

## Rudolph Research - Fertilizer Industry Application for UAN Analysis.

### UAN Fertilizer Concentration Analysis - Measure RI & Density for % Concentration with Rudolph.

UAN 32 is a formulation consisting of 45% Ammonium Nitrate, 35% Urea with 20% water content. The resulting total nitrogen concentration is 32% with nearly half coming from the Ammonium Nitrate and the other half from the Urea. In total there are 3 sources of nitrogen from the ammoniac nitrogen, the nitrate and the water soluble organic nitrogen in the urea. The three provide for both slower and faster nitrogen releases resulting in an immediate and then longer lasting fertilizer.

During formulation of UAN fertilizer solution it must be analyzed to determine the concentrations of urea, ammonium nitrate, water, and total nitrogen. The traditional methods of UAN analysis are Combustion Analysis, Ion Chromatography, and the Digestion and Titration method. The existing analysis methods tend to be impractical due to cost, time requirements, safety, or need for significant operator technical expertise.



### Rudolph offers a simple testing process to analyze UAN solutions.

Rudolph Research offers a more rapid, less complex UAN analysis method using concurrent Density and Refractive index measurements. The results yield a full analysis including concentration of ammonium nitrate, urea, water, and the % of total nitrogen in the sample UAN solution. The advantages of using the Rudolph

UAN measurement method are speed, safety, and a reduction of technical expertise required. No user interpretation is required and there is no unusual danger to the user. Accuracy is within required results with up to 0.024% accuracy when using a Rudolph J457 Refractometer and a DDM series Density meter. Reproducibility is improved over existing methods due to the reduced variables utilized in the Rudolph Method and results are far less dependent upon user skill or procedure.

To facilitate concurrent RI and Density Meter measurements with a UAN sample solution a Rudolph Density meter is paired with a Refractometer Optics Module Box. A sample may be loaded in one step which will automatically result in the two measurements and resulting final UAN Analysis. Sample loading may be performed manually with a syringe or via one of several automatic sample handling methods such as the AutoFlex Sampler, ECS, or a Pumping system. The resulting RI and Density measurements will automatically calculate and display the resulting UAN analysis on an easy to read Digital screen. The operator may then record the results and / or save to a data storage drive or network. Only a small sample volume is required and a complete measurement process takes 1-3 minutes.

Rudolph Research has simplified many measurement application requirements where 2 instruments are required with the use of its highly capable DDM Density Meters paired with the versatile High-Accuracy Refractometer Optics Module. Instead of purchasing 2 complete instruments this combination offers the laboratory user a highly capable and intelligent brain in the DDM Density Meter with just the measurement portion of a highly capable refractometer. Multiple measurements may be taken, results quantified, yet total instrument cost is reduced!



For additional information or to schedule a demonstration please contact Rudolph Research Analytical at:  
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