GILYOS applies the most recent, highly innovative equipment and instrumentation in their laboratories.

GILYOS is more than an end-user of equipment. We partner with industry leaders to develop technologies that extend the understanding of freeze drying processes. Innovations are central to progress for us.

OUR PRECISION, quality and solution driven approaches translate into your success.

OUR KEY TECHNOLOGIES:

- Freeze Dry Microscopy (LT-FDM)
- Freeze Drying Vial System (FDVS)
- LyoCapsule™ and LyoStar™ freeze dryer platforms

PRECISION

FOR

SUCCESS

iQm M

- ControLyo™ Nucleation On-Demand
- Manometric Temperature Measurement
- (MTM)-based SMART Freeze Dryer™ Technology
- Tunable Diode Laser Absorption Spectroscopy (TDLAS)-based SMART Freeze Dryer™ Technology
- TEMPRIS™ Wireless Temperature Sensors
- Access to all relevant physical characterization technologies through our extensive network





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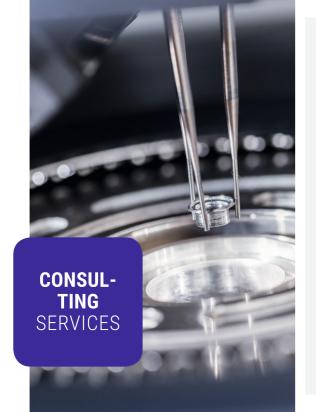
BENEFIT from our more than 20 years of experience in pharmaceutical freeze drying, both in an academic and industrial environment.

THE GILYOS PHILOSOPHY

is quite simple: "RIGHT FIRST TIME"

SOME EXAMPLES OF FREQUENTLY REQUESTED CONSULTING SERVICES:

- Formulation development of small molecules, biologics and complex systems
- Selection of optimum primary packaging material (vial, syringe, etc.)
- Cycle design & optimization of new
- products, Quality by Design (QbD)
- Troubleshooting of existing cycles
- Support in CMO selection
- Scale-up, scale-down and technical transfer of freeze drying cycles



FDVS / LyoCapsule™

Expansion of thermal characterization (mL range): drying performance in vial or syringe, evaluation of the formulation's robustness.

Testing of selected process conditions in single vials, e.g. freezing (controlled nucleation) or secondary drying.

Troubleshooting of existing cycles (scale-down) using innovative PAT (e.g. TDLAS, MTM, TEMPRIS, etc.).



COMPREHENSIVE LIQUID AND SOLID STATE ANALYTICAL CHARACTERIZATION

(e.g. MDSC, XRPD, SEM, μ-CT, SSA, Karl Fischer, and more)

FORMULATION DEVELOPMENT

PROCESS DEVELOPMENT AND OPTIMIZATION

SCALE-UP

LyoStar™ Laboratory Scale Freeze Dryer Formulation screening (multiple formulations per

cycle) / preparation of samples for indicative stability

MDSC / LT-FDM Initial thermal characterization (µL range) of selected formulation(s) to evaluate T, and T,..

Starting point for freeze drying

cycle development and optimization

studies in our in-house stability chambers. Water-based formulations and co-solvent systems. Lyo cycle development and optimization for target formulation using innovative PAT (TDLAS, MTM, TEMPRIS, etc.).



Pilot Scale Freeze Dryer

Process scale-up and adaptation of cvcle conditions.











FREEZE DRYING is a multi-disciplinary field which starts with aspects of chemistry and biochemistry during formulation development and ends with engineering principles during manufacturing.

A SOUND UNDERSTANDING of underlying concepts and interactions in this field is therefore mandatory to successfully accomplish freeze drying projects.

GILYOS has established its own seminar and training program to share our expertise with you:

> LYO(PHILIZATION) SCOP(E) (ENCYCLOP)**EDIA**

LYOSCOPEDIA®

For actual seminar announcements, please visit us

on our website: www.gilyos.com