US carriers to take leave from East Asian waters

China's central bank throws economy a lifeline

India's auto industry chauffeuring Modi along

Singapore Airlines points itself forward

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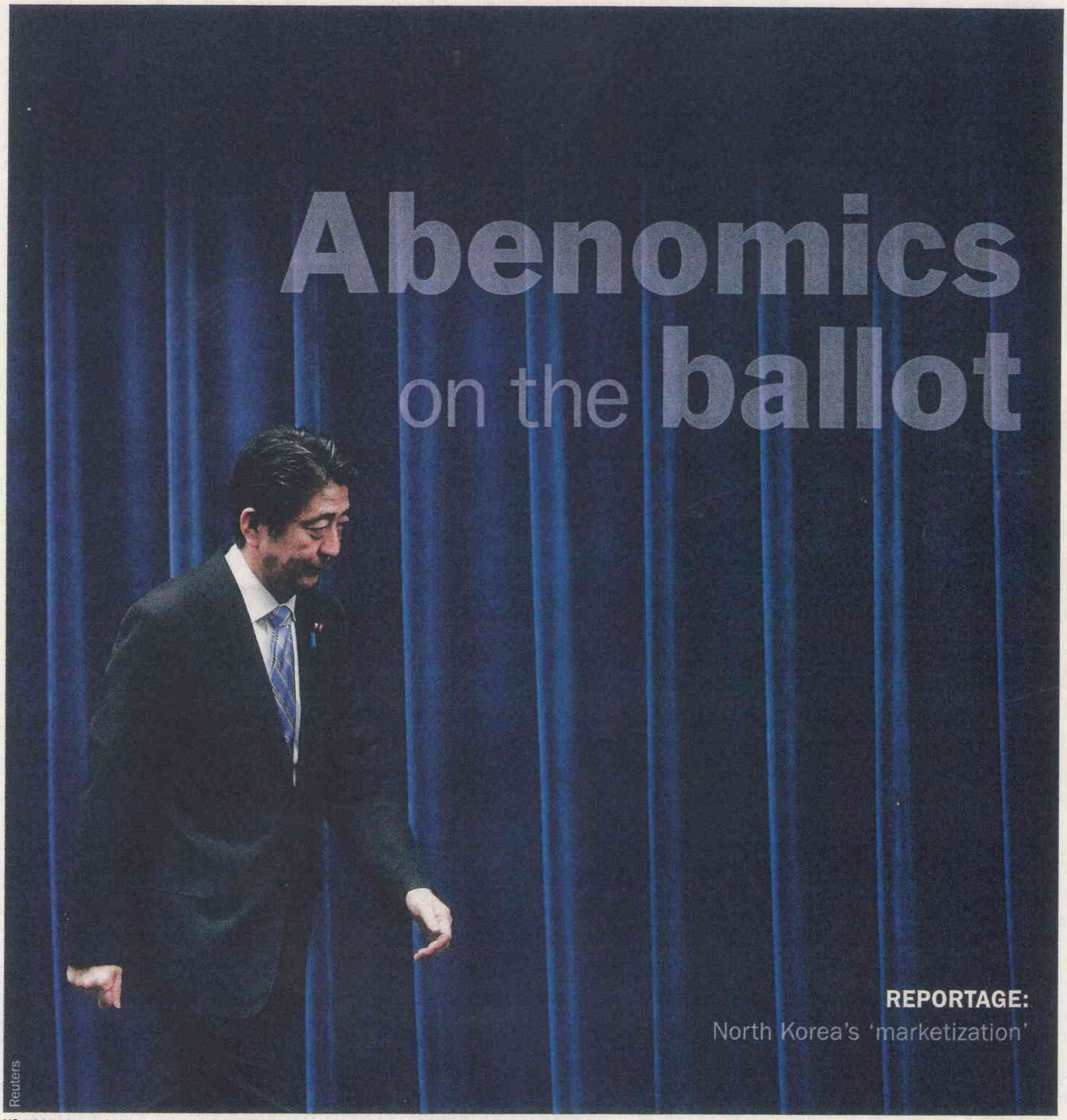

