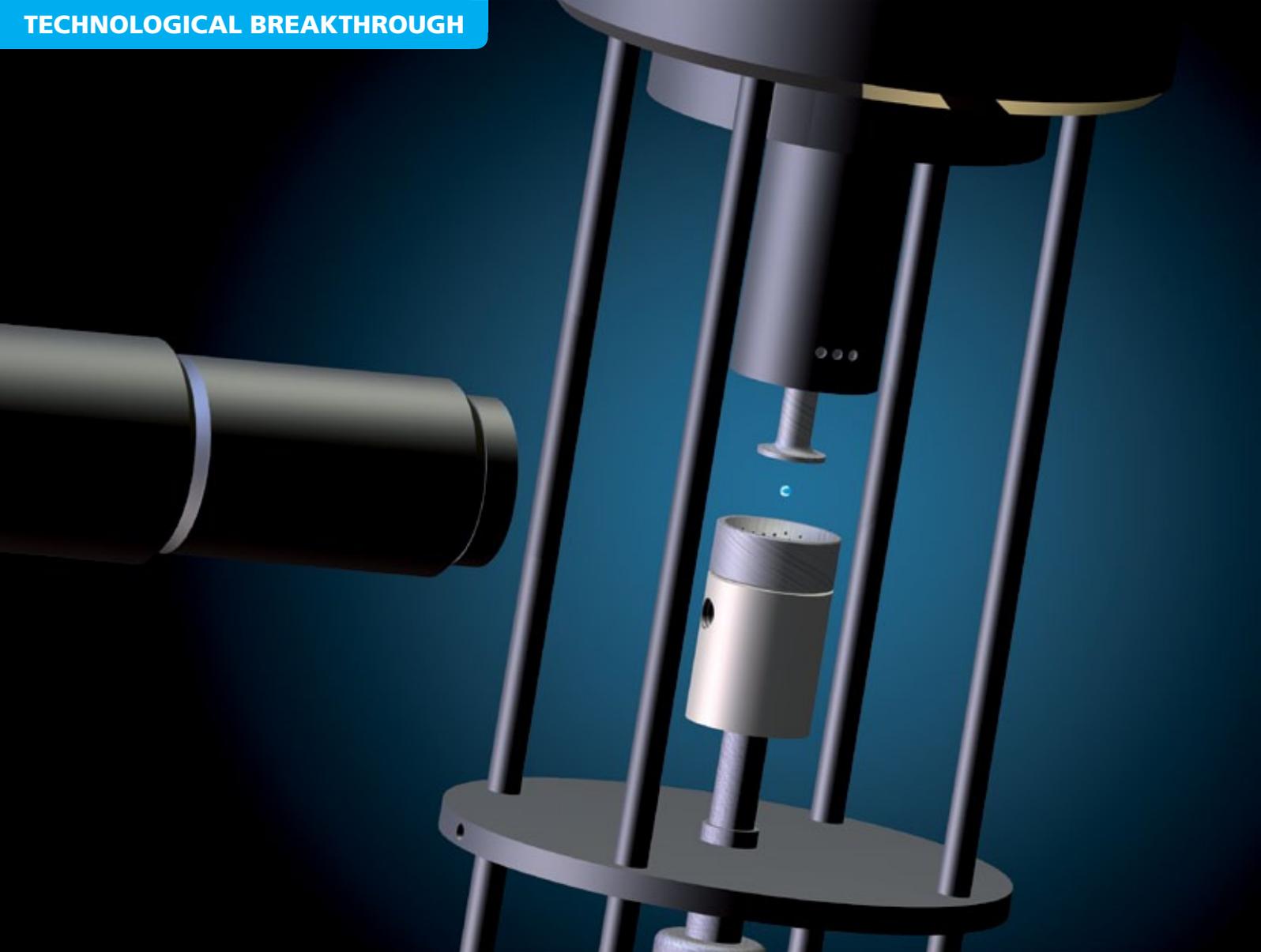# GEA Niro DRYNETICS™

Building a better spray dryer drop by drop

GEA Niro DRYNETICS™ injects real world data into computer simulations to achieve vastly more accurate results

