



# SuperTanks

Visitors to Okinawa Churaumi Aquarium watch whale sharks in the massive Kuroshio Sea water tank.

COURTESY OF OCEAN EXPO PARK / OKINAWA CHURAJUMI AQUARIUM

*The outstanding technological strength of Japanese manufacturers provides the backbone for the sort of equipment that helps to fulfill dreams at theme parks. Masaki Yamada reports on the example of **Nippura Co.**, a small company which produces acrylic panels for aquariums.*

Okinawa Churaumi Aquarium in Okinawa Prefecture is one of the largest aquariums in the world, presenting more than 20,000 marine creatures of more than 700 species in some 77 tanks. The aquarium's main feature is the Kuroshio (Black Current) Sea, a water tank that displays large sharks, rays and migratory fish that live in the flow of the Black Current. The gigantic window of this water tank is 8.2 meters high, 22.5 meters wide and 60 centimeters thick, and holds back a water volume of 7,500 tons. The window carries some of the most advanced panel technology in the world.

Nippura Co., headquartered in the suburbs of Takamatsu, Kagawa Prefecture, manufactured this window. The main feature of the company's giant aquarium panels is their seamless appearance

when combined.

"I wanted the visitors to see the entire body of whale sharks, the world's largest fish, through one single giant panel. When there are pillars connecting tank panels, the fish frequently appear cut off," says



Tetsuhiro Shikiyama, CEO of Nippura Co., alongside samples of Nippura's acrylic panels

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the company's CEO Tetsuhiro Shikiyama.

Nippura's aquarium panels comprise numerous acrylic boards of 3–4 centimeters thickness held together by adhesive. In the case of the large window of the Kuroshio Sea exhibit, 15 acrylic boards each of 4 cm thickness in total are glued together. Seven such panels, each measuring 8.5 meters tall and 3.5 meters wide, are joined together to create a seamless whole.

"Acrylic boards 3–4 centimeters thick offer the most stable quality. Other companies make panels 50–60 centimeters thick with a single acrylic board. These panels could become distorted over time due to water pressure and other factors. Our company's acrylic panels rarely undergo such degradation," Shikiyama says proudly.

The strength of the acrylic panels is obtained by building up high-quality acrylic boards. A shortcoming in this method had been that the head-on transparency decreased if the adhesive layer became uneven when pasting the boards together. The company solved this problem by developing an original adhesion technology for acrylic boards along with the technology for heat-treating the pasted boards, and can now produce huge acrylic panels that offer both strength and transparency.

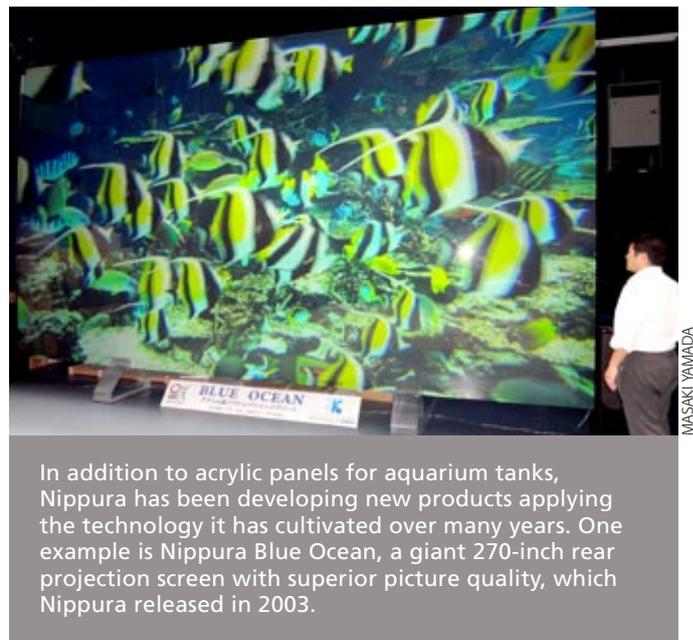
"Technology is one thing, but even more important is the idea. No one else seems to have thought of pasting a number of acrylic boards together," Shikiyama says.

## Clearly the Best

Nippura's acrylic panel manufacturing technology is now used in aquariums in nearly fifty countries. The latest example is in an aquarium in the Dubai Mall which opened in 2008 in Dubai, the United Arab Emirates. One of the panels boasts the world's largest size of 32.88 meters wide by 8.3 meters tall

and was recorded in the *Guinness World Records* that year. It has also been decided that a panel measuring about 40 meters wide made by the company will be used in an aquarium currently under construction overseas. If this aquarium is completed as planned in December 2012, the panel will break the company's own Guinness World Record. "We do not conduct any overseas marketing," Shikiyama says. "I think our technology has been spreading in the world's aquarium industry by word of mouth."

Shikiyama adds that he now hopes to use the company's acrylic panels applying their newly developed laminate technology for sound abatement shields on highways. The acrylic panels Nippura de-



In addition to acrylic panels for aquarium tanks, Nippura has been developing new products applying the technology it has cultivated over many years. One example is Nippura Blue Ocean, a giant 270-inch rear projection screen with superior picture quality, which Nippura released in 2003.

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veloped have high noise barrier performance, and even if a car were to crash into them, there would be no concern of broken pieces flying around.

Nippura is likely to find many more potential applications for its original technologies which have spread to aquariums worldwide. 

### Okinawa Chiraumi Aquarium:

<http://oki-churaumi.jp/en/index.html>

*Masaki Yamada is a freelance writer.*