News Release

GLASS FOR FUTURE
Nippon Electric Glass

April 20, 2021

Nippon Electric Glass Co., Ltd.

Cap Lids with the World's Highest Light Extraction Efficiency are Developed and Commercialized

—Ideal for UV-C LED devices used for sterilization and virus inactivation —

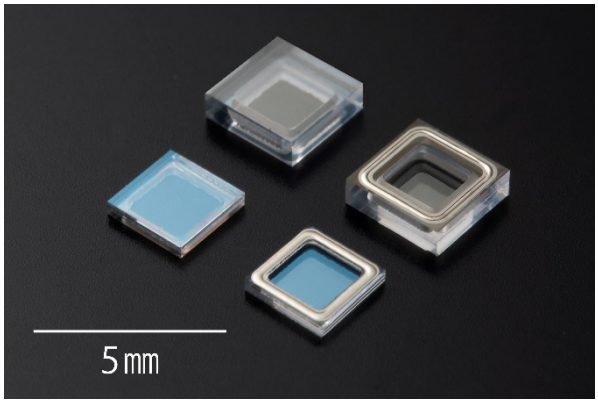
Nippon Electric Glass Co., Ltd. (Head Office: Otsu, Shiga, Japan, President: Motoharu Matsumoto) developed and commercialized two types of cap lids: a square lid (box-shaped lid) for UV-C (*1) LEDs with the world's highest light extraction efficiency (*2) and a domed lid (bowl-shaped lid) for UV-C LEDs with the world's highest light extraction efficiency and a wider light distribution angle. The company has started supplying samples.

The square lid developed is integrated with gold-tin (AuSn) solder for sealing a substrate, to which the necessary AR (anti-reflection) coating is applied. It achieved a light extraction efficiency of 96%, which exceeds that of conventional quartz glass cap lids. On the other hand, the domed lid is a cap lid that is made by processing UV-C high-transmitting glass into a dome (hemispherical) shape and integrating gold-tin solder for sealing a substrate onto the flange. It achieved a light extraction efficiency of 93% and a wide light distribution angle.

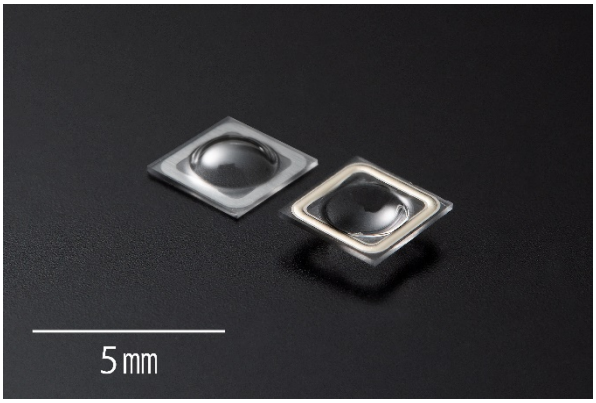
There are high hopes for UV-C LEDs in sterilization and virus inactivation. Many manufacturers have been trying to increase the power of LEDs, but the power remains at less than one-hundredth of that of mercury lamps. For this reason, lids used for UV-C LEDs are required to have improved light extraction efficiency, and lids for high-power LEDs are shifting from a structure to which flat glass is attached to a cap shape with excellent light extraction efficiency.

By supplying the two types of cap lids developed to the market, the company will contribute to the improvement in performance of UV-C LEDs and the realization of mass production.

<Product photo>



Square lid with sealing material



Domed lid with sealing material

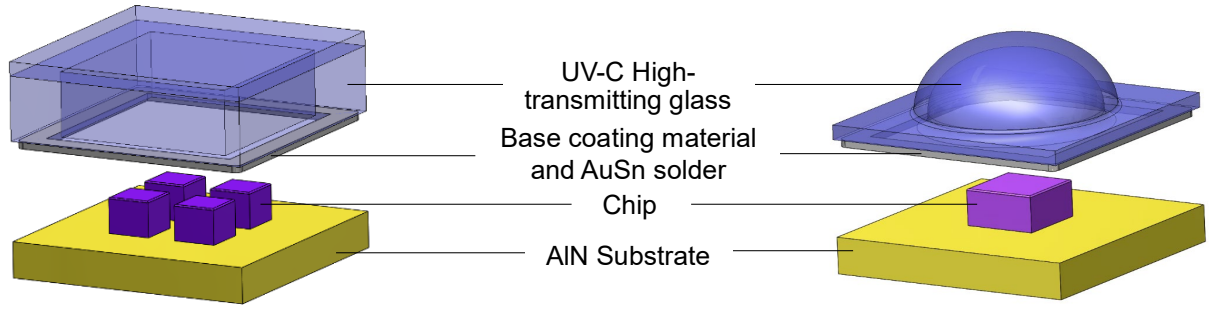
<Lids with sealing material: Lineup and characteristics>

Product name	Square Lid	Domed Lid	(Existing product) Flat Lid
Glass	UV-C high-transmitting glass	UV-C high-transmitting glass	UV-C high-transmitting glass
UV-C AR coating	Double-sided	None *3	Double-sided
Type	High-power type	Light diffusion type	Thin type
Light extraction efficiency	**96%**	93%	< 90%
Light distribution angle	110°	**120°**	100°
Features	• World's highest light extraction efficiency Ideal for high-power UV-C LEDs • Ideal for thinning the entire package	• Wider light distribution angle than square type • World's highest light extraction efficiency of domed type • Compatible with dome diameters of 2.4 to 60 mm • High productivity	• Plate shape suitable for cavity type AlN packages • Ideal for thinning the entire package
	• Prevention of damage after sealing with the base coating (*4) • Any metal solder can be formed		

<Image>

Square lid with sealing material

Domed lid with sealing material



*1: Ultraviolet rays with a wavelength of 100 to 280 nm

*2: Measured wavelength 280 nm, single LED chip, according to Nippon Electric Glass

*3: UV-C AR coating products currently under development

*4: Refer to “Develops and Commercializes “Lid with Sealing Material” for Packages of Optical Devices” (released on January 13, 2021)