

# 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  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> as well as sodium-ion conducting ceramics such as  $\beta$ - and  $\beta''$ -Al<sub>2</sub>O<sub>3</sub> and NaSICON
  - Compression sealing with stainless steels and nickel alloys

## 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 <sup>-6</sup> K <sup>-1</sup>	5.2 10 <sup>-6</sup> K <sup>-1</sup>	6.7 10 <sup>-6</sup> K <sup>-1</sup>	6.6 10 <sup>-6</sup> K <sup>-1</sup>
Sealing temperature	920 °C	1.040 °C	1.030 °C	960 °C
Compositional range in weight-%				
SiO <sub>2</sub>	50-70	60-75	50-70	40-50
B <sub>2</sub> O <sub>3</sub>	5-10	10-20	10-20	>25-30
Al <sub>2</sub> O <sub>3</sub>	1-5	5-10	5-10	17-25
Na <sub>2</sub> O	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 <sub>2</sub> ZnO 0-5 TiO <sub>2</sub> 0-5 SnO <sub>2</sub> 0-5

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

## Applications

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

As hermetic seals for

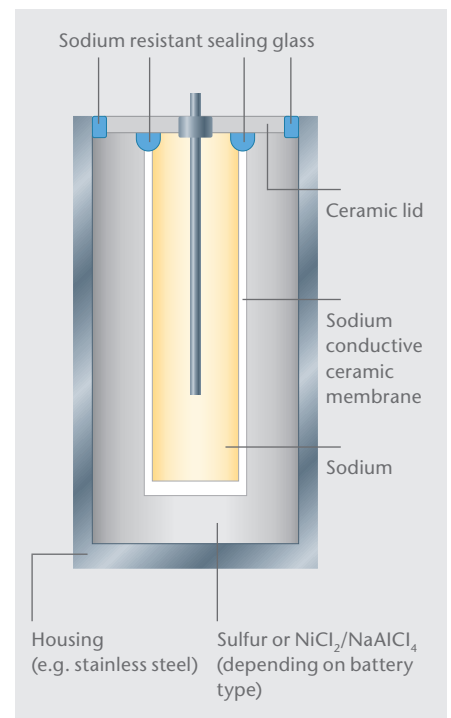
- Sealing of battery components:  
Na/NiCl<sub>2</sub>-type (ZEBRA); Na/S-type
- Sealing of membranes

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.



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 glass made of ideas