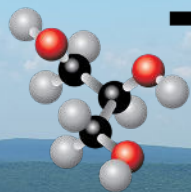


FUTUREFUEL[®]

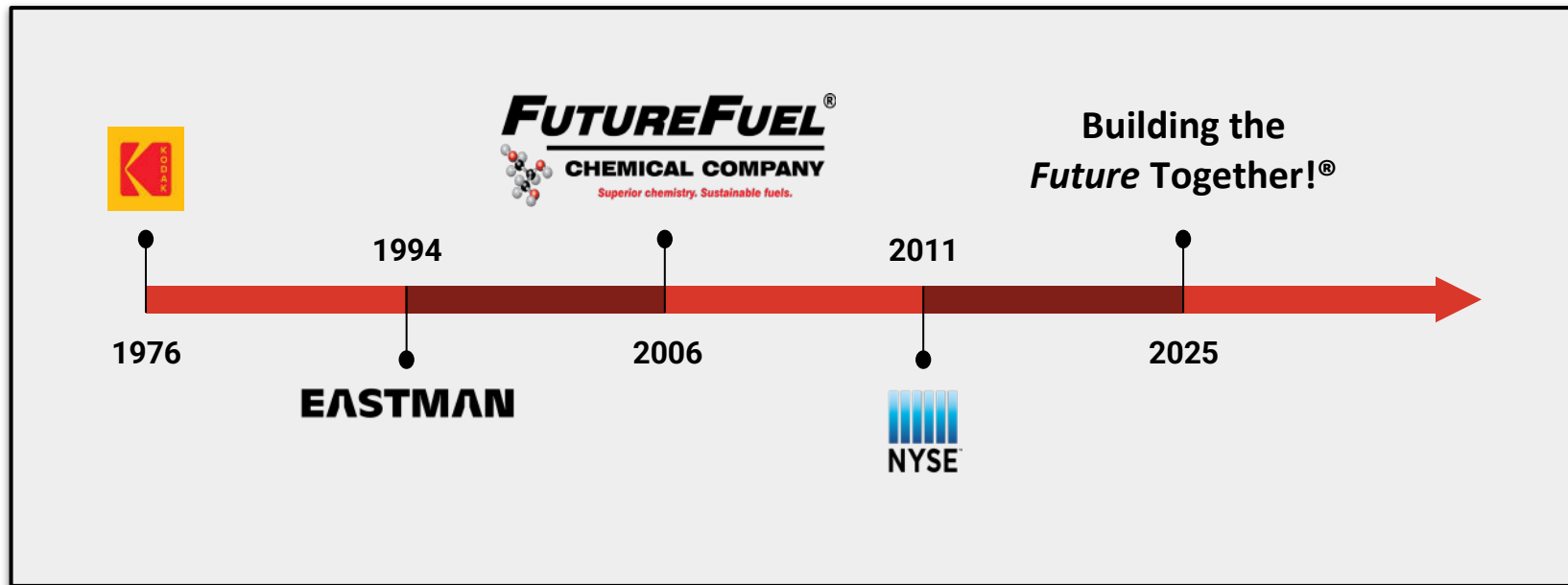


CHEMICAL COMPANY

Superior chemistry. Sustainable fuels.



Our Site History



Company Overview



49 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

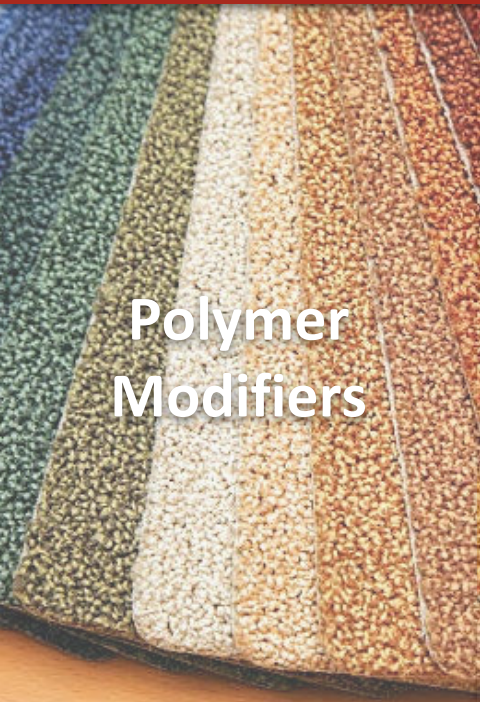
Certifications:

