# who provides custom solutions?

### we do.

pharmaceutical manufacturing services



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## fine chemical and chemical API custom manufacturing services

Ashland is a world class custom manufacturer of key starting materials, advanced intermediates, and active pharmaceutical ingredients produced within a strict cGMP environment. With more than 30 years of experience providing clients with custom synthesis and toll manufacturing, Ashland is well equipped to meet the needs of customers around the globe.

When you partner with Ashland, each project is assigned a multi-disciplinary team of chemists, engineers, regulatory and quality support throughout the development and scale-up phases. We are uniquely positioned to provide solutions to complex problems that arise throughout the development and production life cycle.



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#### research & development

Our research chemists can assist you with choosing the appropriate chemistry and selecting the optimal commercial synthetic route. Our goal is not only to address your technological needs, but also provide you with the most economical product on time and within specification – improving your profitability.

#### areas of expertise

- alkyne chemistry hydrogenation
- reductions

halogenation

lithiation

- solution polymerization
- boron chemistry bromination
- multi-step synthesis Diels Alder
  - cryogenic milling

amination

- low temperature reaction to -100° C
- grignard reactions / couplings

#### manufacturing capabilities

Ashland has the capabilities to support projects from gram to multi-ton quantities, offering our clients flexibility in scale and material of construction.

- pilot to commercial scale reactors
  glass lined, stainless-steel and Hastelloy C22
  ranging from 100 to 4000 gallons
- centrifugation and filtration
- centrifuges Hastelloy C and stainless
- sparkler filters: 36" stainless and 18" stainless
- o drying:
- stainless and Hastelloy C double cone rotary
- stainless tray dryer, HDPE trays
- particle size reduction:
  - Quadro Comil, stainless
- distillation and liquid purification:
- Luwa thin film evaporator, stainless
- 500 gallon batch still, stainless, high efficiency structured packing

#### environment, health and safety

Ashland places a high priority on the safety and health of employees, customers and the communities where we live and operate. Our employees take ownership and play an active role in sustaining a safety and injury/ incident prevention culture at our fine chemicals plant.

Our facility follows internationally accepted Management Systems standards and received ISO certification in 2017 and Responsible Care Management Systems re-certification in 2015. We also operate in compliance with the department of homeland security.

#### quality

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Ashland has an uncompromising dedication to quality.

Our quality systems are fully compliant with the U.S. Food and Drug Administration (FDA) Good Manufacturing Practices, as evidenced by successful completion of 14 FDA inspections over the last 10 years without any Form 483 notifications.

Our in-house quality control and analytical departments support both R&D and production by undertaking methods development (in-process and final product), qualifying raw materials, and conducting in-process analysis and stability studies of final products. We carry out chemical process validation and, when required, the supporting analytical methods.

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#### regional centers

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