

# Tank Repair Information

**DURACRETE**  
PRECAST TO LAST

There are many reasons why a concrete water tank can crack or lose water, and it is not always due to the quality of the tank. In our 55 plus years of concrete water tank manufacturing, we have seen and continue to see to this day, many reasons that can contribute to a water tank cracking or sudden water loss.

You can be rest assured that we will assist with rectifying or monitoring the problem regardless of what may have caused the issue.

This document has been created to assist our customers. It aims to reassure you that although your tank might be developing a crack, your tank still remains structurally safe and sound thanks to our Steel Fibre Technology. It also explains concrete's natural behaviour and many of the issues that we have seen in our time as water tank manufacturers. We would like you to read it to help identify your issue. This will also assist you in completing the questions asked in our Warranty Claim Form.

*"If your tanks are painted dark, you may be more prone to shrinkage cracks"*



## Common causes of cracks/water loss

- 1.** Natural curing of concrete
- 2.** Fibre weeps/bug holes
- 3.** Incorrect site preparation
- 4.** Ground movement
- 5.** Temperature changes
- 6.** Damage during backfilling
- 7.** Leaking fittings/taps/toilet cisterns
- 8.** Accidental syphoning

## Concrete and it's natural behaviour

Concrete is unique in that it is strong but also brittle at the same time. Like most natural products such as timber and metal, it will expand and contract as the ambient temperature increases and decreases, but not in a flexible way such as plastic or rubber. This will naturally occur without being visible to the naked eye.

As the sun rises and falls and seasons change, a concrete tank is subject to many exterior changes in temperature whilst the inside of the tank maintains a constant, cooler temperature. For example, in summer you will have the blazing hot sun on the outside and cold water on the inside. This situation is known as "temperature differential" and could possibly have an effect on your concrete tank.

One such circumstance that we occasionally come across where a temperature differential has caused damage to a tank is when it has been painted a dark colour. Dark paint increases the surface temperature on the outside of the tank in sunny conditions. Much the same as wearing a black t-shirt in the sun compared to a white one. If your tanks are painted dark, you may be more prone to shrinkage cracks as the temperature differential is greater than in a lighter colour or unpainted tank.

## Causes of cracks/types of water loss to consider

There are numerous causes of cracks and various ways that tanks can lose water. Here are a few of those causes to look for.

### Fibre weeps or bug holes

When one of our tanks is made, the fibre that is introduced into the mix at the time of batching the concrete can become lodged from wall to wall. i.e it will bridge the distance from the inside of the tank wall to the outer. Whilst you won't see this with the naked eye, once filled with water it may track along the length of the fibre, showing up as a leak on the outside of the tank wall.

There are also air bubbles in the concrete. Some of these are visible on the outside of the tank wall. If one of these bubbles has an air pocket all the way through the wall, water will track through it and be visible on the outside of the wall, much the same as a fibre weep.

In both cases, the tanks are not structurally affected and remain fit for purpose. 99% of the time, this scenario will heal itself over the next few weeks. If it doesn't improve, we have a product that we can apply that is about the size of your thumbnail which slows the flow to a stop.



Bug hole/fibre weeping



Inadequate site preparation showing fines sitting directly on clay. A 100mm compacted layer of GAP40 fill should be between the clay and the fines as per below:



75mm layer of  
7mm fines  
100mm layer of  
hard fill (GAP40)  
Good/virgin  
ground

Correct site preparation



Natural curing / seeping

In both cases, we advise that you monitor the water seepage and see if it heals naturally. (More about the self-healing properties of concrete shortly).

### Incorrect or inadequate site preparation

Getting the site prepared correctly before installation of our tanks is crucial. After all, the tank and the water combined weigh upwards of 33 tonnes. These 33 tonnes need to be spread evenly across the tank and by following our site preparation requirements outlined in our tank data sheets, you are giving the tank the best possible opportunity to survive any ground movement over its lifespan.

