

AQUAPLATE® steel for water tanks

INTRODUCTION

AQUAPLATE® polymer coated steel has been specifically developed for the fabrication of water tanks and is the only product recommended by BlueScope Steel for this application. AQUAPLATE® steel comprises traditional zinc-coated steel sheet laminated with a food grade polymer film.

Variation in water quality can affect the performance of (non-AQUAPLATE® steel) steel tanks. However, there is minimal impact from water quality on the service life of a tank made from AQUAPLATE® steel. This is due to the presence of the food grade polymer lining, which acts as a barrier to prevent metal to water contact.

MATERIAL SPECIFICATION

AQUAPLATE® steel for tank walls and lids

The polymer film for tank walls and lids is always located on the inside of the tank. The reverse or outside surface is treated with a clear, weatherable water-based lacquer. The primary function of the lacquer is to minimise early dulling of the outside finish.

AQUAPLATE® steel is also available with a prepainted finish that allows the tank to blend in with the architectural features of your home.

AQUAPLATE® steel for tank bases

The bottom surface of a tank base is subjected to more challenging durability conditions (compared to the rest of the outer tank surface), therefore tank bases have the polymer film on both sides of the zinc-coated steel substrate to maximise the tank service life. The polymer film is not resistant to ultraviolet light (UV) and as such should not be exposed to sunlight.

Polymer film

The polymer film is a 200µm thick, food grade material manufactured in accordance with Australian Standard AS2070-1999, *Plastic Materials for Food Contact Use*.

Steel substrate

ZINCFORM® G300S Z450 steel is used as the substrate in the manufacture of unpainted AQUAPLATE® steel. Prepainted AQUAPLATE® steel is manufactured using a substrate of ZINCFORM® G300S Z275 steel.

Corrugations

The corrugations for the tank walls comply with Australian Standard AS1445-2013 *Hot-dipped zinc-coated, aluminium/zinc-coated or aluminium/zinc/magnesium-coated steel sheet – 76 mm pitch corrugated*.

PERFORMANCE

Water types

The type of roofing material from which rain water is collected, be it cement or terracotta tiles, aluminium, ZINCALUME® steel or COLORBOND® steel will not affect the life of a tank made from AQUAPLATE® steel when recommended installation procedures are followed.

Potable river, bore and town waters may also be collected.

Thermal resistance

The polymer lining of the AQUAPLATE® steel tank is not designed to store water at temperatures in excess of 65°C. Avoid subjecting the polymer lining to elevated temperatures.

Chemical resistance

The polymer lining on AQUAPLATE® steel should not have prolonged contact with the following chemicals:

- alkalis of all concentrations
- mineral acids of all concentrations
- petrol, kerosene, mineral turpentine and alcohol
- water solutions of inorganic compounds

The product should not be permitted to come into any contact with:

- low molecular weight organic acids such as acetic, lactic, formic and stearic acids
- aromatic hydrocarbons (e.g. toluene)

- chlorinated hydrocarbons (e.g. 1,1,1-trichloroethane)
- ketones (e.g. Methyl Ethyl Ketone)
- esters (e.g. cellosolve acetate).

Exposure to sunlight

The polymer film is **NOT** UV resistant and degradation will occur progressively by embrittlement if the lining is exposed to sunlight. Additionally, the growth of algae is encouraged by sunlight. To assist in maximizing the service life of a tank, it should therefore be fitted with a suitable lid.

METHOD OF CONSTRUCTION

Tanks made from AQUAPLATE® steel are fabricated in a similar manner to other steel tanks, but it is **ESSENTIAL** to note that soldering is not appropriate.

AQUAPLATE® steel is a sophisticated material which requires care to protect the integrity of the film during tank fabrication. The fabrication methods employed **MUST AVOID FILM DAMAGE**. Unrepaired damage will substantially reduce tank service life. For information on tank fabrication using AQUAPLATE® steel, please refer to [Forming Technical Bulletin FTB-9 Tank Fabrication](#).

After fabrication, the tank interior should be inspected carefully to prevent damage to the polymer laminate and all exposed steel sheet edges and exposed rivets or screws sealed with a neutral cure silicon sealant. Any cuts in the film should also be repaired with sealant. For details on sealants, please refer to [Technical Bulletin TB-9 Sealants for Exterior Finishes](#).

Open seams on outside of tank

It is recommended that the open seams on the outside of the tank be sealed against water ingress as this could cause corrosion.

Cure times

Prior to filling the tank, the sealant must have sufficient time to cure in order to ensure that the sealant is able to withstand the load of water. Refer to the sealant manufacturer for information regarding cure time.

TANK INSTALLATION AND CONNECTION

Location

Ideally the tank should be located in a shady site away from trees to prevent debris clogging the strainer (which may result in contamination of the water).

