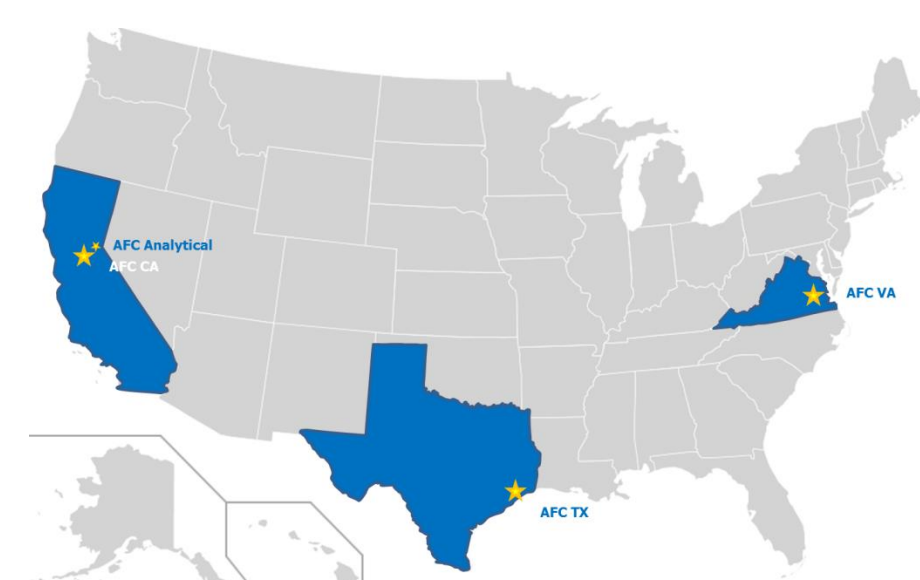


# Technology and Capacity at All Scales for Production of APIs

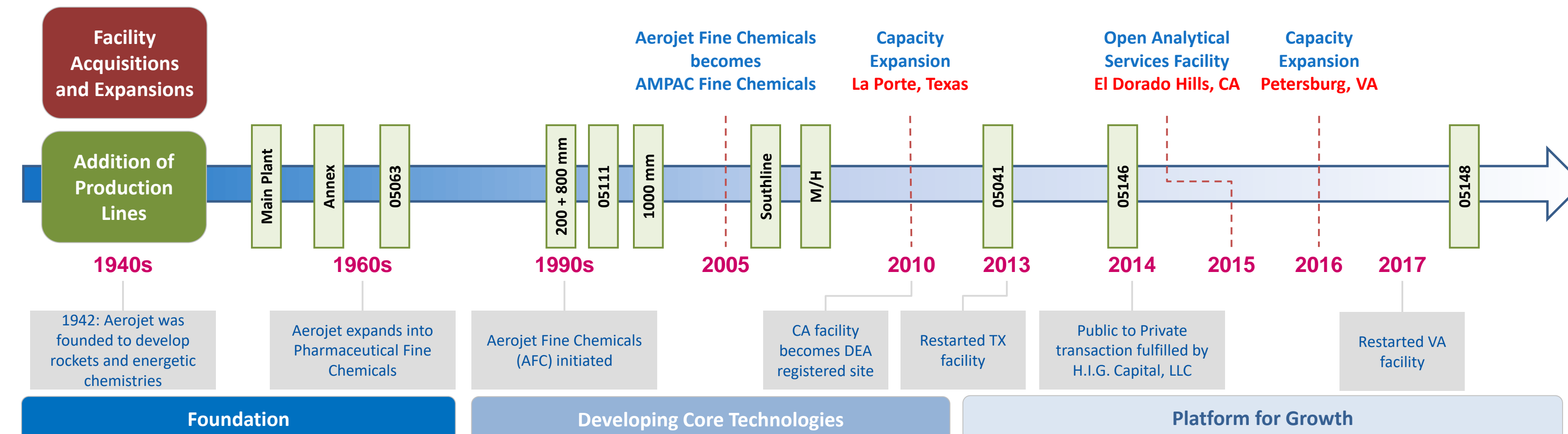
## A Leading Manufacturer of Small Molecule APIs and Enabling Custom Compounds

