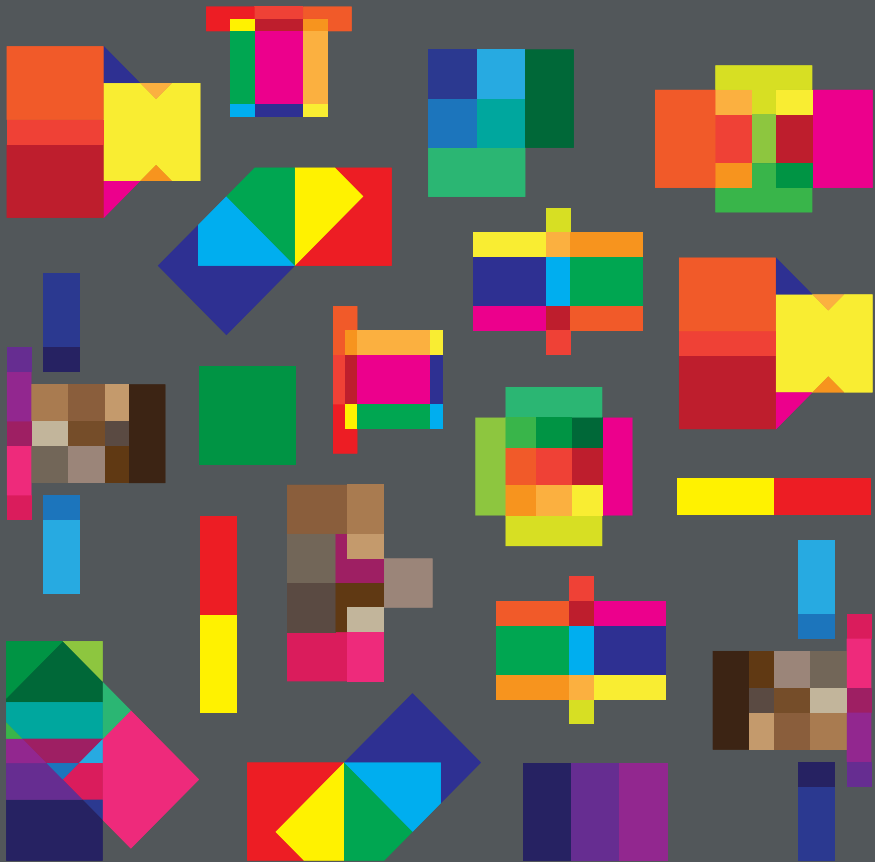


OUR CAPABILITIES

INNOVATIVE PRODUCTS FOR CHEMICAL STORAGE AND CONVEYANCE



Fusion 

Supply

Fusion is one of Australia's largest stockists and suppliers of specialist plastic piping system products.

Our experienced team, technical knowledge, excellent stock holding and fast turnaround time provides market leading service and supply.

Our extensive range includes pipe, fittings, valves, actuation, flow control, parts, accessories and consumables.

These are available in a variety of materials including UPVC, CPVC, ABS, PP, PVDF and PE. This enables our clients to tailor product specifications to their individual applications.

Each product has been carefully selected from global leading brands including Asahi Valves, Charlotte Pipe Co, Polypipe, Flowline Level Measurement and others.

- + East and west coast distribution centres
- + Servicing clients nationally
- + Over 10,000 product lines
- + Over 4,500 products in this catalogue

For information on our full range of brands visit fusionaus.com



Advanced Digital Dosing Pumps & Accessories

GRUNDFOS 

Dosing Pumps

Grundfos is a global pump manufacturer specialising in energy-efficient solutions for water and fluid management. Their dosing pumps are renowned for precision, reliability, and chemical resistance, catering to industries like water treatment, and chemical processing.

grundfos.com



UPVC BS Fittings & Pipe Clips.



Van de Lande

Pipe Clips & UPVC Fittings

Van de Lande is a Dutch manufacturer specialising in PVC pipe clips. They produce over 4,500 distinct items. Van de Lande's commitment to quality and innovation has solidified their reputation in the global market.

vandelande.com

Our Brands



UPVC & CPVC
Schedule 80 Pipe & fittings

CHARLOTTE
PIPE AND FOUNDRY COMPANY

Plastic Pipe and Fittings

Charlotte Pipe and Foundry Company has been manufacturing pipe and fittings in the USA for over a century. Charlotte supplies product extensively throughout the USA and over 35 countries.

Charlotte products include pipe and fittings made from Schedule 80 UPVC & CPVC.

charlottepipe.com



BS UPVC fittings.
ABS pipe and fittings.

EFFAST

Cemented Piping Systems

Polypipe Italia (Effast) is a large plastic piping systems manufacturer based in Genoa, Italy. They produce over 100 product systems and more than 20,000 product lines including pipe and fittings in ABS, PP and UPVC.

Polypipe Italia's products are sold under the Effast brand.

effast.com



Industrial valves
with a 3 year warranty.

ASAHI/AMERICA

Valves & Actuation

Asahi America is a diversified ISO9001 certified manufacturer and supplier of thermoplastic corrosion resistant fluid flow products including valves and actuators.

Manufactured in Japan and the USA, renown for exceptional quality and application specific products.

asahi-america.com



Level measurement
for liquids and solids.

