Reshoring and Onshoring
Premium Pharmaceutical Ingredients
for over 25 years
Onshoring and Reshoring US Based Drug Manufacturing

US Manufactured Premium Pharmaceutical Ingredients

- **Reshoring**: bring manufacturing back to the USA
- **Onshoring**: bring manufacturing to the USA that is only being done overseas.
- **Creates** secure Supply Chains for critical drugs.
- **Reduces** dependency on foreign manufacturers at risk.
- **Providing** sustainable US economic expansion.
Secure Drug Supply Chains - Insights and Perspective

US Manufactured Premium Pharmaceutical Ingredients

- With **80-90%** of all **drug ingredients** being imported today, the crisis for critical drug supply is **far greater** than most people realize. **Solving** that problem, however, will have a **tremendously positive economic impact**!

- More than **100 site visits** with foreign chemical manufacturers has **provided** BioSpectra with a **unique understanding** of the **risks** and the **delicate balance** in the supply of offshore chemicals – many of which are only made overseas.

- Consequently, the **BioSpectra model** presents the **best path** to provide **secure and sustainable supply chains** for all US drugs and drug ingredient manufacturing.
A Secure Drug Supply Chain Requires Secure Supply for All Drug Ingredients

US Manufactured Ingredients Create Safe Drug Products

Final Drug Products compounded in the USA

Synthesized and Purified Key Drug Ingredients In the USA

Purify and Synthesize Core Starting Chemicals In the USA for critical drugs
Benefits to Onshoring/Reshoring Drug Supply Chains

US Manufactured Premium Pharmaceutical Ingredients

• **Significant, Direct Economic Impact:**
  - Economic expansion in manufacturing of over $500bn per year.
  - Job Creation: estimated at 800,000 – direct, industry-related fulltime jobs.

• **Significant, Indirect Economic Impact:**
  - Manufacturing supplies and raw materials.
  - Manufacturing equipment and instrumentation.
  - Consumption of vast amounts of resources for employees.
Further Benefits of Onshoring/Reshoring

- **Supports** key federal initiatives for secure supply of critical drugs while reducing dependency on high-risk foreign companies.

- **Ensures quality** of drug products and patient safety.

- **Drives advancements** in technology and innovation that will keep America first in drug development and manufacturing.
Twenty-Five Years of Experience Onshoring & Reshoring

US Manufactured Premium Pharmaceutical Ingredients

- Highly Experienced Team with Comprehensive Technical Knowledge:
  - Chemical synthesis & purification.
  - Critical ingredient manufacturing.
  - cGMP / ICH Q7 / 21 CFR 210-211

- We provide short-term security and suitability of ingredients by purifying offshore chemicals.

- We provide long-term security by synthesizing our own versions of key ingredients when requested.
BioSpectra: An Example of the Power of Private Business

US Manufactured Premium Pharmaceutical Ingredients

- BioSpectra quickly develops new, key ingredients for drug formulations.

- Our success is based on our ability to design and build custom manufacturing equipment and systems for chemical synthesis and purification of a wide range of drug ingredients.

- Our private ownership allows us to take calculated risks to quickly solve critical problems in time frames atypical of other corporate environments.
Proven Track Record – The BioSpectra Model

US Manufactured Premium Pharmaceutical Ingredients

• A **proven track record** to serve as the **model** for reshoring across PA and the US.

• **Independent Progress**: All of our success with advanced systems, standards and innovations were accomplished without **any** support from government or outside investors.

• We **continue** to **develop** new processes and product opportunities **quickly** and **efficiently** based on three factors: our **culture**, **model** and **private** ownership.
<table>
<thead>
<tr>
<th>Misconception</th>
<th>Reality</th>
<th>Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>All chemicals imported to the US are suitable for drug manufacturing</td>
<td>Many chemicals coming overseas are lower quality and not manufactured with the intent for use in drug products</td>
<td>These imported chemicals should be purified first by a US company, ensuring their suitability</td>
</tr>
<tr>
<td>It is cost effective to manage “lower-cost” offshore manufacturers</td>
<td>It costs more to legitimately and effectively manage offshore suppliers</td>
<td>Managing legitimate US manufacturers like BioSpectra</td>
</tr>
<tr>
<td>Onshoring/reshoring drug ingredients will raise drug prices</td>
<td>Raw materials are a small portion of the overall cost of a final drug product</td>
<td>Costs can be controlled by reshoring/onshoring scale volumes coupled with process efficiencies</td>
</tr>
<tr>
<td>Onshoring/reshoring will have a negative impact on our environment</td>
<td>Lack of environmental controls in India and China are destroying our planet</td>
<td>The technology is available to manufacture all drug ingredients sustainably in the US</td>
</tr>
<tr>
<td>Lower cost labor yields lower cost drugs</td>
<td>Lower cost labor leads to lower quality standards at the expense of patient health</td>
<td>Labor costs are a small portion of the overall cost of manufacturing a final drug product</td>
</tr>
<tr>
<td>The US lacks the knowledge to manufacture key raw materials</td>
<td>The US leads the world in new technology &amp; innovation!</td>
<td>We need Federal, State and local Government support to remove the barriers!</td>
</tr>
<tr>
<td>It’s too late</td>
<td>It’s never too late</td>
<td>BioSpectra’s model can lead the way</td>
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</table>
BioSpectra Continues to Expand

US Manufactured Premium Pharmaceutical Ingredients

Expansion of Research and Development - Rensselaer, NY
• This new facility will further our reshoring initiatives by developing chemical synthetic pathways for key ingredients – some of which are only manufactured overseas.

Distribution Center in Northampton County, PA
• This distribution center will support expanded production of products for a secure supply chain of key ingredients for drug manufacturers in the US.

BioSpectra commits to advancements
• BioSpectra will continue to set new standards and expectations in drug manufacturing through commitments to advance new processes, technology and product opportunities.