

Based on calls taken during the first year of availability, there are 5 commonly asked questions that dealers have raised about the AccuScan unit. We will cover each in turn.

1. Why does the AccuScan give Free Chlorine and Total Chlorine readings that differ from my DPD No. 1 and DPD No. 3 or DPD No. 4 tests?

The AccuScan can read both total and free chlorine up to 10 ppm. The Wet Lab is limited to 5 ppm, with a decrease in accuracy above 3 ppm unless the sample is first diluted with distilled water. If the AccuScan is giving a reading of above 5 ppm on Free or Total Chlorine and either of the DPD tests are indicating a value at 5 ppm or below, the AccuScan is actually much more accurate in these cases. To confirm this, you may perform a DPD No. 1 and DPD No. 3 or DPD No. 4 test on a sample of 50% distilled water and 50% pool/spa water.

The method and reagent that AccuScan test strips use to measure Free Chlorine is different from the method that DPD No. 1 uses to measure chlorine. DPD No. 1 can give a false positive reading when large amounts of monochloramines are present. The AccuScan Halogen III test strips do not give a false positive reading in the presents of monochloramines. Monochloramines are more likely to be elevated when opening a pool that has been dormant for the winter.

Often you will find the AccuScan reports Total Chlorine as 0.4 or 0.5 ppm higher than Free Chlorine. In other words, the AccuScan picks up combined chlorine that isn't detected using DPD No. 3 or DPD No. 4 tablets. This is normally due to a small but measurable chlorine demand. Remember, too, that it is possible to have a measurable chlorine residual even with a high chlorine demand, depending where your customer took the sample, the age of the sample, if they had added chlorine recently, time of day, etc.

2. Why are my AccuScan Total Alkalinity readings different from my Wet Lab readings?

We have checked numerous water samples that have been sent by dealers concerned with discrepancies between the Wet Lab titration method and the AccuScan. We can trace the majority of the discrepancies back to two main issues – the dealer's testing technique (either

with the Wet Lab or the AccuScan) and the age of the Wet Lab reagents. Make sure you are performing the tests correctly by asking yourself the following questions:

Are you using a graduated measuring cylinder when determining the proper sample size for the Wet Lab? Rough "guesstimates" are not acceptable at any time!

- Are you dosing all reagents in the proper amount?
- Are there any air bubbles trapped in the burette, particularly in the narrow outlet tube under the burette tap? Remove them by running a small amount of reagent through the burette and tapping the burette to dislodge bubbles adhering to the sides.
- Are you reading the burette at the "true" endpoint of the titration – that is, at onset of a permanent colour change, not an instantaneous one or a simple lightening of the test solution? If in doubt, note the reading and add another drop of reagent from the burette. If the colour continues to change, you haven't reached the endpoint.
- Are your test reagents reasonably fresh? As a guide, Total Alkalinity Reagents 1B and 2 should last until used, whilst Reagent 3 (the Chlorine Neutraliser) has a shelf life of 1 year. However, almost all reagents will degrade if not stored correctly. Remember – store all chemicals in a cool, dry, well-ventilated place out of direct sunlight.

Never hesitate to ask your Account Manager or a more experienced colleague to show you the correct technique for performing titrations or analyses using the AccuScan. And do not be embarrassed if your titration technique is wrong – many Final Year University chemistry students can't perform titrations correctly!

3. Why are my AccuScan CYA (Cyanuric Acid, Stabiliser) readings different from my Wet Lab readings? Accuracy of the AccuScan CYA test is highly dependent on the pH, Total Alkalinity and chlorine residual of the sample:

- If the pH of the sample is below 7.2, there is a possibility that CYA will read falsely low.
- If the pH of the sample is above 7.8, there is possibility that CYA will read falsely high.
- If the Total Alkalinity of the sample is below 80 ppm, there is a possibility that the CYA will read falsely low.
- If the Total Alkalinity of the sample is above 120 ppm, there is a possibility that the CYA will read falsely high.
- If the chlorine residual is above 10 ppm, the CYA may read falsely high.
- If your freshly filled pool or spa water has an elevated pH (> 7.8) or TA (> 120ppm), you may get a false positive reading for CYA when none is present.

