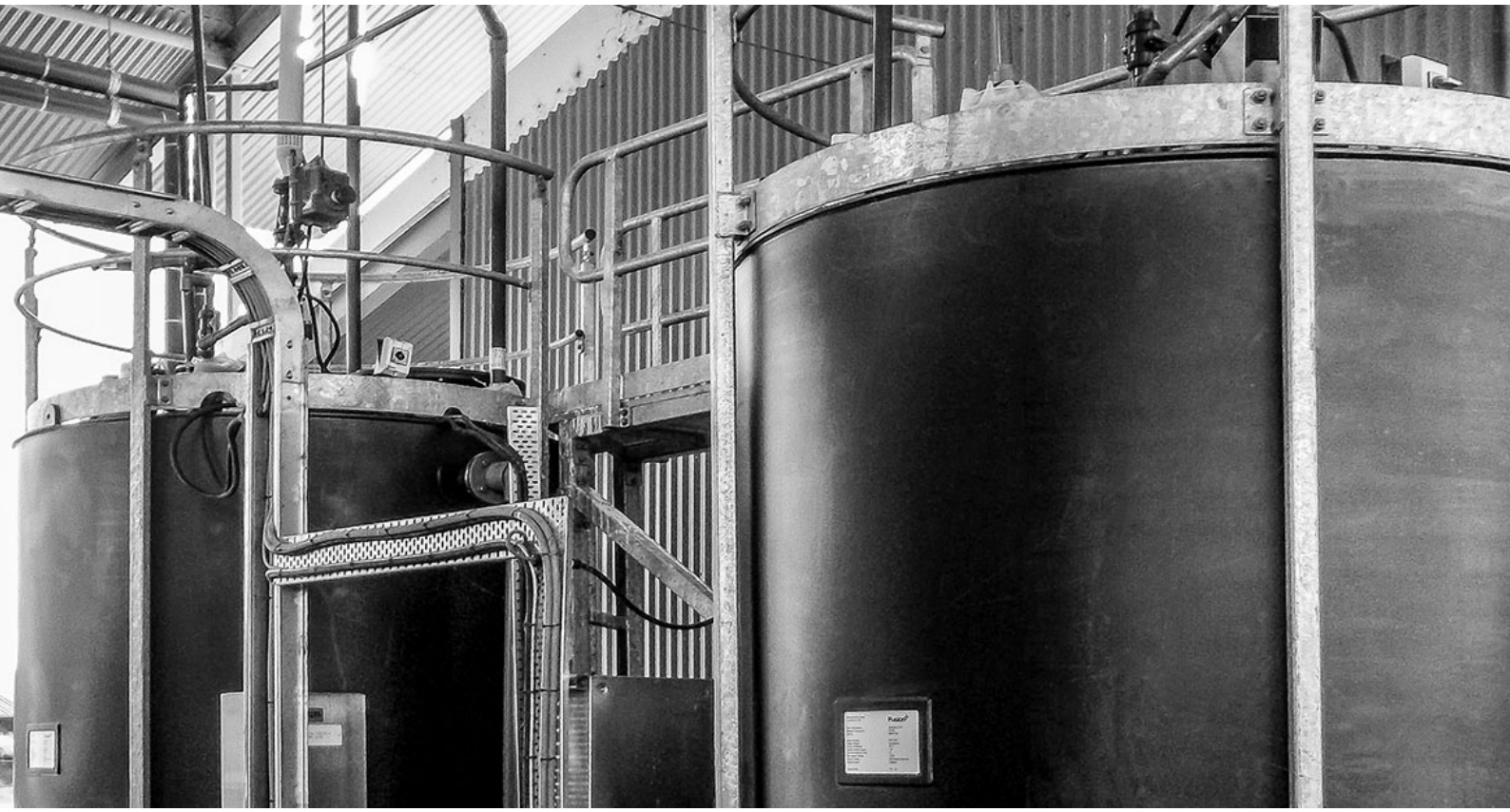
Insulated Dual Wall Tank For Sodium Hydroxide Storage

A case study by Fusion [BW1177]



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A client at an educational facility in Queensland required a redesign and upgrade to their existing sodium hydroxide storage facility. The facility—although not very old—was failing; causing major safety and operational concerns.

This gave Fusion the opportunity to design, manufacture and install a sodium hydroxide plant with thermal protection precautions to prevent the sodium hydroxide from freezing in the cold environment.

Fusion designed and fabricated two thermoplastic, dual walled, glass-wool fibre insulated tanks along with access platforms and heater elements.

The Existing Sodium Hydroxide Storage System

The existing system consisted of dual laminate fibre-reinforced plastic (FRP) tanks. There were a few major safety concerns with this system:

- The entry point (a sideway manhole) was positioned too close to the base, causing stress concentrations in the wall of the tank.
- The welded sections of the thermoplastic UPVC inner liner had failed causing leakage into the FRP outer layer and subsequently leaking into the bund.
- The heater elements were installed a too close together, causing a hot zone on the tank wall which subsequently damaged the inside of the existing vessel.

Right: Photo of the existing tanks on site which the client requested be replaced.

The Objective

Design two new safer and stronger PE thermoplastic, dual walled, glass-wool fibre insulated tanks complete with; platforms, safe access/egress and heating elements to prevent sodium hydroxide from freezing in the cold environment.

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Work Undertaken

- Dismantle and removal of existing dual laminate fibre reinforced plastic (FRP) tanks, including supporting pipework and heater elements.
- Manufacture and design two 7,500L, PE100 double skinned tanks with an glass-wool fibre insulation layer between the inner and outer skins. The roof sections have to be designed with extra strength to be able to support live loads and maintenance personnel.
- All work carried out must comply to DVS, the German welding standards.
- Install: 2 x PE100 tanks including all supporting pipework, heater elements and galvanised outer frame.
- Installation of Asahi ball valves.

Outcome

The project was commissioned successfully and both our client and team where extremely happy with the outcome.

This was the first time our engineer/design team and fabrication team had the experience of both designing and installing heater elements within a dual tank arrangement. They enjoyed the challenge immensely and gained a wealth knowledge and added skill.

Our team is in regular contact with the client to check on the plant's performance. At the six month mark there were no issues and the plant is in full operation. All original safety concerns have now been removed; the design of the new tanks allow for easier and safer access for inspection and maintenance tasks.

Supply Capabilities

Asahi ball valves were the valve of choice on this project. As the Australian distributor of Asahi valves and other premium specialised piping system products, clients can feel safe knowing future, additional valves and fittings can be supplied from Fusion.
Fusion can also assist with all technical support, product selection, supply and installation services.