FLOWLINE
LEVEL BEST

Level Measurement

Flowline's quality solutions measure tank inventories and automate tank processes.

With a focus on reliability, quality and ease of use, Flowline's range includes reflective ultrasonic and radar level transmitters, level switches, level controllers and indicators.

flowline.com



UPVC & CPVC Schedule
80 Pipe & fittings

Eslon

PVC, CPVC Pipe & Fittings

Sekisui Chemical (Eslon) is a large Japanese industrial product manufacturer known internationally for their high quality schedule 80 pipe and fittings as well as valves and much more.

Sekisui's products are sold under the Eslon brand.

eslon-plant.jp/web-en/



Advanced Plug & Play
Chemical Storage
Systems.

snosko

Chemical Storage

Snosko is a market leader in corrosion resistant systems for chemical storage. Snosko offers solutions for a wide range of water treatment, oil & gas, chemical, mining and commercial applications.

Snosko products are designed and manufactured in Australia.

snosko.com

Plastic Fabrication

Fusion is recognised throughout Australia for plastic fabrication expertise, the fast supply of plastic piping systems products and over 22 years of extensive site service history — including installation and maintenance.

Our team of project managers, mechanical engineers, fabricators and installers, can guide you from concept, design, engineering, fabrication, through to final product delivery. Our engineers utilise sophisticated design software to provide a solution to suit most application requirements.

Our manufactured products include; chemical storage tanks, chemical dosing panels, pipe spooling, launders, chutes, machine guards, electro-winning cells, pontoons, machined plastics and just about any custom option our clients require. Industries include; water treatment, chemical processing, mining, shipping, infrastructure and food and beverage.

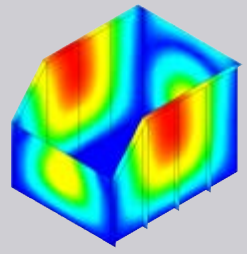
Fusion complies with the requirements of ISO 9001:2008 for the fabrication and installation of plastic products and piping systems.





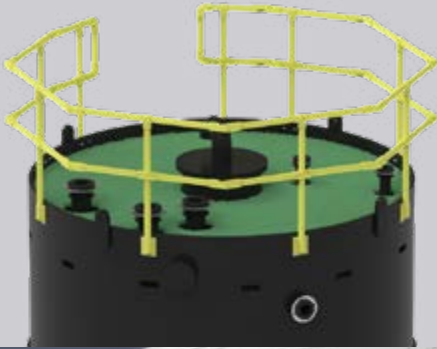
1. PE IBC Bund
2. PP Chemical Dosing cabinet with lower PE overflow base
3. PE Chemical storage tank with sight glass
4. Reinforced PE square storage tanks
5. PE Pipe spool
6. Yellow PE machine guards
7. A large, round PE tank being assembled onto a sloped base with stiffeners
8. HDPE Chemical storage tank for HCL, integrated FRP stairwell and platform for roof manway access.
9. A PP Dosing cabinet's PE overflow base.

Engineering & Design



We utilise our rich history of industrial plastics knowledge, in-house engineering, design, drafting and project management capability, complementing with engaging specialist design consultants for process and electrical engineering to provide robust, cost effective efficient solutions.

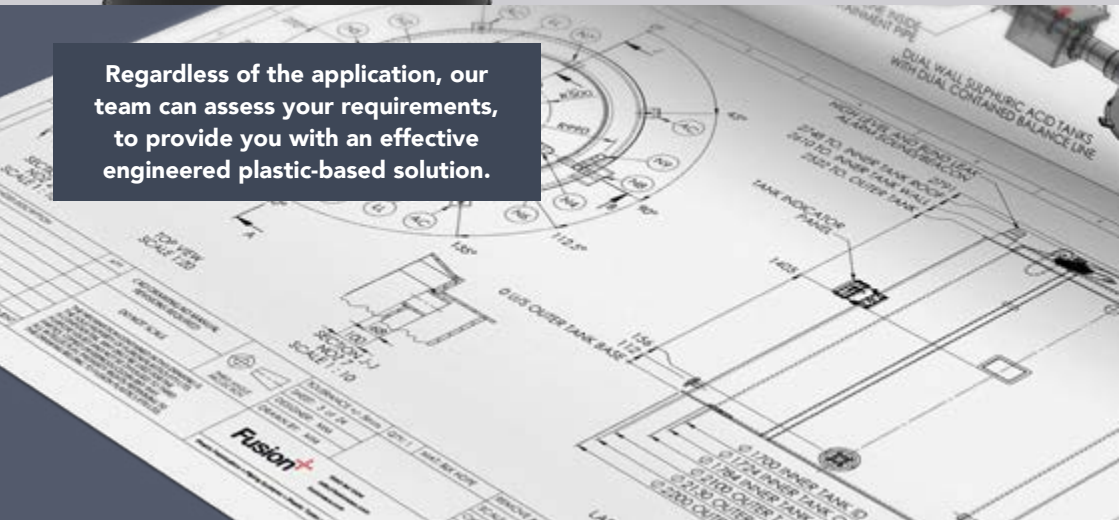
Our engineering and design team consists of experienced engineers and fabricators who can conceptualise and implement innovative design solutions in line with project and client requirements.



