Press information

Ceramic components help guide protons to collision in LHC

KYOCERA's Vacuum Chambers Play Key Role in CERN Large Hadron Collider

KYOTO/NEUSS, 19. January 2010 – Kyocera Corporation (NYSE:KYO)(TOKYO:6971) today announced that its custom-designed ceramic vacuum chambers are being used in the Large Hadron Collider (LHC) operated by the European Organisation for Nuclear Physics (CERN) near Geneva. In the largest scientific experiment ever undertaken, protons fed into the LHC through Kyocera's ceramic vacuum chambers quickly reach speeds of up to 299,792 km per second – just below the speed of light – in the world's largest particle accelerator.

"As a specialist in fine ceramics, Kyocera custom-developed these vacuum chambers in close collaboration with CERN for the LHC's unique requirements," said says Mitsuru Imanaka, the President of Kyocera in Europe.

The vacuum chambers work in a way similar to railway switching points, guiding protons through the largest machine in the world. When necessary, protons can also be removed from the LHC by rapidly alternating magnetic fields – for example, when the LHC is to be shut down. The chambers are made of fine ceramic because metal would produce a time lag in the magnetic fields that drive the protons. Kyocera's chambers maintain the vacuum state present in the whole LHC system in order to keep the racing particles from hitting air molecules, which would otherwise reduce the protons' speed or alter their precisely controlled direction.

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Kyocera was the only company in a position to meet CERN's exacting specifications for the vacuum chambers. "The technical demands of making a fine ceramic component increase in direct proportion to its size and shape," Imanaka explained. "These vacuum chambers exceed one meter in length, requiring us to maintain a uniform, homogenous structure over a large area. Kyocera's material and processing expertise have allowed us to produce fine ceramic components to overcome technical challenges at CERN and in many other industrial and research applications."

The LHC showcases the unique properties of Kyocera's precisely refined ceramic materials. Ceramic serves as an electrical insulator, allowing particles to be freely manipulated in the LHC's highly electromagnetic environment. In addition, ceramic is more resistant to extreme temperatures, friction and corrosion than other materials – critical attributes for such a world-leading scientific project.

While the LHC is the world's largest particle accelerator, Kyocera's precision ceramic vacuum chambers are also utilized in smaller accelerators at national laboratories and universities in the U.S.

About Kyocera

Headquartered in Kyoto, Japan, the Kyocera Corporation is one of the world's leading manufacturers of fine ceramic components for the technology industry. The strategically important divisions in the Kyocera Group, which comprises more than 200 subsidiaries (April 1st, 2009), are information and communications technologies, products to increase the quality of life, and environmentally friendly products. The technology group is also one of the largest producers of solar energy systems worldwide.

With a workforce of about 60.000 employees, Kyocera posted net sales of approximately €8.68 billion in fiscal year 2008/2009. The products marketed by the company in Europe include laser printers, digital copying systems, microelectronic components, fineceramic products and complete solar systems. The corporation has two independent companies in the Federal Republic of Germany: the Kyocera Fineceramics GmbH in Neuss and Esslingen and the Kyocera Mita Deutschland GmbH in Meerbusch.

The company also takes a lively interest in cultural affairs. The Kyoto Prize, one of the most prominent international awards, is presented each year by the Inamori Foundation, once established by Kyocera founder Dr. Kazuo Inamori, to individuals and groups worldwide for their outstanding human achievement (converted at present €370.000 per prize category).

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