

# SURFACE MOUNTED WATER TANK AND LINER ERECTION INSTRUCTIONS

## Tools Required

Speed bit to tighten the bolts and nuts  
17mm socket for tank bolts  
17mm long reach socket for tank brackets or 17mm ring spanner  
Stilsons to tighten outlet (where appropriate)  
Strong pliers to wind up wire strainer  
Rubber hammer for top capping  
Sharp knife to cut liner  
Strong screwdriver or 'Podger'

## Check List

1. The steel sheets for the tank wall are banded together. These should be kept under cover until separated for building. Each sheet is letter coded for thickness and one will have a hole drilled in it for a take-off unit (if specified at time of ordering).



2. Box containing nuts, bolts, washer, anchor brackets and 10mm x 75mm Parabolts.



3. Coil of wire for liner collar and wire strainer.
4. Two lengths of split capping (25mm and 12mm diameter).



5. Butyl rubber waterproof liner.
6. Emergency repair kit for the liner.
7. Ballcock bracket (if ordered).
8. Tank outlet (if ordered).

**NOTE:** Comprehensive stress calculations for our range of tanks have been professionally carried out for us by external consultants for wind loadings of up to 90mph.

The steel thickness shown below and the cement flaunching around the inner circumference of the base are integral of these calculations. A thin gauge top sheet placed in the base ring can be a potential time bomb!

### CONCRETE BASE

In order to comply with the UK Ministry of Agriculture or EC requirements, it is necessary to erect the tank on a concrete base with a minimum thickness of 100mm. Dependent on local soil conditions and size of tank it may be necessary to insert reinforcements into the concrete. The base slab must have a relatively smooth surface and measure 600mm in excess of the diameter of the tank. All sharp projections must be removed and the slab swept clear of all loose rubble, stones etc.

The concrete base should be constructed of pre-mix concrete to a strength of 30 Newton, 300kg/m<sup>3</sup>.

*The approximate quantities to provide a minimum depth of 100mm are shown at the rear of this document headed 'Dimensional Technical Data' in the Appendix 5.*

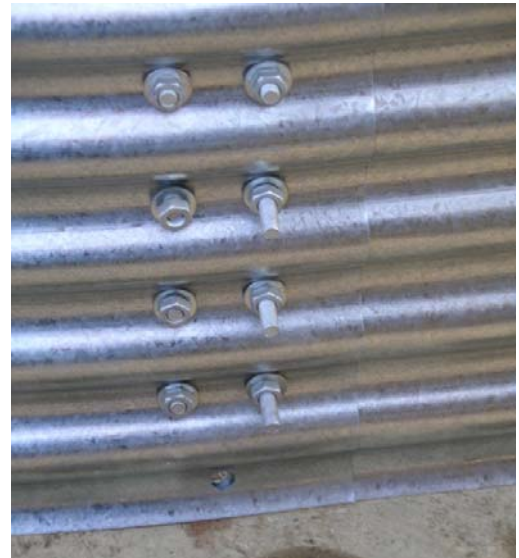
Leave pre-mix concrete a minimum of 72 hours to harden off before any further work is carried out.

## ERECTING THE STEEL WALLS

1. Find the centre of the concrete base and mark out a precise circle with the chalk to the diameter of the tank. Tip sufficient sand on the base area to provide a 50mm layer. Provide enough cement powder for the 75mm flaunching mix later on (step 8). Place the liner, still packed, on the centre of the base.



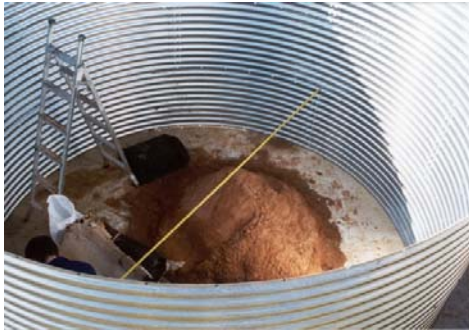
2. Sort out the galvanised sheets to determine the different thicknesses. Each sheet is marked with a labelled code number to denote its gauge, strength and the diameter of the completed tank. eg 16 25 36 = 1.6mm thick, Z25 strength steel, 36' diameter. The relevant thicknesses are 1.6mm, 1.2mm, 1.0mm and 0.8mm.
3. The thickest panel is used at the base of the tank and the thinnest is used at the top. The steels will be supplied on the pallet in the order they should be assembled in, i.e the bottom ring of the tank will be on the top of the pallet.
4. **The base ring:** Working in a clockwise direction and following the chalk line, place each consecutive panel on the inside of the preceding one. Loosely bolt the bottom layer of sheets together using a screwdriver to line up the bolt holes, where necessary. Bolt heads must be inside the tank. Nuts and bolts are not fitted to the bottom horizontal row of holes.



5. Fix the anchor brackets provided on the outside of the tank at each vertical end joint in the base ring, using the long bolts (M10 x 40mm) and additional spacer nuts. Do not fix the brackets to the concrete.



