



TECHNICAL NOTE

34 – Cloudy water

The PWTAG helpline deals with many enquiries, but one of the most frequently asked questions is why is my pool water cloudy? Knowledge on how to identify the cause of cloudy water and finding the right corrective action is a must for any pool operator. This technical note deals with the causes; from which remedies will flow.

How cloudy?

If pool water appears cloudy, its suitability for continued use should first be determined. It should be possible to see clearly from the pool surround the detail of the bottom of the pool at its deepest point.

If not, there is obvious danger, as well as the likelihood of discomfort to bathers because of the poor condition of the water; also, disinfection will be compromised. In terms of nephelometric turbidity units, 0.5NTU is a useful guideline for clarity; above this, water will be unacceptable. Turbidity should be measured using a nephelometer commonly referred as turbidimeter. The testing electronic device uses the principle that light passing through a substance is reflected or scattered by particulate matter suspended in the substance. If the pool fails any of these measures, it should be closed immediately for further investigation.

Why cloudy?

Many cases of reported cloudiness are associated with bacteriological growth. There are three main causes of this.

Free chlorine may be low. This may be associated with:

- failure of the dosing system
- incorrect calibration of the auto-controller
- a blockage of the chlorine dosing point
- under-strength hypochlorite due to age (often the result of poor stock control or storage conditions)
- empty dosing units
- airlocking of dosing pumps
- too many bathers, or the pool inadequately designed for its bathing load
- the inadequately monitored use of chlorinated isocyanurates.

A satisfactory free chlorine residual will oxidise organic matter that may not be filtered, giving the pool water a bluish clarity which is sometimes called a polish.

The circulation pump may have failed, so the pool water is simply not being filtered and disinfected.



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The pH may be too high, and thus disinfection inadequate. The lower the pH, the more active hypochlorite is; 7.2-7.4 is the recommended range for free chlorine residual.

Not bacteriological?

There are other causes of cloudiness.

- Excessive air in the system – often associated with failure of the seal around the circulation pump strainer basket, and failure to vent the filter regularly – usually clears with standing. At one time this was common in ozone pools, where agitation of the water releasing oxygen bubbles in the pool can result in a very cloudy appearance. Wherever pressure is less than atmospheric there is the potential for excessive dissolved air.
- Localised areas of high pH in the water can result in the precipitation of hardness scale – often caused by hand dosing of an alkaline chemical in one location.
- Failure to dissolve solid/powdered chemicals effectively before adding them to the pool water can muddy the water.
- Cleaning materials which are not compatible with the water treatment (added through error or accident) can cause cloudiness and destroy flocculation.
- Sudden changes in water temperature can precipitate hardness scale.
- Excessive water hardness, perhaps from the use of calcium hypochlorite in an already hard water supply, can be problematic – especially if the water is out of balance.
- Algal growth can cloud water.
- Inadequate filtration can cause cloudiness through in two ways. Backwashing filters at the wrong velocity can cause failure of laterals or nozzles in the underdrain system, leading to channelling. Dirt can persist if backwash rates are too low. Incorrect filtration rates or under-sized filters can also be a problem.
- Excessive turnover periods, often linked with high bather loads and poor filtration, are bad all round, not least as far as potentially cloudy water is concerned.

Having identified the most likely cause then the remedial action should follow. Details of this and other topics can be found in greater detail on the PWTAG website at www.pwtag.org and in The PWTAG book, *Swimming Pool Water*.