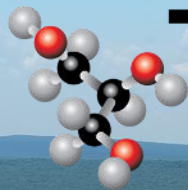


# ***FUTUREFUEL***<sup>®</sup>

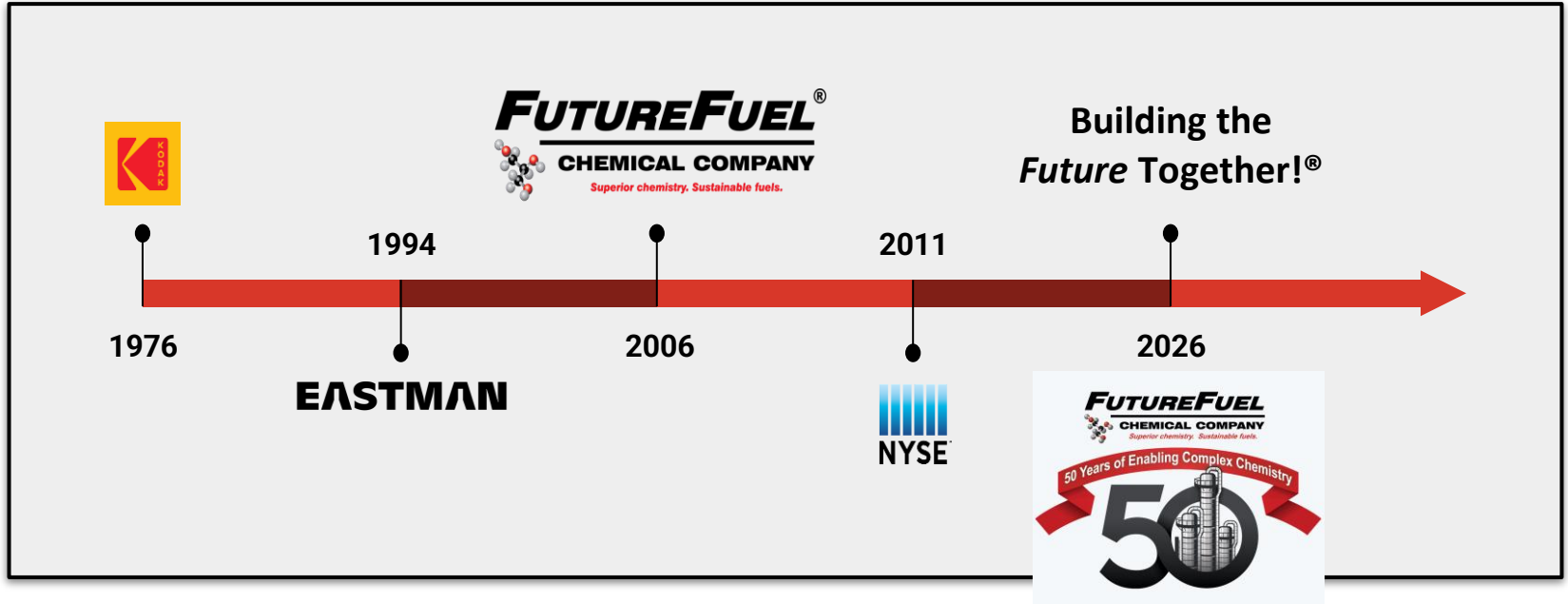


## **CHEMICAL COMPANY**

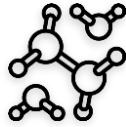
***Superior chemistry. Sustainable fuels.***



# Our Site History



# Company Overview



**50** years of excellence



**2,200** acres



**600** acres footprint



**500+** employees



**300+** custom chemicals produced

# Biodiesel & Glycerin

- Began production in 2005
- Robust operation capable of processing multiple feedstocks
- Rated biodiesel capacity of 59M gallons/year
- Largest producer of biodiesel in Southeastern United States

## Certifications:

- BQ-9000 Producer
- ISO Registered Facility
- Certified in California's Low Carbon Fuel Standard

Glycerin is a by-product of biodiesel and is sold as one of our Performance Chemicals

- Low MONG (>80%)
- Technical (>99%)