6. Check for ovality and adjust accordingly to provide a circle of the correct diameter. Tighten some of the bolts to hold the panels securely. Do not tighten all the nuts and bolts until the tank is fully erected.



7. **Second, third and fourth steel rings:** Each additional ring of panels is fitted outside the ring below, thus creating an external overlap, enabling rain to be shed.



It is essential that each alternate ring is staggered i.e. the end of each panel should rest towards the middle of the panels below, similar to a brickwork effect.

Proceed as for the base ring ensuring the correct thickness of galvanised sheet is used at each level.



Check again for ovality; when all panels are in place tighten all the nuts and bolts. Fix the anchor brackets to the concrete base.

8. **Cement flaunching and sand bed:** Make a 5:1 cement dry mix and place the 75mm flaunching around the inside circumference of the tank wall. Spread the FINE SOFT BUILDERS SAND and cover the base with 50mm of sand.



9. If an outlet is to be fitted, place a gasket washer and alloy disc adjacent to the pre-drilled hole in the appropriate panel. The take-off is fitted last and one of the washers is located between the steel wall and rubber liner.



#### 10. Quantities of sand & cement required for flaunching

Tank Diameter	Sand Required	Cement Required
2.74m (09')	0.26m <sup>3</sup>	25kg
3.66m (12')	0.46m <sup>3</sup>	25kg
4.57m (15')	0.72m <sup>3</sup>	25kg
5.49m (18')	1.04m <sup>3</sup>	50kg
6.40m (21')	1.42m <sup>3</sup>	50kg
7.32m (24')	1.85m <sup>3</sup>	50kg
8.23m (27')	2.34m <sup>3</sup>	75kg
9.14m (30')	2.89m <sup>3</sup>	75kg
10.06m (33')	3.50m <sup>3</sup>	75kg
10.97m (36')	4.16m <sup>3</sup>	75kg
11.89m (39')	4.88m <sup>3</sup>	75kg
12.80m (42')	5.66m <sup>3</sup>	100kg
13.72m (45')	6.50m <sup>3</sup>	100kg
14.63m (48')	7.40m <sup>3</sup>	100kg
15.54m (51')	8.35m <sup>3</sup>	100kg
16.46m (54')	9.36m <sup>3</sup>	100kg
17.37m (57')	10.43m <sup>3</sup>	125kg
18.29m (60')	11.56m <sup>3</sup>	125kg
19.20m (63')	12.74m <sup>3</sup>	125kg

20.12m (66')	13.99m <sup>3</sup>	125kg
21.03m (69')	15.29m <sup>3</sup>	150kg
21.95m (72')	16.65m <sup>3</sup>	150kg
22.86m (75')	18.06m <sup>3</sup>	150kg

**NOTES:** Distribute the sand evenly across the base ensuring it is to a minimum 50mm layer.

A 75mm high flaunching of cement must be provided around the inside circumference of the tank base to ensure retention of the sand and the rubber liner; see drawing below. It is essential to place a 50mm layer of sand over the concrete base. Failure to provide the cement flaunching and the 50mm sand layer will invalidate the warranty.

### THE FLEECE – OPTIONAL ITEM

#### BEFORE FITTING THE FLEECE...

1. **CHECK** that each steel ring has the correct gauge number code.
2. **CHECK** that there are bolts in every punched hole except the top and bottom single line of traverse holes.
3. **CHECK** that all screw heads are inside the tank. All burrs must be removed and smooth surfaces restored.
4. **CHECK** for damaged corners and/or distorted edges of the corrugated sheets. These must be carefully straightened back to their original profiles to prevent puncture damage to the liner.

### FITTING THE FLEECE

This is a two-man job, requiring one person inside the tank and one outside on a ladder. If a tank outlet has been ordered please refer to the Tank Outlet details below.

1. Fit the smaller capping (12mm) around the top of the steelwork. Tape the capping into place to ensure that it remains in place when pulling the liner over it.



2. The fleece comes in widths of 5.25 metres and lengths to suit the height of the tank ordered. Lay out the pieces of fleece onto the base of the tank.
3. The person inside the tank passes up the edge of the liner to the outside man on the ladder who pulls the liner up until he has approximately 300mm of liner hanging down the outside of the tank, which he should secure with clamps.



4. Work around the tank overlapping on the vertical seam by 25cm until the steelwork is completely covered by the fleece.





5. It is now a simple matter to go around and adjust the fleece so there are no creases in the sides.

Now proceed to point 2 of **FITTING THE LINER**.

## THE LINER

### **BEFORE FITTING THE LINER...**

1. **CHECK** that each steel ring has the correct gauge number code.
2. **CHECK** that there are bolts in every punched hole except the top and bottom single line of traverse holes.
3. **CHECK** that all screw heads are inside the tank. All burrs must be removed and smooth surfaces restored.
4. **CHECK** for damaged corners and/or distorted edges of the corrugated sheets. These must be carefully straightened back to their original profiles to prevent puncture damage to the liner.