For years computational fluid dynamics (CFD) has been used in the design and optimization of spray dryer performance. Now in a world's first, GEA Process Engineering has vastly improved the reliability of this simulation technique with a proprietary new method called GEA Niro DRYNETICS™ that puts the software on a more scientific footing.
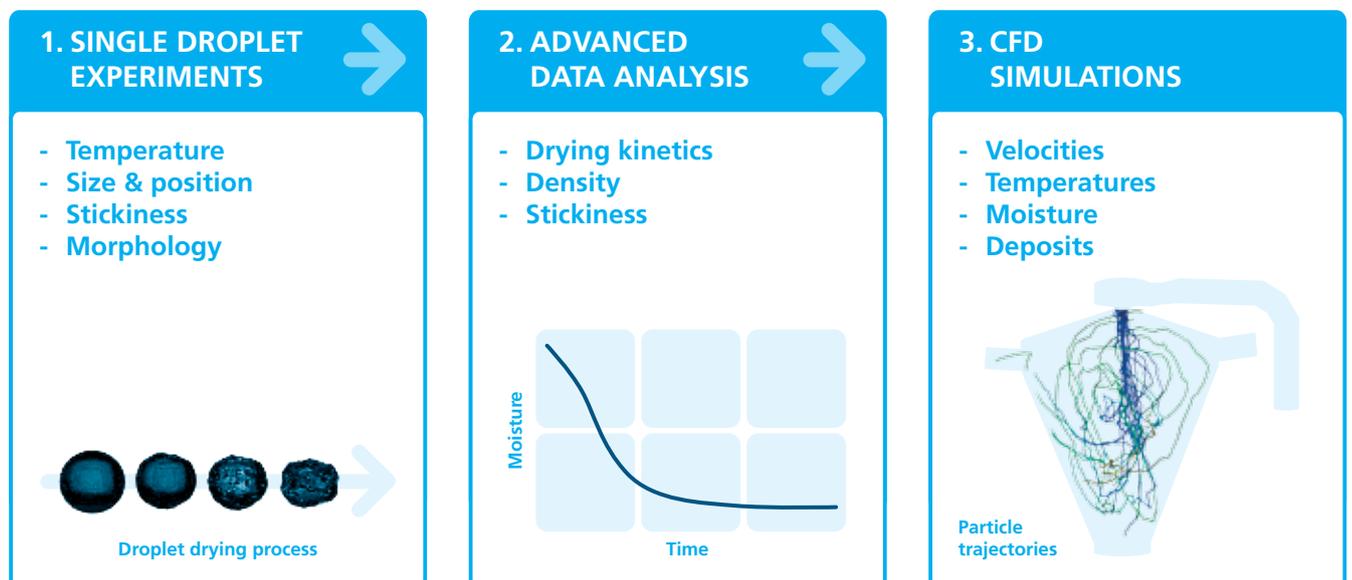
Scientific method
Conventional CFD simulation programs assume when it comes to drying that all feeds are essentially alike. In reality they aren't. Some take longer to dry than others. Some are also sticky and can form deposits on dryer walls, significantly impairing system performance. However, without empirical data it was difficult to predict whether a given feed would pose such problems or where deposits might form.

GEA Niro DRYNETICS™ provides the solution by incorporating real-world measurements into the CFD software. Experiments are conducted on individual droplets of a feed to determine its actual drying properties. The results are then transferred to the CFD software with the help of appropriate mathe-matical models, making it possible to simulate the drying process with unprecedented accuracy.