An improved test pad for CYA is in development but is not ready for commercialisation. We hope that we will have a CYA test that is less sensitive to pH, Total Alkalinity and chlorine in the near future. Importantly, the limitations reported above are not problems with the AccuScan unit itself, but with the chemistry of the pad. Note that the Wet Lab test has its own sensitivities and limitations, and there is a constant search for a more viable and accurate CYA test.

Some advice? If your water sample falls into any of the above categories regarding pH, TA or chlorine, or you suspect that the AccuScan reading is incorrect, repeat the CYA test using your Wet Lab. Remember to add Chlorine Neutraliser No. 4 before testing to prevent interference from chlorine or bromine. Remember, too, to take the reading when the black dot first disappears. If you can just make out the black dot, lower the dipstick a fraction – this will give you the correct reading. Once you have the Wet Lab reading, simply overwrite the CYA value in ALEX before Saving.

4. Why are my AccuScan Calcium Hardness readings different from my Wet Lab readings? There are several scenarios that may explain some of the variances between AccuScan CH readings and Wet Lab CH readings:

- The AccuScan reads Total Hardness – that is, both calcium hardness and magnesium hardness in water. The Wet Lab only measures calcium hardness. If the customer's source water has a reasonable level of magnesium, then there could be a variance between the Wet Lab and the AccuScan. The difference between the higher AccuScan reading and the lower Wet Lab reading should equate to the level of magnesium in the water.
- The AccuScan can only read up to 450 ppm of hardness. Even then, values above 250 ppm are subject to large variations. If the AccuScan reads a value above 450 ppm, ALEX will prompt the dealer to perform a Wet Lab test.
- The AccuScan will measure both calcium in solution and precipitated calcium (usually as finely divided calcium carbonate). The Wet Lab only measures free calcium in solution. If you have a cloudy or hazy water sample and it has a higher calcium hardness level than a Wet Lab test, there is a good possibility that the cloudiness is caused by precipitated calcium. This is the reason why some SpaGuard Perfect Balance-treated spas tested with the Wet Lab return a calcium hardness value of 0 ppm, whilst the AccuScan indicates a small level of calcium hardness.

To get accurate results with both the AccuScan and the Wet Lab, proper test technique is very important. Ask yourself the same series of questions posed in Item 2 above. In addition, when using the Wet Lab, ensure that you add the Calcium Hardness Reagent 1B (buffer) first, then

the tablets, and that you do not add any more buffer than is necessary.

5. My customer has added Optimiser or Optimiser Plus at the recommended dosage. Why are my AccuScan readings lower than I expected?

The borate test continues to be one of most consistent and best performing tests on the AccuScan. Some of the questions to ask are:

- How long ago did the customer add Optimiser or Optimiser Plus? The product should be completely dissolved and circulating in the water for no less than 24 hours before an accurate reading can be provided by AccuScan.
- Are you getting lower than expected readings with the AccuScan? If so, you should review your AccuScan test technique by repeating the test on the same water sample to ensure you are getting consistent results. If successive readings on the same sample vary by more than 3 ppm, there could be a test technique issue.
- Have you or the customer accurately estimated the volume of the pool or spa? Some people only guess at the true volume. The correct volume will greatly effect the proper dosing of Optimiser or Optimiser Plus. If the volume is underestimated, the AccuScan may indicate a level less than what was anticipated by the dealer.
- Has the customer allowed the pool to circulate?
- Has the customer added all to the Optimiser or Optimiser Plus recommended by the label directions?
- Has it been 10 days since their last and final application of Optimiser or Optimiser Plus?
- Has the consumer brushed the pool bottom between and after each addition of Optimiser?

- Did the consumer add the Optimiser through the skimmer? This can cause the Optimiser to harden in the lines and not dissolve properly.
- If comparing AccuScan results with the Wet Lab method, when was the last time you changed your Optimiser Test Kit reagents? Old out-of-date reagents can seriously effect test results.

Notwithstanding the advice in this Technical Information Bulletin, Bio-Lab is working to rectify any perceived shortcomings in the current tests. Extensive research is being undertaken with the view to improving the accuracy of the calcium hardness test (especially at levels in excess of 250 ppm), and it is hoped that an alternative cyanuric acid test will be developed that returns accurate results over the widest possible pH range.

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