Our Team's key assets include:

- + Finite Element Analysis
- + First Engineering Principles
- + Static Structural Analysis
- + Australian and International Standards
- + Factory Acceptance Testing (FAT) regimes
- + 3D CAD Modelling and Drafting
- + Pump and Instrumentation Selection
- + Batching Tanks and Mixing Tank Design
- + Design Verification by Registered Professional Engineers
- + Material selection for plastics for industrial applications
- + Chemical Storage System Design
- + Scrubber and Degasser/ Stripper Design
- + Chemical Dosing Systems and Skid Design
- + Intelligent Piping Layout and Design
- + Level sensor and corresponding PLC design
- + Access Stairs, Ladders, Platforms, Handrails and Walkways Design

Regardless of the application, our team can assess your requirements, to provide you with an effective engineered plastic-based solution.



Hire Equipment

Fusion has an extensive fleet of specialised equipment available for hire to suit plastic fabrication and piping installation requirements. Our fleet of equipment is tested, calibrated and serviced to ISO9001 as well as rigorous internal quality standards.

Our Equipment Fleet

- + Butt fusion welding machinery
- + Electrofusion welding machinery
- + Socket fusion welding machinery
- + Rotary Peelers
- + Generators
- + Hand tools and accessories

Fusion's fleet includes over 80 machines that can be hired and delivered to your site Australia wide. Our teams have the experience and knowledge to advise on your project requirements.

For more information contact a member of our technical sales team at:
fabrication@fusionaus.com



Site Services

Fusion's team of site services technicians are highly skilled in plastic fabricated product and specialised piping systems installation throughout metropolitan, country and remote sites; Australia wide.

Our team provides:

- + Maintenance
- + Installation
- + Plant upgrades

Our site services include:

- + Fabrication and installation of storage tanks, dosing panels and machine guards.
- + Supply and installation of plastic piping systems.
- + Butt, electro and socket fusion welding.

Our site services team regularly complete comprehensive training and obtain High Risk tickets from external training providers.

Their qualifications include:

- + Glue jointing
- + Butt fusion and Electrofusion welding
- + Working at heights and EWP
- + Confined space
- + Manual handling
- + Lifting and rigging

Our teams are proficient with all installation guidelines, industry standards and quality documentation requirements.

Fusion complies with the requirements of ISO 9001 for the fabrication and installation of plastic products and piping systems.





1. PE pipework at a water treatment plant
2. UPVC pipework being installed at a chemical processing plant
3. PE pipeline at a rural mine site
4. UPVC pipe, fittings and Asahi valves installed at a chemical processing plant
5. Pipe spools being loaded for a site project
6. A PE pipeline being butt welded
7. Complex UPVC and CPVC pipework for a chemical manufacturing plant

Case Studies

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Roto-Moulded Vs. Fabricated Chemical Storage Tanks

Plastic tanks for hazardous chemical storage are becoming more commonplace as a cost effective alternative to stainless steel or fibreglass and generally come in two varieties; fabricated or rotationally moulded. Although both are made from plastic they differ in construction method, material, longevity, cost, overall long-term safety and standards compliance—they couldn't be more different.

Fusion Fabricated Tanks

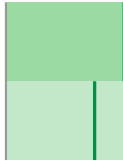
Guaranteed Consistent Wall Thickness

Fusion fabricated tanks are made from sheets of HDPE or PP material (others available upon request) in a technique similar to manufacturing stainless steel tanks. Sheet plastic is manufactured to within a $\pm 0.1\text{mm}$ thickness tolerance; thereby making it a consistently strong material.

To build a fabricated tank, sheet is bent into an open-ended cylinder and the two parallel, touching edges are welded together (fig.1). The base and roof are cut from sheet plastic and welded to the open ends of the cylinder to form an enclosed tank.



Fabricated Wall Thickness Variances Rotomoulded



$\pm 0.66\%$
(@ 15mm wall thickness = $\pm 0.1\text{mm}$)

$\pm 20\%$
(@ 15mm wall thickness = $\pm 3\text{mm}$)

Sheet Material Benefits

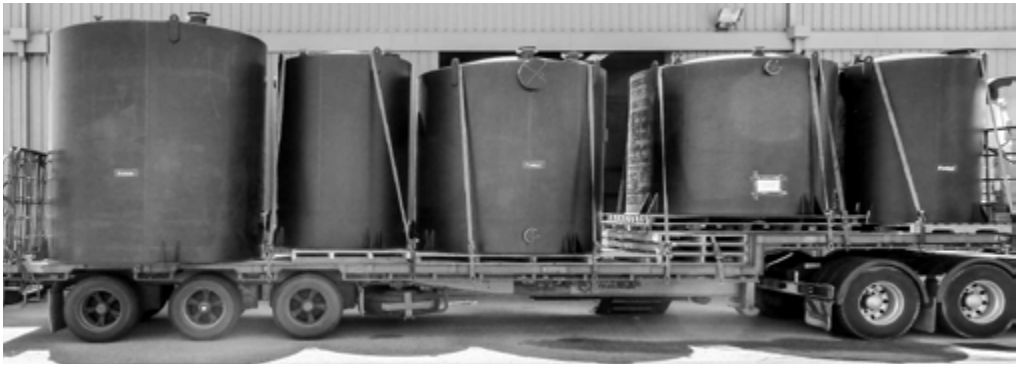
High Density Polyethylene (PE100)

