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Development of Ink that Detects Temperature Aberration for Safe and Reliable Quality Management

Field tests begin for application in supply chain quality management such as IoT-based cold chains(1)

Tokyo, June 27, 2017 --- Hitachi, Ltd. (TSE: 6501, Hitachi) today announced the development of a new ink that detects and changes color when an aberration occurs in controlled temperature environments, to contribute to even greater safety and reliability in product quality management.

The ink has a property of changing color as a result of temperature change, and is able to detect when the ambient temperature exceeds the upper or lower limit set for each product. This process is irreversible, and so even if the temperature returns to the normal range, the ink color will not change back to its original color. Using this ink together with IoT technology, uninterrupted temperature monitoring of products such as fresh foods and medical supplies can be conducted throughout the entire supply chain, from production to consumption.

Until now, temperature management of products in cold chains(1) has been carried out on a truck-by-truck or by-container basis, with expensive data loggers and devices such as RFID(2) sensor-attached recorders, making it difficult to manage on a product-by-product basis. In the US and Europe, however, regulations relating to temperature control of fresh foods, medical supplies and other products, have become increasingly strict, thus requiring greater attention at the individual product level from production through to consumption.

To realize consistent temperature management of individual products from production through to consumption, Hitachi has begun field tests with customers by integrating the use of this ink with IoT technology. Using a smartphone to capture an image of a temperature detection code created by combining this ink with the product ID number, it is possible to obtain information such as storage temperature of the product, time and place (Figure 1), thus enabling greater temperature management at a lower cost. Moving forward, Hitachi will accelerate this effort with the aim of realizing a distribution service providing consistent quality control from production through to consumption. This business will be developed through collaborative creation within the Hitachi Group, with Hitachi Industrial Equipment Systems Co., Ltd. who has a business in marking systems, commercializing this ink for industrial printers for individual products.

(1) A distribution method that continuously maintains products such as fresh foods and medical supplies at low temperature throughout the supply chains, from production, transport through to consumption.

(2) Radio Frequency Identification: Non-contact automatic identification technology that uses radio frequency to read information from a card-shaped media with an embedded IC and antenna, such as a tag.

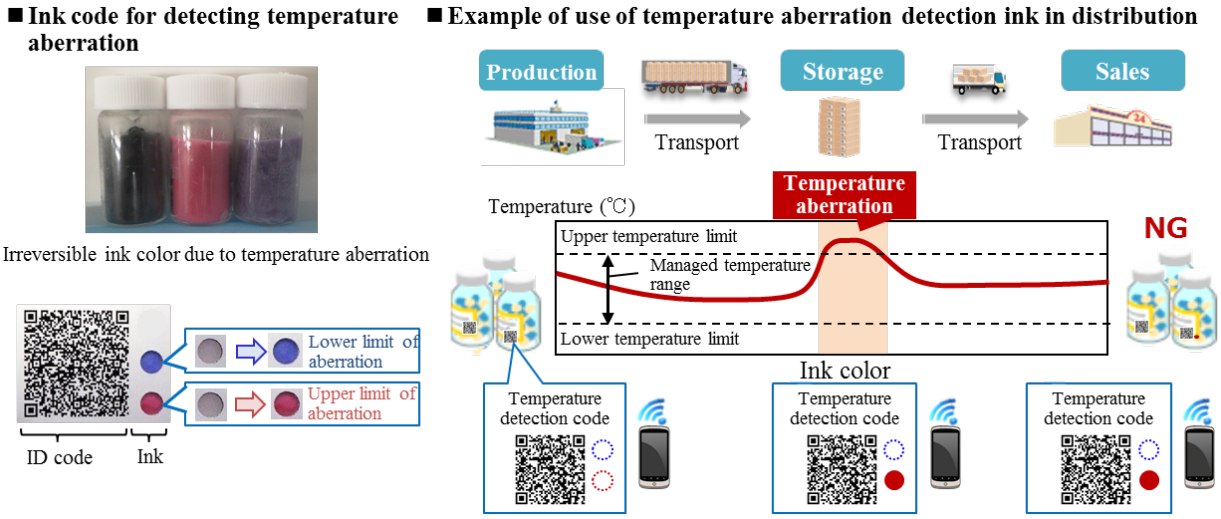

Figure 1. Example use of this aberration-detecting ink in distribution

About Hitachi, Ltd.

Hitachi, Ltd. (TSE: 6501), headquartered in Tokyo, Japan, delivers innovations that answer society's challenges. The company's consolidated revenues for fiscal 2016 (ended March 31, 2017) totaled 9,162.2 billion yen ($81.8 billion). The Hitachi Group is a global leader in the Social Innovation Business, and it has approximately 304,000 employees worldwide. Through collaborative creation, Hitachi is providing solutions to customers in a broad range of sectors, including Power / Energy, Industry / Distribution / Water, Urban Development, and Finance / Government & Public / Healthcare. For more information on Hitachi, please visit the company's website at http://www.hitachi.com.

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