

# Welcome to Optima Chemical Group, LLC





## Who We Are

- Privately owned with solid financial resources (i.e., self-sufficient for capital needs)
- Two Companies/Production Sites: Optima Chemical - Douglas, GA  
Optima Belle - Belle, WV
- Manufacturing operations began Spring 1990 in Douglas, GA
- > 150 Employees Total
- ISO 9001 certified at both locations
- Diverse Sales revenue from Optima products, custom, and contract manufacturing

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Industries Supported

- Pharmaceutical
- Catalysts
- Bioscience
- Energy storage
- Nutraceutical
- Flavors & Fragrances
- Electronics
- Personal Care

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Health, Safety & Environment

- Participant in OSHA's Voluntary Safety & Health Participation Program
- OSHA 1910: Process Safety Management Compliant
- Certified "Drug Free" workplace.
- Fully implemented Behavioral Based Safety program (DuPont STOP®)
- SOCMA ChemStewards Tier III Excellence company (one of 13 SOCMA member companies)

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





Technology

Capabilities

Manufacturing

**Product  
Line**

**Development  
Services**

**CMO & Toll  
Services**

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Technology

**Metals**



**Organometallics**



**Derivatives**

**Grignards  
& Organolithiums**

**Boronic  
Acids**

**Phosphines**

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Product Portfolio

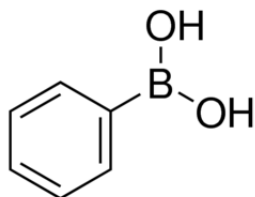
- Boronic Acids, Grignards, Organolithiums, Organophosphines, and related intermediates
- 300+ materials developed & manufactured
- Grams – Kilos – Metric-ton Scale-up
- Pre-clinical to Commercial Support for Pharmaceuticals
- Full time Development of new materials
- Research assets available on contract basis

A global supplier of specialty chemicals,  
toll and custom manufacturing services.

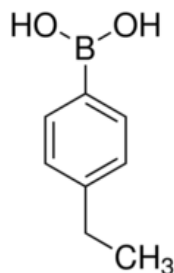




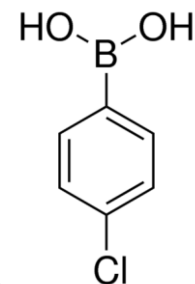
# Boronic Acids



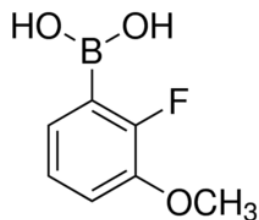
Phenyl Boronic Acid



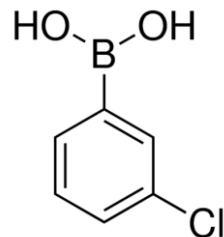
4-Ethylphenyl Boronic Acid



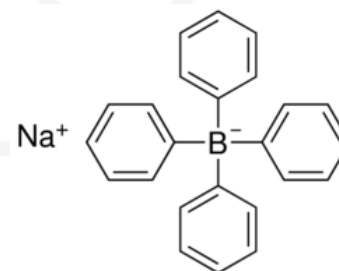
4-Chlorophenyl Boronic Acid



2-Fluoro-3-methoxyphenyl Boronic Acid



3-Chlorophenyl Boronic Acid



Sodium tetraphenyl Borate

A global supplier of specialty chemicals,  
toll and custom manufacturing services.







## Grignards & Organolithiums

- Methyl-MgCl
- n-Butyl-MgCl & t-Butyl-MgCl
- Ethyl-MgBr
- Isopropyl-MgBr
- Phenyl-MgCl
- Isopropenyl-MgBr
- Octadecyl-MgCl
- t-Butyl-Lithium in Heptane
- Lithium t-Butoxide in THF
- Lithium t-Butoxide Solid
- Lithium Diisopropylamide
- Lithium hexamethyldisilazide

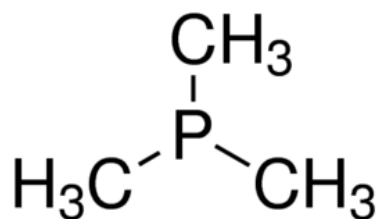
\* Grignards available in variety of solvents

A global supplier of specialty chemicals,  
toll and custom manufacturing services.

