

Development & Scale-up Capabilities

Hikal's process development labs provide a complete range of support services which allow smooth and rapid technology transfer to our commercial facilities. We operate under the highest global quality standards. Hikal's range of scale up, launch and commercial plants cover the entire cycle from pre development through development to the commercial launch of intermediates / API. Our primary focus is on design, optimization and implementation of commercial processes.



Kilo Laboratory (Bangalore & Pune, India)

Our cGMP Kilo laboratory (class 100,000) allows the scale up of processes developed at our R&D labs or tech transferred from our customers. We offer process development from laboratory to production scale and development of innovative and cost-effective routes for the synthesis of intermediates/API's

- 20 Liter Glass Reactors
- 50 Liter Glass Reactors
- 20 Liter high vacuum distillation unit
- Heating/cooling system - 90°C to +200°C
- Pressure Nutsche Filter, Centrifuge
- Vacuum Tray Dryer
- Miller & Sifter



Pilot Plant (Bangalore, India)

Hikal's scale up plant manufactures batches for pre-clinical studies & clinical trials to validation quantities for API's.

- cGMP compliant facility
- Capable of manufacturing advanced intermediates & API's
- Flexible Equipment configuration to suit product requirements
- Reactor Volume: 2.95 m³
- 5 Reactors of capacities ranging from 0.1 m³ to 1.2 m³ of Stainless Steel, Glass Lined & Hastelloy MOC





Launch Plant (Bangalore, India)

- cGMP compliant facility (Class 100,000 area)
- Suitable for producing advanced intermediates and API's
- Flexible equipment configuration to suit product requirements
- Reactor Volume: 26.3 m³
- 13 Reactors of capacities 0.25 m³ to 4 m³ of SS316 & GLMOC
- Independent sections for:
 - Hydrogenation (15 Kg/cm², Capacity - 100 Liter)
 - Cryogenic Reactions: Minus 60°C with Huber System
 - Cracking Reactions: up to 270°C
 - High Pressure and High Temperature Reactions (15 kg/cm², and 250°C)
 - High Vacuum Distillation 1 Torr with 5m packed column and magnetic reflux divider
- Down Stream Processing
 - Agitated Nutsche Filter Dryer (ANFD) of Glass lined / Hastelloy MOC
 - Top and Bottom discharge Halar Lined Centrifuges
 - Rotary Cone Vacuum Drier (RCVD)
 - Rotary Vacuum Paddle Drier (RVPD)
 - Vacuum Tray Dryer (VTD)
 - Air Tray Dryer (ATD)
 - Finishing areas with Milling & Sifting Facility

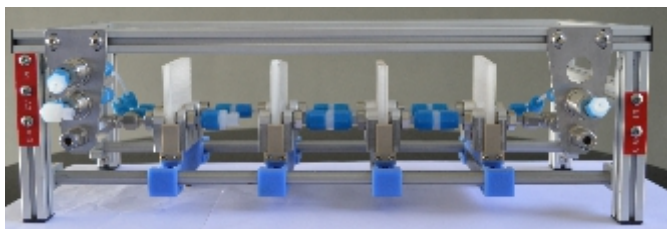
Multipurpose Pilot Plant (Bangalore, India)

Our multipurpose pilot plant offers scale-up capabilities and can provide validation and launch quantities from US FDA site for advanced intermediates and API's

- cGMP compliant facility
- Class 100,000 manufacturing area
- Reactor Volume : 7.71 m³
- Number of reactors : 14
- Reactor size : 63-1000 Liter
- Hydrogenator (Ss316): 500 Liter
- Centrifuges: 18 inch & 24 inch (SS316/Halar coated)
- Nutsche Filters : 500 Liter
- Nauta Dryer : 600 Liter
- Rotary Vacuum Dryer : 250 Liter
- Customization of PSD
- Multimill : 150 Kg/hr
- Air jet mill (microniser) : 10 Kg/hr
- PLC Controlled Operation

Biocatalysis at Hikal R&D Plant (Bangalore, India)

- Enzyme Chemistry
- Commercial using Enzymes



Process Intensification Laboratory

Our process intensification lab caters to the need of multiple process intensification requirements with state-of-the-art equipment

- **Continuous Stirred Tank Reactor (CSTR)**
 - Capacity: 2 Liter
 - MOC: Glass
 - Can be used to estimate the key unit Operation variables to reach a specified output
 - Carrying out two phase reactions
 - Liquid-Liquid Reactions
 - Gas-Liquid Reactions
 - Solid-Liquid Reactions

- **Corning Advanced Flow Reactor (AFR)**
 - Flow Rate: 30 -200 ml/min
 - Capacity: 30 -150 TPA
 - Can be used effectively for heterogeneous and homogenous reactions
 - Decreases waste generation & energy consumption
 - Suitable for different types of reactions: Hydrogenation, Nitration, Oxidation Bromination, Chlorination, Grignard reaction & Polymerization

Analytical Instruments

- HPLC
- GC
- GCMS
- UPLC
- NMR 400 MHz
- Stability Chambers
- Malvern Particle Size Analyzer
- Microbiology Analysis



- **Pinch Tube Reactor**
 - MOC: Glass/SS316
 - Used for carrying out continuous two phase reactions
 - Liquid-Liquid Reaction
 - Gas-Liquid Reaction
 - High Efficiency set up
 - Successfully established for API's

- **Vapor Phase Reactor**
 - MOC : SS316
 - For carrying out chemical reactions with efficient control as needed over a vapor phase
 - Used for Ammoxidation reaction (Production of Nitrile using Ammonia & Oxygen)

High Potent Facility (Pune, India)

- Capable of handling Hi-Potent compounds with OEL value of 10 microgram/m³
- Suitable for lab development work
- About 100 g material can be prepared





HIKAL®
Just the right chemistry

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