

## PROCESS EQUIPMENT



### Horizontal Reactors

- > 130 liter FV, 50 psig, hot oil
- > 1,200 liter FV, steam heated, water cooled
- > 4,200 liter FV, 50 psig, tempered water
- > 7,000 liter FV, 50 psig, steam heated, water cooled
- > 10,000 liter FV, 50 psig, tempered water
- > 15,000 liter FV, tempered water

### 200 Gallons

- > 316L SS, FV, 75 psig internal, tempered glycol

### 2,000 Gallons

- > 316 SS, 50 psig internal, tempered water
- > Pfauder glass-lined, 100 psig internal, tempered water

### 2,500 Gallons

- > 316 SS, steam heated, water cooled internal coils
- > 316 SS, steam heated, water cooled internal coils

### 3,000 Gallons

- > 316 SS, FV, 100 psig internal, tempered water
- > 316 SS, FV, 100 psig internal, tempered water

### 4,000 Gallons

- > 316 SS, FV, 75 psig internal, tempered water
- > 316 SS, FV, 50 psig internal, hot/cold oil

## PROCESS CAPABILITIES

DanChem is the expert at batch organic synthesis and this is complemented with knowledge of key unit operations such as blending, formulation, and crystallization.

### Among others, the key chemical reactions undertaken are:

- > Acetylation
- > Amidation
- > Condensation
- > Esterification
- > Etherification
- > Hydrolysis
- > Methylation
- > Oxidative coupling
- > Phosphation
- > Polymerization
- > Quaternization
- > Sulfonation

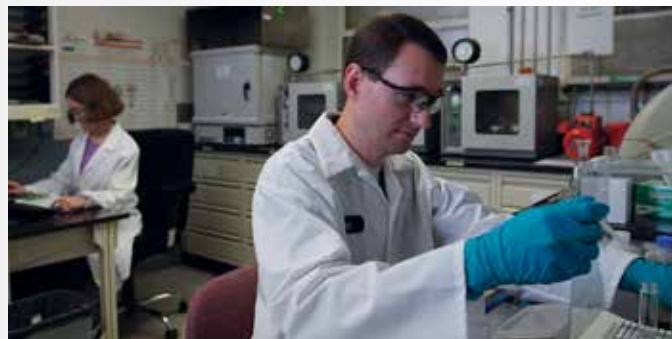


### Key unit operation include:

- > Blending
- > Centrifugation
- > Crystallization
- > Drying
- > Emulsification
- > Encapsulation
- > Filtration
- > Distillation
- > High Viscosity (up to 1,000,000 cP)
- > Mixing
- > Milling
- > Sifting
- > Impregnation
- > Coating

# AUXILIARY EQUIPMENT & PROCESS UTILITIES

- > Centrifuges (36" and 48")
- > Cooling Tower
- > Blend Tanks (5,000-7,000 gallons SS)
- > Filters (Sparklers, FSIs)
- > Compressed Air (100 psig)
- > Bulk Storage for Flammables
- > Steam Boilers (100 psig)
- > Nitrogen (bulk), Oxygen (bulk)
- > Warehousing (50,000 ft<sup>2</sup>, climate-controlled)
- > 3 Wyssmont Dryers
- > Vacuum Systems  
(2-stage oil pump, Stokes mechanical pump)
- > Fulton Hot Oil Furnace
- > Bulk Storage Tanks (3,000-20,000 gallons)
- > Water & Glycol Chillers (80-350 tons)



## LABORATORY & ANALYTICAL EQUIPMENT

- > HPLC (UV or RI Detectors)
- > GC  
(Direct Injection and Headspace, ID and TCD Detection)
- > Atomic Absorption Spectrometer
- > UV/Vis Spectrophotometer
- > FTIR Spectrometer
- > Autotitrators (Colorimetric, Potentiometric, Redox)
- > Karl Fischer  
(Volumetric and Coulometric, Coulometric Headspace)
- > Automated Flashpoint
- > Brookfield Viscometers (LV, RV, HAHB)
- > Muffle Furnace (to 1,000 °C)
- > Vacuum Ovens
- > Moisture Analysis (Microwave & Halogen Lamp)
- > Colorimeters (Solids & Liquids, Various Color Scales)
- > Melt Point
- > Sieve Analysis
- > GPC (UV or RI Detectors)
- > Density (Fluids, Solids, Tapped)
- > pH Meters
- > TGA
- > Ion Chromatography
- > Turbidity
- > Refractive Index