- / 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® & FutureSol®



Polymer
Modifiers



Cleaning
Ingredients



Solvents
Adjuvants



New Product
Development
& Applications

Custom Chemicals

- / 49 years of reliable, custom contract manufacturing
- / Fully integrated facilities and full-service site
- / Flexible, responsive, and committed to excellence
- / History of building long-term partnerships with our customers

Experts in providing:

- / Complex organic synthesis
- / Process & project development
- / Process hazard evaluation
- / Concept to commercialization
- / Customer support





GMP Manufacturing

- / GMP qualified 1994-2004
 - / Supplied leading pharmaceutical companies with intermediates and APIs
- / GMP ready again
 - / Past GMP compliance is significant strength
- / Can support GMP projects for high-value human & veterinary pharmaceuticals
- / Production of a GMP intermediate for leading major pharmaceutical company is currently in progress



Technology Capabilities

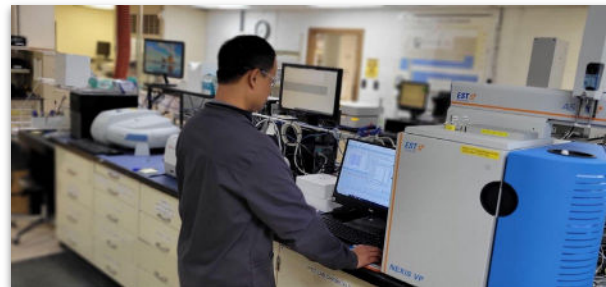
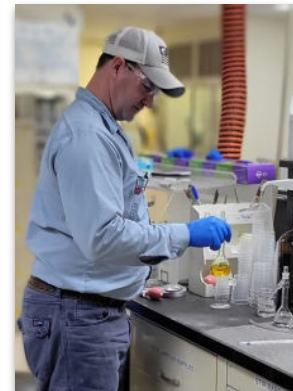
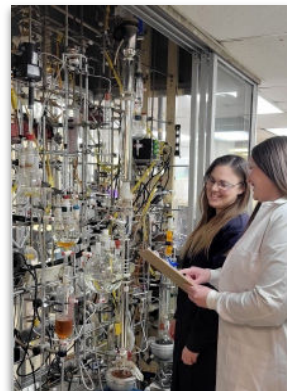
- / Extensive process development & synthesis
- / Comprehensive on-site facilities
- / Fully-equipped Analytical Laboratory

Services:

- / Synthesis development – including multi-step synthesis
- / Method development, validation
- / Product & process safety testing
- / Complex analytical testing
- / Process optimization

Future plans:

- / Kilo lab and pilot plant in planning stages



Synthesis Expertise

Acetoacetylation

Acetylation

Acid Chlorides

Acylation

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

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
- / 3rd Party Safety Demonstrations
- / Incident Investigations
- / Safety Audits
- / HAZOP
- / PHA
- / PSRC



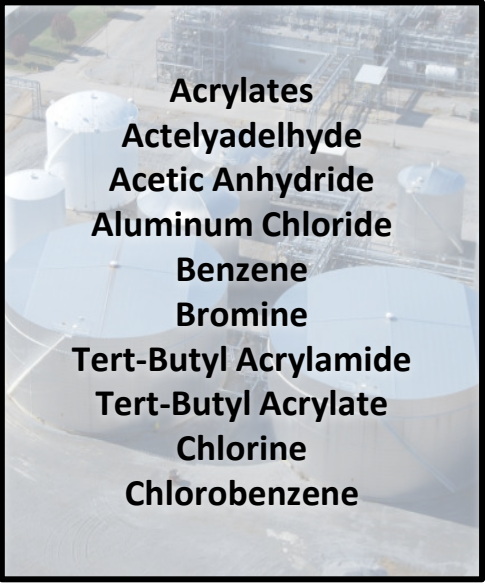
FutureFuel First Responders, H&S Staff, & Resources:

