

David Engel, Ph.D.

Entrepreneur | Investor | Scientist | Expert Witness | Technical Specialist

E david.engel@seleniumm.com

T +1 (832) 296 6624

Summary

David has over 25 years of industrial experience in a variety of areas ranging from chemical synthesis, pharmaceutical chemistry, sensors, light to energy conversion, membranes, nanotechnology, security technology, analytical methods, chemical additives, combinatorial chemistry and process separation technologies.

David is the co-inventor in 21 United States Invention Patents on various subjects relating to technology development. David has completed a

number of technical projects, plant troubleshooting visits and business development initiatives for Eastman Kodak, Porous Media, Pentair, General Electric and Sulphur Experts in the Latin America, Europe, Middle East, US and Canada regions. He has authored several 50+ papers and presented at 50+ conferences on a variety of technical subjects. Recently David has focused on enhancing process efficiency, plant profitability, equipment reliability and sustainability.

David has a unique combination of technical and analytic skills for troubleshooting. He has distinctive capabilities and expertise at the interface of process engineering and chemistry. This enables David to perform accurate root-cause analysis and develop sound practical solutions.

Currently, David is appointment as Managing Director at Nexo Solutions and Senior Partner at Seleniumm Holdings. David is a member of the Advisory Board the American Filtration & Separations (AFS) Society Southwest Region Chapter, and member of the Gas Processors Association, Section M.



Publications

1. **Testing And Effects Of Pipeline Chemicals On Gas Processing Facilities**
PTQ Gas 2024
2. **New Inlet Feed Gas Conditioning Technology for Contaminant Removal in Amine Units**
Gas Processing 2023
3. **Fouling in Gas Processing Facilities: Testing, Root-Cause Analysis and Mitigation - Part 1**
Gas Processing 2022
4. **Fouling in Gas Processing Facilities: Testing, Root-Cause Analysis and Mitigation - Part 2**
Gas Processing 2022
5. **Technical and economic pathways for sustainable hydrogen production**
H2Tech Magazine 2021
6. **Solids Fouling Mitigation in Process Units via Advanced Analysis**
Gas Processing 2021
7. **Technical and economic impacts of piperazine content in MDEA Solvents**
Gas Processing 2021
8. **Startup Troubleshooting of Amine Units in LNG Production Facilities**
Gas Processing 2020
9. **Finding the Solution**
Hydrocarbon Engineering Magazine 2020
10. **The Science of Separation**
LNG Industry 2020
11. **Contamination in Gas Compression: Causes, Effects, and Solutions**
PTQ Gas 2020
12. **Look Beneath the Surface**
World Pipelines Magazine 2020
13. **Manage contaminants in LNG feed gas and cryogenic processing - Part 1**
Gas Processing Magazine 2020
14. **Manage contaminants in LNG feed gas and cryogenic processing - Part 2**
Gas Processing Magazine 2020
15. **Cost-Effective, Modular Technologies for Butane, Propane and NGL Treating**
Gas Processing Magazine 2020
16. **Identifying and Managing Contaminants in LNG Feed**
Gas Compression Magazine 2020
17. **Feed Gas Conditioning to LNG Processing Plants**
LNG Magazine 2019
18. **LNG Troubleshooting**
Hydrocarbon Engineering Magazine 2019
19. **Manage Contaminants in LNG Feed and Cryogenic Processing - Part 2**
Gas Processing Magazine 2019
20. **Manage Contaminants in LNG Feed and Cryogenic Processing - Part 1**
Gas Processing Magazine 2019
21. **Case studies of troubleshooting amine treating foaming - Part 2**
Gas Processing Magazine 2019
22. **Case studies of troubleshooting amine treating foaming - Part 1**
Gas Processing Magazine 2019
23. **War Stories from Foaming Front**
PTQ Magazine Gas 2019
24. **Analysis of semi-solid “shoe polish” material in a refinery TGTU**
Gas Processing Magazine 2019
25. **Managing Process Contaminants in Amine Units**
Nexo Solutions Publication Version 1.2 2018
26. **Feed Conditioning Technologies for Gas Processing Plants**
PTQ Magazine 2018

