Sodium Resistant Sealing Glasses

Product Information

SCHOTT offers sealing glasses that were specially developed for the hermetic sealing and joining of ceramics and/or metals to be used in highly corrosive environments, such as molten sodium batteries. These batteries operate at high temperatures above 300°C, where sodium and nickel chloride or sulfur are in a liquid state. In this highly challenging application, the long-term stability of the sealing glass is decisive for the overall product lifetime.

Advantages of SCHOTT's sodium resistant sealing glasses

- **High chemical resistivity under both anodic and cathodic environments**
  Unlike other battery sealing glasses that have optimized chemical resistance for either electrode, SCHOTT's sealing glasses were specially developed to resist both of these highly corrosive environments

- **Reliable, long-term stability of the hermetic glass seal** even after many thermal cycles
  - CTE matched with ceramics such as α-Al_2O_3 as well as sodium-ion conducting ceramics such as β- and β''-Al_2O_3 and NaSICON
  - Compression sealing with stainless steels and nickel alloys

Applications

Sodium resistant sealing glasses are suitable for use in corrosive sodium environments (vapors and melts):

As hermetic seals for
- Sealing of battery components: $Na/NiCl_2$-type (ZEBRA); Na/S-type
- Sealing of membranes

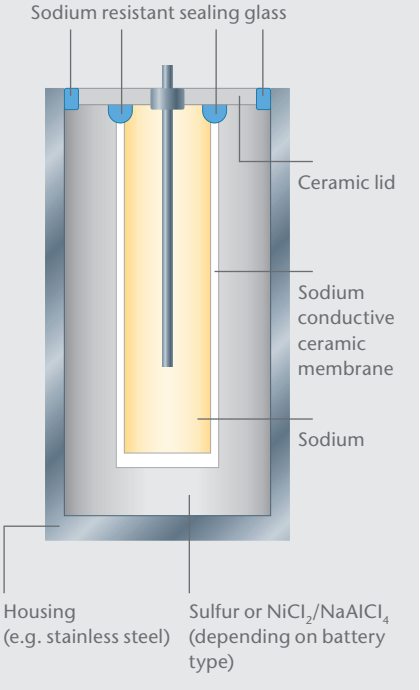
As sensor feedthroughs in
- Sodium production (chemical industry)
- Rapid breeder technology (sodium cooled nuclear reactors)

Supply Form

Sealants are available in powder, paste and preform formats.

Technical Details

SCHOTT Glass Code	8436	8245	8455	G018-402
Description	Sodium vapor resistant sealing glasses	Molten sodium resistant sealing glass	Molten sodium resistant sealing glass	Molten sodium resistant sealing glass
Tg	624 °C	505 °C	565 °C	488 °C
CTE (20-300 °C)	6.5 10^{-6} K^{-1}	5.2 10^{-6} K^{-1}	6.7 10^{-6} K^{-1}	6.6 10^{-6} K^{-1}
Sealing temperature	920 °C	1.040 °C	1.030 °C	960 °C
Compositional range in weight-%				
SiO_2	50-70	60-75	50-70	40-50
B_2O_3	5-10	10-20	10-20	>25-30
Al_2O_3	1-5	5-10	5-10	17-25
Na_2O	5-10	5-10	10-20	5-15
MO (MgO + CaO + SrO + BaO)	10-25	–	1-5	<2
Others	10-20	1-5	1-5	free of ZrO_2
				ZnO 0-5
				TiO_2 0-5
				SnO_2 0-5



Other sodium-resistant sealing glasses covering the CTE range of 5.5 to 8.5 10^{-6} K^{-1} available upon request. Optionally up to 30 Vol.% of an oxidic filler may be added to adapt the properties.

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