

STAFF

John Wing - Brief Bio

President of the consulting firm John Wing, PE, LLC - has a Bachelor of Chemical Engineering with Honors from University of Florida and a Master of Engineering in Administration from Univ. of South Florida. His decades of service to the phosphate industry have involved consulting, process design, project management, technical service, process development, & production supervision. He was Sr. VP of HiTech Solutions and was previously employed by other engineering and phosphate production companies. He has engineered or managed projects for nearly all of the phosphate chemical plants in the United States and several in Saudi Arabia, Jordan, India, Australia, Africa, and South America.

John does process engineering for new plants, modifications and expansions for phosphoric acid, DAP, MAP, & TSP plants. He did process and conceptual design for six phosphoric acid evaporators, scores of fume scrubbers, and five fluosilicic acid recovery systems.

He helped pioneer the energy-efficient Hemi process by doing process design for the Belledune and Arcadian Hemi conversion, the multi-train Ma'aden plant in Saudi Arabia, and for converting huge Oswal dihydrate plant in India to Hemi-Di (a project that stalled before completion). John was owner's engineer for Indo-Jordan Chemical Co.'s Hemi plant and now provides technical services and engineering for modifications of the plant.

Technical presentation topics have included many papers regarding phosphoric acid DAP, and the phosphate industry in general, and he has been featured in four articles in *Fertilizer International* journal. John is a Fellow of AIChE, a registered Professional Engineer, and past Chairman, Vice Chair, & Secretary of the Central Florida AIChE Section.

Others

- **Arthur Burt:** Expert on phos acid filters. Was international tech rep. for Bird Filters (now Andritz). Invented the EX/LV central valve, which became standard in new filters, and has been retrofitted on all of Mosaic's Bird filters.
- **G M (Jim) Hebbard:** Chemical Engineer who provided decades of phosphoric acid and phosphate fertilizer technical service and engineering.
- **James Pardee:** Mechanical Engineer who provided decades of engineering design work for phosphate mining & fertilizer plants.

JOHN WING, P.E.

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SUMMARY: Chemical Engineer (BChE & M.Engr.) Phosphoric Acid (Di & Hemi); DAP; Gypsum Consulting, process design, project mgt., operations, R&D, economic evaluations, presentations. Implemented the advanced Hemi process in several phosphoric acid plants since 1986.

EDUCATION: Bachelor of Chemical Engineering (Honors), Univ. of Florida
Master of Engineering, Administration, Univ. of South Florida

ORGANIZATIONS: FELLOW of AIChE (American Inst. Chemical Engineers), Section Chair, Vice-Chair, & Sec'y
AIChE Engineer of the Year, 2012 MENSA

LICENSED PROFESSIONAL ENGINEER: Florida #22832

TECHNICAL PRESENTATIONS:

Hemi Phosphoric Acid Process: Phosphates 2016 & AIChE Clearwater Conf. (7 presentations)
Phos Acid Evap's, Gypsum, & Water Systems: AIChE Clearwater Convention (4 presentations)
DAP Innovations: Phosphates 2015 (Tampa) & Arab Fertilizer Association, 2011
Gypsum, FSA, Uranium, & Rare Earths: Phosphates 2013 & AIChE Clearwater 2012 & 2016
Altruism in Engineering: AIChE National & Clearwater Conventions
Featured in 6 articles in *Fertilizer International* journal

EXPERIENCE

JOHN WING, PE, LLC: Lakeland FL, USA President & Phosphate Consultant [2007 to Present]

Several Clients on 4 Continents (some not named due to confidential nature) 2007 to present
Technical consulting regarding:

New or Expanded Phosphoric Acid or DAP Plants - 7 clients
Consulting to improve several existing Phosphoric Acid Plants
Fluosilicic Acid Recovery from phos acid evaporators - advanced scrubbers & separators
Rock Grinding, SSP, Fume Scrubbing in DAP/NPK plants, etc.

Indo-Jordan Chemical Co., Eshidiya, Jordan 2007 to 2008

Headed 2-consultant team for major increase in capacity of a hemi phosphoric acid plant & related rock, FSA, and gypsum facilities.