Publications

27. **Manage contaminants in amine units Part 2: Rich amine filtration, inlet separation & amine foaming**
Hydrocarbon Processing Magazine 2018
28. **Managing process contaminants in amine units Part 1: Lean amine filtration**
Hydrocarbon Processing Magazine 2018
29. **Surfactant-stabilized emulsions in amine units for LPG treating**
PTQ Magazine 2018
30. **Surfactant Contaminants in Feed Gas Streams to Amine Units—The Phantom Foaming Agent**
Gas Processing Magazine 2018
31. **Novel H₂S Removal Technology Proved in Gas Treating Field Tests**
Oil and Gas Journal 2017
32. **Strategies for Minimizing Hydrocarbon Contamination in Amine Acid Gas for Reinjection**
Carbon Dioxide Capture and Acid Gas Injection, Chapter 9 Wiley 2017
33. **Manage Activated Carbon Effects on MDEA Solution Foaming**
Gas Processing Magazine 2016
34. **Remove mercaptans from hydrocarbon condensates and NGL streams**
Gas Processing News Magazine 2016
35. **Improve LPG treating via advanced amine-solvent recovery technologies**
Hydrocarbon Processing 2015
36. **Solid Sludge (Shoe Polish) Evaluation in Refinery Amine & Tail Gas Treating Units**
Filtration News 2015
37. **Activated carbon impact on MDEA amine solutions**
Filtration + Separation 2015
38. **Filtration and Separation: Avoid Common Errors**
Chemical Engineering Magazine 2015
39. **The Seven Deadly Sins of Filtration and Separation Systems**
Gas Processing News 2015
40. **Controle de Contaminação em Unidades de Amina e TGT (Tail Gas Treating)**
Revista Meio Filtrante 2014
41. **Examine Inlet Separation Technologies for Increased Reliability**
Gas Processing News 2014
42. **Natural Gas Contaminants in Compressor Feeds**
Compressor Tech2 2014
43. **Choose Optimal Feed Conditioning Strategies for Gas Processing**
Gas Processing Magazine 2014
44. **Hydrocarbon Contamination in Amine Acid Gas**
Sulphur Journal 2014
45. **Seven Deadly Sins of Filtration and Separation Systems in Gas Processing Operations**
Gas Injection for Disposal and Enhanced Recovery Chapter 12, Wiley 2014
46. **Reducing Hydrocarbons and Solids Contamination in Sour Water Strippers**
Hydrocarbon Processing Magazine 2013
47. **Filtration and Separation in Sulfur Recovery**
Chemical Engineering Magazine 2013
48. **Fouling Solutions - is Suspended Solids Filtration the Right Answer?**
Filtration News 2013
49. **Process Industries: Mitigating the Fouling Menace**
Filtration + Separation Magazine 2013
50. **Strategies for Minimizing Hydrocarbon Contamination in Amine Acid Gas**
Sulphur Journal 2013

Publications (continuation)

51. **Troubleshooting Contamination in Gas Compression**
Compressor Tech 2 2013
52. **Reducing Hydrocarbons in Sour Water Stripper Acid Gas**
Sulphur Journal 2012
53. **Amine Unit Contamination Overview**
American Filtration and Separation Society Web Article 2012
54. **Carbon Capture Using Amine-Based Technology**
Carbon Dioxide Sequestration and Related Technologies, Chapter 9 Wiley 2011
55. **A Four Component Coupling Strategy for the Synthesis of d-Phenylglycinamide-derived Noncovalent Factor Xa Inhibitors**
Bioorganic & Med Chem Letters 2003, 13(14), 2255-2259
56. **Incorporation of n-Alkanols in Reverse Micelles in the AOT/n-Heptane/Water System**
Langmuir 1992, 8, 452
57. **Synthesis of the Highly 1D Conductor (THTTF)₄I₁₉**
Synthetic Metals 2003, 133-134, 381