Cracks that are created by poor site preparation start at the bottom of the tank and go through the cove, continuing vertically or diagonally up the wall. The cove is a 170mm thick internal corner of the tank where the floor and wall meet. To crack this area, a significant amount of stress has been placed on the tank.

This type of crack can be repaired, but the tank will be required to be completely emptied beforehand.

Please check your site to see if it has been prepared in accordance with our requirements. If we can access this site preparation, we will also check this at the time of a site visit or repair.

### Ground movement/subsidence under or around tank

Has your tank been in place for some time and had no issues? Has there been heavy rain? Have there been slips in the area? Is my overflow washing away the site and undermining the tank?

If suddenly there is a crack coming up from the base in a vertical or horizontal direction the site that it is sitting on may have moved or subsided due to the above. All these scenarios are possible and whilst they could be impossible to pinpoint, may have occurred.

Again, vertical or diagonal cracks of this type can be repaired if the tank is empty.

### Natural curing of the concrete

A common perception regarding our concrete water tanks is that they are bulletproof, flexible and will never crack. Unfortunately, this is not the case. They are not bullet proof or flexible and all concrete can crack under certain circumstances. For example, concrete driveways, footpaths and house slabs will develop cracks at some point and they only take foot traffic or light vehicles over them. They also have crack inducers cut into them to assist with the location of the inevitable cracking. Our tanks cannot have crack inducers cut because they hold 25 tonnes of water and should we cut these inducers in, the structural integrity of the tank would be weakened.

Over the first 25 years of the lifespan of your tank, it will still be curing. Concrete takes a long time to fully cure and whilst it is doing so, it can expand, contract and yes, shrink. In our experience, these shrinkage cracks are usually horizontal and appear out of the blue after years of not being there. It is highly likely that the crack will be hairline, lose minimal water and self-heal quickly.

If your tank displays this type of horizontal crack, please monitor it over the course of a couple of months. The less water that is passing through the crack the better as this will increase the chances and time it takes to self-heal.



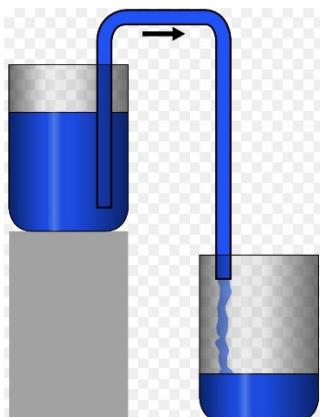
Damage caused during backfilling (impact point)



Repaired damage caused during backfilling



Roof Crack



Basic syphoning principle

## Damage to the tank during back filling

If your tank is fully or partially buried, you have mitigated the temperature differential mentioned above by keeping the outside of the tank nice and cool thanks to the surrounding earth.

Think of the tank as an eggshell that doesn't take to kindly to an impact. When backfilling occurs, sometimes the digger bucket can accidentally contact the tank. Once backfilling has taken place, you will struggle to see the impact point but a crack will form and work its way up to the top of the tank wall and be visible thanks to what remains out of the ground. We suggest you dig down and follow the crack for a bit to see if you can locate an impact point.

We can apply something to the outside of the tank below the ground level, but the best option is to again, drain the tank and allow the repair to take place from the inside.

## ROOF CRACKS

It is not uncommon for the roof of a cone top tank to develop cracks at some point.

These cracks usually develop around the manhole or from the edge of the roof inwards, towards the pinnacle of the cone shaped roof. These rooves are unable to have crack inducers cut into them as footpaths and driveways do, so cracks will appear where the concrete feels that the weakest point within it is.

Please remember that the purpose of this roof is as a dust cover that keeps leaves, dirt, animals and people out of your water supply. The odd crack in this part of the tank does not affect the primary purpose of the product... to hold water.

Repairs to the roof area are not impossible but will leave a visible scar on the outside of the roof that is not guaranteed to be effective given the shape of the roof and exposure to the elements. Our suggestion would be to monitor them but leave them be, much like a footpath crack.