- + 100% weld integrity with PE100 pipe
- + Superior, long term material strength
- + Exceptional weld strength
- + Construction of higher tanks
- + Superior acid resistance
- + Weatherproof (exceptional UV stability)

Polypropylene (PP)

- + Very high chemical resistance
- + Excellent high temperature resistance
- + Excellent impact resistance
- + Higher scratch resistance than HDPE
- + Excellent moisture resistance
- + Food grade





Greater Design Flexibility

Customisation is a considerable benefit in the fabricated tank manufacturing process. Sizes can be scaled up and down from 300L to 60,000L and vary in shape / diameter, as this process doesn't require expensive moulds to be setup.

Fusion fabricated tanks are designed and manufactured to DVS2205 & BS/EN12573, which are accepted globally as the comprehensive standard for the calculation of tanks and

apparatus made of thermoplastics. These standards include design procedures that take into account load stresses, environmental effects and safety features, along with strict rules on welding and construction methods.

Adherence to these standards allows Fusion to manufacture long lasting tanks in a variety of sizes with varying nozzle arrangements (shown in Fig. 2); perfect for chemical processing and storage.

Fabricated Tank Sizes

300L

60,000L

Larger Sizes
Available Upon Request

Custom Modifications & Designs

Fusion fabricated tanks can be custom manufactured to include a variety of modifications for use in water treatment, mining, oil and gas, food and beverage, pharmaceutical, industrial and other chemical processing sectors.

A range of process nozzles from DN15 to DN600 can be included as part of any tank package. An example of a process tank featuring a custom, client specified nozzle arrangement is shown in Fig.3.

Fusion fabricated tanks can also be manufactured with structural and nozzle variations which meet a range of Australian and German Engineering Standards. These can meet:

- + Chemical storage and processing safety requirements (vents and overflows);
- + Working at heights platforms, including balustrades and ladders in chemical resistant FRP (fig.4);
- + Seismic hold down clamps and stays;
- + Roof mounted and sideways mounted man-ways for confined space access; and
- + Rated lifting lugs for trouble-free manoeuvrability and tank installation.

Process Tank

+ Homogeneous Material

Nozzles are welded onto the tank with homogeneous material to DVS2205 guidelines. This prevents cracks and subsequent leaks.

+ Nozzle Size Range

Nozzle sizes range from DN15 to DN600.

+ Prevents Wall Fatigue and Buckling

Filling and empty load factors associated with process tanks are taken into consideration, preventing wall fatigue and buckling.

fig.3



Assembly Tank

A Roof Mounted Manhole Access

Sideways manways can also be manufactured.

B Balustrade

Designed and constructed to AS1657-2013 and constructed from polyester FRP to suit corrosive environments

C Overflow and Vent

Designed and constructed to AS3780-2008 for corrosive chemicals.

D Tank Hold-Down Anchors

Designed and constructed to DVS2205.

E Lifting Lugs

Designed and constructed for easy handling of tanks.

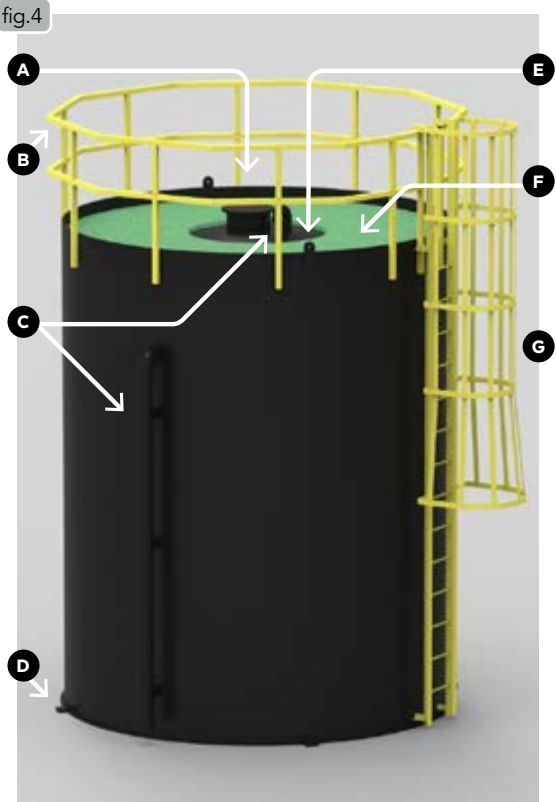
F Tank Platform

Designed with loadings according to AS1170-2002.

G Lockable Ladder / Cage

Constructed from polyester FRP to suit corrosive environments and lockable cage to prevent non-permitted access.

fig.4



Conical or Sloped Tanks

Fusion fabricated tanks can be manufactured with a range of conical or sloped bases for ease of draining. Mixing baffles can also be included for optimal chemical blending and powder dissolving processes with the addition

of both plastic and/or steel structural support frames which are designed using harmonic analysis techniques to minimise the effect of vibrational fatigue on the vessel. An example of a conical mixing vessel is shown in Fig.5.