Conferences

- 1. Produced Shale Water Fouling of Process Units**
Shale Water Management USA 2023
- 2. Challenges in Refinery Biofuels Coprocessing: Root-Cause Analysis and Mitigation of LPG Emulsions in Amine Units and Caustic Units**
IRPC Houston 2023
- 3. Testing and Effects of Pipeline Chemicals on Gas Processing Facilities**
GPA Midstream Association Convention 2023
- 4. Fouling In Gas Processing Facilities: Testing, Root-Cause Analysis & Mitigation**
GPA Midstream Association Convention 2022
- 5. Contamination Control Strategies in Natural Gas Liquids Processing**
Liquid Rich Basin Conference 2021
- 6. Transforming Refinery Gas Treating to a Digitalized and Sustainable Process**
IPRC 2021
- 7. Blue Hydrogen Amine Optimization**
H2Tech Solutions Symposium 2021
- 8. Small-Scale Butane, Propane and NGL Desulfurization Technologies**
Gas Pro 2020
- 9. Hydroprocessing Catalyst Bed Protection Using Feed Generated Contaminant Testing**
International Refining and Petrochemicals Eurasia 2020
- 10. Energy Minimization in Gas Processing**
GPA Midstream Association Convention 2020
- 11. Understanding and Improving the Operation of an Amine System**
SynGas Conference 2020
- 12. Startup Troubleshooting in Amine Units for LNG Plants**
GPA Midstream Association Convention 2020
- 13. Identifying and Managing Contaminants in LNG Feed Gas and Cryogenic Processing**
GPA Midstream Association Convention 2019
- 14. War Stories from Foaming Front**
Laurance Reid Gas Conditioning Conference 2019
- 15. New Technologies for Mercaptan Removal in Natural Gas Liquids**
Gastech, 2018
- 16. New Mercaptans Removal Technologies for Treating Hydrocarbon Streams**
Gas Processor Association National Convention 2018
- 17. New Inlet Feed Gas Conditioning Technologies for Contaminant Removal in Amine Units**
Gas Processor Association National Convention 2018
- 18. Surfactant Contaminants in Feed Gas Streams to Amine Units: The Hidden Foaming Agent**
Europe Gas Processor Association National Convention 2017
- 19. Surfactant Contaminants in Feed Gas Streams to Amine Units: The Hidden Foaming Agent**
Gas Processor Association National Convention 2017
- 20. New Technologies for H₂S and Mercaptans Removal in Natural Gas and Natural Gas Liquids**
Gas Pro 2016
- 21. Feedstock Contaminant Separation Impacts: Process Stability, Equipment Reliability and Plant Capacity**
Petchem Tech Forum 2016
- 22. Feed Contamination to Amine and Sour Water Stripper Units Affecting the Sulfur Recovery Process**
RefComm 2016
- 23. Exion GT: The Next Generation of Hydrogen Sulfide Removal Technologies for Natural Gas Treating**
Gas Processors Association 2016
- 24. Mercaptans Removal from Hydrocarbon Condensates and NGL Streams**
Laurance Reid Gas Conditioning Conference 2016

Conferences (continuation)

- 25. Amine System Filtration: How to Maximize Benefits**
SOGAT 2015
- 26. LPG Treating Throughput Improvement Using Amine Solvent Recovery Technologies**
American Fuel & Petrochemical Manufacturers 2015
- 27. Oil & Gas Process Separation Scale-Up Part 1: Sour Water and Sour Gas**
AIChE 2014
- 28. Evaluating Inlet Gas Separation Systems for Plant Reliability**
American Filtration & Separations Society, National Conference 2014
- 29. Where Filtration Fails - Media Sealing and Related Economics**
American Filtration & Separations Society, National Conference 2014
- 30. The Seven Deadly Sins of Sour Water Stripping**
AFPM 2014
- 31. Reducing Hydrocarbons in Sour Water Stripper Acid Gas**
LRGCC 2014
- 32. Seven Deadly Sins of Filtration and Separation Systems in Gas Processing**
Gas Processors National Convention 2013
- 33. Feed Conditioning Strategies for Gas Processing**
SOGAT 2013
- 34. Innovation in H₂S Removal Technologies for the Oil & Gas and Chemical Processing Industries**
Cheminnovations Conference 2013
- 35. Sour Water Production and Processing in Oil Gas Operations**
American Filtration & Separations Society National Meeting 2013
- 36. Suspended Solids Fouling and Column Protection Using Separation Technologies**
American Filtration & Separations Society National Meeting 2013
- 37. Process Reliability in Amine Units by Contamination Control**
Chemnovations Conference 2012
- 38. Inlet Gas Coalescence for Reliability and Capacity Increase**
American Filtration and Separation Society National Meeting 2012
- 39. Pretreatment of Organic Materials for Selective Separation in Sensor Applications**
American Filtration and Separation Society National Meeting 2012
- 40. Chemically Assisted Separation Technologies**
American Filtration and Separation Society National Meeting 2012
- 41. Gas Coalescer Failure Modes and Effects**
American Filtration and Separation Society National Meeting 2012
- 42. Filtration and Separation Technologies in the Sulphur Trail**
Sulphur Conference 2011
- 43. Overview of Amine Unit Filtration and Separation Systems**
American Filtration and Separation Society Regional Meeting 2011
- 44. The Seven Sins of Filtration and Separation systems**
American Filtration and Separation Society National Meeting 2011
- 45. Pharmaceutical Industry Approach to Drug Discovery. Use of Multicomponent Reactions**
General Electric Biotechnology Seminar 2003
- 46. Development of an Ugi Four Component Coupling Reaction for the Synthesis of D-Phenylglycinamide-Derived Non-Covalent Factor Xa Inhibitors"**
225th National Meeting of the American Chemical Society 2003.
- 47. Small Molecules for Medicinal and Material Chemistry**
General Electric Corporate Research Seminar 2002
- 48. Small Molecules for Medicinal and Material Chemistry Applications**
Lubrizol Corporation Research Seminar, Cleveland, OH 2002

