

## Flexible UV Reflector LUXAL<sup>®</sup>-UV

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### 【1. Introduction】

Studies of sterilization technologies have increased in importance due to public health concerns. UV sterilization, proven effective against germs and viruses, is proposed for sterilizing surfaces, air, and water. Along with this trend, highly reflective UV reflectors are in demand to maximize UV sterilization efficiency.

Aluminum has the highest UV reflection of all metals, is lightweight, and is exceptional in processability and recyclability. Aluminum foil, for its flexibility, makes it an ideal material for UV reflectors.

LUXAL-UV has been developed to enhance UV reflectance, based on the smooth-surface aluminum foil known as LUXAL. The following sections will detail the remarkable qualities of LUXAL-UV, as well as showcase examples of its further processing for various applications.

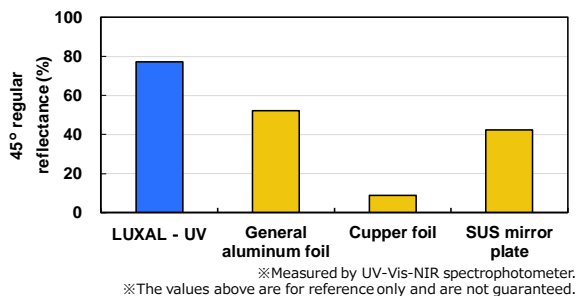


Fig. 1 Regular reflectance at 254nm.

### 【2. Advantages】

#### 〔2 - 1〕 Highly Reflective

Fig. 1 shows the regular reflectance at a wavelength of 254 nm. LUXAL-UV, having a smooth surface ( $R_a < 10$  nm), surpasses general aluminum foil and SUS mirror plate by 1.5 and 1.8 times, respectively.

#### 〔2 - 2〕 Stable and Reliable

Reflectors must maintain UV reflectance in real-world conditions, including heat and humidity. The reliability testing shown in Fig. 2 proves its retention of over 90% original regular reflectance value even after 12,500 hours of high temperature (200°C) and high temperature and humidity (60°C and 90%) exposure.

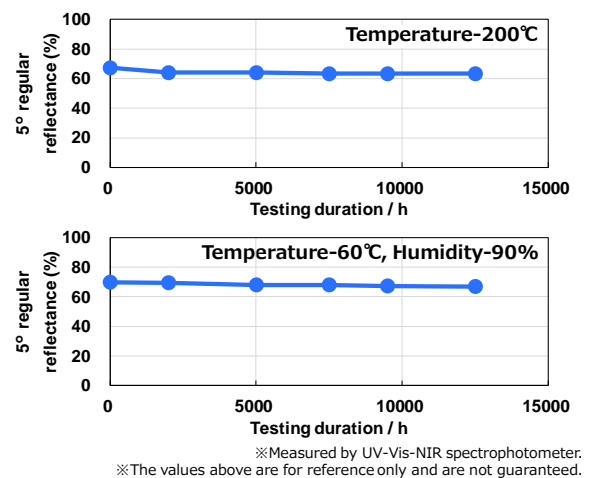


Fig. 2 Results of the reliability testing for 12,500h.

The surface SEM image of LUXAL-UV, after a 2,000-hour reliability test, showed no signs of surface degeneration such as corrosion and maintained its original condition as shown in Fig. 3.

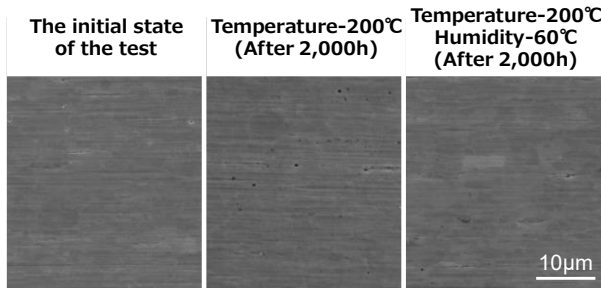


Fig. 3 Surface after 2,000h of the reliability testing.

### [2 - 3] Flexible and Bendable

LUXAL-UV, a single aluminum layer foil without an anodic oxide film or vapor deposition layer, eliminates the risk of surface cracking during bending and forming, a common issue with thicker reflective products. With a thickness of 0.03-0.2 mm, it offers the flexibility to bend sharply and form into small shapes while maintaining high reflectance.

### [2 - 4] Available in Rolls

Our technology produces highly reflective products through a roll-to-roll process, resulting in a readily available supply of rolls.

### [3. Additional Processing]

These advantages allow processing without loss of reflectance depending on the target application. Below are some examples.

- Protective film
- Adhesive layer granting
- Inorganic water-resistant coating (Fig. 4)
- Bending and forming (Fig. 5)
- [Currently in the works] Innovative draw forming technology, designed for use as a UV-LED reflector (Fig. 6)

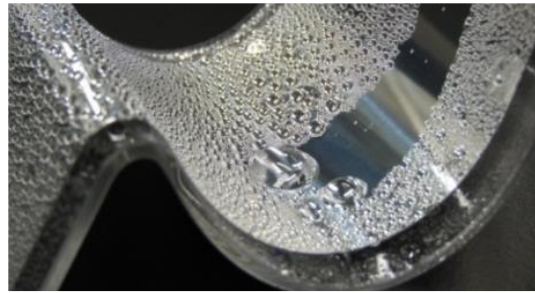


Fig. 4 Inorganic water-resistant coating.

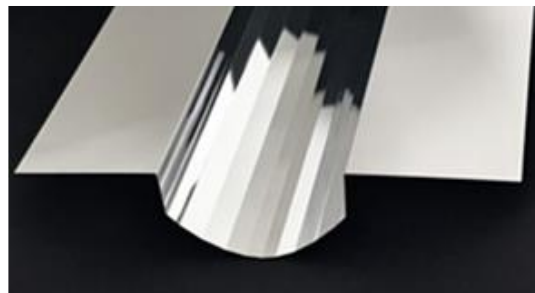


Fig. 5 Bending and forming.

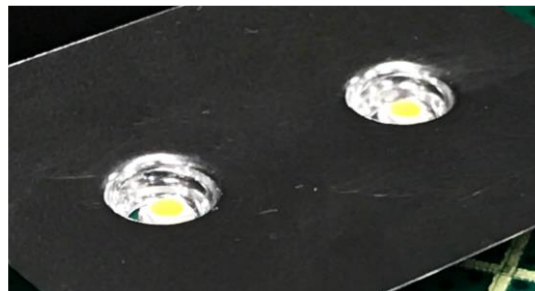


Fig. 6 Draw forming technology for use as a UV-LED reflector.

### [4. Future Prospects]

LUXAL-UV, made utilizing the inherent ability of aluminum, is a unique aluminum foil, ideal for UV reflectors due to its high reflectance, flexibility, and reliability. And it's available in rolls. Its superior performance sets it apart from other products on the market.

We're working on the new processing technology of this foil, as well as the development of the diffuse-reflective version of it. Our aim is to support public hygiene through UV sterilization.