# Performance Chemicals

FutureChem<sup>®</sup> & FutureSol<sup>®</sup>



Reactive  
Monomer



Polymer  
Modifiers



Cleaning  
Ingredients



Solvents  
Adjuvants



New Product  
Development  
& Applications

# Custom Chemicals

## Provide Specialty Chemicals across various markets:

Coatings, Adhesives, Sealants, Elastomers (CASE)

Energy

Polymer Modifiers

Agricultural Intermediates

Dyes & Pigments

Personal Care & Nutrition

Cleaning Ingredients

Pharmaceutical Intermediates

**Lab** → **Scale-Up** → **Production**

**Complex Organic Synthesis Development**

**Custom Lab Scale Manufacturing (g to kg)**

**Method Development and Validation**

**Process Hazard/ Reactive Chemical Evaluations**

**Complex Analytical Testing and Quality Control**

**Process Optimization**

**Integrated Process and Project Engineering**

**Multi-Scale Manufacturing (kg to MTs)**

# GMP Manufacturing

- Site GMP qualified 1994-2004
- Supplied leading pharmaceutical companies with intermediates and APIs
- GMP ready again
  - Past GMP compliance is significant strength
  - Strong commitment to quality control and assurance
  - US manufacturing operations for supply chain security
- Evaluated 10 different opportunities over the past 2 years
- Production of a GMP intermediate for a leading major pharmaceutical company has recently been completed



# Manufacturing Operations

Acetoacetylation

**Acetylation**

Acid Base Reactions

Acid Catalysis

**Acid Chlorides**

**Acylation**

Alcoholysis

Aldehydes

**Aldol Condensation**

Alkoxylation

**Alkylation**

Alkylation (Reductive)

Amidation

Amino Acid Derivatives

Amino Alkylation

Asymmetric Synthesis

**Benzoylation**

Benzylation

**Bromination**

Carbonylation

Catalytic Reduction

Chemical Reduction

**Chlorination**

Chlorosulfonation

**Condensation**

Cyclization

Decarboxylation

Dehalogenation

**Dehydration**

Dehydrogenation

Diazotization

Eliminations

Epoxidation

**Esterification**

Etherification

**Extractions**

**Formylation**

**Friedel-Crafts**

Halogenation

Halogen Replacement

**Heterocyclic Chemistry**

Hydrobromination

Hydroformylation

**Hydrolysis**

Hydroxylation

Methylation

N-Alkylation

Nitrosation

**Nucleophilic Substitution**

**O-Alkylation**

Organometallic Reactions

**Oxidation**

**Phase Transfer Reactions**

**Polymerization**

**Quaternization**

Rearrangements

Ring Closure

**Saponification**

**Solvolysis**

**Sulfonation**

**Transesterification**

# Analytical Capabilities

## Chromatography

- Liquid Chromatography (LC)
- Liquid Chromatography Mass Spectrometry (LC-MS)
- Gas Chromatography (GC)
- Gas Chromatography Mass Spectrometry (GC-MS)
- Ion Chromatography (IC)



## Spectroscopy

- NMR Spectrometer
- FT-IR Spectrometers
- UV-VIS Spectrophotometers
- Inductively Coupled Plasma Optical Emission Spectrometers (ICP-OES)
- XRF Spectrometer
- UVF Sulfur Analyzer
- Particle Size Analyzer
- TOC Analyzer
- Thermal Analysis
- Thermogravimetric Analyzer (TGA)
- Differential Scanning Calorimeter (DSC)

## Wet Chemistry

- Volumetric & Coulometric KF Titrators
- Auto titrators

## Sample Preparation

- Microwave Digestion System

## Miscellaneous

- Bomb Calorimeters
- Cloud & Pour Point Analyzers
- Flashpoint Analyzers
- Rancimat
- Viscometers

# Process Hazard Evaluation & Scale-Up

- On-site Process Hazard Analysis & Safety Training on all FFCC processes before startup
- 1-Liter Mettler Reaction Calorimeter (RC-1) used to scale-up from the lab to our plant reactors
  - Evaluates the heat of reaction and mimics process conditions and agitation
  - Mitigates the need for pilot plant
- DSC (Differential Scanning Calorimetry)
- RSST (Reactive Safety Screening Tool)
- Carius Tube System