Mixing Tank

A Mixer Support Structure

Designed using harmonic analysis and constructed to DVS2205 guidelines.

B Baffles

Dimensioned and sized according to mixing process (e.g. chemical or powder)

C Conical Base

Designed and constructed to DVS2205.

D Seismic Supports

Designed using finite element analysis (FEA) and constructed to DVS2205 guidelines.

fig.5: A fabricated thermoplastic mixing vessel with a conical base, mixing baffles and a harmonically balanced agitator structural support.

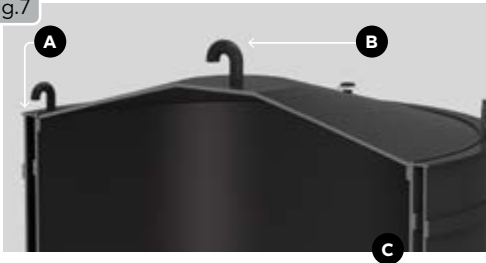


Custom Designs

Due to the design flexibility of the manufacturing process, Fusion fabricated tanks can be engineered to meet a multitude of site and space requirements. Examples of this include:

Rectangular tanks (fig.6) to meet restrictive space requirements, and Dual wall tanks (fig.7) to meet AS3780-2008.

fig.7



Above: A Fusion fabricated thermoplastic dual walled vessel.

Dual Skin Tank

A Double Skin Volume

Designed and constructed to AS3780:2008 for corrosive chemicals.

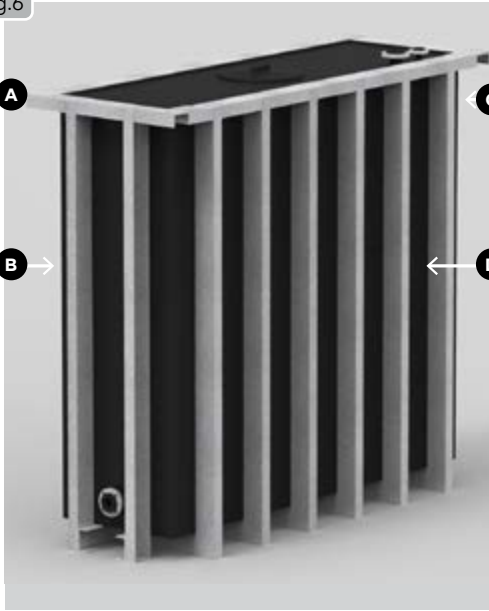
B Vents

Prevent pressure build-up in the event of a leak.

C Double Skin Wall

Designed and constructed to DVS2205.

fig.6



Rectangular Tank

A Steel Frame

Designed to DVS2205 and AS4110 for steel structures.

B Traceability

A full traceability report for the steel structure is available upon request.

C Differential Thermal Expansion

Calculated and evaluated for each tank.

D Filling Fatigue Prevention

Designed and constructed to DVS2205. Deflection on the rectangular tank walls is limited to prevent filling fatigue.

Fig.6: A fabricated plastic rectangular vessel with galvanised steel frame (frames can also be manufactured from thermoplastic) designed to DVS2205-5 standards.

Material Density & Structure

The molecular arrangement in HDPE is in the form of long chains. The chains pack tightly together in a crystalline structure, giving HDPE its high density, strength, stiffness and chemical resistance.

Material Options

Fusion fabricated tanks can be made from a variety of other plastics including: Polypropylene (PP), polyvinyl-chloride (PVC) and polyvinylidene difluoride (PVDF). These can be chosen to match desired characteristics such as chemical resistance, operational temperatures and more. Designs can also include combinations of plastics to further optimise performance and obtain maximum longevity for your application.

Repairs & Maintenance

HDPE is used for the tank, joins and fittings, making an optimal environment with no variances in thermal expansion (not susceptible to cracking), chemical resistance and temperature rating.

Maintenance is infrequent and repairs are less likely

Life Span

Initial costs for fabricated tanks are often more, however the return on investment is much greater when taking into account the lifetime of the tank, minimal maintenance costs and repairs. Subject to application, Fusion offers a 25 year design life on tanks. This statement can be made as a result of consistently accurate materials and specifically engineered per-application designs.



Rotationally Moulded Tanks

Rotationally moulded tanks are manufactured in a process whereby a charge of thermoplastic powder is heated and spun in a hollow metal mould. The heating and spinning turns the plastic molten; coating the mould, which is then cooled to set and form the tank.

This process has the advantage of fast and inexpensive mass manufacturing repeatability,

making the end-product-cost of roto-moulded tanks desirable to consumers.

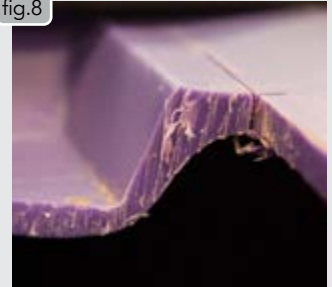
However, when compared to fabricated tanks, and especially in instances of chemical storage, there are a few key points which make this manufacturing technique less reliable; especially for longevity and safety.

