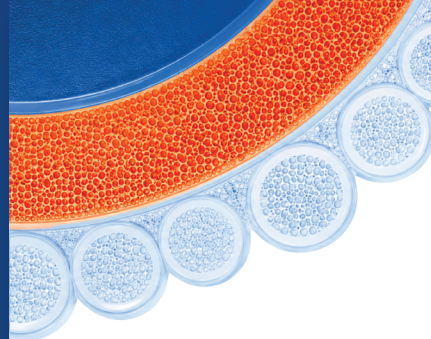


Syngene

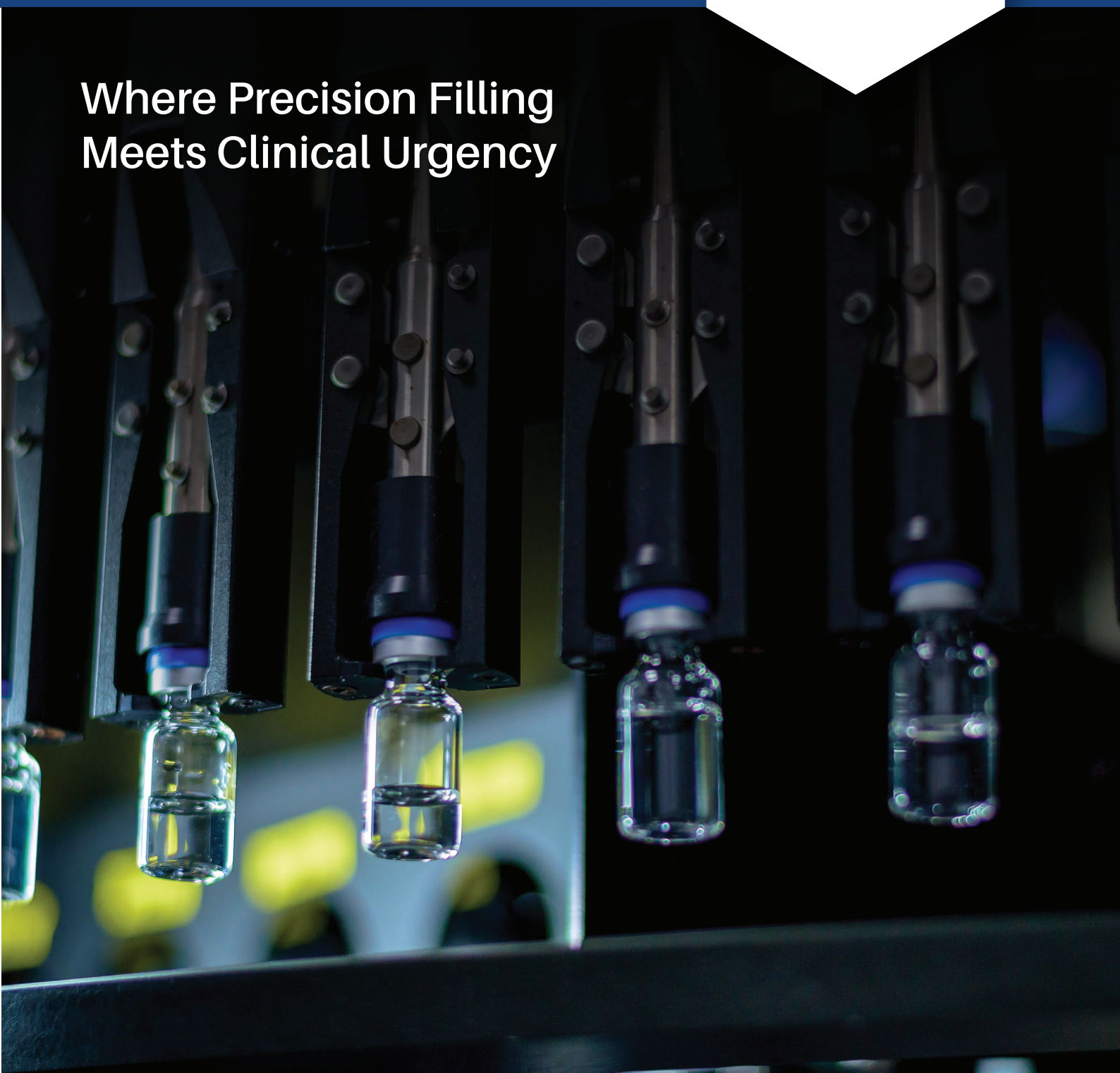
Putting Science to Work



Sterile Fill-Finish

Science
For People
**ADVANCING
INNOVATION**

Where Precision Filling
Meets Clinical Urgency



Sterile Fill-Finish Facility

For Your Biologics and Small Molecule Drug Products

Syngene's Sterile fill-finish facility is custom-built to meet market demand for clinical supplies of sterile drug products having short development timelines.

As an integrated CRDMO, we can formulate, fill, and finish your sterile products into pre-sterilized vials or pre-filled syringes for clinical supply. The facility offers drug product (DP) development and clinical manufacturing services for both biologics and small molecules. All the equipment in the facility is 21 CFR compliant.