# Health & Safety Commitment

## Safety Initiatives:

- New Employee Orientation
- Leading Indicator System
- Safety Roundtables
- 3<sup>rd</sup> Party Safety Demonstrations
- Incident Investigations
- Safety Audits
- HAZOP
- PHA
- PSRC

## FutureFuel First Responders, H&S Staff, & Resources:

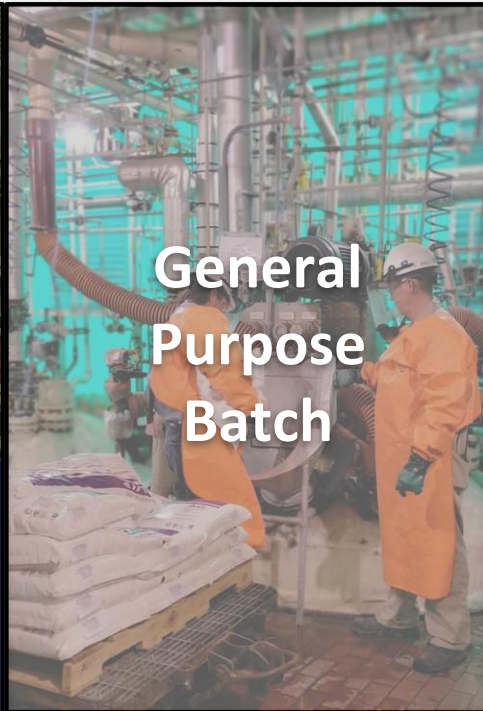
- Emergency Response Crew
- Hazard Material Response Crew
- Fire Fighting Crew
- Paramedics
- Certified Industrial Hygienist
- 2 On-Site Staff Nurses
- Local Contracted Physician
- Firefighting Training Center



# Manufacturing Resources



Development  
Scale



General  
Purpose  
Batch



Dedicated  
Batch



Dedicated  
Continuous

# Batch Plant Equipment

## Reactors

**69** - Multipurpose GL & SS  
(1,000 - 6,000 Gallons)

## Distillation Stills & Dryers

**6** - GL & SS  
(1,000 - 3,000 Gallons)  
**10** - Rotary Cone Vacuum Dryers

## Pollution Abatement

**10** Particulate Waste Scrubbers  
**12** - Caustic Scrubbers  
**2** - Regenerative Thermal Oxidizers  
**2** - Thermal Oxidizers

## Filtration Equipment

**31** - Nutsches  
**11** - Alloy C & SS Centrifuges  
**3** - AutoFilter Dryers

## Distillation Columns

**20** - Hastelloy, SS, & GL  
0.3m (1ft) to 0.6m (2ft) Dia.  
2.7m (9ft) to 4.6m (15ft) Tall

## Miscellaneous

**1** - SS Flaker Systems  
**44** - Weigh Tanks  
**6** - Agitated Mix Tanks  
Numerous Bulk Tanks  
Refrigerated Warehouse

# Continuous Plant Equipment

## Reactors

- 21** - GL & SS Stirred Reactors (500 - 6,500 Gallons)
- 4** - Carbon Steel Fixed Bed Reactors (50 - 60" X 20')

## Dryers

- 4** - Ring Dryers

## Distillation Columns

- 3** - GL
- 23** - SS
- 4** - Hastelloy
- 1** - Titanium
- 1** - Polymer Lined
- 5** - Carbon Steel

## Liquid/Liquid Extractors

- 3** - Alloy 20 (42" X 22')
- 1** - SS (21" X 48')

## Vacuum Flash Tanks

- 6** - SS (96" X 11')
- 1** - GL (3,000 Gallons)

## Evaporators

- 1** - SS Wiped Film Evaporator (125 sq.ft.)
- 1** - Stainless Steel Thin Film Dryer (25 sq.ft.)