Wall Thickness Variances

Wall thickness variances can be an issue and the process of heating the plastic powder must be very accurate (fig.8)

If over or under heated, the plastic can become brittle or may not completely adhere to the mould, making areas weak. Likewise, the cooling process must be monitored and undertaken slowly, otherwise warping can occur.

fig.8



Material Incompatibilities

Material Incompatibilities can be an issue for roto-moulded tanks. On a molecular level, the commonly used lower density plastics are non-uniform in structure. Inlets and outlets are generally manufactured from PE100 and welded directly to the LDPE tank wall. The molecular differences between the tank and these inlets / outlets can lead to failures and cause cracking; significantly reducing operational life.

Right: Fig.9. A roto-moulded tank with a leaking nozzle in the early stages of crack propagation.

fig.9



Rotationally Moulded Tanks

Material Density & Structure

Materials commonly used in rotationally moulded tanks are LDPE, LLDPE or MDPE (Low Density Polyethylene, Linear Low Density Polyethylene or Medium Density Polyethylene) with other grades used for certain chemical storage applications. Generally these are lower in density and weight compared to common fabricated tank materials and can affect overall strength and longevity.

Benefits

- + Low specific gravity
- + Chemical resistance
- + Impact strength

Limitations

- + Very low strength/stiffness
- + Poor heat resistance
- + High coefficient of thermal expansion

Repairs & Maintenance

Rotomoulded tanks tend to fail at the weak points in the shell. This often corresponds to joints connecting pipe fittings and additional fabricated thermoplastic components. If not repaired quickly, this cracking can propagate (Fig. 10) and initiate catastrophic failure—a major OH&S Hazard.

Repairs can not only be costly, but insufficient. They often involve welding virgin PE100 to material which has been exposed to the environment (fig.11 shows the variance between these materials). This can result in material cross contamination causing cracks and leak points to easily re-occur. When storing hazardous chemicals, cracks and leak points are not an option; they can result in damage to the environment, associated plant equipment, and operating personnel.

fig.10



fig.11



Conclusion

Rotomoulded tanks have their place in the market, it is clear that the overall potential for variability in the manufacturing processes and issues of material incompatibilities, makes them a less reliable option for chemical storage tanks and process vessels. A Fusion Fabricated tank can provide exact specifications with little variance in wall thickness and no issues with material incompatibility. These features make Fusion fabricated tanks a safe and reliable option for chemical storage and process applications.

Selecting a Fusion fabricated plastic tank at the project design stage will ensure years of reliable operation.

For more information
about Fabricated Chemical
Storage Tanks visit

fusionaus.com

Complete Mechanical Plant Design

with FRP Top-Access Platform PE Tanks

Fusion undertook a complete mechanical plant design for a milk plant in New South Wales. The project included three large plastic fabricated tanks with top-access safety platforms and above ground pipelines designed to withstand the high thermal expansion and contraction differentials in the hot Australian climate. The plant treats effluent according to Environmental Protection Agency (EPA) requirements.

Fusion's role in this project included:

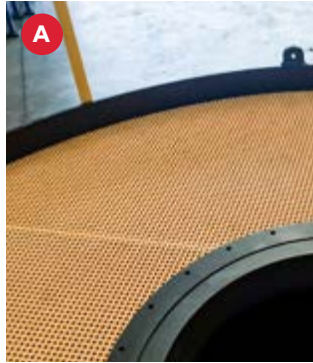
- + PE Tank design and manufacturing of 2 x 52kL and 1 x 30kL HDPE grade PE100 tanks;
- + FRP Tank platforms on all of the supplied Fusion vessels as per the AS1657-2013 standard;
- + Hydraulic design and pipe sizing of the plant as per the AS2200-2006 standard;
- + Pipe support design as per the AS4130-2009 standard and supplier specifications;
- + Supply of all the thermoplastic pipelines and valves and installation of all the supplied components.

Waste Water Processing Tanks with FRP Platforms

The plant uses a hydrochloric acid, caustic and water mixture to neutralise milk waste and required mixing / reactor tanks for processing. The client requested a design including top access to provide easy installation and removal of large aerator mixers.

This feature was included via an FRP platform, ladder and balustrade, designed to AS1657-2013.

- A** Close up of the FRP platform.
- B** The tanks with semi assembled balustrades



Transport

Fusion's fabricated HDPE tanks are easy to transport and install as they're lightweight (for their size), tolerate vehicular movement on roads and come with lifting lugs to crane into position.

- C** Transferring one of the tanks to a truck
- D** Lifting into position.



Site Installation

At the plant, Fusion provided installation services that included commissioning the tanks, installing 1.25" Charlotte UPVC pipe lines, Asahi valves, UPVC dosing systems, filter skids and a range of PE fittings, as well as PE pipe in 90mm – 160mm sizes.



Fusion staff at site assisting with the installation of the wastewater tanks.



Close up of the FRP ladder affixed to the side of the PE tank.



UPVC Pipework installation at the Dairy Plant



The tank installation complete.

Outcome

This project allowed for the Fusion Queensland branch to undertake a complete mechanical plant design and a milestone for plastic fabricated tank design; as these are some of the first fabricated plastic tanks with top-access platforms and safety balustrades.

Furthermore, Fusion was chosen on this project for our pipeline and pipework support design capabilities. The pipelines were constructed above ground for maintenance access and designed to withstand the high thermal expansion and contraction differentials which can occur in the hot Australian climate.

