the world.

Applications

Fusite GTM feedthroughs are custom designed for various pump applications, including water pumps, slurry pumps, chemical pumps, and mixed-use pumps.

Customization

Fusite has broad capabilities to develop customized pump feedthroughs to meet customer-specific requirements. The customization options we offer include:

- Solid pin and high conducyivity copper core pins (produced in-house by Fusite)
- Molded silicone rubber for outside electrical over-surface
- Heavy duty ceramic insulators for inside electrical over-surface
- Glass pre-forms are produced from Fusite's proprietary custom smelted glass
- Straight pin, flags, and connector block connections
- Single-pin and multi-pin configurations
- Resistance-welded and bolt-on attachment styles

Typical Specifications

- Hermeticity: < 1 x 10^{-7} standard cc/sec helium
- Insulation resistance: > 10,000 megohm @ 500 VDC
- Dielectric voltage: Min. 2500 volts @ < 0.5 mA leakage
- Burst pressure: Typical GTM seals meet or exceed 2,250 psi pressure test, but should be verified in customer specific applications
- Regulatory: UL Recognition on select models

Hybrid Car Compressor Electrical Feedthroughs

Relying on 70 years of experience in manufacturing premium glass-to-metal (GTM) hermetic seals for AC/R applications, Fusite designed the first feedthrough in the world for use in hybrid electric vehicle air conditioning (AC) compressors.

We continue to provide innovative GTM products and solutions, such as electrically driven AC compressors, to most of the existing and emerging hybrid and all-electric vehicle OEMs around the globe.

Applications

Fusite GTM feedthroughs are custom designed for hybrid vehicle and all-electric vehicle AC compressors.

Customization

Fusite delivers custom designs for hybrid auto compressor customers with the following design options:

- Molded silicone rubber for outside electrical over-surface
- Heavy duty ceramic insulators for inside electrical over-surface
- Straight pin, flag or tab-style pin connections
- Resistance-welded and bolt-on attachment styles

Typical Specifications

- Hermeticity: < 1 x 10^{-7} standard cc/sec helium
- Insulation resistance: > 10,000 megohm @ 500 VDC
- Dielectric voltage: Min. 2500 volts @ < 0.5 mA leakage
- Burst pressure: Should be verified in customer specific applications.

Battery Feedthroughs

Fusite manufactures battery seals designed for extreme temperature environments and long-endurance applications. Fusite's glass-to-metal seals can also withstand the harshest corrosives.

Fusite employs specialized high-volume manufacturing processes and techniques, such as proprietary corrosion-resistant glasses, vision inspection, and vibratory assembly machinery. This provides the best overall value and highest reliability whether the requirement is for a small quantity of prototypes or millions of units.

Applications

Fusite high reliability battery seals and lids are used worldwide in aerospace power and automotive mixed-use applications, as well as military hand-held radio communications, surveillance systems, and battery back-up systems.

Customization

Fusite engineers are experts at creating custom designs to meet engineering specifications, often turning prototype drawings around in less than 24 hours. With broad and deep experience, each Fusite custom design has the highest degree of performance reliability available today.

Typical Specifications

- Hermeticity: Better than $1x10^{-8}$ cc/sec helium
- Battery seals and lids are produced with components compatible with, lithium thionyl chloride, lithium sulphur dioxide, and lithium manganese dioxide
- Standard sizes include 1/2AA through D
- Models can be either resistance or laser-welded onto a battery lid
- For any application requiring hermetic battery seals, lids, terminals, or batteries requiring lithium or silver-zinc hermetic seals
- Ability to combine pure metals, such as molybdenum used in feedthrough pins and stainless or cold-rolled steel used in battery bodies, with corrosion-resistant glass (e.g. TA-23) in battery seals and lids for the utmost in reliability, performance, and durability