Ultrasonic field
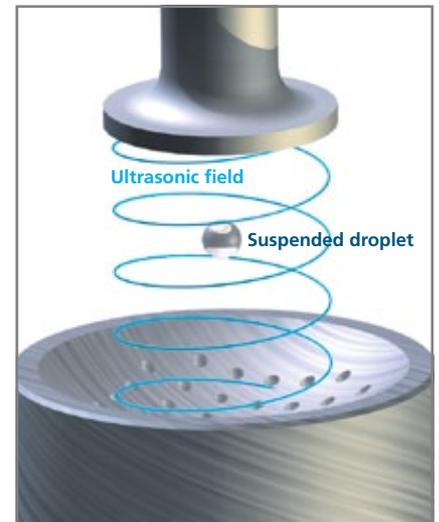
Suspended droplet

Ultrasonic levitation is used to suspend the droplet of feed being tested, making it ideal for observing and measuring the drying process.

The GEA Niro DRYNETICS™ method consists of three separate stages.

1. SINGLE DROPLET EXPERIMENTS

- Temperature
- Size & position
- Stickiness
- Morphology

Droplet drying process

2. ADVANCED DATA ANALYSIS

- Drying kinetics
- Density
- Stickiness

Moisture

Time

3. CFD SIMULATIONS

- Velocities
- Temperatures
- Moisture
- Deposits

Particle trajectories

Improving the method improves the result

Using GEA Niro DRYNETICS™ to improve the drying process inevitably leads to better results, whether you define that as a better product, a better bottom line or, more likely, both. By providing a more realistic picture of what goes on inside the spray dryer, GEA Niro DRYNETICS™ opens a new door to process improvements and product innovation. Airflows can be better distributed for optimal performance. Dryer size and energy requirements can potentially be reduced. New formulations can be tested under realistic conditions. Drying properties of different feeds can be fine-tuned.

Moreover, GEA Niro DRYNETICS™ can be used with virtually any type of dairy, food, chemical, biological, or pharmaceutical product. It's an important step forward for designers of spray dryers as well as those who use them, brought to you by GEA Process Engineering.

For more information please see www.niro.com or contact us at development.niro@geagroup.com

No deposits **Heavy deposits**

Standard

GEA Niro DRYNETICS™

The superiority of GEA Niro DRYNETICS™ as a predictive tool is clearly shown in this comparison. Standard software fails to detect the accumulation of sticky deposits on the dryer's walls, whereas GEA Niro DRYNETICS™ pinpoints the problem, suggesting the need for a redesign or operational improvement.

MODEL COMPARISON OF PARTICLE STICKINESS

STANDARD
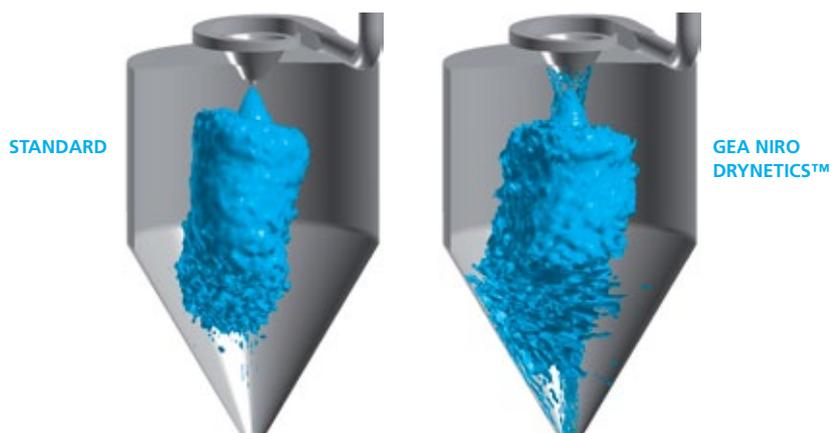
GEA NIRO DRYNETICS™

GEA Niro DRYNETICS™ depicts the drying process as it really is thanks to the use of experimental data. Here the volume of sticky particles indicates the accumulation of troublesome wall deposits that would otherwise be overlooked.

GEA

Excellence   Passion   Integrity   Responsibility   GEA-versity

GEA Group is a global mechanical engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX Europe 600 Index.

GEA

GEA Process Engineering

GEA Niro

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