



## Cycletime Tips - Automotive

### Volume 12: Purchasing Moisture Measurement Equipment

Many of our customers are faced with the production challenge of drying hygroscopic thermoplastic polymers. In some cases, these materials can display what is known as hydrolysis if they aren't dried properly. If the polymer is melted in an excessively wet state, chain scission will occur and the parts are deemed worthless. The regrind cannot be reused as intended and the polymer is scrapped. In order to avoid wasting these high cost engineering resins, we often pursue a procedure for quantifying the moisture content within the pellet at time of process. This is known as Moisture Analysis.

The original method of measurement was done via Karl Fischer titration method in most cases. This is still a viable and very accurate method for measuring moisture content within the polymer. Due to this instrument's perceived shortcomings, many new instruments were developed to make the process cheaper and less labor intensive. When working to acquire this type of equipment, please ask the potential supplier these questions.

- Does the instrument require a controlled environment to operate effectively?
- Is nitrogen or argon required to achieve the most accurate and reliable readings?
- Is the device “moisture specific”?
- What polymers are best suited for this type of equipment?

The reasoning behind this line of questioning is simply due to the fact that some devices are better than others for moisture measurement. Weight loss units that use an atmosphere of air can yield unreliable results. The fear is that we might be removing something other than moisture from the pellets (residual monomers, degradation byproducts, etc). The moisture specific instruments are desirable in that they monitor what you are trying to measure, but in the long-term they are as expensive as the Karl Fischer equipment. It should be assumed that all devices require a controlled atmosphere for ultimate results (utilizing nitrogen). For some materials, the difference between 200 ppm and 300 ppm moisture content can yield degraded parts, so accuracy is critical.

Please feel free to contact Jim Cardinal or myself if you should have questions or require input regarding this equipment.

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