Hitachi Metals Newly Develops a LAN Cable for Rolling Stocks Compliant with European Norm

Hitachi Metals, Ltd. is pleased to announce the new development of a high-speed Category-7 Ethernet[1] cable (Cat.7 LAN cable) "CO-IREE-SB C7E(X)," which is compliant with the European railway fire safety standard, EN[2]45545-2. Hitachi Metals is keen to offer a range of wires and cables that will provide the optimum solutions to increased worldwide demand caused by wider usage of Ethernet cables for rolling-stock electronic devices and Internet access service for passengers.

1. Background

Hitachi Metals manufactures and sells a range of electrical wires, cables, and related materials for various uses—including within rolling stock. The stable quality of our products is recognized and appreciated by our diverse range of customers.

The functionality of rolling stock has been greatly enhanced in recent years, including widening use of Ethernet cables through advancing train vehicle electronics and increasing demand for on-board Internet access from passengers. This in turn pushes up the data volume transmitted during train operations, requiring rolling stock telecommunication cables to offer ever higher performance.

2. Outline

Cables for use in rolling stock must satisfy the fire safety requirements as specified in the applicable fire safety standards, and must pass a set of fire tests that measure flame-resistance, smoke generation, and toxicity. Utilizing our exclusive fire safety design technologies for rolling stock electrical wiring that Hitachi Metals has developed over the years, we have now launched CO-IREE-SB C7E(X), a rolling stock Cat.7 LAN cable. The unique cable structure and our exclusive highly flame-retardant halogen-free outer sheath enabled us to realize a product that can simultaneously deliver both high-performance electrical characteristics and European railway fire safety.

Photo: CO-IREE-SB C7E(X), Cat.7 LAN cable for rolling stock use

■ Features of CO-IREE-SB C7E(X)

(1) Insulator
Micro foam technology[3] and multilayer extrusion technology successfully reduced dielectric properties and use of flammable insulation materials.

(2) Shielding tape
Our unique taping method shields electromagnetic interference, ensuring the electrical characteristics and high bandwidth of up to 600 MHz required by a Cat.7 LAN cable.

(3) Outer sheath material
Adoption of a highly flame-retardant halogen-free material exclusively developed by Hitachi Metals in the cable outer sheath satisfies fire safety standards, including the low smoke generation and low toxicity required by EN45545-2.

The introduction of CO-IREE-SB C7E(X) to our product lineup will help Hitachi Metals to respond to customer demand in Europe and Asia for higher performance in cables and wiring for use in rolling stock.

Hitachi Metals will continue to focus on the development of new materials and on contributing to the technological advancement of train vehicles through our solution technologies that target the range of challenges faced by our customers.

3. Production Location

Hitachi Metals Ltd., Ibaraki Works

4. Patent
Application pending

For inquiries from the press: Corporate Communications Office, Hitachi Metals, Ltd.   hmcc.sa@hitachi-metals.com

〈Supplements〉

■ Structure of Cat.7 LAN cable for rolling stocks

Item	CO-IREE-SB C7E(X)
Wire conductor size	24AWG
Insulator outer diameter	Nominal 1.4 mm
Number of pairs	4
Cable outer diameter	Nominal 8.6 mm

■ Transmission speed and bandwidth of the LAN cable (Benchmarks)

Item	Cat.5E (2P)	Cat.7 (4P)
Maximum transmission speed	100 Mbps	10 Gbps
Bandwidth	100 MHz	600 MHz

■ European railway fire safety standard (EN45545-2)

Test item	Threshold
Test for vertical flame propagation for a single cable	Burned part ≤ 540 mm Unburned part > 50 mm
Test for vertical flame spread of vertically-mounted bunched cables	Burned part ≤ 2.5 m
Smoke density	Light transmittance ≥ 70%
Toxicity	Toxicity index ≤ 6

*1	Ethernet	Ethernet is a registered trademark of Xerox Corporation. A computer network protocol widely used in wired local area networks (LANs) commonly used in offices and households across the world. It is designed to deliver efficient communications among numerous computers connected by LANs.
*2	EN	Abbreviation of "European Norm," which specifies standards for products, services, and systems in the European market.
*3	Micro foam technology	A method to expand a melted thermoplastic resin with vast numbers of micro bubbles generated by a sudden pressure reduction after melting a large volume of foaming agent into the resin in a high-pressure environment.