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glass made of ideas

Leak- and vacuum-tight.
Even in extreme heat
and cold.

GTAS® Battery Lids



Lithium-Ion Battery



Lithium-Ion Battery

New: GTAS[®] Leak-tight, Glass Sealed Lids for Lithium-Ion Battery Cells

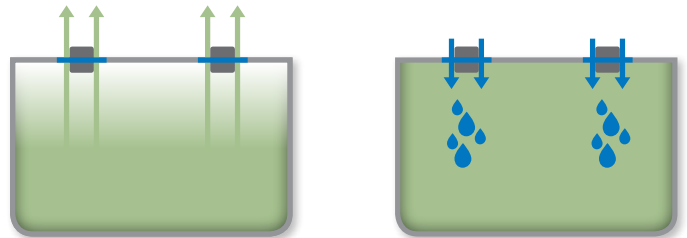
Stops moisture intrusion and electrolyte evaporation, enabling battery cells to maintain high capacity

Leakage impacts battery capacity

The industry standards for automotive batteries generally require a storage capacity of 80% or more after 10,000 charging cycles. For the EV/HEV battery to achieve this goal during a lengthy service life, OEMs and suppliers must take care of leak tightness down to the smallest battery component – the single battery cell.

Electrolytes must not leak from the battery cell (Pic. 1) and moisture should not be able to enter the cell (Pic. 2). If the battery cell is not gas-tight, not only will battery capacity decrease over the long term, but an improperly enclosed battery cell could also be damaged by the penetration of atmospheric humidity. Suppliers, manufacturers and customers would all like to minimize the capacity loss in the expensive batteries used in electric and hybrid electric vehicles.*

Aging affects polymer sealing



1 | Electrolyte Evaporation

2 | Humidity intrusion

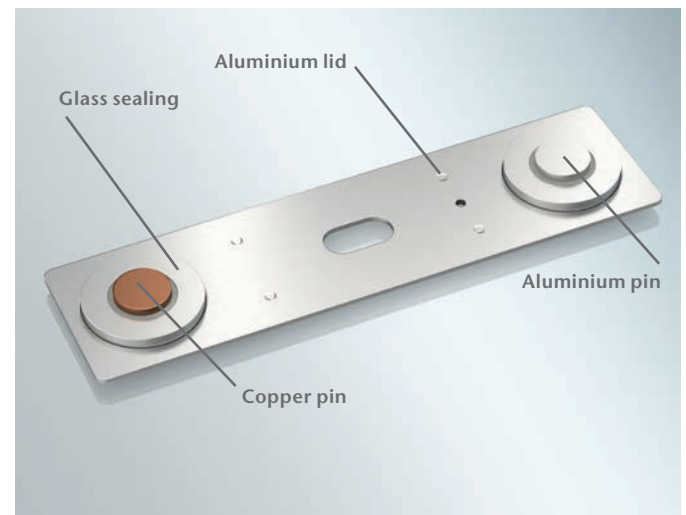
A common cause for the loss of electrolyte is evaporation via the polymer sealing of the battery terminals.

Polymers as all organic materials are affected by aging processes and thus can become brittle and lose their gas-tightness over time.

GTAS[®] Battery Cell Lids

are newly developed to eliminate the loss of electrolyte and moisture intrusion into lithium-ion battery cells by employing a special glass seal for the battery terminals, replacing the organic sealing material.

As a result the battery terminals are hermetically sealed into the aluminium lid (GTAS: glass-to-aluminium seals) and thus protect the battery cell from moisture intrusion or electrolyte evaporation via the pin sealing.



Glass-to-metal sealing remains gas-tight, a proven mass market lid technology

A preferred solution typically used for electronic or electro-chemical components is the sealing of pins with inorganic, non-aging materials like glass. This is commonly called a Glass-to-Metal Seal (GTMS) and is used in combination with materials like steel, kovar and others. Glass-to-metal sealing is a standard packaging technology for many mass market components like automotive sensors, quartz oscillators and battery caps for Lithium-Thionyl Batteries.



Standard glass-to-metal seals for millions of Lithium-Thionyl Batteries

*Source: <http://advancedmanufacturing.org/testing-ev-batteries/> June 8, 2017 by Bill Koenig – Senior Editor



Product Advantages

- Simplified lid design
- High temperature resistance, from -40°C to more than +125°C
- Electrolyte resistant glass sealing prevents humidity penetration into the cell housing
- Elimination of electrolyte leakage via the pin sealing
- Improved battery safety due to gas-tight cell housing
- Depending on cell design, the battery can maintain higher capacitance and longer shelf life

Product Features

No additional ceramic isolator needed!

Specifications	
Electrical isolation	Small designs: $10^8 \Omega$ to $10^9 \Omega$ Large designs: $10^7 \Omega$ to $10^8 \Omega$
Chemical resistance	High against range of standard electrolytes
Temperature resistance	High (from -40°C to + 125°C and more)
Pressure tightness	High, > 10 bar for the glass-to-aluminium seal
Mechanical strength	High, depending on dimension even very high
Sealing material	SCHOTT glass
Pins	Aluminium, Copper
Lid	Aluminium
Lifetime	15 years

Applications

Today, all lithium-ion battery cell types are under intensive development for new application fields such as electric vehicles, e-Bus, renewable energy storage and many more. These new application fields pose new technical requirements to battery cells demanding higher or longer lasting performance. GTAS leak-tight Battery Cell Lids can enable small and large battery designs to fulfill these new requirements.



EV/ HEV



E-Bus



Renewable Energy

About SCHOTT

For more than 130 years, the international technology group SCHOTT has been developing and manufacturing special glasses and materials as well as components and systems to improve people's lives. About 15,000 employees around the world are committed each day to the needs of our customers. As a business unit of SCHOTT, Electronic Packaging (EP) manufactures hermetic housings and other components for the reliable, long-term protection of sensitive electronics. SCHOTT has experience in glass-to-metal sealing technology since 1939 and is a world leader in hermetic packaging of high volume automotive electronics such as airbag inflator headers, sensor housings and battery seals.



SCHOTT AG
Christoph-Dorner-Strasse 29
84028 Landshut
Germany
Phone: +49 (0)871/826-702
Fax: +49 (0)3641 28889-090
epackaging@schott.com
www.schott.com/epackaging

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