### AFC is a US Based Manufacturer of Registered Intermediates and APIs



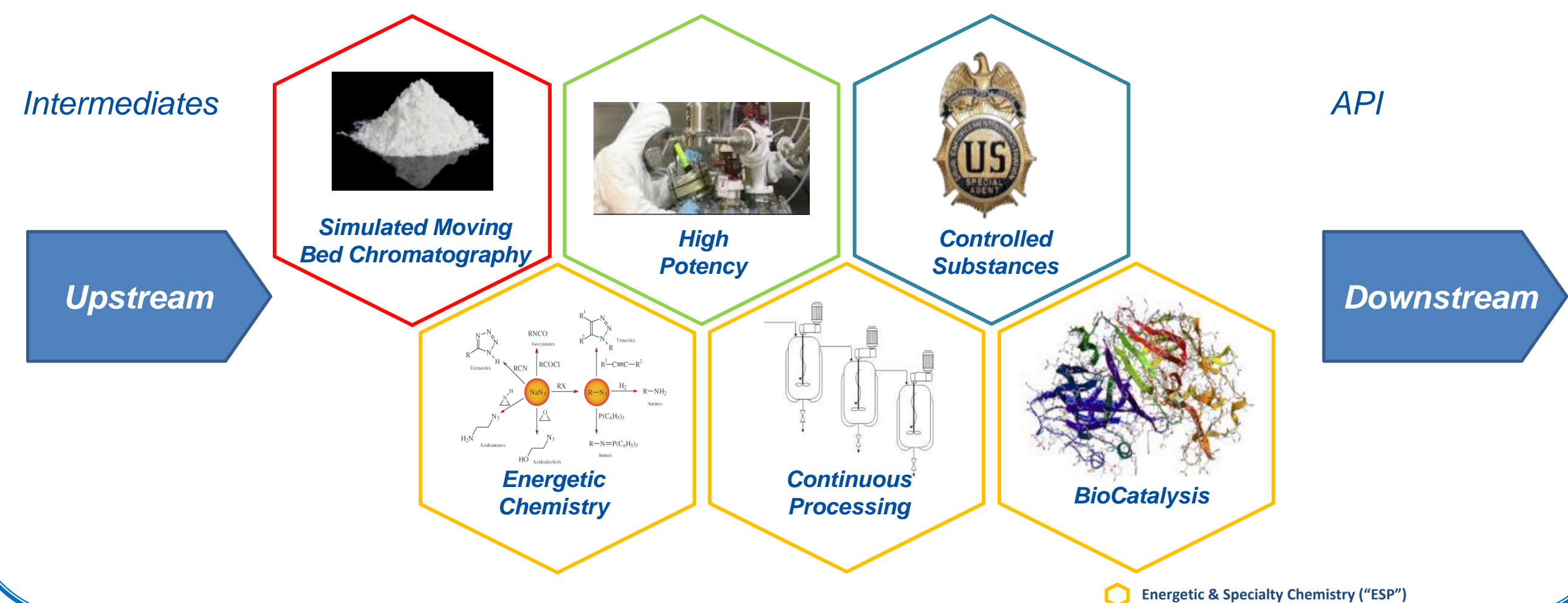
- California Facility was established in 1942
- Customers include Pharma, Biotech, and High Technology Companies
- Headquartered on a secure 13,600 acre campus at Rancho Cordova, CA
- cGMP manufacturing at three locations:
  - ✓ Rancho Cordova, CA; La Porte, TX; Petersburg, VA
- API facilities for all scales of production, commercial CS, HPAPI, and significant available capacity
- AMPAC Analytical - El Dorado Hills, CA

### AFC has a History of Continuous Expansion



## AFC Offers a Large Portfolio of Key Enabling Technologies over Three Sites

### From RSM and Intermediate to API



### Rancho Cordova CA – Headquarters



Location	Rancho Cordova, California
Equipment	77 Reactors 84,000 Gallons 7 SMB Units
Acreage	241 acres
Square Feet	200,000+
Mission	Support Development, High Potency, SMB, ESP, Controlled Substances, cGMP manufacturing at Small, Medium, and Large-scale

### La Porte TX – Commercial lines



Location	La Porte, Texas
Year Acq.	2010 (restarted in 2013)
Equipment	13 Reactors 24,000 Gallons
Acreage	5 acres
Square Feet	42,500
Mission	Support ESP, cGMP manufacturing at small and large scale

### Petersburg VA – Capacity expansion



Location	Petersburg, Virginia
Year Acq.	2016 (restarted in Q1, 2017)
Equipment	77 Reactors 45,000 Gallons
Acreage	197 acres
Square Feet	200,000+
Mission	Support Development, High Potency, ESP, Controlled Substances, cGMP manufacturing at all scales

