SOCMA Show

AVN Overview

March 4-6, 2026

West Virginia Regional Technology Park

World Renowned Campus:

- Opened in 1949
- 681 acres
- Over 800,000 SQFT of buildings
- Former Union Carbide Global Technology Center
- Over 30,000 patents and $18B in value creation

Major Facilities Include:

- Research and development laboratories
- Several chemical pilot plants
- Two new community college facilities

AVN

The History of AVN

Research and development corporation formed in 2004:

AVN Corporation acquired MATRIC assets in late 2022

Offices in Charleston and Morgantown, West Virginia

Focused on adding genuine value throughout the intellectual property development, technical services, R&D, technical engineering and commercializing processes

Actively expanding into specialty and custom manufacturing

R&D and Engineering staff of over 100 professionals:

- 15 PhD-level researchers
- Several Professional Engineers
- 25+ average years of experience
- Three Fellows of AIChE
- One member of National Academy of Engineering
- Highly skilled laboratory and pilot plant technicians

The AVN Advantage:
Specialized Capabilities for Chemical Process Development

AVN delivers an integrated and highly specialized portfolio of services to our customers, including:

- Contract Research & Process Development
- Pilot Plant Design and Operation
- Specialty and Custom Chemical Manufacturing

Together, these services enable our clients to rely on AVN as their preferred partner throughout every stage of chemical process development and operation.

AVN R&D & Pilot Facilities

R&D Labs: Building 740:

- Small-scale research labs
- Large floor to ceiling hoods
- Analytical lab

Intermediate Scale Research: Building 770 Annex:

- Two-story hoods
- Large-scale lab equipment and pilot facilities

Piloting and Manufacturing: Building 771:

- High-pressure and reactive chemical cells
- Pilot facilities and small-scale manufacturing
- General utilities (steam, nitrogen, plant air, cooling water, 220/440V electric, process sewer, vapor destruction)

Automation:

- Full automation is available at all scales via Siemens PCS7 Control System
- **AVEVA PI data historian also provides secure, remote real-time data access**

Overview: R&D/Pilot Facilities

Process & Product Development
- Economic-directed research
- Radical process innovation & synthesis
- Process & plant improvement
- Product development & testing
- “Green” chemistry & environmental solutions

Separations Technologies
- Distillation, crystallization, membranes, simulated moving bed, other advanced techniques

Reactor & Catalyst Technologies
- Reaction engineering
- Substrate and formulation design
- Catalyst design, scale-up, testing & modeling

Process Pilot Plants
- Pilot plant construction, scale-up, development & demonstration
- Product manufacture for testing, market development

Stirred Reactors

- Mini-bench scale reactors (<1 liter)
  - Multiple Parr reactors in the 300 to 600 mL range, SS and Hastelloy
- Bench scale (1 – 20 liters)
  - 1-Liter reactors, SS (3)
  - 2-Liter reactor, SS
  - 1-Gallon reactors, SS (3)
  - 2-Gallon reactor, SS
  - 5-Gallon reactor, Hastelloy (2000 psi)
  - 5-Gallon glass-lined reactor
- Pilot scale reactors (20-100 liters)
  - 10-Gallon reactor, Hastelloy
  - 11-Gallon reactor, SS
  - 20-Gallon glass-lined reactor
  - Jacketed stirred glass reactors up to 50 liters
- Demonstration scale reactors (>100 liters)
  - 80-Gallon reactor, SS
  - 200-gallon reactor, SS
  - 360-gallon pressure reactor (900 psi), SS

R&D/Pilot Fixed Bed Reactors

- Bench-Scale Fixed Bed Units (0.001 - 1 L of catalyst charge)
  - Multiple reactors have been set up for small-scale testing in either gas or liquid phase service, typically constructed of piping by a local welding shop. A number of used reactors are available.
- Pilot-Scale Fixed Bed Units (1 – 100 L catalyst charge)
  - MAN Diesel & Turbo DWE® molten salt reactor equipped with six tubes with an operating range up to 550°C. Each tube is approximately 1" in diameter by 17' long. The shell of the reactor is broken into three molten salt zones, each capable of operating at independent temperatures.
  - Other pilot-scale reactors have been fabricated to meet the requirements of specific projects, and this can be done for new projects as needed.
- Demonstration-Scale Fixed Bed Units (100 – 1000 L catalyst charge)
  - 6" diameter x 22' long reactor (150 L) designed for use as an adiabatic reactor, equipped with an electric superheater capable of preheating the feed to 500°C or greater.
  - Other pilot or demonstration sized fixed bed reactors can be fabricated locally based on clients' needs and are normally available within 2-3 weeks.