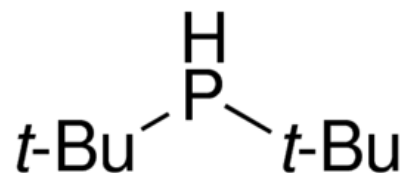




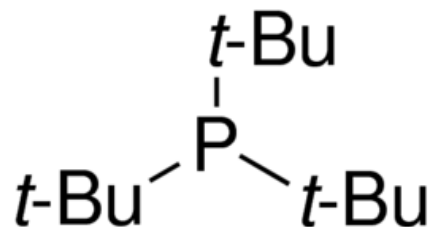
# Organophosphines



Trimethylphosphine



Di-tertbutylphosphine



Tri-tertbutylphosphine

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Development Services

- Process Engineering
- Modern R&D lab
- Kilo lab
- Pilot Plant
- Manufacturing Plant

**Efficient  
Capital  
Deployment**

**Short-term  
Assistance**

**Long-term  
contracts**

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Analytical Services

- Full service Analytical Lab for method development, raw material and final product release at both sites
- Analytical Equipment:
  - GC, HPLC, ICP-OES, XRD, FTIR
  - Karl Fischer, Density Meter, Auto Titrator, VIS Spectrophotometer
  - Outside Lab Services at Valdosta St University & University of North Carolina – Charlotte (24 Hr Service):
    - NMR, GC Mass Spec, DSC, and TGA





## Capabilities

- High Hazard chemistry
- Moisture sensitive
- Air sensitive
- Pyrophoric handling
- Fractional Distillation
- Solids handling

**Sensitive  
Chemistry**  
(heat, air, water)

**Cryogenic**  
**-80° C**

**Emission  
Control**  
(including flare)

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Capabilities

- Grignards, Lithiations
- Organometallic Reactions – (Li, Mg, Na, K)
- Substituted Boronic Acids - Suzuki Coupling reactions
- Phosphorus chemistry ( $\text{POCl}$ ,  $\text{PCl}_3$ , etc.)
- Friedel-Crafts Reaction
- Hydrazine chemistry
- Pyrophoric/water reactive/oxygen sensitive materials
- Biomass Extractions / Leaching
- Hydrogenations up to 250 psi

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Manufacturing

- Reactions (Low Temp/Cryogenic)
- Extractions/Leaching
- Precipitation/Crystallizations
- Solution Filtration
- Solids Isolation/Purification
- Drying
- Fractional Distillation/Solvent Recovery

**> 30 Years  
Experience**

**ISO9001:  
2015**

**Two  
Manufacturing  
Sites**

A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Pilot Plant - Douglas

- 50 – 1000 Gallon Reactors:
  - Glass-lined and Stainless Steel
  - Temperature Range: -80 to 250°C
  - Pressure: 0 to 180 psi
- Isolation/Filtration:
  - 2.0 m<sup>2</sup> Hastelloy Rosenmund® filter/dryer
  - Filter press
  - 0.2 m<sup>2</sup> Buchner filter
- Dryers:
  - 70ft<sup>3</sup> Double cone dryer
  - Ribbon Dryer, jacketed and vacuum-rated
  - Littleford Plow Dryer, jacketed and vacuum-rated
  - Vacuum Tray Dryer
- Other Equipment
  - 6" Packed Distillation Column on 50 gallon stainless reactor



A global supplier of specialty chemicals,  
toll and custom manufacturing services.