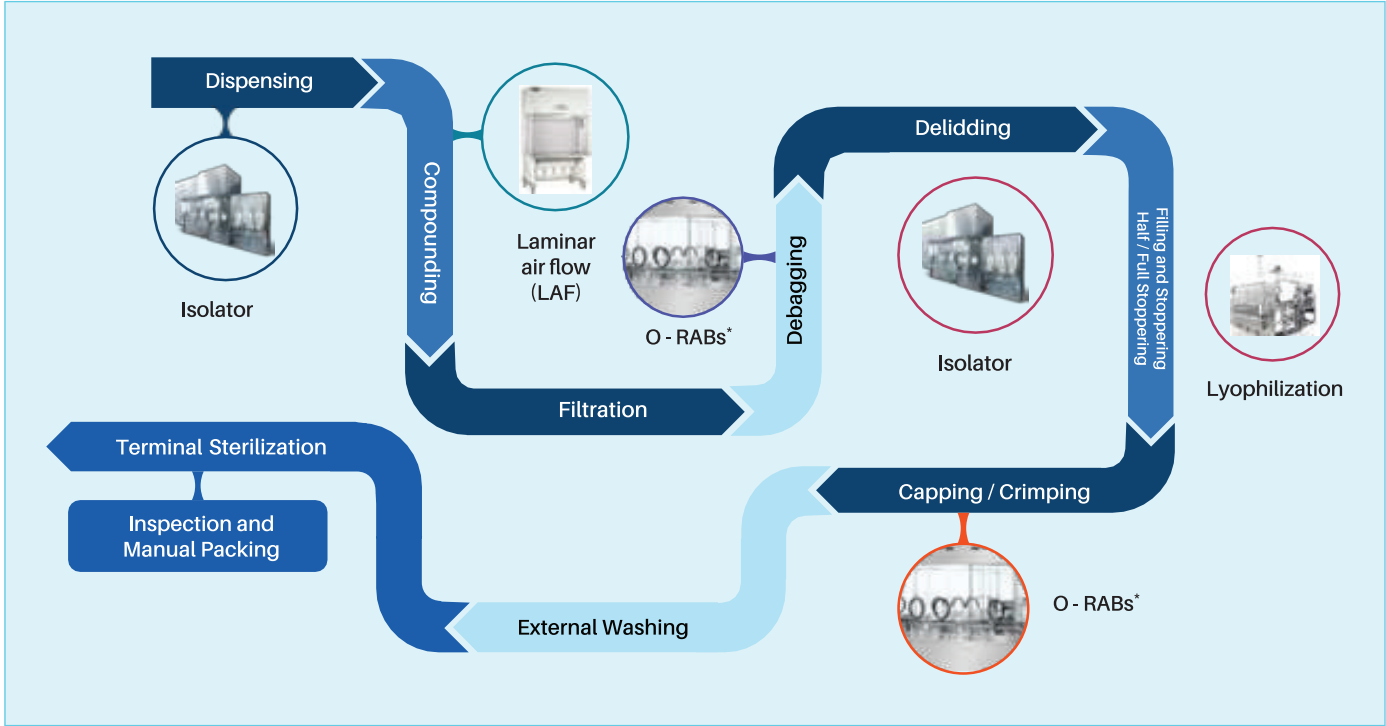
Sterile Fill-Finish Facility – Overview

Product Type	Key Features
- Ready-to-use solutions and lyophilized products (pre-sterilized vials and prefilled syringes (PFS)) - Biologics, aqueous small molecules, non-cytotoxic, and non-antibiotics - Occupational exposure limit (OEL): $\geq 1\text{ }\mu\text{g}/\text{m}^3$ (non-cytotoxic) - Batch size of 500 to 25,000 vials (5 L - 50 L)	- Process area: 4000 sq. ft. - Campaign-based manufacturing facility (one product at any given point in time) - Single-use mixing vessels, transfer vessels, tubing for biologics DP - Ready-to-use (RTU) vials and stoppers - Robotic filling machine for vials and PFS (MAR Italy) - Isolator (Comecer) - Sterile filtration and terminal sterilization - Storage chambers: 2 °C – 8 °C and - 30 °C - Semi-automatic labelling and packaging

Ready-To-Use (RTU) nested vials liquid and lyopilised vials	Fill volume: 1 ml to 50 ml (ISO 1 R to ISO 50 R) Output: 2000 vials/hour for 10 ml
Lyophilizer	3500 10 R vial
RTU nested PFS	Fill volume: 0.1 ml to 10 ml Output: 1000 PFS/hour for 1 ml PFS



Process Flow: Liquid Vials / PFS / Lyo



*O-RABs: Open-Restricted access barrier system.



Vials and PFS Filling Line with Isolator

Vials and PFS Combi Filling Line with Isolator (Isolator Make: MAR)

Ready-to-use (RTU) nested vials liquid and lyophilised vials	Fill volume: 1 ml to 50 ml (ISO 1 R to ISO 50 R) Make: OMPI Ez fill vials Output: 2000 vials/hour for 10 ml	
RTU nested PFS	Fill volume: 0.1 ml to 10 ml Make: SCHOTT Output: 1000 PFS/hour	

Technical Details:

	Debagging under O-RABs (manual process), de-lidding under isolator (manual process), filling and stoppering under isolator (grade A surrounded by grade C), transfer to Lyo room, lyophilisation if applicable, de-nesting in O-RABs, Alu cap sealing
	Filling mechanism: peristaltic pump (2 head filling)+N2 pre-post gassing. Provision for upgrading to piston pump
