

Document Title: Description, AN, Verification Standards		Part # and Rev. 14503-01	
		Release Date:	
Rev.	Description	Revision By	Date
-01	Updated to compliance with Style guide	DDH	5/16/11

Production Filename: 14503 (In Product Library)

Path to Working Files: DecaDoc\Application Notes\Master

Dimensions: 8.5 inch wide, 11 inch tall

Material: Paper, 92 Bright White or better, 75g/m² or heavier


Colors: Color Print on White

Printer: HP Color LaserJet 8550-PS

Finish: None

Adhesive: None

Special Notes: Illustrations are Ref Only ** Not to Scale ** (Shown page 1 of 2)


Application Note

AquaLab Verification Standards

Using the AquaLab is easier than ever. Prepackaged standard salt solutions are immediately available for performance verification, saving you time and money. Validation and documentation for GMP and GLP has also become easier. Operate your instrument with certainty and insure the quality of your food product by using low cost precision salt solutions.

- No need to purchase and store reagent grade salts.
- No additional laboratory equipment necessary.
- Avoid solution handling and mixing errors.
- Save technician time.

The AquaLab should be verified against a known salt standard daily. For high use or batch processing, the instrument should be checked regularly against a known salt standard of similar water activity. Checking the water activity of a standard solution will alert the operator to the possibility of contamination of the unit or shifts in the linear offset from other causes.

Now, you can verify the AquaLab performance with confidence. Performance Verification Standards come in four water activity levels: 0.984, 0.760, 0.500, and 0.250 a_w. The standards are produced under a strict quality assurance regime. The accuracy of the standards is verified by an independent third party and are shelf stable for one year. Order your verification salt standard of similar water activity today.

Uncertainties Using Saturated Salt Solutions

The water activity values listed in our operator's manual for saturated salts were reprinted from Greenspan (1977). His method for determining water activity was to combine all of the available data from tests by other researchers. He did not set up any experiments of his own. The uncertainty he published is due to variation among the results from the different methods. There are, therefore, limitations to the accuracy of these values. The instrumentation available for making water activity measurements is much better now than it was in 1977, so improved standards are needed.

Saturated salt solutions can be prepared by several methods. The AOAC method involves starting with salt and adding water in small increments, stirring well with a spatula after each addition, until salt can absorb no more water as evidenced by free liquid (where it will take on the shape of the container but will not easily pour). This method gives the most accurate readings, but only for a short time unless great care is taken to prevent water gain or loss. When a salt standard is prepared so that it consists mostly of liquid with a few crystals in the bottom, it can result in a layer of less than saturated solution at the surface which will produce a higher reading than anticipated. Conversely, solid crystals protruding above the surface of the liquid can lower the readings. To comply with Good Laboratory Practices (GLP), a saturated salt solution must read within reasonable analytical error of the accepted published value for a given temperature.

Why AquaLab Verification Standards are Superior

Our research indicates that unsaturated salt solutions make much better standards than saturated salts. Robinson and Stokes (1965) give activity coefficient for various salt solutions. These can be used to compute the water potential, or partial specific Gibbs free energy, of the water in the solution using:

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