

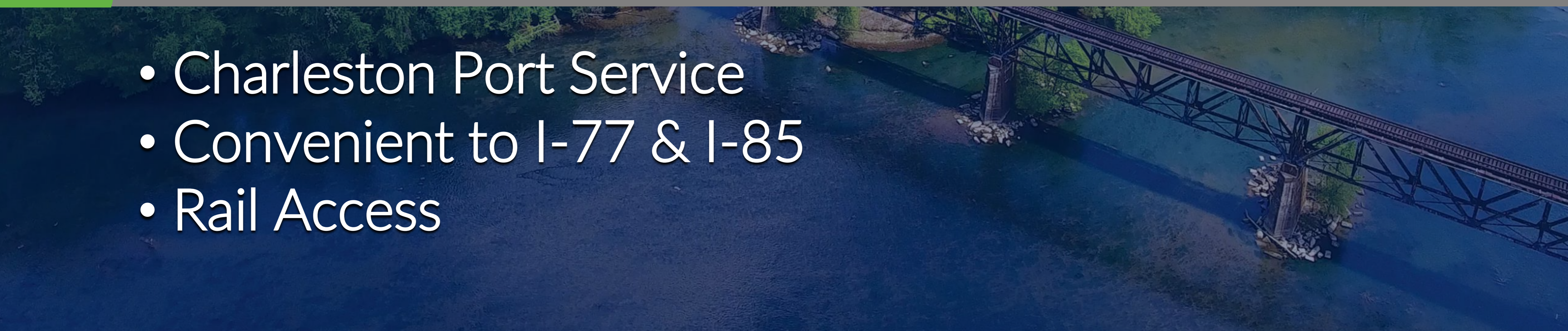




## U.S. Production | Fort Mill, SC

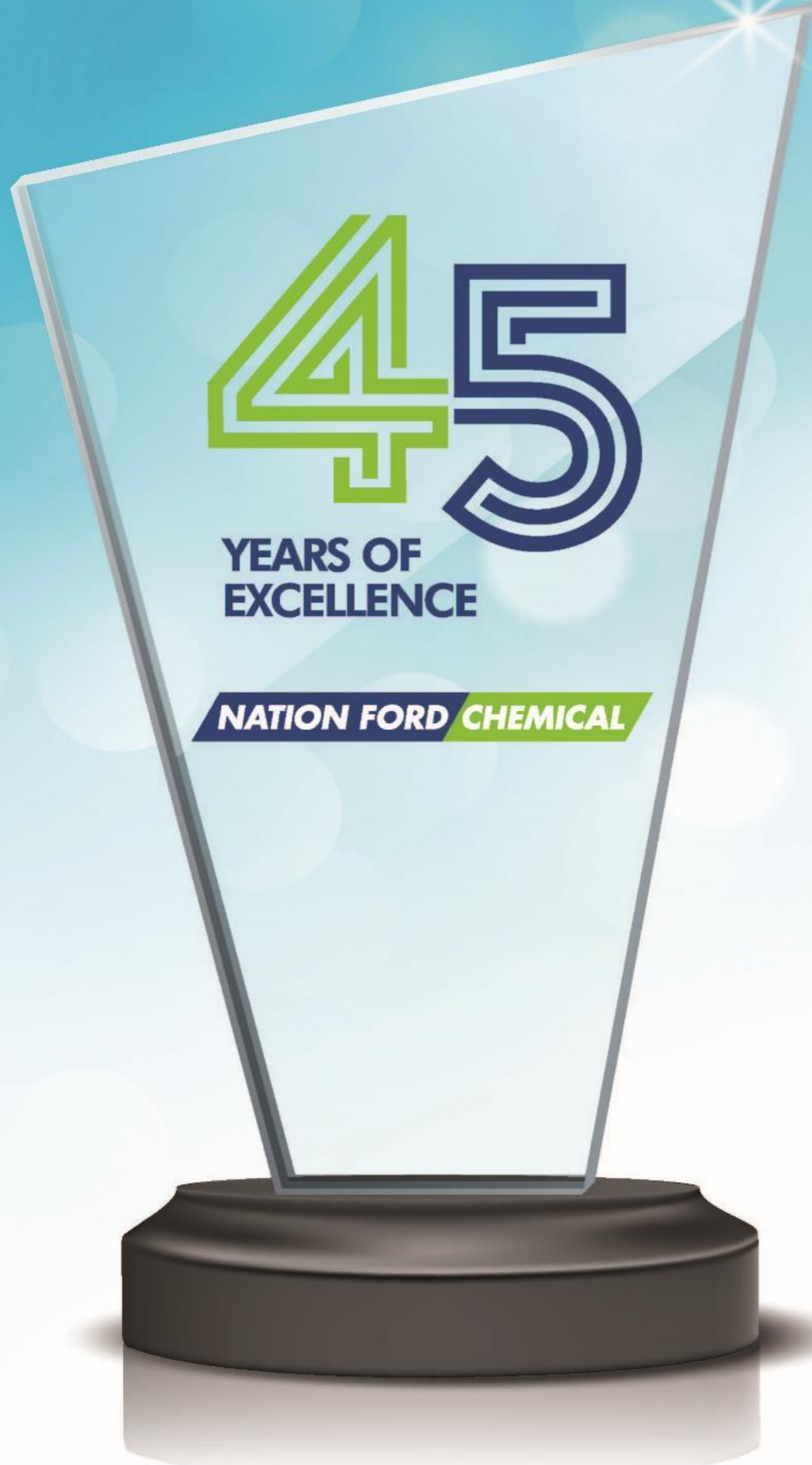
**NATION FORD CHEMICAL**

- Charleston Port Service
- Convenient to I-77 & I-85
- Rail Access





Family Owned Since 1978 • 85 Employees



# ACHIEVED SOCMA'S HIGHEST HONORS





EHS&S