- / 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

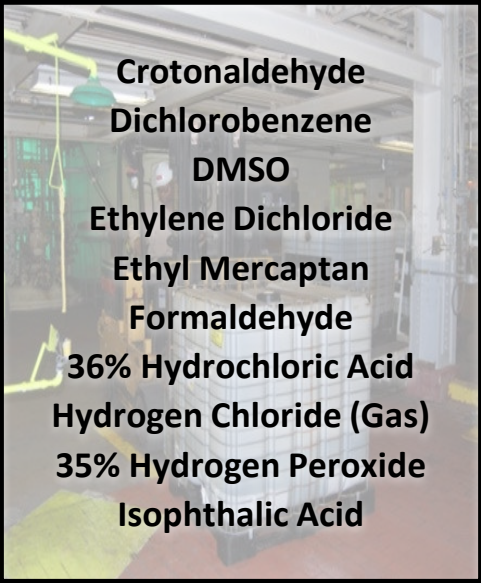


Raw Material Handling

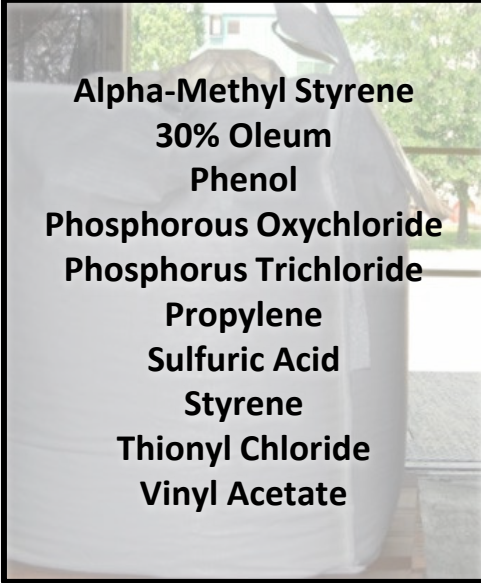
Our commitment extends to safely and reliably handling hazardous materials



Acrylates
Actelyadelhyde
Acetic Anhydride
Aluminum Chloride
Benzene
Bromine
Tert-Butyl Acrylamide
Tert-Butyl Acrylate
Chlorine
Chlorobenzene



Crotonaldehyde
Dichlorobenzene
DMSO
Ethylene Dichloride
Ethyl Mercaptan
Formaldehyde
36% Hydrochloric Acid
Hydrogen Chloride (Gas)
35% Hydrogen Peroxide
Isophthalic Acid



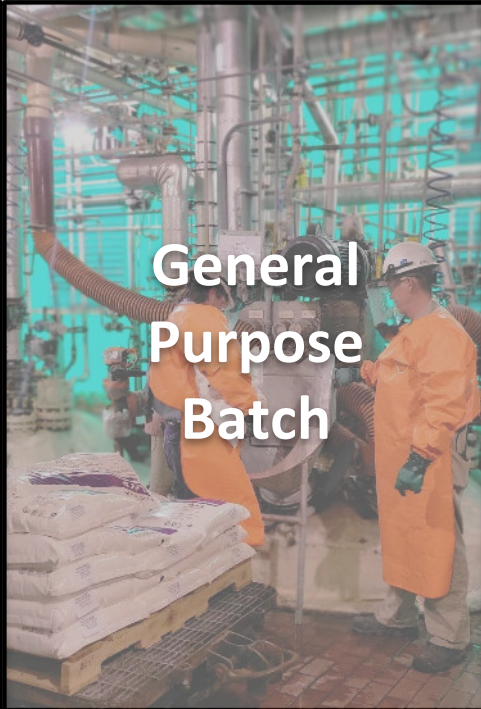
Alpha-Methyl Styrene
30% Oleum
Phenol
Phosphorous Oxychloride
Phosphorus Trichloride
Propylene
Sulfuric Acid
Styrene
Thionyl Chloride
Vinyl Acetate