AVN

Purification Capabilities

Liquid-Liquid Extraction Columns

- 1-inch x 20-inch Scheibel column, glass
- 1.5-inch x 30-inch Scheibel column, glass
- 2-inch x 10 ft Karr column, glass/PTFE/316 SS

Evaporation Equipment

- Lab: 2-inch ID wiped film evaporator, glass, about ½ sq ft
- Pilot: High-Vac wiped film evaporator, 12-inch, 4.2 sq ft, Hastelloy

Separation Capabilities

- Crystallization: multiple glass lab-scale crystallizers from <1 liter to 50 liters, batch cooling/evaporative and continuous crystallization; also 1-inch and 2-inch falling-film crystallizers
- Distillation: Dozens of distillation columns from 1-inch to 6-inch, glass Oldershaw, some packed; SS pressure reactive distillation columns
- Membranes: 2.5 x 40-inch commercial membrane modules, RO, nanofiltration, ultrafiltration, microfiltration; ceramic membranes
- Solid-liquid separations: lab pressure filters, basket centrifuges from 6-inch to 14-inch, pilot-scale decanting centrifuge, pilot-scale Nutsche filter

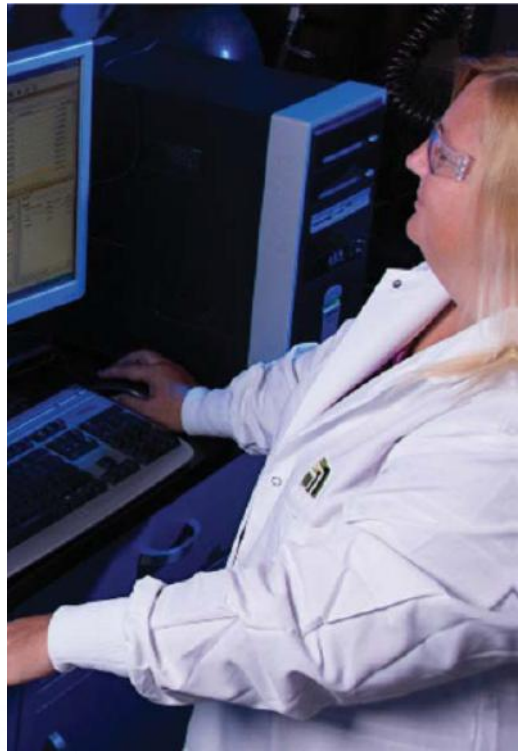
Analytical Services:

Internal Analytical Capabilities

- GC, including TC and FID
- GC/MS
- HPLC
- Ion Chromatography
- ICP-OES
- FTIR, including DRIFTS capability
- UV/Vis
- TGA
- DSC
- Autotitrators
- Viscosity
- Karl-Fischer
- Particle Size Analysis (Malvern)
- XRD

Facile-Access External Capabilities

- NMR
- XRF
- SEM-EDS
- TEM
- XPS



Custom Scientific Glassblowing Division

"Decades of Craftsmanship, Precision-Engineered Performance—Expertly Crafted, Custom-Built Scientific Glassware Delivered Fast."

Meet Mike Hale, a veteran glass blower who learned the craft from his father and brings more than three decades of hands-on expertise to every piece he creates

AVN

Technical Engineering Capabilities

Process Package Development

- Techno-economic Analysis & Feasibility Studies
- Technology Licensing and M&A Support
- Front-End Loading, FEL 1–2

Process Optimization, Process Improvements and Operational Excellence

- Problem Solving techniques: SPC/SQC, Experimental Design, Kepner-Tregoe and Six Sigma
- Process commissioning & start-up support
- Process control & automation
- Process and plant improvement

