

Low Outgassing Wire for In-vehicle LED Lamp “IRRAX B (K)”

1. Outline

Conventionally, halogen lamps have been used for automotive headlamps and rear lamps. Recently, however, LED lamps have been increasingly used due to their long service life, low power consumption, and quickness to attain maximum brightness.

Regarding the internal structure of in-vehicle LED lamps, an LED lamp and a driver module are built into the housing, as shown in Fig. 1. Automotive low-voltage electric wires are used for the wiring.

Electric wires used in LED lamps must have anti-fogging characteristics to prevent fogging of the glass over long-term use. However, the electric wire covering causes fogging of the glass due to outgassing after a long period of use.

Thus, the electric wire covering used for wiring in LED lamps must have low outgassing properties.

This paper introduces our newly developed insulation material with low outgassing properties derived from our proprietary blending technology.

2. Features

Automotive halogen lamps are not hermetically sealed because it is necessary to be able to replace the lamps. Thus, low outgassing properties were not required.

Meanwhile, LED lamps can be hermetically sealed because they do not need to be replaced. Thus, low outgassing properties are required.

Various additives, including flame retardants and anti-oxidants, are added to ordinary insulation covering for in-vehicle electric wires to meet the evaluation standards required for in-vehicle electric wires.

However, after a long period of use, such additives are deposited from inside the resin and evaporate, resulting in outgassing. The newly developed IRRAX B (K) electric wires for in-vehicle LEDs have succeeded in suppressing deposition of additives and achieving low outgassing properties by taking full advantage of our proprietary blending technology.

An anti-fogging test specified in ISO 6452 is used as a method of evaluating the low outgassing properties.

As shown in Fig. 2, a test sample was placed in a beaker and was covered by a glass plate and cooling plate. After heating for a long time by a heater, the HAZE value, which indicates the degree of fogging of a glass plate, was measured.

Compared to AESSX in-vehicle low-voltage electric wires, which are conventionally used for the wiring of halogen lamps, IRRAX B (K) wires have succeeded in reducing the HAZE value to about one fifth.

The newly developed IRRAX B (K) wires have achieved low cost compared to conventional products through measures to improve productivity. As automated driving comes into widespread use, sensors, including LiDAR, are

likely to be built into the LED lamps. IRRAX B (K) is expected to be used for their wiring.

• IRRAX is a trademark or registered trademark of Sumitomo Electric Industries, Ltd.

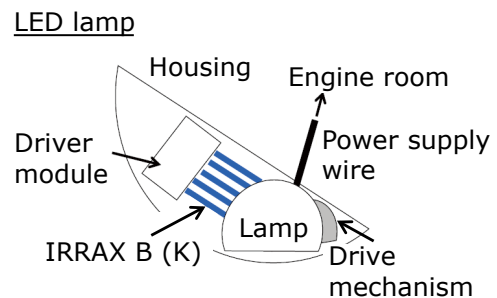


Fig. 1. Internal structure of an in-vehicle LED lamp

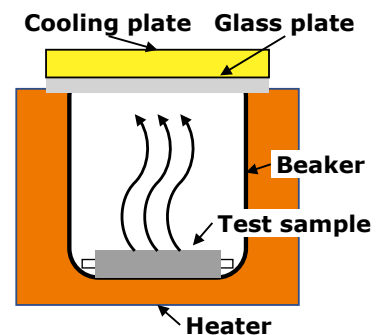


Fig. 2. Anti-fogging test (in conformity with ISO 6452)

Table 1. Product specifications

Size	0.3SQ	0.5SQ
Heat-resistant temperature	120°C	120°C
Conductor	Tinned annealed copper	Tinned annealed copper
Diameter of conductor	0.75 mm	1.0 mm
Outer diameter	1.4 mm	1.6 mm