

## PROCESS EQUIPMENT



### Horizontal Reactors

- > 130 liter FV, 150 psig MAWP, hot/cold oil
- > 1,200 liter FV, steam heated, water cooled
- > 4,200 liter FV, 50 psig MAWP, tempered water
- > 7,000 liter FV, 50 psig MAWP, tempered water
- > 10,000 liter FV, 50 psig MAWP, tempered water
- > 15,000 liter FV, tempered water

### Vertical Reactors

#### 200 Gallons

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

#### 2,000 Gallons

- > 316 SS, 50 psig MAWP, tempered water
- > Pfalder glass-lined, 100 psig MAWP, tempered water

#### 2,500 Gallons

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

#### 3,000 Gallons

- > 316L SS, FV, 100 psig MAWP, tempered water

#### 4,000 Gallons

- > 316 SS, FV, 75 psig MAWP, tempered water
- > 316L SS, FV, 50 psig MAWP, hot/cold oil
- > 316L SS, FV, 200 psig MAWP

## 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
- > Phosphation
- > Polymerization
- > Quaternization
- > Sulfonation



### Key Unit Operations 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")
- > Blend Tanks (5,000-7,000 gallons SS)
- > Compressed Air (100 psig)
- > Steam Boilers (100 psig)
- > Bulk Storage Tanks (3,000-20,000 gallons)
- > Water Chillers (80-100 tons)
- > Glycol Chillers (100-300 tons)
- > Air Liquid Self-generating Nitrogen System
- > Packed Distillation Column



## 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