## Filtration Equipment

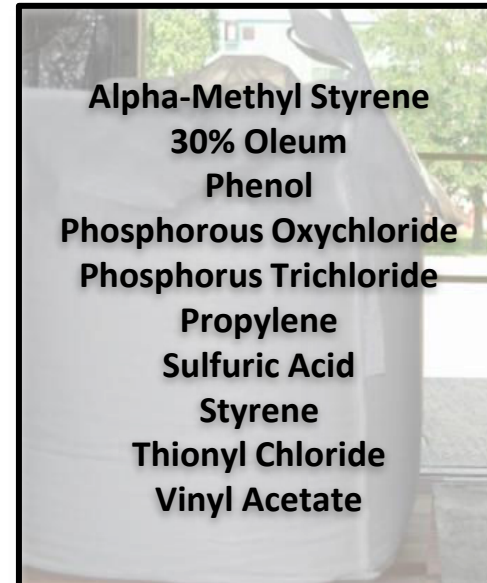
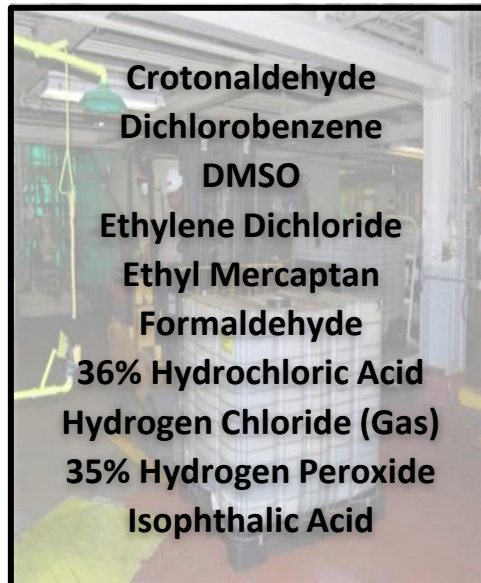
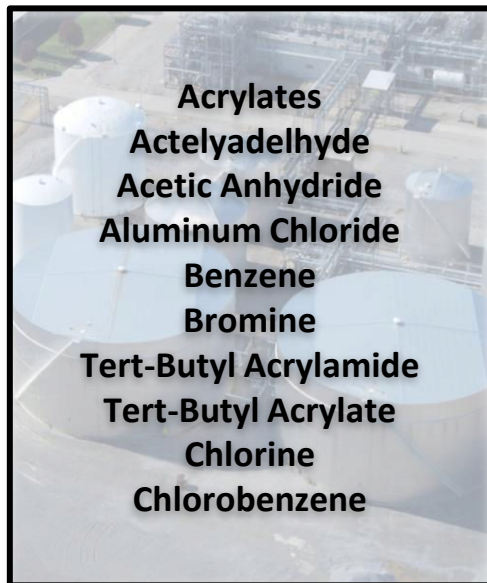
- 3** - Solid Bowl Centrifuges SS (Largest 30" X 120") (0.76m X 3.0m)

## Miscellaneous

- 6** - Chrome Plated Scraped Surface Coolers (11 sq. ft.)
- 2** - SS Rotary Drum Coolers (66" X 30')
- 5** - SS Adiabatic Vacuum Crystallizers (48" X 12')
- 5** - SS Bepex Extruders
- 1** - Melt Extruder

# Raw Material Handling

Our commitment extends to safely and reliably handling hazardous materials



# Bulk Material Handling Capabilities

Typical Monthly Movement



# Environmental Commitment



**2** regenerative thermal oxidizers  
**2** thermal oxidizers



**2,800** VOC points monitored



**On-Site** wastewater treatment

# Environmental Commitment



**On-site** licensed RCRA hazardous waste material incinerator



**99.8%** of generated waste is treated onsite in permitted treatment systems



**132M** lbs of hazardous waste diverted to reuse & recovery in 2025

# Utility Capabilities



**5** boilers generate steam supply  
(30, 60, 90, 150, 600 psig)



**3** cryogenic nitrogen plants



**River Water** provides cooling water and  
fire-fighting capabilities

\*Our site generates its own steam and nitrogen. Some nitrogen, natural gas, coal, electricity, and potable water are purchased via third party.