## Commercial Plant - Douglas

- ~100,000 Gallon Reactor Capacity:
  - 2000 – 5000 Gallon: Hastelloy, Glass, Stainless Steel
  - Temperature: 0 to 250°C
  - Pressure: 0 to 250 psi
  
- Isolation/Filtration:
  - 2.4 m<sup>2</sup> Zwag Filter and 4.0 m<sup>2</sup> Zwag Filter/Dryer
  - Solid Bowl Centrifuge
  - Basket Centrifuge
  - Disk Centrifuges
  - Filter Presses



A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Commercial Plant - Douglas

- **Dryers:**

- 3 x Glass-lined Double Cone
- Hastelloy Double Cone
- Stainless Steel Pan type
- 2 x Solidaire® Rotary dryer
- ProcessAll Plow Dryer



- **Fractional Distillation:**

- Solvent recovery/recycle
- 6000-gallon reboiler
- 36 in. diameter column, 33 fixed bubble trays
- Koch 24 in. diameter, packed column (Vacuum)
- 12 in. diameter packed column, 23 theoretical plates



A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Commercial Plant - Douglas

- Liquid / Liquid extraction
  - Centrifugal extraction
- Solids / Liquid Leaching
  - Biomass processing & handling
- Blending: Solids & Liquids
- Product storage
  - 75,000 ft<sup>2</sup> warehousing
  - Liquid storage: Up to 50,000 gallons



A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Commercial Plant - Belle

- Former DuPont Site
- Acquired two production facilities in 2015
- Shared utilities via Chemours
- Access to rail & barge access for raw material & finished goods transport
- On-site industrial waste-water treatment plant
- FIFRA Registration – Ag Intermediates
- Honeywell DC Control System



A global supplier of specialty chemicals,  
toll and custom manufacturing services.







## Commercial Plant - Belle

- ~30,000 Gallon Reactor Capacity:
  - 500 – 4000 Gallon: Hastelloy, Glass, Stainless Steel
  - Temperature: -29 to 250°C
  - Pressure: 0 to 100 psi
  
- Isolation/Filtration:
  - Hastelloy Basket Centrifuge 48" x 30"
  - Stainless Basket Centrifuge 48" x 30"
  - Stainless Filter Housing w/ 18 bags
  - Rosenmund Filter Dryer – 5m<sup>2</sup>





## Commercial Plant - Belle

- Dryers:
  - 2000 gallon Hastelloy Filter dryer
  - Hastelloy Paddle Dryer – 1200 gallon
- Miscellaneous Support Equipment:
  - 2 Chillers – Rated  $-30^{\circ}\text{C}$  100 Ton &  $-20^{\circ}\text{C}$  150 Ton
  - Scrubbers - Caustic
  - Thermal Oxidizers
- Storage & Warehousing:
  - 20,000 sq ft warehouse for finished goods & raw materials
  - Tank Storage:
    - Glass, Stainless Steel, Carbon Steel, & Fiberglass
    - 200 – 150,000 gallon capacities



A global supplier of specialty chemicals,  
toll and custom manufacturing services.





## Lab to Commercial Example

- Lab Scale – Pilot Plant - Capital Plan – Commercial Plant
- \$4+ Million Capital Project: Upfront spend provided by Optima and amortized over production commitment
- Schedule: Groundbreaking to Production Launch in 7 Months
- Plan included 3 Unit Operation Bays, Tank Farm, Utility Plant, Cryogenic condensing system, Full automation



A global supplier of specialty chemicals,  
toll and custom manufacturing services.



**WEST VIRGINIA**

901 W DuPont Avenue  
Belle, WV 25015

# USA Facilities



**GEORGIA**

200 Willacoochee Hwy  
Douglas, GA 31535

A global supplier of specialty chemicals,  
toll and custom manufacturing services.







**Contact us at:**

**Email: [sales@optimachem.com](mailto:sales@optimachem.com)**

**Web: [www.optimachem.com](http://www.optimachem.com)**

**Phone: +1-912-384-5101**

A global supplier of specialty chemicals,  
toll and custom manufacturing services.