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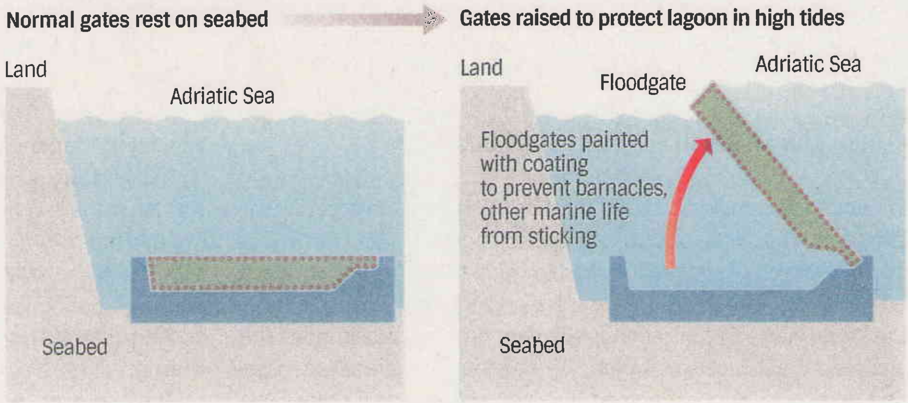
Venice floodgates



amount of lipophilic, or oil-friendly, material into a largely oil-repelling mix. The film reduces the amounts of stuck oils by half. Any oil that does manage to stick to the film is attracted by the lipophilic portions. This thins out smudges so screens do not appear to be as dirty.

Toray developed this technology for touch screens but is looking into applications for appliances and furniture.

Barnacle busting

Social infrastructure is also benefiting from nonadhesion technologies. A case in point are the floodgates of the Moses project, which protects the streets of Venice from flooding during high tides.

These steel floodgates rest on the seabed, surfacing at high tide. They are filled with air to bring them to the surface and form a giant wall between Venetian canals and the onslaught of the Adriatic Sea. Each gate is 3-5 meters thick, 20 meters wide and 20-30 meters tall.

The challenge is to keep barnacles, algae and other marine organisms from sticking to the submerged gates. To keep these unwanted guests off, the gates are coated with Bioclean, an anti-fouling material developed by Chugoku Marine Paints.

Bioclean is a silicon-based coating with a structure of alternating hydrophilic and hydrophobic materials. "Any adhesive cements secreted by marine organisms slip off, if they ever manage to attach in the first place," explained Kenji Yokogaki, manager of the company's offshore project marketing department.

From food to gadgets to social infrastructure, nonadhesion technologies are becoming ubiquitous.

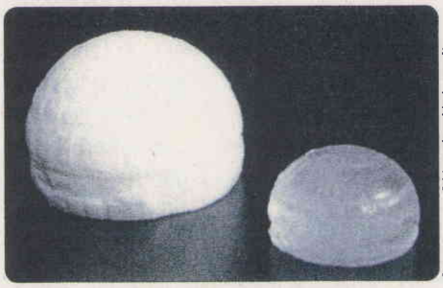
Researchers discover supercheap way of making high-performance optical components

TOKYO – A Kyushu University research team has developed a method of producing high-quality silica glass in complex shapes at less than one-hundredth the cost of the stuff made by conventional processes.

The silica glass is suitable for use in high-performance optical components such as upscale lenses.

The new technology consists of mixing silica powder of about 10 nanometers in particle diameter with a water-soluble synthetic resin, then casting and drying the liquid mixture and heating the cast at 1,100 C to 1,200 C for tens of minutes. The resin decomposes and dissipates during heating.

Conventional production processes for silica glass parts involve cutting them from a large piece of the material or casting them after melting the material at temperatures of over 2,000 C.



Courtesy of Kyushu University

A cast and dried mixture of silica powder and a synthetic resin, left, is transformed into a silica glass object, right, by using heat.

Silica glass is the purest glass. It consists solely of silicon dioxide and maintains its shape even at temperatures above 1,000 C. It is also resistant to chemicals. As such, it is also made into reaction vessels used in chemical experiments.

However, making complex shapes out of silica glass can cost up to several hundred thousand yen, a factor restricting its use in many cases. The researchers expect the new process will allow for lenses that now cost 50,000 yen ($425) to be sold for 500 yen.

In addition to its ability to produce low-cost optical components for use in high-performance telescopes and medical devices, the new method can also be used in to manufacture semiconductors, according to the team, led by professor Shigeru Fujino. The researchers are also considering other applications, such as its use as cover glass for ultraviolet disinfection units.

Researchers expect silica glass to become used more widely in medical and industrial fields. They hope to collaborate with companies to commercialize the new technology within three years.

(Nikkei)