Tank base

The service life of a tank is significantly increased by installing on a firm, stable platform with no overhang of the tank over the edge. Tank stands must be engineered to support the tank safely when full of water with attention given to the extra weight of a full tank (keeping in mind that one litre of water weighs one kilogram).

As tanks made from AQUAPLATE® steel are supplied with a protective membrane under the base, they may be installed directly onto a concrete pad or timber platform.

Accessories

Any accessories used for water tanks must be designed to give a long life to match that of the tank itself. **DO NOT** use copper fittings for any part of a tank made from AQUAPLATE® steel as copper is incompatible with the tank's zinc coating. Refer to [Corrosion Technical Bulletin CTB-12 Dissimilar Metals](#).

Inlet strainers

Anodised aluminium mesh is recommended for inlet strainers. Copper or copper alloys **MUST NOT** be used. ZINCALUME® steel or plastic are suitable materials for the strainer surround, but ZINCALUME® steel must not be continually immersed. The strainer must be located above the water level.

A PVC overflow with appropriately contoured flanges or a stormwater pipe adaptor should be fitted and a gauze filter should also be fitted to prevent mosquito infestation.

Outlet fittings

Copper and its alloys **MUST NOT** be used for fittings connected to an AQUAPLATE® steel water tank. If a copper outlet pipe is used, at least two metres of food grade plastic tubing must be installed between the copper pipe and the tank.

Wash tanks before use

All tanks must be washed out after fabrication and before being put into

use. Washing is required to remove contaminants which may have developed during the many processes involved in producing the AQUAPLATE® steel and its subsequent rollforming, transport and fabrication into a tank.

Cuprosolvency

Waters of low pH and low alkalinity are aggressive to copper pipes and may dissolve some of the metal. Even minute quantities of dissolved copper will deposit a green/blue stain within residual soap films occurring on household wet area surfaces. This staining does not originate from the polymer film on AQUAPLATE® steel, the tank itself or prepainted roof surfaces, such as COLORBOND® steel.

Odour and taste

Care should be taken to ensure that contaminants are not introduced into the water tank.

In the event that any odour or taste is evident from water originating from a tank made from AQUAPLATE® steel, the catchment area should be checked for contaminants such as lichen or deceased animals as these are known to effect water quality.

Experience has shown that slight odours or tastes associated with the water from a new tank made from AQUAPLATE® steel will disappear after the tank is flushed out.

PAINTING OF EXTERIOR TANK WALLS

To allow the tank to blend in with the architectural features of your home AQUAPLATE® steel is also available with a prepainted steel substrate.

In some cases the tank may need to be painted after installation. This may be for enhanced corrosion resistance in aggressive conditions (such as coastal or industrial sites), or for aesthetic or environmental reasons.

Please refer to [Technical Bulletin TB-2 Overpainting and Restoration of Exterior BlueScope Steel Products](#) for recommendations related to painting.

GOOD PRACTICE WITH DRINKING WATER TANKS

1. Wherever possible, all sections of inlet pipes should be directed down and rainwater should flow into the top of the tank. The inclusion of

rising section will provide potential traps for sediments, biofilms and stagnant water and these should be avoided.¹

2. The first fill collected should be discarded to prevent contamination of the collected water by any contaminants which may occur during fabrication or transport.
3. If a roof is to be post painted, always check the suitability of the paint for collection of drinking water.
4. **DO NOT** collect drinking water from lead, copper or copper treated timber.
5. Avoid build-up of, or immersion in, dirt and/or detritus around the bottom of the tank walls.
6. Avoid build-up of detritus on the leaf strainer to prevent overflow of catchment water directly onto the exterior surface of the tank lid and walls, creating an inert catchment corrosion problem.
7. The design of the tank overflow pipe should ensure that water discharged from the overflow is directed clear of the tank walling.
8. Internal access to the tank is discouraged, as this may result in damage to the polymer lining leading to premature failure.

¹ National Environmental Health Forum – Guidance On Use Of Rainwater Tanks, 1998

RELATED BLUESCOPE STEEL TECHNICAL BULLETINS

Technical Bulletin TB-2

Overpainting and Restoration of Exterior BlueScope Steel Products.

Technical Bulletin TB-9

Sealants for Exterior Finishes

Forming Technical Bulletin FTB-9

Tank Fabrication

Corrosion Technical Bulletin CTB-12

Dissimilar Metals

REFERENCED AUSTRALIAN STANDARDS

- **AS 2070-1999** – *Plastics materials for food contact use.*
- **AS 1445-2013** – *Hot-dipped zinc-coated, aluminium/zinc-coated or aluminium/zinc/magnesium-coated steel sheet – 76 mm pitch corrugated.*

NOTE:

All Australian and Australian/New Zealand Standards should be read to incorporate any and all amendments to the most recently published version.

If you have any questions regarding this Bulletin, please contact BlueScope Steel Direct on 1800 800 789.

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