Important information to our customers concerning the Quality of Measurements

Do you use analytical results to make decisions and judgements?

As an accredited laboratory, we closely manage the quality of the measurements we supply to you. We would like to let you know that we have report options available that show the analytical variation in our testing. These reports are designed to help you make better decisions with the analytical results you obtain from us.

What is Analytical Variation?

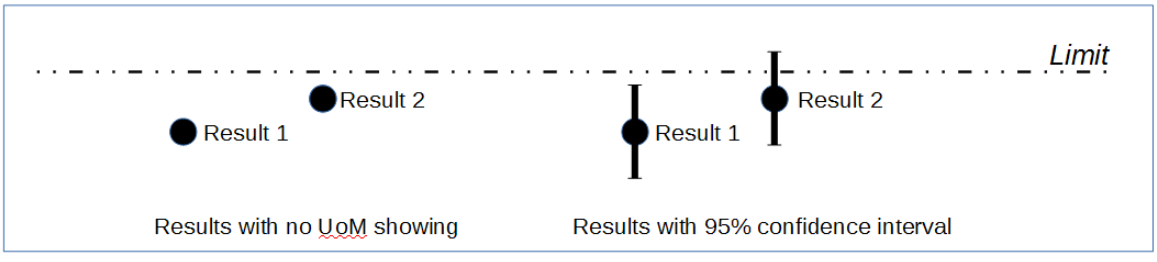
We hope that this doesn't surprise you but if we carry out ten analyses on the same sample we will not get ten identical results. The results produced will vary slightly each time due to slight variations in testing conditions, such as equipment, the technicians carrying out the test, or the environment. In the laboratory, we call this "Uncertainty of Measurement" or "UoM" for short. We have regular controls to measure the UoM for a test and we actively try to remove as much variation as best we can, but the variation in any analytical process will never be zero.

Why is Analytical Variation Important?

A common reason for testing is to ensure limiting values are not exceeded. Without knowing the UoM, it may seem easier to make decisions, but these decisions may be incorrect and lead to undesired outcomes. Therefore it is important match the analytical method's capability with the limit or critical value under consideration. Providing us with full information about any limits your result is likely to be compared against, will ensure the best testing method is chosen for your sample(s).

The example below illustrates this. With no UoM shown, it seems that Result 1 and 2 are below the limit and pass. However because the UoM information is not included, we are unsure how confident we can be regarding these decisions. It also increases the risk of making an incorrect decision.

When including the UoM with the results, for Result 1 the result indeed passes. We also have greater confidence in that pass decision, as the top of the 95% confidence interval is below the limit. For Result 2 on the other hand, the top of the 95% confidence interval crosses the limit. This means that we cannot say Result 2 passes with 95% confidence and that there is a small but significant possibility that the true result could actually fail. This increases the risk of accepting the pass decision. Reanalysis of the same sample could result in a different conclusion, with potentially drastically different consequences. Re-sampling or reanalysis may be required to achieve a clearer understanding.



We hope the above example illustrates the importance of UoM in the decision making process.

Our optional UoM reports will provide you with an estimate of UoM that allows for better decisions to be made, thereby reducing your risk. This is especially important where results are close to the limit required to be met. Variation in repeating a test in such cases may show some results as being acceptable compared to the limit and some not. The uncertainty estimate allows for an assessment of where the result is truly likely to lie.

When is UoM Reported?

In New Zealand, IANZ accredited laboratories must be able to provide UoM information when the customer asks for it. In some cases, such as testing for Drinking water, the reporting of UoM is a mandatory requirement. Such requirements are likely to become more common in the future.

What will the reports look like?

Hill Laboratories will typically still provide the standard report type as a default. UoM results will be provided along side your results in a separate report if requested. The UoM report will however be the default report in cases when providing UoM is a mandatory requirement.

How will UoM be reported?

The result and its associated uncertainty will be reported in the following way:

Your result: 4.87 ± 0.65 g/m3 (95% confidence level)

In this example, we can be 95% sure the true result lies somewhere in the range 4.22 and 5.52 mg/kg. Stated another way, if the test was repeated 100 times, you would expect that 95 of the results obtained would fall between those values. Our default is to report a level of confidence of 95%.

*Please note that the uncertainty reported with a result is an estimate based on routine laboratory performance on typical sample matrices. It does not include variation due to steps outside of the laboratory's control, such as sampling by the customer.

What is the Coverage Factor?

The accepted method for combining uncertainties is using standard uncertainties (the equivalent of one standard deviation, approximately 68% confidence level). For reporting, this standard uncertainty is multiplied by an appropriate coverage factor to give the required level of confidence. A coverage factor of 2 is used to give approximately 95% confidence, and a coverage factor of 3 is used for 99% confidence. If you wish to use our uncertainty estimates in your own calculations, you will first need to divide them by the supplied coverage factor.

Our aim is to make your job easier

If you have any further questions about this, please don't hesitate to contact the laboratory. We are eager to understand your testing needs and ensure that they are met consistently, so that your decisions are easier and more meaningful. We hope you are satisfied with the additional information available to you and find it useful when making decisions.

Contact Details

For further information contact one of our Client Services Managers:

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