

6. Building Solutions

6.1 Delivery of Ultra-High-Capacity High-Speed Elevators to Azabudai Hills Mori JP Tower



Courtesy: PIXTA

Azabudai Hills Mori JP Tower



Structural model of double-deck elevator

Ultra-large-capacity high-speed elevators delivered to Azabudai Hills Mori JP Tower

Toshiba Elevator and Building Systems Corporation delivered a total of 50 elevators, including eight ultra-high-capacity high-speed double-deck elevators, to Azabudai Hills Mori JP Tower^(*), which opened in November 2023. The double-deck elevators have a rated speed of 360 m/min and shuttle between the entrance lobby and the sky lobbies on the 33rd and 34th floors. With a total loading capacity of 4 500 kg, each cabin of the double-deck car has a capacity of 34 passengers, contributing to efficient passenger transportation in the building.

The double-deck elevators in Azabudai Hills Mori JP Tower are our first elevators to be equipped with an automatic diagnostic and recovery function, which restores temporary service following an earthquake if no abnormalities are detected.

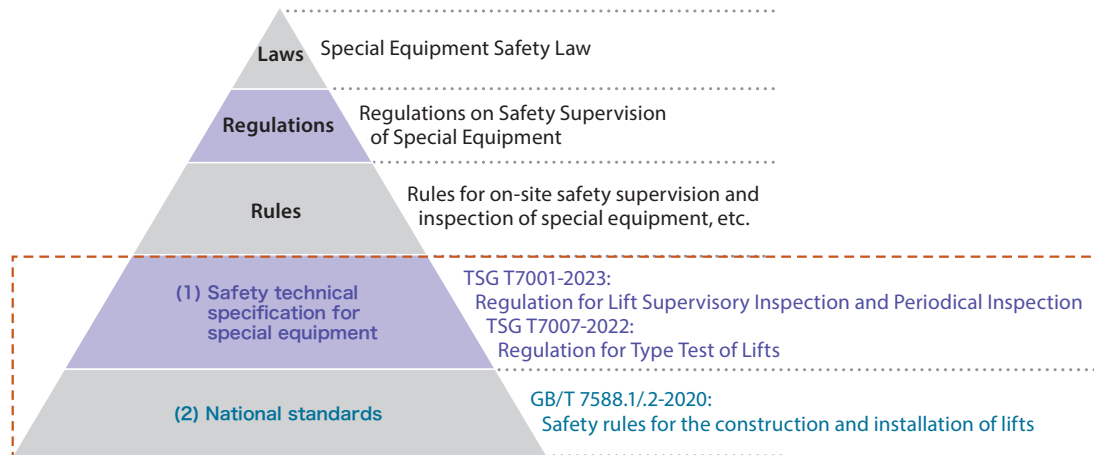
To address the challenges of installing elevators in high-rise buildings, we implemented measures for mitigating the effects of strong winds and earthquakes on elevator banks serving high floors, including wire rope isolators to dampen car vibrations caused by building sway and a long-object sway control function for moving the elevator cage to a position with minimal rope sway in the event of an earthquake.

In addition, we adopted a PC-based monitoring system with the capability to analyze elevator operating data, which enables the utilization of passenger flow data.

(*) The Azabudai Hills Mori JP Tower is a mixed-use complex in Minato City, Tokyo developed by Mori Building Co., Ltd.

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6.2 Elevators Compliant with Chinese Regulations



TSG: Safety technical specifications for special equipment
EL: Elevators
ES: Escalators
GB: National Standards of the People's Republic of China

Elevator regulations in China

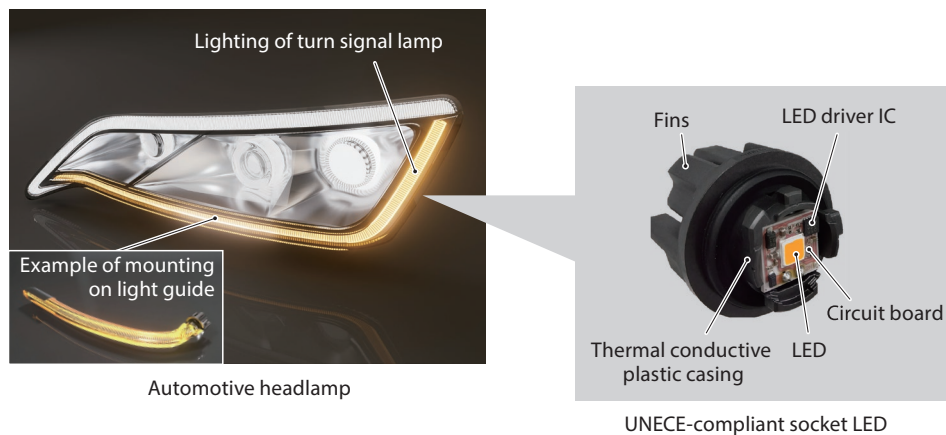
Many countries revise safety regulations periodically to enhance elevator safety, and Toshiba Elevator and Building Systems Corporation has developed elevators compliant with the latest Chinese regulations which were revised for the first time in six years, later commencing mass production.

The revised regulations fall into two main categories:

- (1) Safety technical specifications for special equipment (mandatory): These specifications stipulate the safety requirements for products manufactured and sold in China. They also serve as the criteria for inspections conducted by China's administrative agencies before elevator usage is permitted. The revision includes new requirements for the prevention of elevator overspeeding due to simultaneous failure of two brakes. Conventionally, elevators have been equipped with two independent brakes so if one fails, the other can stop the elevator. Our new elevators incorporate an upgraded inverter circuit to support regenerative motor braking for overspeed prevention.
- (2) National standards (recommended): The National Standards of the People's Republic of China are equivalent to the European EN regulations and prioritize safety measures for users and maintenance personnel. The revision introduced additional requirements, including improved door strength, protection of rotating parts and charging components, and consideration of electromagnetic compatibility (EMC). Our new elevators incorporate noise mitigation measures to comply with the new EMC requirement.

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6.3 Socket LED for UNECE-compliant Automotive Turn Signal Lamps



Socket LEDs mounted on automotive headlamp unit and turn signal lamp

Socket light-emitting diodes (LEDs) are increasingly used as exterior automotive light sources. Specifications for socket LEDs are being standardized mainly in Europe based on the United Nations Economic Commission for Europe (UNECE) regulations^(*).

Toshiba Lighting & Technology Corporation developed and commenced mass production of LED light sources for brake and tail lamps in 2021. In addition, we have now developed a socket LED for turn signal lamps to expand our product lineup, considering that UNECE-compatible light sources will become mainstream both in Japan and abroad. The new socket LED satisfies the optical and electrical requirements stipulated by the UNECE regulations. In addition, while meeting the dimensional requirements, the heat dissipation structure and circuit configuration are designed to reduce the size and weight of automotive lamps. The heat dissipation structure of the lamp chassis uses a thermally conductive plastic with excellent thermal properties, and a metal piece is inserted between the heat source LED and chassis fins to further increase heat dissipation efficiency. The lamp board circuit is configured with an LED driver integrated circuit (IC) that integrates the functions for controlling the current to the LED in response to ambient temperature and input voltage fluctuations, reducing the number of mounted parts.

We have decided to use the new socket LED for automotive headlamps, commencing mass production in August 2023.

(*) Unified regulations relating to the safety and environmental performance of vehicle structures and equipment stipulated by the UNECE