## Continuous Improvements via Lean Manufacturing and Supply Chain management Provide Cost Reduction

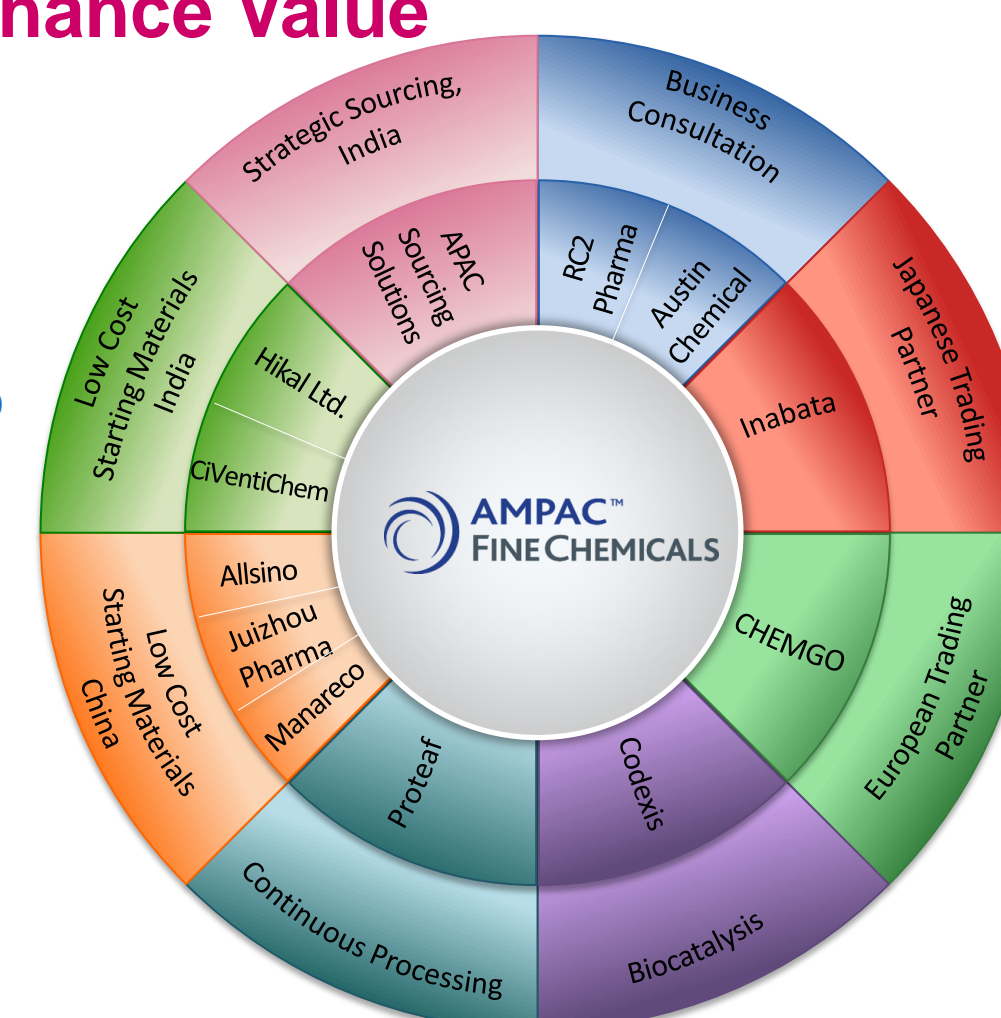
### Continuous Improvement Drive the Increase in Performance

- Lean Manufacturing Cultural Enhancement
  - Kaizen events with diversified teams
- War on Foreign Objects and Debris (FOD)
  - Dedicated cross functional teams focused on eliminating FOD sources
- Right First Time: Quality and Documentation
  - Quality totem poles provide transparency and continuous feedback
- Capacity Enhancements
- Improved Supply Chain Management

Lean Manufacturing Continuous Improvement Initiatives		
Area	Project Types	# Active Projects
Engineering	War on FOD	44
Operations	5S, Guidance Documents, Efficiency, Changeover, War on FOD	16
IT	Automation, Control Upgrades, Network Infrastructure	20
AFC TX	War on FOD, Throughput/ Yield and Efficiency	6
Maintenance	Maximo, Bottom Valves, PM's/Annuals, Docking System	10
Total		96