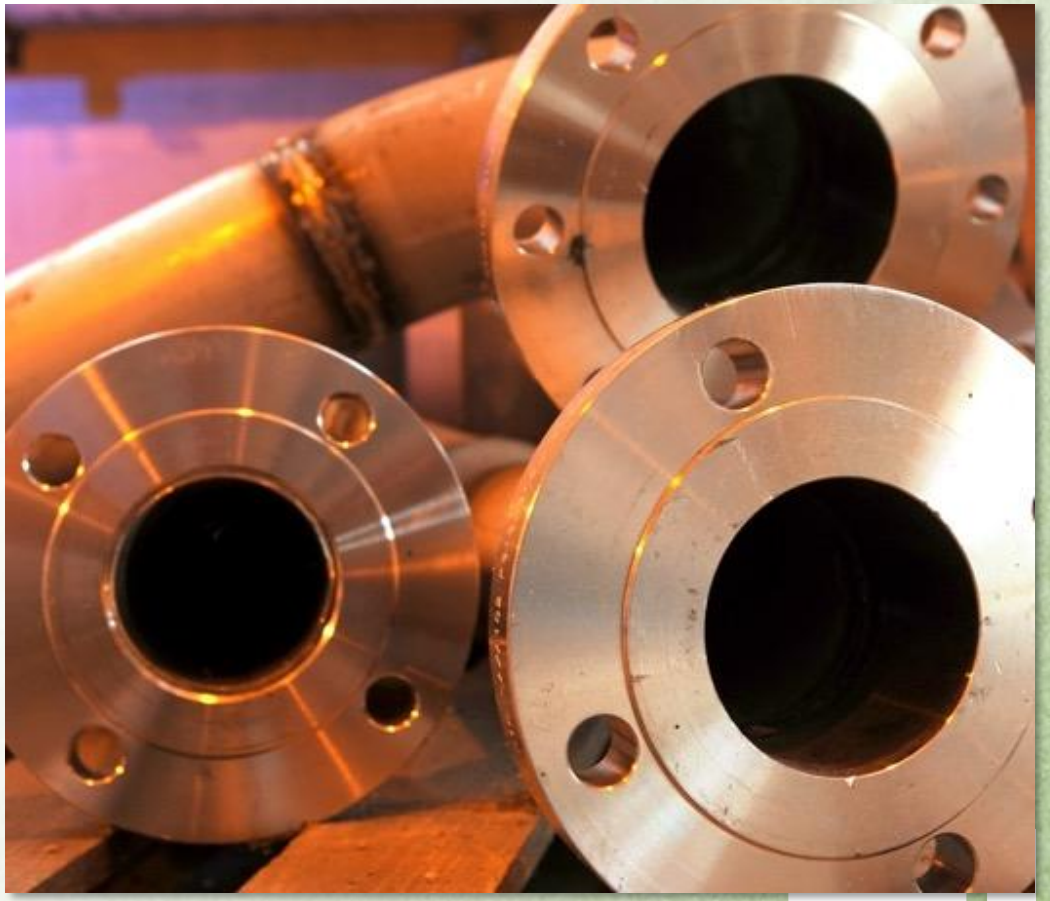
Manufacturing

Specialty & Custom Manufacturing:

- Growing a base for custom manufacturing in South Charleston, WV
  - Continuous or batch processes

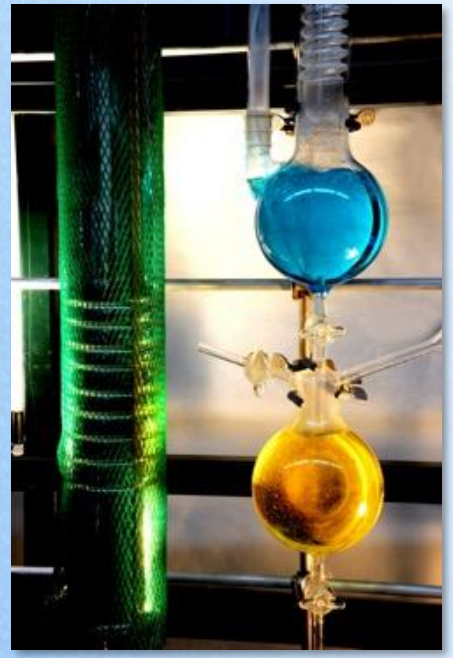
- Facilities:
  - Continuous and batch processing equipment available and configurable
    - Batch up to 360-gallon reactors and 900 psig
    - (3) 1000-gallon glass-lined reactors
    - (1) 2000-gallon glass-lined reactor
  - Process automation
  - Emission-control and destruction systems
  - Industrial wastewater treatment
  - Facility siting for challenging chemistries and operating conditions

Open to exploring strategic relationships for long-term manufacturing



Summary

AVN is a rapidly expanding organization focused on market-driven results working for a variety of global customers in R&D, engineering, and manufacturing.



- Experienced management team and **world-class research staff**
- Fully **customizable** lab and pilot facilities with significant equipment available
- State-of-the-art engineering tools and processes.
- Specialty & custom chemical manufacturing capabilities
- Unique approach to intellectual property ownership

AVN

CONTACT US

VISIT US AT BOOTH # 606

Ron Smith, Ph.D.
Business Development Manager
Office: (304) 720-1030 Ext. 8130
Mobile: (304) 761-8899
Ron.Smith@AVNcorp.com

Jack Dever, Ph.D
Chief Technology Officer
Office: (304) 720-8617
Mobile: (504) 463-4372
Jack.Dever@AVNcorp.com

AVN

www.AVNcorp.com