Dürr Megtec offers drying parameter characterization from a bench-top laboratory system. The drying lab allows for early scale-up steps in formulation development, drying characterization, optimization, and troubleshooting. Using this tool will allow you to:

- Obtain more detailed information than a lab batch oven can generate
- Observe and record quantitative drying data for your coating
- Simulate continuous process dryer conditions

The drying behavior of coatings on web-based substrates typically has significant impact on the design and economic viability of industrial coating processes. In the early development stages, advanced materials are often available in limited quantities, which makes traditional pilot-scale coating and drying trials impractical.

The ability to characterize drying behavior on a smaller scale offers the opportunity to capture key information for timely process design decisions before making extensive development expenditures in time and capital.

Dürr Megtec benchtop drying lab offers new laboratory methods that can provide key data from coupon-scale samples.

**Observe Drying Behavior Both Qualitatively and Quantitatively**

The ability to speciate water and organic solvents in coatings provides an enhanced capability to quantitatively observe the drying of water-based, organic solvent-based, and combination water and organic solvents in coating materials.

This approach can also be helpful when drying organic solvent-based coatings on paper or other web substrates that contain moisture. Solvent from the coating can be quantitatively recognized while simultaneously observing the drying of moisture from the web. Further, the visual assessment of the specimen surface makes it possible to see the formation of defects or optical attributes during the drying run.
**Information and Data that are Generated**

Process measurements are logged over the required drying time and are used to generate a drying curve as shown below. Key information may be used for a number of operational needs.

- For the Process Formulator
  - Estimate of drying time and temperature requirements for coatings
  - Qualitative drying behavior of coatings – blistering, binder migration, etc.
  - Comparison of drying behavior of coating formulation options

- For the Plant Process Engineer
  - Falling-rate critical moisture; zone temperature profiles; drying times
  - Target humidity and/or solvent LFL levels
  - Drying profile settings for defect avoidance

- For the Drying Process Engineer
  - Drying data for dryer hardware sizing (drying model inputs)
  - Drying oven process strategy – zones; temperatures; velocities
  - Falling-rate period(s); critical moisture; temperatures
  - External and internal mass transfer rates and coefficients, (k/h, internal diffusion coefficients)

**Generate Data for Your Applications**

- Qualitative, semi-quantitative, and even precise drying measurements suitable for early research work are possible with the drying lab apparatus.
- The Dürr Megtec Drying Lab provides enhanced capabilities in formulation development work, while requiring relatively small sample amounts to conduct experiments.
- Design and selection of candidate drying methods can be made early in the development of new coatings, which can help assess commercial viability of scale-up to production.
- Analyses and troubleshooting of drying issues on existing processes are also possible with the benefit of conducting work off-line

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**Drying Curve from Laboratory Apparatus**

*Example – Nonwoven Specimen/ Aqueous & Isopropyl Alcohol Solvent*