### Using Established Partners to Enhance Value

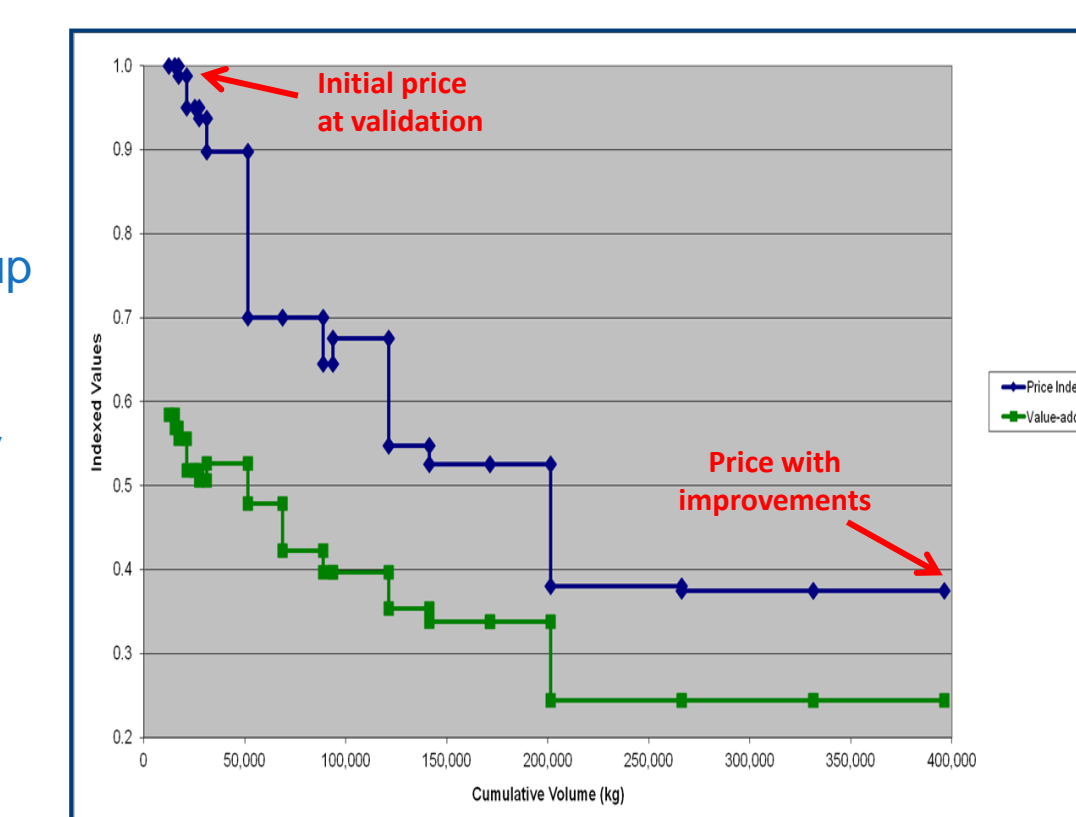
- Established Supply Chain for Raw Materials
  - Continue to build key relationships in China, India, US, EU
- Enhanced Audit Activities
  - Established partners in various countries with focus on Q3D
- Dual Source Strategy
  - Geographic diversity
- Key Partnerships in Europe, US, and Japan
  - Extend AFC's supply chain
  - Extend AFC's presence worldwide
- Technology Enhancement
  - Work with partners to increase competencies in key technologies



### Demonstrated Cost Reduction via Manufacturing Excellence

Process and supply chain improvements drive 'Engineered Chemical Solutions' to reduce costs within regulatory filing.

- 33 Ph.Ds. lend leadership across the major disciplines
- 48 R&D scientists for process development and scale-up
- 56 Engineers to lead manufacturing operations
- 102 Quality Control & Assurance experts independently verify compliance
- Over 220 High performance Chemical Operators
- 20 AFC-Analytical Team Members