	Statistical IPC available; vaporized hydrogen peroxide (VHP) sterilization
	Equipment can handle large molecule biological products
	21 CFR compliant equipment
	Online particle counter with data logging facility in isolator
	Beta port for aseptic transfer of rubber stopper and product contact parts after VHP cycle
	Online airborne particle counter: Four locations in filling line and two in mobile LAF



Lyophilization Equipment Details

Lyophilization (Make: Tofflon China - Model Lyo 3), Grade B Area

- RTU vials: Lyophilized vials. Can handle vials of 2 R to 30 R
- Lyo loading capacity: 3500 vials of 10 R nested tubs
- 21 CFR compliant equipment
- Manual loading using mobile LAF that is integrated with online particle counter
- Number of shelves: 6 + 1 (upper radiant shelf) with shelf spacing of 100 mm
- Condenser access through manhole with clean in place (CIP) / sterilization in place (SIP) capability
- Vials stoppering within Lyo
- Chamber design temperature: -75 °C~128 °C
- Condenser design temperature: -75 °C~128 °C
- Comecer isolator for transferring half stopper product to mobile LAF after filling
- Mobile LAF for manual loading



Autoclave and Terminal Sterilizer

Autoclave and HPHV Terminal Sterilizer:

- Vials and PFS which are sterilized after filling
- Capacity: 500 L
- Terminal sterilization, 5000 10 R vials in one cycle
- Jacket cooling available after sterilization cycle
- 21 CFR compliant equipment



Small Molecule Drug Product Development and Manufacturing Capabilities

Equipment Capabilities

Development scale: 100 ml – 25 L

- High pressure homogenizer (Panda plus, Microfluidics)
- High-speed homogenizers (Silverson, Ultra-Turrax)
- Spray dryer (Labultima-lab scale and pilot scale - non-sterile processing)
- Propeller mixer and stirrers
- Lyophilizer (VirTis)
- Brookfield viscometer
- Pressure vessels, filtration assembly
- Particle size analysis - Malvern, Zetasizer
- Head space analyzer
- Coulometry, KF
- Autoclaves (Non-semipermeable containers)