Conferences (continuation)

- 49. Synthesis of the Highly 1D Conductor (THTTF)4I19**
ISCOM 2001 - Sapporo, Japan 2001
- 50. Synthesis and Properties of New Electroactive Heterocycles**
Eli Lilly and Company Research 1999
- 51. Preparacion y Caracterizacion de Nuevos Materiales y Farmacos**
Universidad de Santiago de Chile Seminar 1999
- 52. Synthesis and Study of New Electroactive Heterocycles**
Eli Lilly and Company Seminar 1999
- 53. Introduccion a Conductores y Superconductores Organicos**
Universidad de Santiago de Chile Seminar 1999
- 54. Incorporacion de n-Alcoholes a Micelas Inversas**
Latin-American Congress of Chemistry 1990
- 55. Utilizacion y Estudio de las Propiedades Fisico-Quimicas de Indoles y Derivados**
Bolivian Congress of Chemistry 1990

Invention Patents

- 1. Method for Removing Amine from a Contaminated Hydrocarbon Streams**
United States Patent 10316256
- 2. System for the Treatment of Mercaptan Contaminated Hydrocarbon Streams**
United States Patent 10316257
- 3. System for the Treatment of Contaminated Hydrocarbon Streams**
United States Patent 10221364
- 4. Removal of Hydrocarbon Contaminants**
United States Patent 9982201
- 5. Material compositions for sensors for determination of chemical species at trace concentrations**
United States Patent 8647883
- 6. Rinsable metal pretreatment methods and compositions**
United States Patent 8585834
- 7. Method for removing calcium from crude oil**
United States Patent 8366915
- 8. Dynamic desalter simulator**
United States Patent 8043858
- 9. Material compositions for sensors for determination of chemical species at trace concentrations and method of using sensors**
United States Patent 7807473
- 10. Separatory and emulsion breaking processes**
United States Patent 7771588
- 11. Medical article and method of making and using the same**
United States Patent 7682696
- 12. Emulsion breaking process**
United States Patent 7612117
- 13. Marked article and method of making the same**
United States Patent 7459259
- 14. Serine protease inhibitors**
United States Patent 7351822
- 15. Serine protease inhibitors**
United States Patent 7053078
- 16. Serine protease inhibitors**
United States Patent 6946467
- 17. Serine protease inhibitors**
United States Patent 6936611
- 18. Serine protease inhibitors**
United States Patent 6900196
- 19. Serine protease inhibitors**
United States Patent 6878725
- 20. Serine protease inhibitors**
United States Patent 6784182

Invention Patents (continuation)

21. Multiactive electrophotographic elements containing electron transport agents
United States Patent 5272032

Work Experience

Selenium Holdings

Senior Partner: 2021-to date

Nexo Solutions

Managing Director: 2012-to date

Sulphur Experts

Process Specialist: 2010-2012

Pentair

Business Development Leader: 2007-2010

General Electric

Project Leader: 2003-2007

Eli Lilly

Chemist: 1999-2002

Eastman Kodak

Process Specialist: 1993-1999

Appointments

American Filtration and Separation Society

Member, Southwest Region Chapter

GPA

Member, Section M

Education

Indiana University Bloomington

Ph.D., Organic Chemistry, 1996 –2002

Rochester Institute of Technology

M.S., Organic Chemistry, 1990 – 1992

Universidad de Santiago de Chile

B.S., Industrial Chemistry 1985 – 1990

Certifications

Project Management

General Electric April 2004

Six Sigma

General Electric December 2003

Certified Quality Technician

American Society for Quality September 1993

Expert in Legal Cases

1. **Fowler Rodriguez** - Gulf Coast Shipyard Group v. Crescent Coatings
2. **Bracewell** - Nalco Champion v. Baker Hughes Inc.
3. **Meyer, Knight & Williams, LLP** - GHP Nail Systems v. Benelux Cosmetics
4. **Jordan, Lynch & Cancienne PLLC** - Total Petrochemicals & Refining USA Inc v. White Tucker Company
5. **Arnold & Itkin LLP** - Randal Harris v. Flying J
6. **Nguyen & Chen, LLP** - Morimatsu v. McDermott
7. **Baker Botts (UK) LLP** - Osaka Gas v. Freeport LNG
8. **Hogan Lovells** - Transportadora De Gas Natural De La Huasteca v. Iberdrola Energía
9. **Hogan Lovells** - Transportadora de Gas Natural De La Huasteca v. CFE
10. **Bair Hilty, P.C.** - NV Nutrition, LLC v. Texas Fueling Services Inc.