

About Furphy Engineering

J. Furphy & Sons is an Australian engineering icon. Established in 1864, it is still family owned (fifth generation) and operated from its base in Shepparton, Victoria. The company is renowned for its historical links to rural Australia and in particular its most famous product - the Furphy Water Cart. Today, the company is much different.

The design and manufacture of stainless steel tanks and pressure vessels is Furphy's core business, and is predominantly responsible for the company's growth and the profile it enjoys today as one of Australia's premier and most unique metal manufacturing companies. Its client base includes many of industries most reputable multi-national and domestic companies.

In recent times, the company has received several significant industry awards including the Australian Family Business of the Year 2000 and the WTIA Large Fabricator of the Year in 2000 and again in 2008. J. Furphy and Sons was an inaugural inductee into the Victorian Manufacturers Hall of Fame. For more information, please visit: www.furphys.com.au



Converting the bulk fuel supplier's fuel tanks from carbon steel to stainless delivered project cost savings, increased fuel quality, and reduced maintenance costs.

Fuel Tanks Converted from Carbon to Stainless Steel

Project Overview

- **Company:** Furphy Engineering
- **Client:** Bulk Fuel Supplier
- **Location:** Townsville, Queensland
- **Project:**
 - 4 Diesel Fuel Tanks and 2 ULP Fuel Tanks
 - Fuel Storage Tanks to support mining and local industries

Project Specification Changes

Originally specified as Carbon Steel tanks, the 6 storage tanks were converted to Stainless Steel vessels. The decision was based on the benefits of increased fuel quality, lower maintenance requirements and project cost savings

Conversion to Stainless Steel

Stainless Steel provides superior corrosion resistance, compared to Carbon Steel tanks. As a result, a corrosion allowance was not required to be built in to the thickness of each tanks' walls. Stainless Steel also offers a higher strength to material thickness ratio, enabling a thinner gauge of steel to be specified. These attributes delivered cost savings to the client.

Storage in a Stainless Steel vessel also provides a more sterile environment. Unlike Carbon Steel a Stainless Steel surface does not require a paint system. This removes the need for repainting during the life of the tank and delivers an internal surface that will not flake or contaminate the fuel with paint

particles; reducing maintenance requirements and increasing the quality of stored fuel.

Design Considerations

All elements of design considered Australian and International standards to optimise the life and performance of each tank.

Structural design considered the density of stored fuels - diesel and ULP, along with the venting requirements for petrochemicals, in accordance with AS1692. Additional components were added to each tank; these included access points for maintenance and internal floating roof systems to create vapour barriers.

Townsville's geographic location; the local wind and earthquake loads, determined each tank's height, depth and structural requirements.

Tank components such as nozzles, floor structures and roof installation were developed according to API650 and AS1210, with finishing welds meeting AS1554.6-2012 II (a), for structural integrity.

Build Requirements

All tanks were fabricated at Furphy Engineering's Shepparton plant in Victoria using stainless steel sourced through Australian-based supply outlets. The project used 96 tonnes of stainless steel and required 15 weeks to complete.

NATA approved non-destructive testing (NDT) was carried out by third party providers to evaluate the properties of each tank; ensuring they passed all code requirements.

Transportation

With manufacture taking place in Shepparton and installation in Townsville, tank design needed to consider suitability for long haul transport. The tanks weighed 15 tonnes and were up to 21 metres long, requiring heavy haulage equipment and the support of pilot vehicles, for the trip.

Tank design considered the most suitable transportation method, the cost to transport and how to maintain the structural integrity of each tank throughout the delivery and installation process.



The new Stainless Steel tanks arrive on-site in Townsville.