Low temperature glass to metal sealing

**PRINCIPE**

Glass to metal sealing consists of producing a perfectly "hermetic" barrier between two different mediums, while allowing the passage of electric information.

The harsh environments (temperature, pressure, and vibrations) and the lifetime of the products require the use of stable materials in time.

The materials are metal (header, terminal) whilst the electrical insulator around the terminal is glass. In traditional glass to metal sealing the link between glass and metal is obtained at high temperature (> 950°C). Under these special conditions, the range of useable metallic materials is limited.

In low temperature glass to metal sealing more materials can be used.

**ADVANTAGES**

*Response to new challenges…*

Weight reduction become necessary for aeronautical and space applications. ASB Hermetics has developed new glass to metal sealing on light metal alloys (aluminum, titanium…).

*…by the introduction of new sealing methods*

This new type of sealing, realized at a lower temperature, has the same characteristics as traditional seals.

*…and new materials*

This new type of sealing, realized at a lower temperature, allows the use of materials, which, have up to now only been rarely used in seals (aluminum, titanium, brass, etc.). But it can also be used with more traditional materials (stainless steel, for example), where it has the effect of making these more mechanically effective. In traditional glass to metal seal the heat treatment reduced 50 % of mechanical characteristics of stainless. With low temperature sealing the mechanical characteristics are not changed. Thus allowing the best resistance under constraint, for example: pressure.

And all of this is possible at lower usage costs.
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**MATERIAL**

**Standard materials for low temperature sealing**

For header:
- Stainless steel (AISI 303, 304L, 316L, 321...),
- Iron-Nickel (ASTM F30, Nilo®, N48®, N52®),
- Titanium (TA6V, T40...),
- Aluminium (1050A, 2017A, 2024, 5083, 5086, 6061...),
- Brass,
- Steel (XC10F...).

For terminal:
- Iron-Nickel (ASTM F30, Nilo®, N48®, N52®),
- Iron-Cobalt (Vacon®),
- Copper (CuBe2),
- Platinum,
- Thermocouple Chromel/Alumel.

**RELIABILITY**

This sealing was internally qualified in order to compare its characteristics with traditional sealing. Many mechanical tests (vibrations, pull test of the pins...) and electrical tests (insulation in temperature) were carried out in comparison with sealing obtained at high temperature. The results show almost identical characteristics.

Qualified on many applications, this type of sealing is today offered at your service.