Fusion's own in-house engineers, fabrication and site installation staff allow us to be one point of contact for an entire project from idea to implementation. In the case of this project, we were able to successfully work with the client throughout the entire process and ensure a speedy project completion.



The Fusion PE tanks with FRP top access platforms successfully commissioned at site.



Supply Capabilities

Asahi ball valves and Charlotte UPVC schedule 80 pipe and fittings, were installed in this project. As the Australian distributor of Asahi valves and Charlotte UPVC pipe and fittings, our clients can rest assured that any additional valves, fittings and pipe required in the future can be supplied through us.

Fusion can also assist with all technical support, product selection and supply / installation services.

Find out more about our Asahi Valve range, our installation services and our fabrication services on our website at:

fusionaus.com

Insulated Dual Wall Tank For Sodium Hydroxide Storage

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 Storage

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 sideways 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 too close together, causing a hot zone on the tank wall which subsequently damaged the inside of the existing vessel.



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.



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.



Outcome

The project was commissioned successfully. Our client and team were extremely happy with the outcome.

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.



Dual Wall Tanks For Safer Chemical Storage

Fusion often designs and fabricates single walled PE100 tanks for chemical storage. While they are a great solution, when the chemical being stored is highly corrosive (e.g., sodium hypochlorite, sulphuric acid), extra safety considerations are needed.

An option for highly corrosive media storage is dual walled tanks as opposed to single walled.

Fusion has a history of constructing dual wall tanks which offer a variety of benefits for highly corrosive media.

Fusion Dual Wall Tank Solution

- + **Intrinsic safety** – if the inner tank containing the harsh chemical fails, the outer tank will contain the chemical without external leaks.
- + **A fully enclosed design** – unlike a traditional open bund, fully enclosed dual walled tanks greatly reduce the possibility of ingress of unwanted external material (e.g., rainwater, plant & wildlife etc.), and if the inner tank fails, also prevent the possibility of the chemical splashing

out of the bunded area.

- + **Turnkey solution** – Fusion’s dual walled tanks look and operate just like single walled tanks. These tanks can be fabricated to include nozzles with custom flange and pipe fitting options to suit individual customer requirements. In most cases, these tanks are also ready to simply be moved in place prior to operation with no additional on-site fabrication needed.
- + **Environmental considerations** – like single walled tanks, all of Fusion’s flat-bottomed dual walled PE100 tanks are designed to withstand environmental factors to Australian Standards (including wind, earthquakes and UV radiation).
- + Sloped and conical bottoms can be integrated in the tank design to allow for full drainage of the contents.



Project Photography

A recent dual wall sodium hypochlorite storage tank fabricated at the Fusion WA branch.

To find out more about our chemical storage solutions visit:

fusionaus.com



Shows the space between the inner and outer walls, before a cover is applied.



Two complete dual skin tanks undertaking hydrotesting





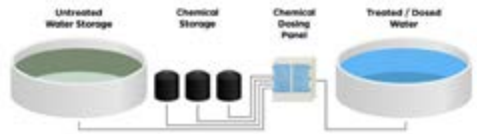
Critical Factors In Dosing Panel Design

Protecting People & The Environment

The protection of people and the environment is paramount where dangerous chemicals are used in industrial applications. Fusion, in consultation with a leading design house and the WA state utility provider, Water Corporation, asked Fusion to provide a design for a fully contained chemical dosing cabinet offering maximum protection against the accidental leak or spill of harmful chemicals.

Chemical dosing panels, loading panels and sample panels are used in many industries for the safe treatment of water; in both permanent and transportable/containerised water treatment plants. The process of creating clean drinking water requires additional chemicals to remove bacteria and provide a continual, safe and consistently healthy supply of water in the residential, commercial and industrial sectors throughout Australia and worldwide.

The panel is the primary access point to controlling the dosage of chemicals whereby piping, valves, pumps, instrumentation and meters



provide the controls necessary to implement consistent dosing or make minute adjustments.

Dangerous chemicals and heated liquids such as: sodium hydroxide, aqueous ammonia hydroxide, citric acid, sodium hypochlorite, sodium bi-sulphite and antiscalant; pass through dosing panels from chemical storage tanks thereby making it critical that the highest safety concepts are designed into the panel to significantly reduce the risk of accidental spray or leaking of chemicals onto operators, other personnel accessing the area or the environment.

There are several features and material choices built into Fusion's chemical dosing panels which minimise the risk of chemical leaks.

Polypropylene Plastic

Fusion chemical dosing panels are built from Simona or Rochling polypropylene (PP) sheet, a thermoplastic with high mechanical strength, great impact, corrosion, chemical and moisture resistance; perfect in applications such as chemical

engineering, tank building, ventilation, equipment manufacturing, and laboratory technology and in products such as chemical storage tanks, electroplating barrels, fume cupboards and pipe flanges.



Self Supporting

Fusion's dosing panels are fully self-supporting. The PP enclosure is the supporting structure and makes for a longer lasting, corrosion-free environment.

Rigid, Self-closing Doors

Door design is vital to provide easy access, but also to ensure a safe enclosure. Fusion's recommended design dosing panel doors use self-closing, variable tension hinges to ensure that when access isn't required, the doors close and passers-by are protected from the pipework.