Bulk Material Handling Capabilities

Typical Monthly Movement



Manufacturing Resources



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

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



99.9% non-hazardous liquid waste treated on-site



331M lbs of hazardous waste diverted to reuse & recovery in 2023



42.5M lbs by-product directed toward reuse in 2023

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



FutureFuel by the Numbers



**525M+
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+

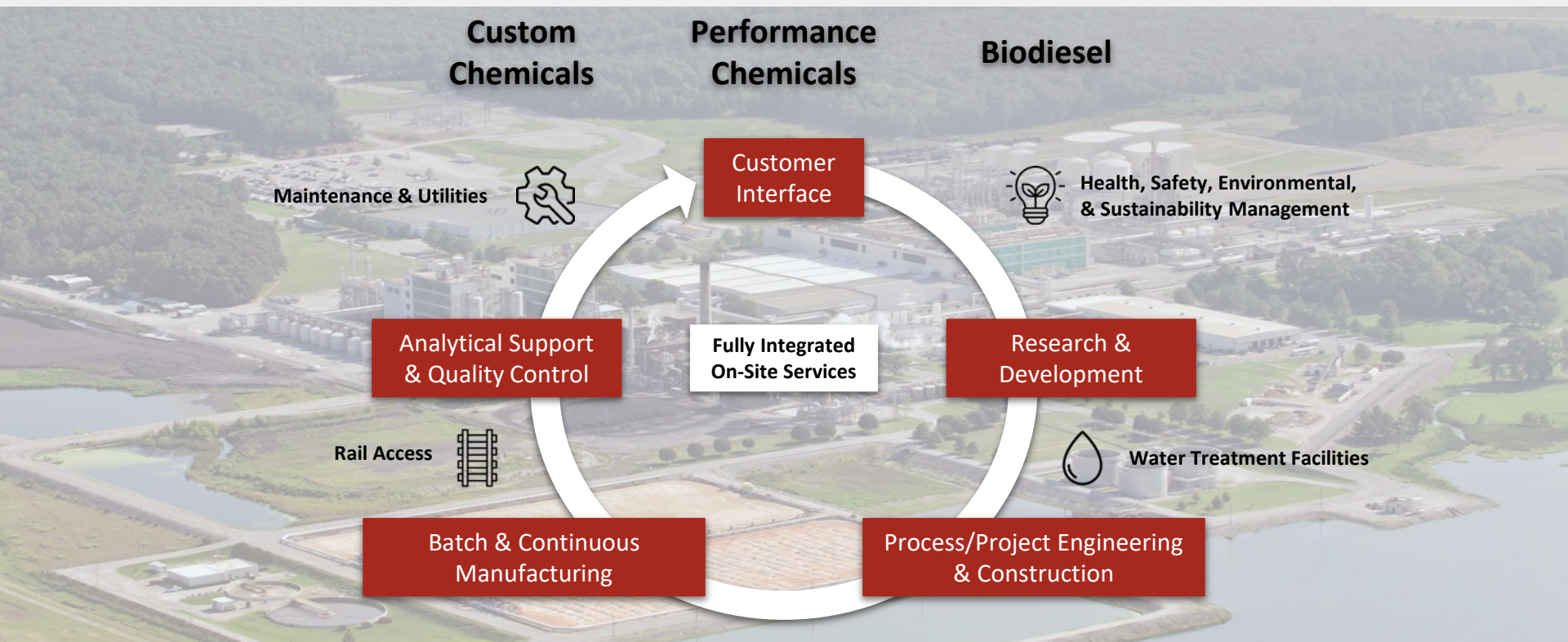
Project
evaluations
and chemical
processes in
our portfolio



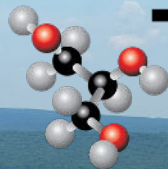
\$15M+

Projected capital
investments with
new construction
for **2024-2025**

Why Partner with FutureFuel?



FUTUREFUEL[®]



CHEMICAL COMPANY

Superior chemistry. Sustainable fuels.

Visit us at Booth #719