

Stainless steel wave water tank

ISSF Member

Manufacturer

Field

Location

Environment

Grade and surface

Competing materials

POSCO, Korea Iron and Steel Association

POSCO E&C / Daemyung SES Co.

water equipment

Park One Tower, Seoul, Korea

urban

329LD Duplex Stainless Steel

SMC (Sheet Molding Compound);

PDF (Polyethylene Double Frame);

PE (Polyethylene);

FRP (Fiber Reinforced Plastics); concrete

Advantage points of using stainless steel

329LD has enabled a curved panel design of water tanks to increase seismic resistance and to withstand high water pressure.

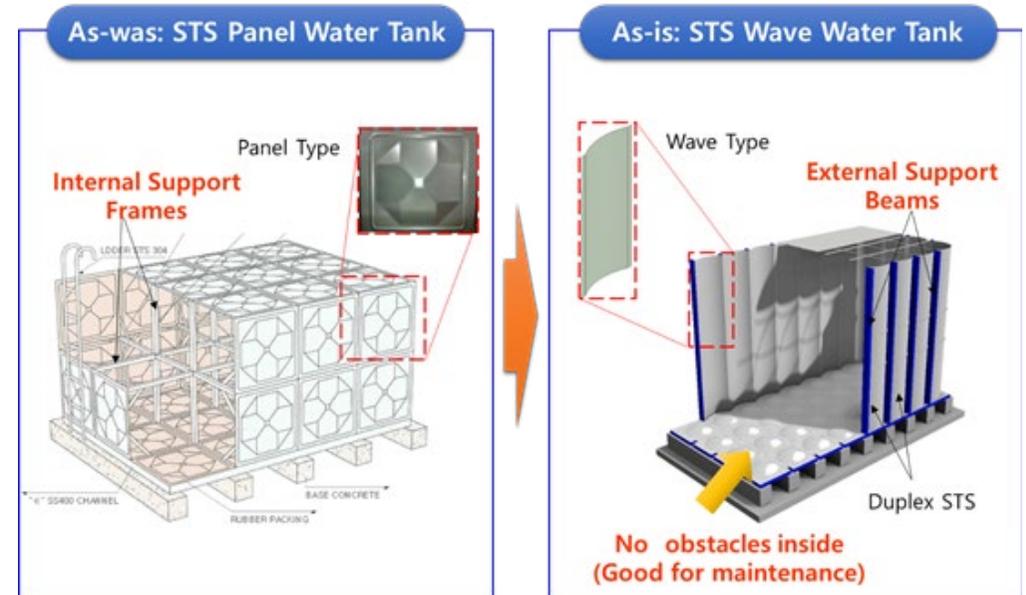
Product description

After the earthquake in Gyeong-ju in 2016, the Korean government decided to strengthen anti-seismic design guidelines for all buildings. Water tanks were also revised to require seismic design guidelines to provide seismic performance. This made it difficult to use the stainless steel water tank, which was ordinary used, because it didn't meet the new seismic design guidelines.

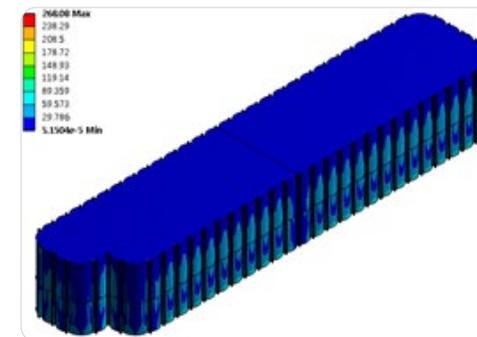
Due to that reason, POSCO has developed a waved/curved stainless steel panel concept for water tanks to provide excellent water pressure distribution and seismic resistance. The wave tank mainly consists of wave panels to form the outer wall and wide flange beams to support wave panels.

First of all, using STS329LD duplex stainless steel, which is twice the yield strength of austenitic stainless steel, was used to reduce thickness and improve the seismic performance while also increasing corrosion resistance.

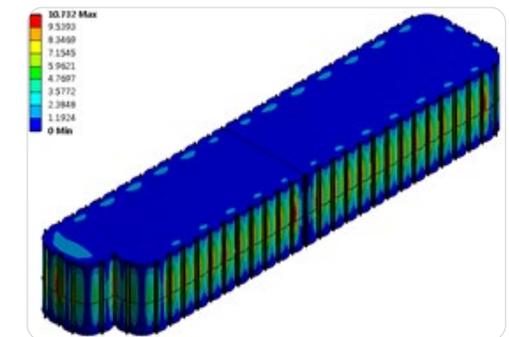
The wave shape panel can distribute water pressure to the circular panel surface to improving structural stability. This design, unlike conventional rectangular water tanks, there are no internal support frames, making it suitable for cleaning



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Contour plot of stresses



Contour plot of displacements

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and maintenance, and space utilization has improved as well as cost reduction is possible.

In 2019, POSCO collaborates with customers, installed 33 units of stainless steel wave water tanks containing from 25 to 900 cubic meters at the "Park One Tower", a new skyscraper in Seoul. The biggest tank was subject to a pressure of 0.9 bar (seismic loading included) in a wave panel wall of 29 meters. All of the tanks were very stable after filling of water and showed no deflection problems at all. The construction was completed successfully.

Stainless steel wave tank has turned the disadvantages of existing water tanks into advantages through use of new design and duplex. It shows excellent seismic performance, maintenance, space utilization and cost improvement compared to existing products. This new product is expected to greatly contribute to expanding the stainless steel water tank market, replacing the demand for water tanks using other materials as well as stainless steel products.



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