## AFC Offers Unique Technologies at all Scales

### Multiple Azide-Rated Manufacturing Facilities

<b>05001A/F</b> <ul style="list-style-type: none"><li>50 to 100 gal reactors (GL)</li><li>Filter dryer (Hastelloy™)</li></ul>	<b>05063</b> <ul style="list-style-type: none"><li>500 to 2,000 gal reactors (GL)</li><li>Vertical Basket Centrifuge (Hastelloy™)</li><li>Tumble dryer (Hastelloy™)</li></ul>	<b>South Line</b> <ul style="list-style-type: none"><li>300 – 1,000 gal reactors (GL)</li><li>Heinkel Centrifuge (Hastelloy™)</li><li>Tray dryer</li></ul>	<b>Annex</b> <ul style="list-style-type: none"><li>750 to 2,000 gal reactors (GL)</li><li>2,000 gal filter reactor (Hastelloy™)</li><li>Heinkel Centrifuge (Hastelloy™)</li><li>Tumble dryer (Hastelloy™)</li></ul>
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### cGMP Production of HPAPIs

<b>05017 (CA) – 0.2 µg/m³</b> <ul style="list-style-type: none"><li>50 to 200 gal G/L</li><li>Hydrogenation</li></ul>	<b>05111 (CA) – 0.2 µg/m³</b> <ul style="list-style-type: none"><li>50 liter - 20 gal G/L</li><li>Filter Dryer</li><li>HPAPI Milling</li></ul>
<b>05046 (CA) – 0.2 µg/m³</b> <ul style="list-style-type: none"><li>50 to 200 gal G/L</li><li>Filter Dryer</li></ul>	<b>S3-Labs (VA) - 5 ng/m³</b> <ul style="list-style-type: none"><li>Lab Scale equipment</li><li>100 L G and Hastelloy</li></ul>
	<b>S3-Bay 31 (VA) – 0.2 µg/m³</b> <ul style="list-style-type: none"><li>25 to 100 gal G/L and Hastelloy</li><li>Filter Dryer</li></ul>

### Controlled Substances Manufacturing

- Schedule II - V CS facility
  - 100, 300, 500, 750, and 2,000 gal reactor trains
  - Annually audited by the DEA
- AFC-CA registered for multiple APIs:
  - Thebaine Intermediate, Tapentadol, Levorphanol, Methylphenidate, Dexamethylphenidate
- AFC-VA Registration in Progress.
- On Going Commercial production of multiple CS II
- Schedule 1 Researcher's License experience for Cannabinoid & other drug products

### AFC can Perform SMB at all Scales

- SMB is a Binary Separation Technique
  - Main application remains chiral separations but can be used for complex separations
- SMB has been used for APIs for over 25 years
  - Several APIs are produced using SMB
  - Continuous technology inspected and accepted by the FDA and EMA
  - Competitive technology compared to traditional methods
  - AFC has 8 units from bench top to multi-ton manufacturing

## AFC Key Capabilities and Manufacturing Services Drive Successful Partnerships

### AFC Offers Full Manufacturing Capacity and Support

- Fully equipped R&D, Kilo, QC, and Analytical Labs
- cGMP Continuous "Zone" Reactor suite
- Pilot-scale production facilities: 30 - 200 gal reactors
- Small-scale High Containment facilities: Lab Scale to 50 - 200 gal reactors
- Medium-scale High Containment (1 µg/m³) facilities: 500 – 2,000 gal reactors
- Multiple Large-scale Production lines: 1,500 – 2,000 gal
- Over 158,000 gal manufacturing capacity
- Multiple SMB units:
  - Laboratory scale; various, 8 x10 mm
  - Kilo scale; 8 x 50 mm
  - Pilot scale; 6 x 75 mm, 8 x 100/200 mm
  - Commercial units; 6 x 800 mm, 5 x 1,000 mm

### AFC Rises Above Competition to Offer Added Value

AFC's customers realize additional Quality, Performance & Cost Benefits

**War on FOD**  
**Process Innovation**  
**Right the First Time**  
**PAI Heritage of Success**  
**Dedicated Lean Operations Team**  
**Continuous Improvement Kaizen Culture**

On Time Performance	Continuous Cost Reduction	Technology Experience and Talent
Effective Project Management	Location and Large Available Capacity	cGMP Quality

AFC provides all the Performance attributes expected from a cGMP CMO

### We are AMPAC Fine Chemicals LLC

- Strong record of Regulatory Compliance
  - Maintain all necessary approvals to operate and supply cGMP products worldwide
- A strong team of renowned industry leaders
  - Experts in process development and commercial production
- A portfolio of key enabling technologies
  - Proven technology platforms and applications of new processes
- Trusted partners with the majority of Large Pharma and BioPharma
  - Reliable supply supported by multi-year agreements and continuous improvement
- Recognized innovators with 75 years of chemical production heritage
  - Practical application of technology to reliably deliver quality products to save and improve lives