# Stellar Environmental Record





# Health & Safety Day

**Safety** // Improvement Projects

**Health** // Heart Health Screening

**Community** // Blood Drive

**Safety Participation** // Safety Awards Raffle

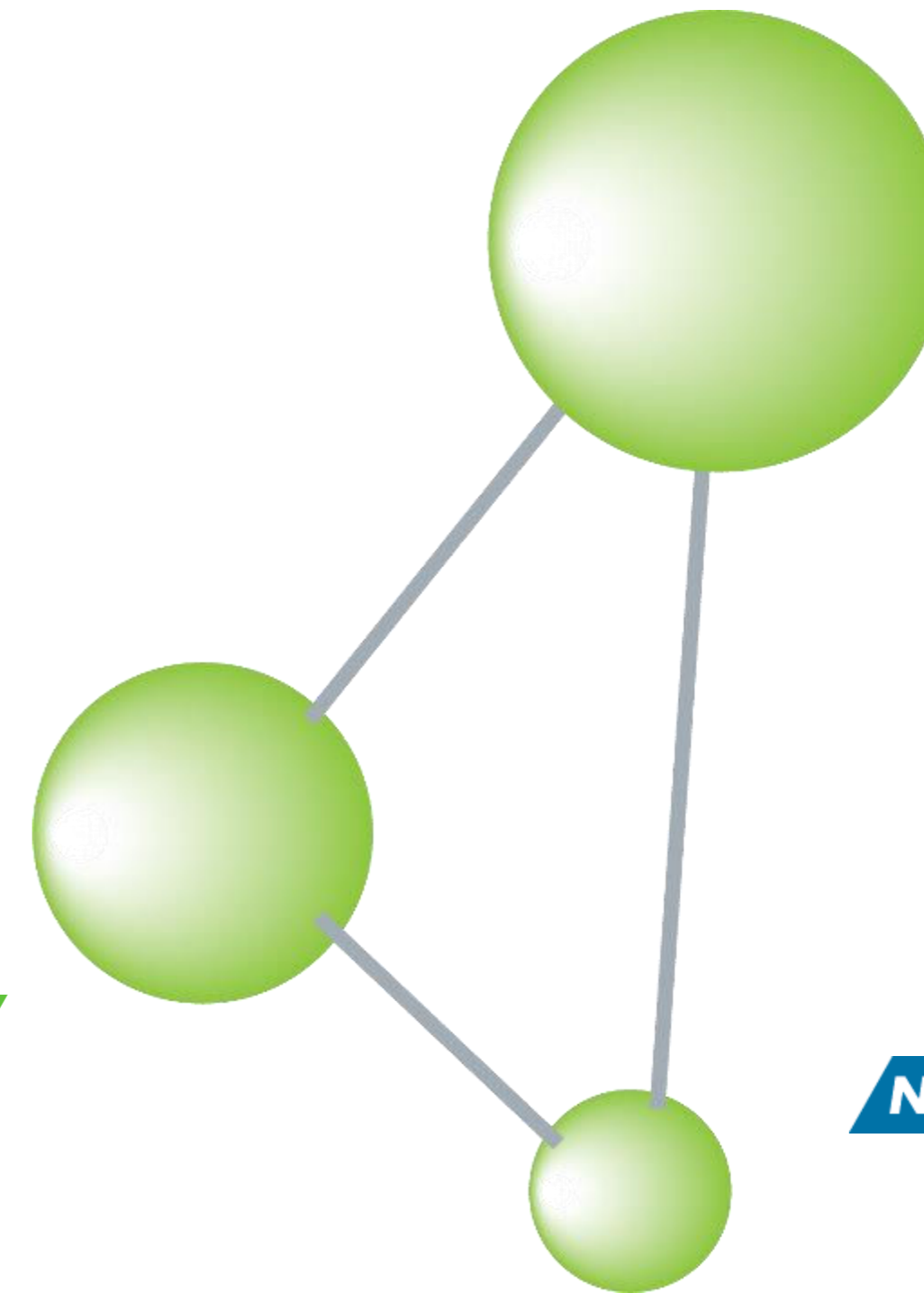
**Employee Commitment** // Years of Service Awards

