



# Biosynthetic Technologies

Company and Technology

*Delivering Innovations for a Sustainable Future*

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# Company

## *Delivering Innovations for a Sustainable Future*

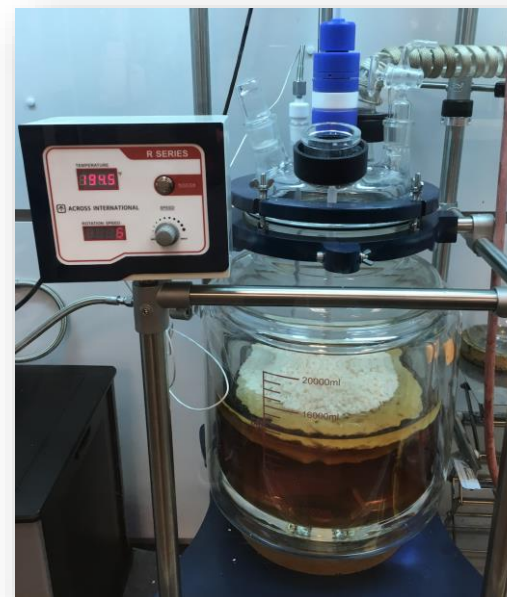
- BT specializes in developing and commercializing high-performance, sustainable chemical ingredients that can be used in a variety of applications
- BT products are designed for Health, Safety and Environment; They are bio-based, biodegradable, and non-toxic
- Lubricants are BT's first target market, though versions of these products have been investigated for use in plastics, rubbers, hydraulic fluids, dielectric fluids, pharmaceuticals, and even foods
- R&D focused on a new class of synthetic compounds, called estolides. First commercial Biosynthetic Base Oil is BT75, an ISO VG 680 product, with samples available today and large-scale manufacturing coming online Q3 2019.

# Company - Location and Facilities



- Access to ample lab space, specialty equipment, experienced chemists and engineers
- Shared analytical resources for bench chemistry and process development
- Pilot plant space, pilot scale equipment

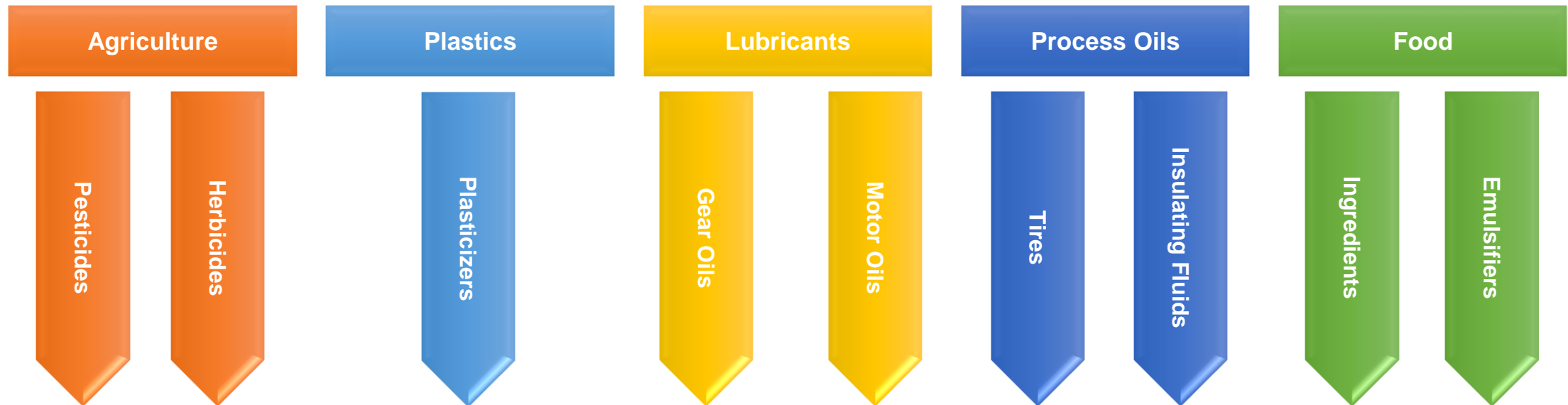
- Headquartered at a world class research facility called “The Center” in Indianapolis, Indiana
- The Center was built to drive discovery and innovation across a wide range of platforms.