Ma'aden Phosphate Co., Ras Al Khair, Saudi Arabia 2012 to present

Consulting for 3 large hemi phosphoric acid plants.

Paradeep Phosphates, Ltd., Paradeep, India 2010 to present

Phosphoric acid plant modifications to improve recovery & capacity
Fluosilicic acid recovery from evaporation; PA fume collection & scrubbing improvements

Aleff Group, London 2011 to Present

Process consulting for phos acid, granulation, & phosphogypsum utilization
Plant sites in Central Asia, Middle East, etc.

HITECH SOLUTIONS, INC.: Lakeland, Florida, USA [1986 to 2007]

Senior Vice President: Responsible for all process design by the company, including:

- Phase 1 Basic Engineering for 3 large Hemi Phosphoric Acid plants for Ma'aden, Saudi Arabia
- Conversion of Arcadian phos acid plant from Dihydrate to Hemi process - achieved record recovery.

- Expansion & modernization of several DAP & MAP plants, involving Vaporizer-Scrubbers, Dual-Mole Reactor/Granulator Scrubbing, Pre-neutralizers, Granulators, Dryers, & Screening.
- Basic Engineering to convert a 2650 t/d phosphoric acid plant to advanced Hemi-Di process
- Consulted as owner=s engineer for new Hemi phosphoric acid plant - Indo-Jordan Chemicals Co.
- New granular phosphate plant with advanced recycle control for Pequiven in Venezuela
- Numerous projects for Fume Scrubbers, Fluosilicic Acid recovery, Gypsum Handling (wet & dry), Water Treatment, and processing of various liquid and solid materials
- Promoted Hydro/Yara Hemi process with many presentations, feasibility studies, & process designs.

BEARDEN-POTTER CORP.: Lakeland, Florida

Senior Process Engineer: Process design:

- Conversion of a phosphoric acid plant from Dihydrate to Hemi process at Belledune, Canada
- New phosphoric acid Reactors and Filters in several plants
- Detailed Study to develop Uganda's Sukulu Hills phosphate deposit. Basic engineering for Beneficiation, Rock Grinding, & SSP/PAPR fertilizer plant.
- Modification of GSFC phos acid plant to achieve 60% more capacity with existing reactor & filters – Awarded India "Phosphate Plant of the Year"
- 3 new phosphoric acid evaporators of our own design & 2 modified phosphoric acid evaporators
- Installation of new Evaporators at 4 plants
- Expansion & modernization of several DAP fertilizer plants
- Fluosilicic Acid (FSA) recovery system on several phosphoric acid evaporators
- Large 2-train NPK fertilizer plant; project manager for detail design of fume scrubbing system
- Sulfuric acid evaporation facility for a parchment plant
- Steamsavings studies and implementation at two phosphate chemical plants

CONSERV CHEMICALS: Nichols, Florida

Senior Process Engineer for reactivation & modernization of a phosphate fertilizer complex

USS AGRI-CHEMICALS: Bartow, Florida

Manager, Process Development Station with a staff of 17 engineers & technicians

Environmental Engineer

Managed all Environmental Protection at 2 phosphate chemical complexes & phosphate mine

CONTINENTAL OIL CO. & AGRICO DIVISION: South Pierce, Fla. & Ponca City, OK

Asst. Phosphoric Acid Superintendent, South Pierce:

Set capacity records. Reduced overall P_2O_5 loss from 20% to 11%.

Converted Gypsum storage method from a settling pond into an enclosed stack.

Process Engineering Coordinator: Responsible for all process improvements at phosphate plant

Sr. Process Engineer in Oklahoma: Process design of petrochemical plants.

AMERICAN CYANAMID: Brewster, Florida

Chemical Development Engineer:

Developed improvements in phos acid & DAP plants.

Designed, erected, & operated 4 pilot plants for new processes & innovations.

HERCULES, INC.: Brunswick, Georgia

Process Engineer at plant extracting rosin, resins, and oils from pine stumps.

Trouble-shooting, process improvement & development. Automated rosin leaching process.