# Memberships & Certifications



**RESPONSIBLE CARE**<sup>SM</sup>  
Driving Safety & Sustainability



# FutureFuel by the Numbers



**450M+  
lbs**

Products produced annually for the Energy market



**1B+  
lbs**

Products produced for the Cleaning market



**15+  
products**

Intermediates and products produced for the Agriculture market



**40+  
years**

Continuous production of products in Polymer Modifiers & Coatings markets



**2000+**

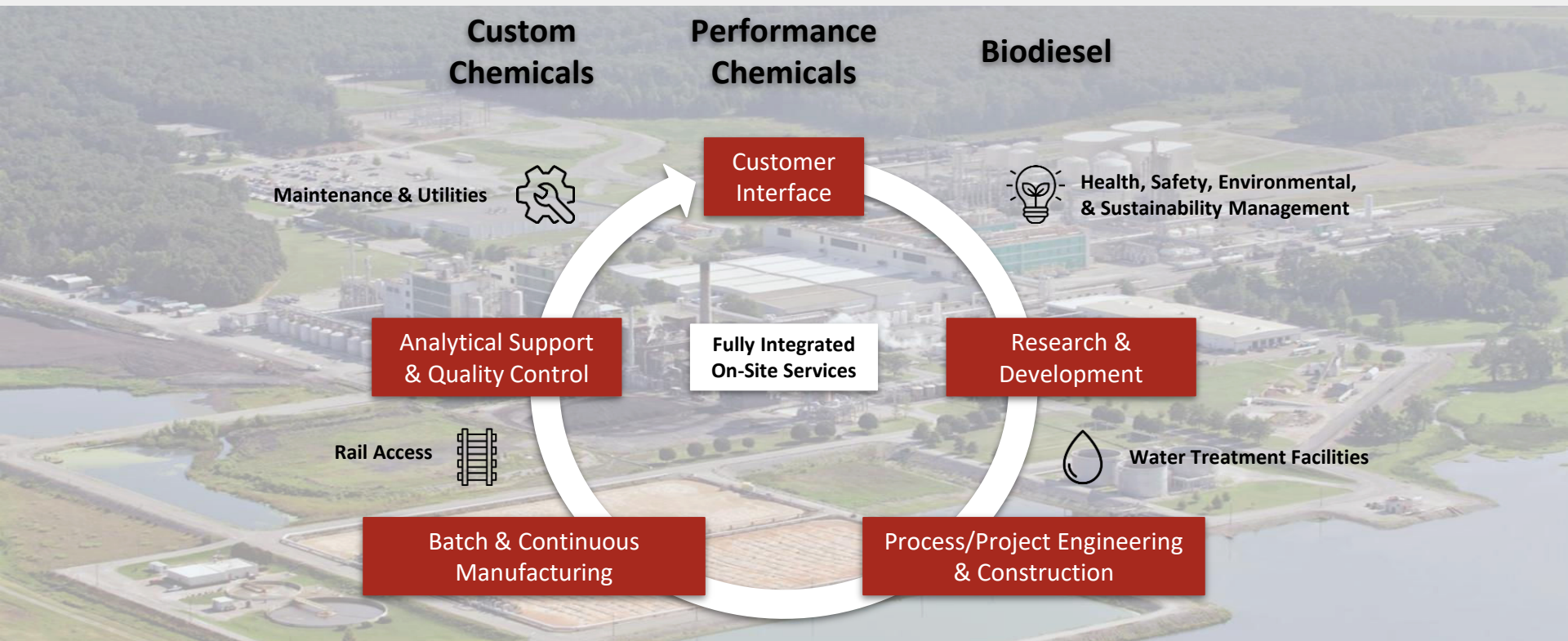
Project evaluations and chemical processes in our portfolio



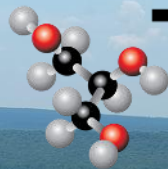
**\$15M+**

Completed capital investments in **2025**

# Why Partner with FutureFuel?



# **FUTUREFUEL<sup>®</sup>**



**CHEMICAL COMPANY**

*Superior chemistry. Sustainable fuels.*



**Visit us at Booth #719**