Ready-to-use Solutions

- Suspensions – including depot, sustained release
- Microemulsions

Lyophilized Products

- For solution
- For suspension



Biologics Drug Product Development and Manufacturing Capabilities

Pre-Formulation

- Biophysical characterization
- Buffer screening
- Excipient screening

Process Development

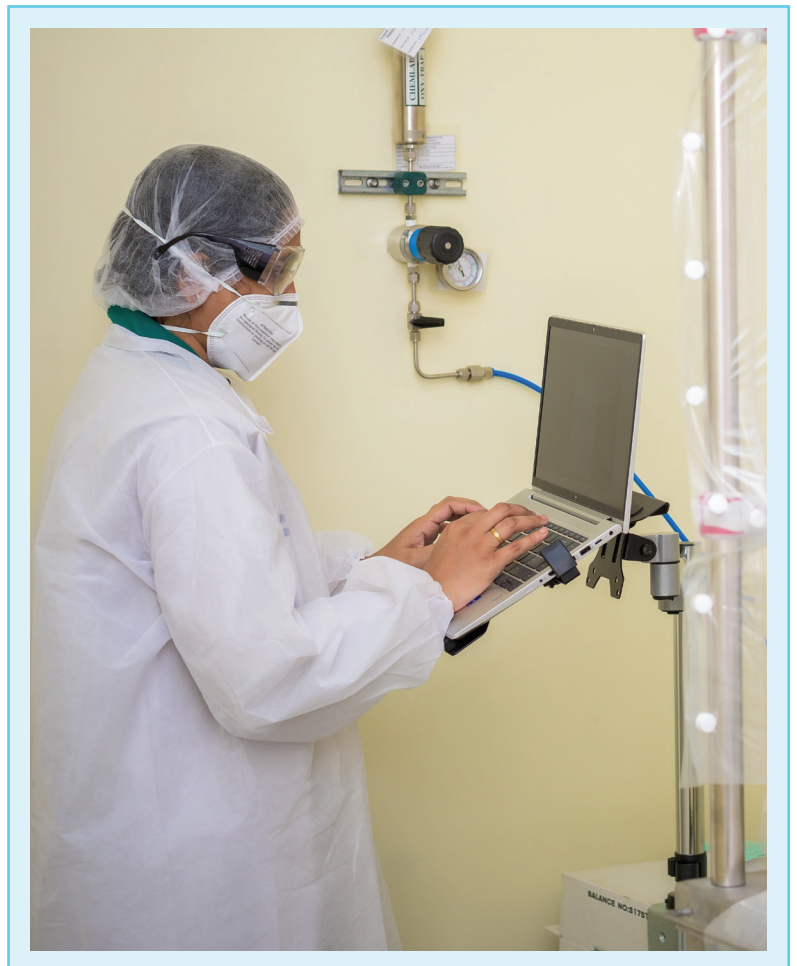
- Design of Experiments (DoE)
- Tubing compatibility
- Filter sizing and adsorption
- Container closure compatibility
- Mixing study

Formulation Nomination

- Formulation optimization
- Storage stability study (hold time)
- Stress stability study
- Agitation and freeze-thaw study

Analytical Capabilities

- Orbitrap MS, Synapt QTOF-MS, 5600
- QTOF-MS
- MALDI-TOF and ESI-ion trap
- Capillary Electrophoresis
- Imaged capillary: Isoelectrophoretic focusing
- Fluorescence detector
- HIAC 9807+
- FLOWCAM
- Solo VPE
- Plate reader
- BiaCORE
- UPLC / HPLC (ELSD, PDA, FLD, and CAD)
- Viscometer, Osmometer, Turbidometer
- Head space analyzer



Our Sterile Formulation Development Expertise / Offerings



Sterile formulations:
Ready-to-use solutions and
lyophilized formulation



Solubility enhancement for
sterile solutions: Co-solvents,
surfactants, and complexation



Long-acting sterile development.
Example - microspheres and
suspension-based formulations



