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Contacts:

Hitachi, Ltd.

Japan: Masayoshi Yamaji
Hitachi, Ltd.
+81-3-5208-9324
masayoshi.yamaji.ca@hitachi.com

U.S.: Mickey Takeuchi
Hitachi America, Ltd.
+1-914-333-2987
masayuki.takeuchi@hal.hitachi.com

Hitachi High-Technologies Corporation

Katsuhiro Akita,
Aiko Matsumoto
Hitachi High-Technologies Corporation
+81-3-3504-3258
akita-katsuhiro@nst.hitachi-hitec.com
matsumoto-aiko@nst.hitachi-hitec.com

Hitachi and Hitachi High-Tech Receive IEEE Milestone for "First Practical Field Emission Microscope, 1972"

Hitachi Pioneered Development of the World's First Practical FE-SEM:
the HFS-2 Model (Launched 1972)

Tokyo, January 31, 2012 – Hitachi, Ltd. (NYSE:HIT / TSE: 6501, Hitachi) and Hitachi High-Technologies Corporation (TSE: 8036, Hitachi High-Tech) today announced they had received the IEEE Milestone for Hitachi's pioneering development of the world's "First Practical Field Emission Electron Microscope, 1972" from the IEEE[1], the world's largest professional association in the electrical, electronics, information and communications engineering fields.

Established in 1983, the IEEE Milestone honors historical technical achievements from among innovations in the electrical, electronics, information and communications engineering fields that have contributed substantially to the advancement of industry and society. The IEEE Milestone is awarded only after at least 25 years have passed since development.

Hitachi created a practical field emission (FE) electron beam source together with the late Dr. Albert Crewe (former professor of the University of Chicago), the original developer in 1968. Subsequently in 1972, Hitachi installed the FE electron beam source in a scanning electron microscope (SEM), marking the successful development of the HFS-2 model, the world's first commercial FE-SEM[2]. The HFS-2 model could be easily operated to observe stable and reliable ultra-high resolution images. Thereafter, Hitachi applied this technology to the development of a Critical Dimension (CD)-SEM model used for process control in semiconductor manufacturing lines, which contributed to the miniaturization of semiconductor devices at the time. At the same time, Hitachi contributed to the advancement of the healthcare and biotechnology fields through such achievements as the world's first observation of an SEM image of the AIDS virus using Hitachi's FE-SEM. Furthermore, Hitachi's FE-SEM has played a vital role in research and advancement in science and technology. Notably, the Aharonov-Bohm[3] effect was demonstrated using electron beam holography generated by a Hitachi FE-TEM[4] fitted with an FE electron beam source.

Hitachi High-Tech was formed through the integration in 2001 of Nissei Sangyo Co., Ltd., a Hitachi Group trading company specializing in technology, and the Instruments Group and Semiconductor Manufacturing Equipment Group of Hitachi, Ltd. The Hitachi High-Tech Group is currently responsible for electron microscope manufacturing, sales and services. The IEEE Milestone has been jointly conferred on Hitachi and Hitachi High-Tech.

Looking ahead, the Hitachi Group will continue to develop outstanding proprietary technologies and products in fields including electron microscope, where it received the IEEE Milestone, with the view to contributing to the establishment of a safe, secure and comfortable society and the advancement of industry worldwide.

IEEE Milestone

At present, the IEEE Milestone has honored around 120 technical achievements worldwide. Of this number, 16 technical achievements have honored in Japan, including this receipt.

1995	Jun.	Directive Short Wave Antenna, 1924
2000	Mar.	Mount Fuji Radar System, 1964
2000	Jul.	Tokaido Shinkansen (Bullet Train), 1964
2004	Nov.	Electronic Quartz Wristwatch, 1969
2005	Dec.	Pioneering Work on Electronic Calculators, 1964-1973
2006	Oct.	Development of VHS, a World Standard for Home Video Recording, 1976
2007	Nov.	Railroad Ticketing Examining System, 1965-1971
2008	Nov.	The First Word Processor for the Japanese Language, 1971-1978
2009	May	Yosami Radio Transmitting Station, 1929
2009	Oct.	Development of Ferrite Materials and Their Applications, 1930-1945
2009	Nov.	Development of Electronic Television, 1924-1941
		First Transpacific Reception of a Television (TV) Signal via Satellite, 1963
2010	Apr.	Kurobe River No. 4 Hydropower Plant, 1956-63
		Commercialization and Industrialization of Photovoltaic Cells, 1959-83
2011	Nov.	First Direct Broadcast Satellite Service, 1984
2012	Jan.	First Practical Field Emission Electron Microscope, 1972

Note:

1 IEEE: Headquartered in the U.S.A., the IEEE is the world'slargest professional association of electrical, electronics, information and communications engineers, with more than 400,000 members in more than 160 countries worldwide.

2 FE-SEM (Field Emission-Scanning Electron Microscope): Refers to an SEM that enables ultra-high resolution observation through a built-in FE electron beam source, which provides a smaller wave dispersion and higher intensity than electron beam sources (thermal electron sources) used in conventional SEMs.

3 Aharonov-Bohm Effect (AB Effect): In 1959, Yakir Aharonov and David Bohm stated that a potential was itself a fundamental physical entity, and would affect a charged particle even in a region in which there was no electric or magnetic field.

4 FE-TEM (Field Emission-Transmission Electron Microscope): Refers to a TEM that enables high-resolution observation, chemical analysis in ultra-fine domains and related features through a built-in FE electron beam source.

ABOUT HITACHI

Hitachi, Ltd., (NYSE: HIT / TSE: 6501), headquartered in Tokyo, Japan, is a leading global electronics company with approximately 360,000 employees worldwide. Fiscal 2010 (ended March 31, 2011) consolidated revenues totaled 9,315 billion yen ($112.2 billion). Hitachi will focus more than ever on the Social Innovation Business, which includes information and telecommunication systems, power systems, environmental, industrial and transportation systems, and social and urban systems, as well as the sophisticated materials and key devices that support them. For more information on Hitachi, please visit the company's website at http://www.hitachi.com.

ABOUT HITACHI HIGH-TECH

Hitachi High-Technologies Corporation (TSE: 8036), headquartered in Tokyo, Japan, conducts wide-ranging operations from a worldwide network of bases, employing approximately 10,000 employees globally. Hitachi High-Tech reported consolidated net sales of 653.4 billion yen ($7.9 billion) and operating income of 27.9 billion yen ($335 million) in fiscal 2010 (ended March 31, 2011). With core strengths in electronic device systems, fine technology systems, science and medical systems, and industrial and IT systems, Hitachi High-Tech aspires to become a global leader in high-tech solutions as a business creation company by leveraging synergies between its trading and manufacturing capabilities. For more information on Hitachi High-Tech, visit the Company’s website at http://www.hitachi-hitec.com/global/.