Optima Chemical Group LLC

WWW.Optimachem.com

Manufacturing Site - Douglas, Georgia
Driving time from Airports:
- Jacksonville, FL – 2.0 hours
- Savannah, GA – 2.5 hours
- Atlanta, GA – 3.5 hours

Convenient Sea Port service
- Jacksonville, FL
- Savannah, GA
- Charleston, SC
Who We Are

- Privately owned with solid financial resources (i.e., self sufficient for Capital needs).
- Site Manufacturing operations began April 1990
- 90 Employees
- Recently moved our quality system to the ISO 9001 standard
- Intense focus EH&S programs, world class incident rate performance
- Diverse Sales revenue from Optima products, custom, and contract manufacturing
Optima Business Platforms

- Contract Manufacturing
- Optima Brand Products
- Custom Manufacturing
Core Competency

Contract Manufacturing
Toll Manufacturing – Customers

Our customers

- Established Company, medium to large in size in a wide variety of chemistries
  - Outsourcing Manufacturing Segments
  - Developing new products or markets for existing products
  - Geographic considerations
  - Internal capacity constraints
  - Competitive Make vs. Outsource
Toll Manufacturing

- Customer Requirement
  - Large volume
  - Short lived, 18 months
  - Existing technology
  - No internal capacity

- 5000 and 3700 gallon
  316 stainless steel reactors
- Both agitated and insulated
- Both with distillation
  columns 24” and 12” and
  OH condensers
Toll Manufacturing - Unit Operations

- Reaction (including low temp/near cryogenic)
- Extractions / Leaching
- Precipitation / Crystallization
- Solution Filtration (reactive)
- Solids Isolation / Purification
- Drying
- Fractional Distillation / Solvent Recovery
Toll Manufacturing

- Reactors (~40,000 gal capacity)
  - Glass Lined
  - Stainless Steel
  - Inconel
  - 50 gallon to 5000 gallon
  - Full Vacuum to 100 psig
Toll Manufacturing

- **Filtration**
  - Jacketed & Non-Jacketed Rosenmund type. 2.4 & 4.0 sq meter surface area
  - 2.0 m² Hastelloy Rosenmund filter/dryer
  - Solid Bowl Centrifugation
  - Basket Centrifugation
  - Filter Press
  - Monel Vertical leaf
Toll Manufacturing

- **Dryers**
  - Vacuum tray
  - Glass lined Double Cone
  - Stainless Steel Pan type
  - Solidaire® Rotary dryer

- **Fractional Distillation**
  - Solvent recovery/recycle
  - 6000 gallon re-boiler
  - 36 in diameter column, 33 fixed bubble trays
  - Koch 24 in diameter, packed column (Vacuum)
  - 12 in diameter packed column, 23 theoretical plates
Toll Manufacturing

- **Liquid / Liquid extraction**
  - Karr columns
  - Centrifugal extraction
- **Solids / Liquid Leaching**
  - Biomass processing & handling
- **Blending**
  - Solids
  - Liquid
- **Product storage**
  - 75,000 ft² warehousing
  - Liquid storage. Individual tanks to 50,000 gallons
Products that Fit

Optima Brand Products
Our customers

- A wide variety primarily in the Pharma, Catalyst, Electronics, markets
  - Looking for Organometallic non-GMP reagents
  - A US manufacturer of high quality products with short lead times
  - Volumes for both developmental and commercial quantities
  - Make to order and custom formulations
Substituted Boronic Acids

- Currently 150 + derivates manufactured by Optima
- Can supply needs from pre-clinical to commercial production. Quantities from Grams – Kilos – Metric tons produced at our plant
- Full time & on going Development of new Derivatives. Prioritization is Customer need driven
- Research assets available on contract basis if necessary for specific needs
Product Offerings

- **Metal Hydrides (LiAlH$_4$ & LiBH$_4$)**
  - Used for customer synthesis reductions