## OTHER FORMS OF WATER LOSS

If you are contacting us due to your tank suddenly losing water, the question must be asked... has anything changed?

The following examples are all scenarios of calls that we have had where the tank was fine on the weekend and full to the top and now suddenly there is no water. Please check this list to see if any of these scenarios have occurred.

- Ground settlement or contraction during dry months can pull plumbing fittings out of the external connection point to the tank. You may notice a wet area around a certain point of the tank.
- Running taps, toilet cisterns or irrigation systems that are left on or not shutting off properly will continuously allow water use. If they are not turned off properly or shutting down at the correct time, water will continue to run as your water pump is sensing a pressure release in the line. Until these types of scenarios are identified and rectified, your water tank will be drained down.
- Garden hoses or alkathene lines that have been left in manholes of water tanks whilst filling them with water will create a syphon effect if left in the water once water is turned off. Please remember to turn them off and remove once your tank is full or you may be in for a surprise tomorrow.

*If you notice that  
your tank has  
developed a crack,  
DO NOT PANIC!*



Our Steel Fibre technology being introduced to the mix



Calcification

## Our Steel Fibre Technology

Your tank is produced using high strength self-compacting concrete (SCC). It is reinforced using galvanised steel fibres which are introduced to the concrete mix so that they are distributed throughout the tank structure.

The high strength SCC together with the steel fibres ensure that your tank is structurally sound and able to handle the 25 tonne of water that it will be holding. If a crack occurs, it will not burst open like you see in the movies when a crack appears in a dam. The steel fibre throughout the tank will ensure that this doesn't happen.

There is a misconception that steel fibre will stop your tank from cracking. Unfortunately, this is not the case. What it does do however, along with providing structural strength and security, is control the crack.

By controlling the crack, we mean that it should keep it to a minimum width which will allow water to only seep or pass through the tank wall at as slow a rate as possible. When this slow seepage occurs, you will start to see a process known as "calcification" occurring.

## Calcification

The calcification process occurs in concrete when moisture passes through the existing concrete and reacts with the calcium in the cement. Once this happens, the cement is effectively re-setting, therefore sealing the crack. It can also be referred to as self-healing.

When concrete calcifies or self-heals, you will start to notice some white-coloured crystallisation over the crack. This is exactly what we want to happen.

Calcification times vary from case to case, so if it doesn't happen within a couple of weeks, it doesn't mean it won't happen at all. The slower the speed that the moisture takes to travel from inside the tank to the outside, the faster the calcification or self-healing process will be complete.

## Repairs

Should your tank display an issue, never fear ... concrete can always be repaired. Or, as mentioned above, it may even repair itself, unlike other water tank materials on the market which need to be flattened, disposed of, and replaced if they split or are damaged.

If you have read to this point, you may have seen a similarity in what we have mentioned or shown in the photos above with what is happening and giving you an indication if your tank requires repairing or not.

Should you wish to undertake a repair, the tank will need to be empty. Repairs on water tanks are most successful when undertaken from the positive side of the tank wall. To be empty, we will advise of one or 2 options.

**1. Use the water in the tank.** If you have more than one tank, isolate the tank with the issue from the other tanks on site, ensuring your roof catchment will not fill it back up and use the water in there. Once the water level is down to no more than ankle height, we can access the inside of the tank and repair the area concerned.

**2. Pump it out.** If you are after a quick fix, isolate the tank with the issue from the other tanks on site, ensure your roof catchment will not fill up the tank and begin pumping the water out of the tank. Once the water level is down to no more than ankle height, we can access the inside of the tank and repair the area concerned.

Please remember that your tank holds 25 000 litres of water. We ask that you use a commonsense approach to the issue and use this document to help identify the type of problem you have and the amount of water loss. If it has not started self-healing already, this process is likely to start in time. It may not be worthwhile to dispose of 25 000 Litres of water to fix a leak that is losing only losing half a litre per day and will likely self-heal in a few months' time.