**Health & Safety Improvements** // Latest Safety Products



# Business Units

**NATION FORD CHEMICAL**  
NFC Products



**NATION FORD CHEMICAL**  
Tolling Services

**NATION FORD IMPORTS**  
Imports &  
Distribution





# PRODUCTS

# PANA – Jet Lubricant Additive



# Smoke Dyes



# Sulfanilic Acid

## **Worldwide**

#1 Producer  
Highest Quality

## **Uses**

Pharmaceutical  
Yellow Food Dyes  
Optical Brightener  
Concrete Additive





# PRODUCTION & PROCESSES

# Custom Chemical Production

- Aniline derivatives
- Organic intermediates
- Solution polymerization
- Solvent dyes
- Bio-degradable polymers
- Ag chems
- Pigments
- Organic oxidations



# Tolling Capabilities

- Scale-up from lab or pilot plant
- Commercialization
- Technology transfer
- Strength in engineering
- Process Improvement
- Computer control



# Plant Processes

- Reaction chemistry
- Batch and continuous distillation
- High temp and deep vacuum
- Hydrogenation
- Filtration
- Flaking
- Drying
- Blending
- Repackaging
- Bulk storage and distribution





# Reaction Experience

- Acetylation
- Alkylation
- Amination
- Chloroacetylation
- Catalytic Reduction
- Condensation
- Diazotization
- Ethylation
- Friedel-Crafts
- Hydrogenation
- Oxidation
- Polymerization
- Nitration
- Ring Closure
- Sulfonation
- Thiophenylation



# Plant Equipment

## REACTORS

(many outfitted with solvent recovery capability)

- (3) 6,000 gallon Hastelloy reactor
- (1) 6,000 gallon Furan reactor
- (7) 2,000 gallon glass-lined reactors
- (1) 750 gallon glass-lined reactor
- (1) 15,000 gallon SS reactor
- (1) 12,000 gallon SS reactor
- (3) 6,000 gallon SS reactors
- (3) 4,000 gallon SS reactors
- (1) 3,000 gallon SS reactor
- (9) 2,000 gallon SS reactors
- (2) 1,500 gallon SS reactors
- (1) 1,350 gallon SS reactor
- (1) 1,000 gallon SS reactor

## DISTILLATION

High temp and high vacuum  
batch and continuous

Many of our reactors are outfitted  
with solvent recovery capability.

## GRINDING / MILLING / BLENDING EQUIPMENT

- (1) 6' x 6' SS ball mill; heated/cooled
- (1) 8' x 10' SS ball mill; heated/cooled
- (1) ACM air classifying mill
- (1) Pin mill
- (3) Fitzmill grinders
- (2) 250 ft<sup>3</sup> SS solids blenders

## FLAKING

- 2' x 30' Sandvik SS Belt Flaker
- 48" x 40" Blaw Knox Flaker
- 24" x 60" Buflovak Flaker  
(with agitator roller or feed pan)

## HYDROGENATION

## ON-SITE BULK STORAGE

## FILTRATION / DRYING

- (4) 7' diameter SS vacuum Nutsche filters
- (1) 48" SS basket centrifuge filter
- (1) 48" Hastelloy basket centrifuge filter
- (6) Sparkler SS pressure leaf filters
- (1) 2' x 7' SS vacuum belt filter
- (1) 308 ft<sup>2</sup> Hastelloy clad DrM filter
- (1) 672 ft<sup>2</sup> Hastelloy DrM filter
- (1) 2' x 12' Witte SS fluidized bed dryer
- (1) 1' x 6' Witte SS fluidized bed dryer
- (1) 40 ft<sup>3</sup> SS double cone vacuum dryer
- (1) 90 ft<sup>3</sup> SS double cone vacuum dryer
- (3) 140 ft<sup>3</sup> SS rotary vacuum dryers
- (1) 130 ft<sup>2</sup> Luwa SS thin film dryer/evaporator
- (1) 43 ft<sup>2</sup> Pfaudler SS wiped film dryer/evaporator
- (1) 26 ft<sup>3</sup> tray dryer

## BIO-BASED CHEMICAL SCALE-UP



# Utilities

- 125 psig/175°C steam
- 650°F/340°C hot oil
- Cooling water
  - River water
  - Chilled water, 8°C
  - Glycol chilled water, -12° C
- Vacuum <10 torr
- On-site wastewater treatment



# Hebei Nation Ford

Office in Shijiazhuang

Purchasing Chinese  
Intermediates for NFC use

Low overhead/  
Competitive prices



# Distribution

- Aniline
  - Drum, Tank Truck, ISO, Rail
- 1-Naphthol
  - 25kg, 500kg bags, molten
  - Technical & Pure Grades

## BOOTH 202

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### HYDROGENATION

### WIPED FILM EVAPORATION

- 12 sq ft, external condenser
- 50 sq ft, short path

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