Device compatibility and Drug
Product compounding studies
for small molecules and biologics



Phospholipid-based
nano-emulsion formulations



Development and ICH
stability studies

Technology Transfer to Manufacturing Site

Our expertise in drug development allows us to define and undertake the following:

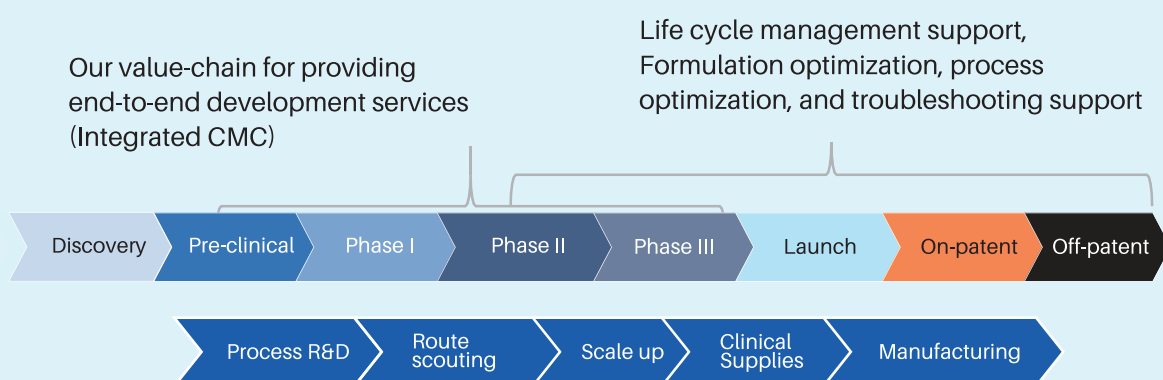
- In-process and finished product specification development
- Preparation of master formula card and review of batch manufacturing records
- Pre-validated method transfer of analytical methods all the way to quality check (QC)
- Troubleshooting and completion with support from analytical development team
- Transfer / verification of analytical methods in the quality control lab
- Product-specific testing at Syngene with minimal testing at third party labs
- Engineering batch manufacturing undertaken in the presence of the technical team. Technical understanding implemented before initiating clinical batch
- Clinical batch manufacturing undertaken in the presence of technical team
- Undertaking release testing and generating batch manufacturing report(s)
- Stability loading of clinical batches as per agreed stability protocol



Your Integrated Partner for Sterile Drug Products

We offer end-to-end services from GLP-Tox batches to clinical supplies, and process R&D and scale-up to cGMP manufacturing of sterile drug products for biologics and small molecules. We have the ability to seamlessly integrate between DS development, DP development, and cGMP manufacturing for both DS and DP.

Drug Development Lifecycle



Syngene offers more than just fill-finish of sterile injectables. Strong technical capabilities and broad parenteral resources help us align with your company's clinical / commercial objectives, and our shared goal of 'putting science to work'.



The Syngene Advantage

- Integrated partner across DS and DP development through to clinical manufacturing
- Access to world-class experts in formulation development
- In-depth experience in handling biologics and small molecules as well as products that are sensitive to light, temperature or oxygen
- Flexible solutions for vials, pre-filled syringes filling, based on specific needs for integrated formulation development
- Analytical expertise to support all stages of development from pre-clinical to clinical with integrated and standalone solutions for drug substance, drug product, and intermediates
- Expertise in technology transfer and troubleshooting during batch manufacturing and successful completion of cGMP batches (clinical or commercial)



About Syngene

Syngene International Ltd. (BSE: 539268, NSE: SYNGENE, ISIN: INE398R01022) is an integrated CRDMO (Contract Research, Development and Manufacturing Organization), serving the global pharmaceutical, biotechnology, nutrition, animal health, consumer goods, and specialty chemical sectors. Syngene's ~6000 scientists bring the skills and capacity to deliver great science, strong data security, and quality manufacturing, at speed, helping improve time-to-market and lower the cost of innovation. This is backed by ring-fenced dedicated centers, as well as ~3 Mn sq. ft of specialist discovery, development, and manufacturing facilities.

For more details, visit www.syngeneintl.com or write to us at bdc@syngeneintl.com