Lock Open & Easy-Close Doors

While the auto-closing feature provides extra safety by ensuring the doors remain closed, it is necessary to have them stay open while important maintenance is undertaken. We install lockable sliders along the bottom of our doors. When the door is opened to its full extent, the slider engages and keeps the door open.

Lockable Doors

On top of the self-closing hinges, we can install strong twist handles to make opening and closing easy and most importantly, they can lock the door shut when panel access isn't required.

Entire System Design

Fusion's work developing, fabricating and installing the safest chemical dosing panels, in consultation with a leading design house and state utility provider, is a testament to our view of always evolving and improving our designs and our dedication to producing the highest quality plastic fabricated products for industrial use, in Australia.

Our team of experienced project managers, mechanical engineers, fabricators and installers, and over 17 years of fabrication and design experience in this field, has also contributed in making Fusion a world-class, trusted partner on major water treatment, desalination and utilities projects Australia-wide.

Power Station RO System UPVC Pipework

A utilities client who operates a power plant in rural WA required an upgrade to their existing Clean-In-Place (CIP) area.

Fusion's experienced engineers and on-site technicians assisted with the design, supply and installation of a UPVC piping system with supports in two locations within the facility. The pipework

conveys chemicals to clean the membranes inside reverse osmosis cartridges (also called Headers) and ensure efficient water filtration.

Materials used in the Clean-In-Place system are Charlotte Schedule 80 UPVC and Asahi Type 21 UPVC Ball Valves.

The UPVC Piping System

Fusion installed Charlotte UPVC pipe and fittings and Asahi Type 21 ball valves to connect the chemical storage tanks to the rest of the Clean-In-Place system and the headers.



Fusion installed UPVC Pipework in front of the reverse osmosis headers.



UPVC pipework and Asahi valves exiting the cable tray above and heading to different ends of the reverse osmosis cartridges.



Other Fusion Products on Site



Pipework coming down from the overhead cable trays.



Top: A PE IBC bund fabricated by Fusion.

Right: A fabricated, sheet PE storage tank built by Fusion.



Retrofitted Safety Cabinetry

Benefits

- + Corrosion Resistant.
- + Chemical Resistant.
- + Light weight.
- + Maintains pipework visibility.
- + Provides added safety by reducing the pipe-to-person exposure time.



A This existing panel required screening but with the option to isolate the pumps separately and still be able to safely maintain the system.



B Fusion designed a cabinet to house the panel and sectioned each system via an internal partition.

PE Culvert Fabrication



We were contacted to quote only for PE supply, however, after an explanation of our fabrication capabilities, the quote expanded to include culvert fabrication. Being able to communicate with one company for both the culvert fabrication and supply, was a major contributing factor for the client awarding to project to Fusion.

Culverts are most commonly used to divert water—and debris carried by water—underneath roads and other passages of transport.

The client supplied the design and requested a black HDPE culvert with circular openings, transitioning into a rectangular centre for fitting underneath an existing concrete culvert. The stiffness of HDPE, the number of braces in the design and the reinforcement of the conversion joints, ensured our fabrication team were in for a few challenges. It was also critical to fabricate a smooth transition from the culvert's circular ends into the rectangular centre, ensuring minimal obstruction to water flow.

A left: large bore PE end in the foreground shows transition to the rectangular extrusion welded, reinforced, central section.

Remote WWTP UPVC Supply

Fusion supplied plastic piping system products for the construction of a wastewater treatment plant (WWTP) in remote Australia.

The system chosen for this project was Schedule 80 UPVC. It's recognised around the world as a superior, corrosion free, reliable piping solution. In this instance, ABS did not provide the chemical resistivity required and installation times for PE would have outweighed potential savings on material.

The remote location of this WWTP leaves little room for pipework failure; as it's critical for the maintenance of up to 2,500 construction beds on site. UPVC has excellent solvent weld strength and reliability. For that reason, it's used internally, externally and below ground throughout the entire plant.



A The Pump Container — The container houses the permeate pump skid, chemical dosing tanks and dosing pumps. Ferric chloride and sodium hypochlorite are being dosed for the site and batching sodium hypochlorite and citric acid for membrane cleaning cycles.

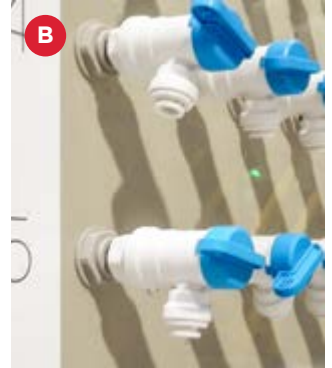
B The Permeate Pump Skid – The pumps draw permeate from membranes and pumps them to a treated effluent storage tank. Chlorine and turbidity are both monitored and three way valves will send any non-compliant effluent back to the process.

Sampling Station

Fusion manufactured a polypropylene (PP) water sampling station to allow for a water treatment facility to easily perform testing / analysis on water from a large array of reverse osmosis membranes.



A Sampling station showing all outlets, complete panel and steel frame. Installed on site.



B Outlet taps with grid numbering.



C The reverse side of the panel showing organised tubing.



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