- **Organophosphines & Organosilanes**
  - Range of electron rich, hindered Phosphines
  - Specialty higher valued phosphines derived from organometallics

- **Organomagnesiunms**
  - Aromatic and aliphatic Grignards and dialkyl magnesium reagents
  - 15 years of experience manufacturing experience
  - Production scale to be competitive world wide
Product Offerings

- Alkyllithiums and Aryllithiums
  - t-Butyllithium, Methyllithium, etc.
- Alkoxides and Lithium Amides
  - Na, Mg & Li t-butoxide Li diisopropylamide, Li hexamethyldisilazide
- Custom formulations available
Natural Progression

Custom Manufacturing
Custom Manufacturing Customers

Our customers

• Primarily small to midsized companies or companies we have worked with in the past
  o A place to scale up chemistries from the lab to commercial scale
  o Process improvement work in specific equipment
  o New product introduction
  o Manufactures uncomfortable handling pyrophoric or air sensitive chemistry
  o Fast track projects that have a short deadline that cannot be done internally
Value add for Custom Projects

- Customer new product commercial launch after process development completed at Optima
- 3 Unit Operation bays, tank farm, Utility plant, cryogenic vent condensing system, fully automated
- $4+ million capital spend
- Groundbreaking in November; production launched the following May (7 months)
- Optima provides upfront Capital; amortized over production commitment
Custom Manufacturing

Areas of Expertise

- Grignards, Lithiations
- Organometallic Reactions
  - Sodium, Lithium, Potassium, Magnesium metal
  - n-butyl and sec-butyl lithium
- Substituted Boronic Acids - Suzuki Coupling reactions
- Phosphorus chemistry (POCL, PCL3, etc.)
- Friedel-Crafts Reaction
- Hydrazine chemistry
- Pyrophoric/water reactive/oxygen sensitive materials
- Biomass Extractions / Leaching
Process Development

- Expertise in process scale up
- Bench Scale
- 22 liter Kilo Lab
- 50 gallon Pilot Plant
- 250 gallon Pilot Plant
Upgrades to the pilot plant include:

- A 200 and 300 gallon glass Rx
- 20 plate distillation system
- Adding 75 cuft double cone dryer
Analytical Capabilities

- **GC**
  - Agilent 7820/7697 Headspace Analyzers (FID), Multiple FID GCs, TCD Capability

- **HPLC**
  - UV Detection On Agilent 1100 and Perkin Elmer Instruments, RI Detection on Perkin Elmer Instrument

- **NMR**
  - Same day service from Valdosta State University, Agilent 400 MHz FT NMR with broad band probe

- **GC Mass Spec**
  - Same day service from Valdosta State University, Agilent 5975 with triple axis detector

- **DSC and TGA**
  - Same day service from Valdosta State University, Perkin Elmer Instrumentation

- **FTIR**
  - Nicolet 380 ATR (Zn-Se crystal)

- **Karl Fischer**
  - Volumetric and Coulometric Mettler-Toledo Autotitrators

- **Density**
  - Mettler-Toledo DM-50 Density Meter

- **Wet analysis**
  - Mettler-Toledo T-90 Auto Titrator, Thermo Visible Spectrophotometer
Adding Additional Capabilities

- **Reactors**
  - 3 Hastalloy - 2K gallon
  - 2 Glass – 4 K gallon
  - 2 Glass – 2 K gallon

- **Solids Processing**
  - Hastalloy 48” Centrifuge
  - Hastalloy Rotary Dryer

- **Bulk Handling**
  - Rail service in and out
  - Barge capabilities for raw materials

- **State of the art industrial WWTP**
  - Several process scrubbers
  - Thermal Oxidizer

- **FIFRA Registration**
Why choose Optima?

- Agile, Customer Focused, and Cost Competitive in the global market place
- 23 years of custom/contract manufacturing experience
- A unique portfolio of products to support synthesis projects
- US based company with high Quality and EHS&S programs in place

Check out our Website at

www.Optimachem.com