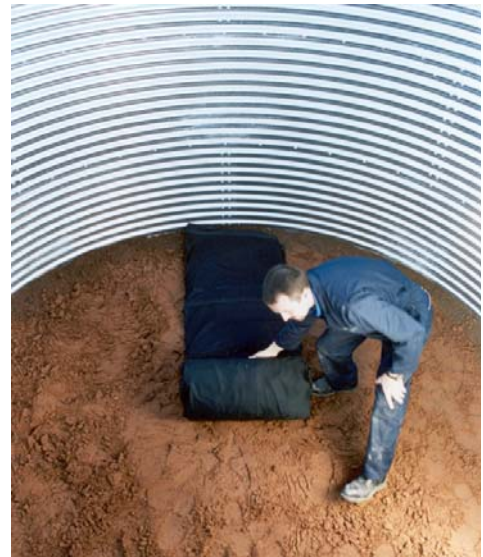
## FITTING THE LINER

This is a two-man job, requiring one person inside the tank and one outside on a ladder. If a tank outlet has been ordered please refer to the Tank Outlet details below.

1. Fit the smaller capping (12mm) around the top of the steelwork. Tape the capping into place to ensure that it remains in place when pulling the liner over it.



2. Roll out the liner over the 50mm sand base, laying it out so that the base to wall circumference seam is touching the steelwork all around. The vertical side will then be laying flat on the base. **BEFORE working with the liner check the sand for stones or sharp objects. Also check your SHOES.**



3. The person inside the tank passes up the edge of the liner to the outside man on the ladder who pulls the liner up until he has approximately 300mm of liner hanging down the outside of the tank, which he should secure with 75mm pieces of outer capping.



4. The inside man should check that the side of the base seam exactly fits into the corner of the cement fillets. He then moves around to the next vertical steel joint and repeats until the liner is hung. This operation will have stretched the liner wall and you will probably have vertical or diagonal creases in the wall. It is now a simple matter to go around and adjust the liner so there are no creases anywhere in the sides or the base by removing the 15cm clips and readjusting.
5. Included in the kit is a length of wire and a wire strainer to act as a collar. This secures the 300mm overhang around the outside circumference of the tank to prevent the liner creeping back under the capping in time. This wire collar should be tightly strained just below the split capping and above the first horizontal row of bolts. Slip a spare piece of butyl sheet behind the strainer to prevent it cutting into the liner while it is being tightened.



6. When the liner is free of creases, fit the outer split capping, removing the temporary clips as you go. The outside flap should be even all round; if it is not the tank is oval.



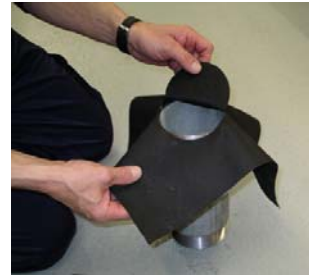
*Creases in the liner always show. They can be detected even when the liner has been removed from the tank. ANY SIGN OF CREASES INVALIDATES THE WARRANTY.*

### TANK OUTLET UNIT

When the liner is properly hung, the take-off unit can be fitted.

Tap out a neat circle of rubber on the end of the threaded outlet once it has been pushed through the steelwork. Use PTFE tape around the threads of the outlet to prevent water seeping down the threads. The rubber gaskets should be positioned either side of the liner between the metal washers. Tighten the inside nut by hand as far as necessary and with the inside nut held stationary by a spanner, complete the tightening on the OUTSIDE nut. Take care not to rotate the threaded pipe as this will distort and tear the liner.

The process is shown here, please note that we prepared this in our workshop to demonstrate the procedure.





**NOTE:** It is advisable to fit the brass gate valve to the short thread of the outlet assembly prior to making the connection through the tank wall.

## OUTLET ASSEMBLIES



**Screwed Outlet Assemblies** These are available in 2", 3" and 4" and screwed Male BSP, providing a thread to take a filter assembly on the inside of the tank and a screwed gatevalve on the outside of the tank. The panels are provided with predrilled holes to customer specification and the outlet assemblies are installed so that the liner and tank panels are trapped between backing flanges.

**Flanged Outlet Assemblies** These are available in 110mm up to 200mm diameter to allow for overflow or larger outlets. Panels are supplied drilled for bolts as required, although due to the weight of some of the larger assemblies it is important that pipework has additional support.

It is essential to check the correct positioning of the liner to ensure that the wall to base seam has not moved away from the tank side. This will not show from a cursory inspection and it is essential that the erector is inside the tank to check correct positioning whilst the first 50 to 75mm of water is run in.

Failure to position the liner correctly will cause dangerous bridging. See Appendix 6.

Flood the tank floor with 150mm of water. Fix the anchor brackets to the concrete base with parabolts.

## TOOLS REQUIRED

Speed bit to tighten the nuts



'PODGER' or strong screwdriver to align and hold the steel panels



17mm socket for tank bolts



19mm socket for parabolts



12mm drill bit & drill to drill holes for Parabolts



17mm long reach socket for tank brackets or 17mm ring spanner



Stilsons to tighten tank outlet (where appropriate)



Strong pliers to wind up wire strainer



Rubber hammer for top capping



Standard hammer for marking liner with outlet



Sharp knife to cut liner