# Technology - The Estolide Platform

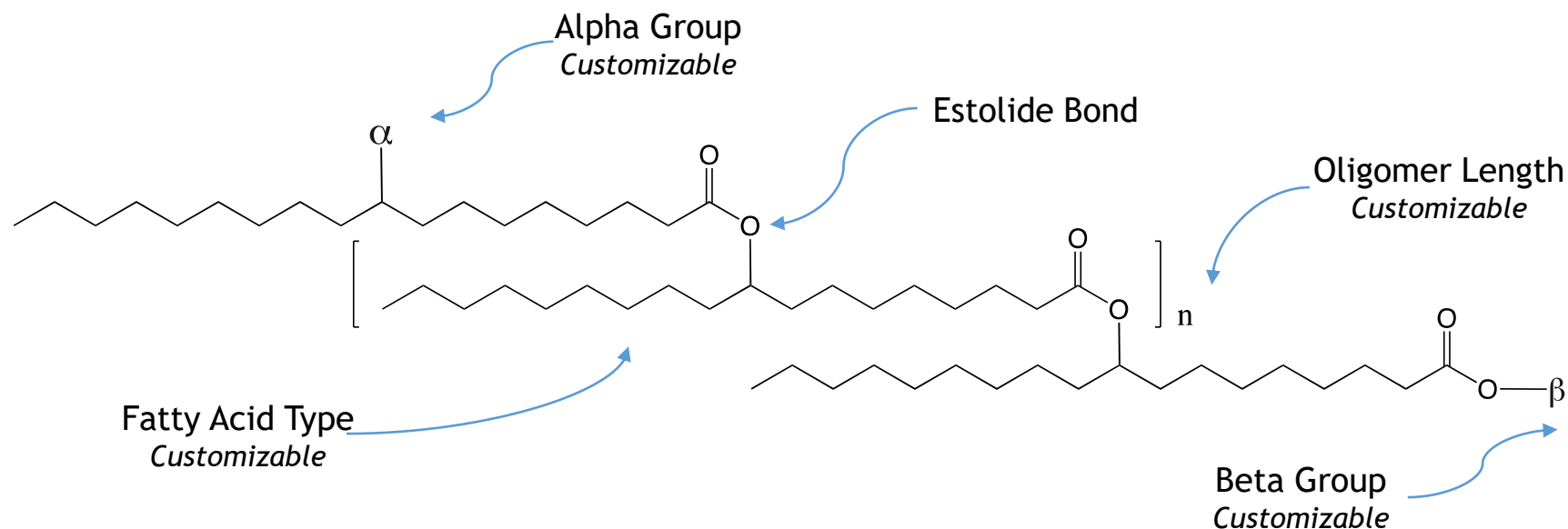
A powerful combination of performance and environmental benefits offer formulators the tool kit necessary to design cutting-edge environmentally friendly products

## Estolides Represent a Platform of Products



# Technology - The Estolide Platform

- Estolides are fatty acids linked together to form oligomers
- The general structure of an estolide is shown below



## Synthetic variants:

- Use different fatty acid feedstocks
- Make molecules larger or smaller (n)
- Modify functional groups (a, b)

Changing the estolide structure results in products with different physical properties, making them suitable for various applications

# Technology - The Estolide Platform

Multiple inputs allow for the customization of an estolide product.

**Oligomer Length**  
Small, Medium, Large

**Alpha Group**  
Hydroxy, Sulfurized, Saturated, etc.



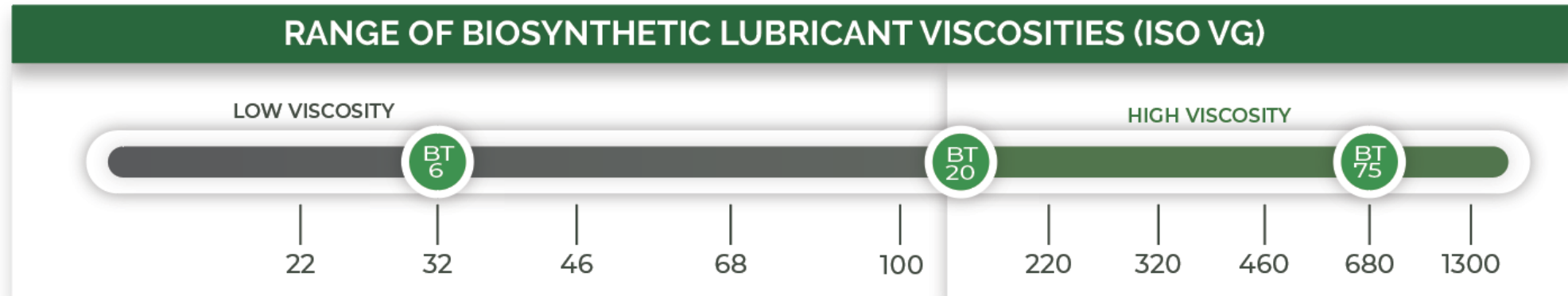
**Fatty Acid Type**  
Short, Long, Hydroxy, etc.

**Beta Group**  
Alcohols, Glycols, Free Acid etc.



# Lubricant Base Oils

- BT offers Biosynthetic Base Oils ranging from ISO VG 32 to ISO VG 680



Diverse Applications

## Automotive

- Passenger Car Motor Oil
- Truck Engine Oil
- Scooter / Motorcycle Oil
- Transmission Fluid
- Gear Oil and Greases



## Industrial

- Process Oil
- Hydraulic Oil
- Compressor Fluid
- Gear Oil and Greases
- Metalworking Fluid



## Marine

- Hydraulic
- Gear Oil and Greases
- Gear Oil
- Trunk Piston Oil
- Cylinder Oil



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