



FOR IMMEDIATE RELEASE

July 3, 2014

Toshiba Corporation

IBIDEN Co., Ltd.

Toshiba and IBIDEN Establish Manufacturing Technology for Reactor Core Material Using Silicon Carbide (SiC)

— *The companies succeed in prototyping a fuel assembly cover* —

TOKYO— Toshiba Corporation (Tokyo: 6502) and IBIDEN Co., Ltd. (Tokyo: 4062) today announced that the companies have established a manufacturing technology for a SiC-based material with outstanding heat and oxidation resistance, intended for reactor core applications in nuclear power plants. Toshiba and IBIDEN have successfully utilized the new technology to create a prototype of a fuel assembly cover.

Both companies have been collaborating with Nuclear Fuel Industries, Ltd., as well as Professor Yutaka Kagawa of the Research Center for Advanced Science and Technology (RCAST) of the University of Tokyo, and Professor Takashi Goto of the Institute for Materials Research of Tohoku University.

The fuel assembly cover was manufactured using a composite SiC material that consists of continuous SiC fiber to provide reinforced strength. The new manufacturing technology achieves SiC layer formation at a speed approximately 20 times faster than the conventional method<sup>\*1</sup> by using chemical vapor deposition<sup>\*2</sup> (CVD), as well as the optimized layer formation apparatus and process. This speed-up has been considered necessary to make it possible to offer the fuel assembly cover material in production quantities.

The new manufacturing technology uses a machined mold (die) set based on a special carbonaceous material in order to form long SiC fiber in the shape of the fuel assembly cover. It also employs a long CVD reaction chamber to produce a SiC material exceeding four meters in length with high precision, without compromising density or strength. This technology can be used to create specially shaped items such as thin-wall, long cylinders. It can also be applied to the production of fuel cladding tubes.

For data collection and verification purposes, Toshiba and IBIDEN will begin the testing of the new fuel assembly cover in 2016 in a research reactor. The companies aim to put the cover into practical use by around 2025, as a replacement part for operating nuclear power plants.

Toshiba will enhance its nuclear power plant services and fuel business to maintain stable profitability and to improve the safety of nuclear power plants.

IBIDEN will continue to offer products that contribute to the prosperity and well-being of society through fusions and composites of proprietary technologies, in the line with commitment to creating new value.

Toshiba and IBIDEN will exhibit the new manufacturing technology at the 22th International Conference on Nuclear Engineering (ICONE22), which will be held in Czech Republic starting on July 7.

- \*1 The new technology controls the temperature of only the film formation process and the source gas supply whereas the conventional technology controls the temperature of the entire film formation apparatus and the source gas supply.
- \*2 A chemical process used to deposit thin films on the substrate surface by introducing gases into a reaction chamber

#### Prototypes of the fuel assembly cover



#### **About Toshiba**

Toshiba Corporation, a Fortune Global 500 company, channels world-class capabilities in advanced electronic and electrical product and systems into five strategic business domains: Energy & Infrastructure, Community Solutions, Healthcare Systems & Services, Electronic Devices & Components, and Lifestyles Products & Services. Guided by the principles of The Basic Commitment of the Toshiba Group, “Committed to People, Committed to the Future”, Toshiba promotes global operations towards securing “Growth Through Creativity and Innovation”, and is contributing to the achievement of a world in which people everywhere live in safe, secure and comfortable society.

Founded in Tokyo in 1875, today’s Toshiba is at the heart of a global network of over 590 consolidated companies employing over 200,000 people worldwide, with annual sales surpassing 6.5 trillion yen (US\$63 billion).

To find out more about Toshiba, visit [www.toshiba.co.jp/index.htm](http://www.toshiba.co.jp/index.htm)

#### **About Ividen**

To find out about Ividen, visit [www.viden.com/index.html](http://www.viden.com/index.html)

###