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10 *SOILWORKS, LLC, an Arizona corporation*

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**UNITED STATES DISTRICT COURT**  
**IN AND FOR THE DISTRICT OF ARIZONA**

SOILWORKS, LLC, an Arizona  
corporation,  
  
Plaintiff / Counterdefendant /  
Counterclaimant,

NO.: 2:06-CV-2141-DGC

**SOILWORKS' DISCLOSURE OF  
EXPERT WITNESS**

v.

MIDWEST INDUSTRIAL SUPPLY, INC.,  
an Ohio corporation authorized to do  
business in Arizona,

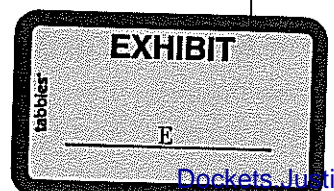
Defendant / Counterclaimant /  
Counterdefendant.

Pursuant to Fed.R.Civ.P. 26(a)(2)(A)-(C), and the Court's Case Management Order dated May 10, 2007, Plaintiff SOILWORKS, LLC hereby makes disclosure of its expert witness who is expected to testify at the trial of this action and present evidence under Fed.R.Evid. 702, 703 or 705.

**Identity of Expert Witness**

Dr. Edward W. Funk  
EWF Consulting, Inc.  
676 DeTamble Avenue  
Highland Park, IL 60035

Dr. Funk is a Professor of Chemical Engineering at University of Illinois, and is also President of EWF Consulting, Inc. A copy of Dr. Funk's *curriculum vitae* is attached hereto.



1 Written Report:

2 (i) *A complete statement of all opinions the witness will express and the*  
3 *basis and reasons for them;*

4 Dr. Funk is expected to testify that defendant's '266 and '270 patents have not  
5 been validly issued because the claims of those patents are not patentable under  
6 §§102, 103 and 112 of Title 35 U.S.C. The claims of said patents are obvious, based  
7 upon prior art in the field and in the industry.

8  
9 (ii) *The data or other information considered by the witness in forming*  
10 *them;*

11 1) The patents themselves and all claims associated with them;

12 2) All applications associated with the patents including prior applications  
13 which were subsequently abandoned;

14 3) Defendant's patent and trademark file wrappers from USPTO;

15 4) Documents produced by the party hereto and by non-party Spinnard  
16 Builders;

17 5) 30(b)(6) deposition testimony of defendant and individual testimony of  
18 Robert Vitale;

19 (iii) *Any exhibits that will be used to summarize or support them;*

20 Documents described in Section (ii) above.

21  
22 (iv) *The witness' qualifications, including a list of all publications authored*  
23 *in the previous 10 years;*

24 See witness *curriculum vitae*.

25  
26 (v) *A list of all other cases in which, during the previous 4 years, the*  
27 *witness testified as an expert at trial or by depositions;*

28 See witness *curriculum vitae*.

1  
2 (vi) A statement of the compensation to be paid for the study and testimony  
in the case.

3  
4 Dr. Funk is being compensated at the rate of \$200 per hour to review  
5 documents and for deposition testimony (plus travel expenses and copy fees), and at  
6 the rate of \$250 per hour to provide testimony at trial plus travel expenses.

7 Dated this 7<sup>th</sup> day of March, 2008.

8 KUTAK ROCK LLP

9  
10 By /s/ E. Scott Dosek

11 E. Scott Dosek, Esq.  
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14 **COPY** of the foregoing sent via electronic mail  
15 this 7<sup>th</sup> day of March, 2008, to:

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# Edward W. Funk, Ph.D.

CHEMICAL ENGINEERING CONSULTANT/EXPERT WITNESS

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"Very professional in giving a deposition; knows what he has been hired to testify on and what is outside his box."

## Curriculum Vitae



EDWARD W. FUNK, PHD

Edward W. Funk, Ph.D.

Chemical Engineering Consultant / Expert Witness

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## Professional Summary

Experienced R&D director at Exxon and Honeywell. Presently a consultant/expert witness and a Professor of Chemical Engineering at the University of Illinois. Technical expertise in applied chemistry and chemical engineering. Author of 40 technical papers and 35 presentations at technical meetings, national laboratories and industrial research centers. Author of 6 U.S. patents.

## Education

Ph.D., Chemical Engineering, University of California, Berkeley, 1970  
B.S., Engineering Science, Yale, 1967

## Present Professional

1. Consultant and expert witness, EWF Consulting, Inc., 1992-present  
Technical consultant to medium-sized chemical companies and national laboratories. Expert witness on patent infringement and process/product liability cases with law firms.
2. Professor of Chemical Engineering, University of Illinois, 1992-present  
Teaching of courses in process and product design. Technical writing and oral communication.

## Previous Experience

Allied-Signal/UOP (now Honeywell), Des Plaines, IL, 1982-1992  
Manager of Chemical Process / Product Technology

- Responsible for the commercial development of new products in the areas of petrochemicals, polymers, membranes and films, environmental processes and chemical processing; and novel process systems.
- This work led to new membranes, surface-modified films, ozone-friendly fluorocarbons, extraction processes for treating contaminated soils, conducting polymer resins, carbon molecular sieves, etc.
- Managed the advanced technology for UOP division of Honeywell, the process technology affiliate of Honeywell. This included petroleum processes and process technology in food and related industries.
- Led the design effort that identified new commercial applications for oxygen-enrichment membranes and ultrafiltration processes for food processing.
- Lead technology manager in the Dow/Honeywell patent infringement suit that resulted in a \$30 million award to Honeywell.
- Project Manager for a \$5 million Department of Energy contract on the development of energy saving membrane processes. The yield from this contract included the first commercial processes for hydrocarbon separations, and a gas-membrane process for removal of carbon dioxide from natural gas.
- Obtained for Honeywell R&D contracts from NASA and Los Alamos and established joint R&D projects with Kraft and Proctor & Gamble.

Corporate Research, Exxon (now ExxonMobil), Linden, NJ, 1973-1982  
Senior Research Engineer

- Established a new program on the extraction of oil from Canadian tar sands and obtained the key patents. Directed the laboratory studies, developed unique software for process analysis, and built small-scale demonstration units.
- Developed new test methods for the characterization of asphaltenes, lubricating oils, and synthetic fuels.
- Served as the principal engineer in the investigation of potential uses of supercritical fluid technology within Exxon's business units.
- Was lead engineer of the engineering/chemistry team that commercialized Exxon's FLEXSORB process for the use of aqueous tertiary amines for removal of acid gases from natural gas.

Ford Foundation, Chile, 1971-1973  
Senior Fellow

- Established new R&D programs focused for the food and mineral industries with government labs and universities.

## Awards & Societies

Arthur D. Little Award in Engineering  
Allied-Signal Technical Achievement Award  
Member, American Institute of Chemical Engineers

## Publications / Presentations / Patents

1. Funk, E.W., and Prausnitz, J.M., "Thermodynamic Properties of Liquid Mixtures: Aromatic-Saturated Hydrocarbon Systems," *Industrial and Engineering Chemistry*, 9, 8 (1970)
2. Thermodynamic Properties of Aromatic-Saturated Hydrocarbon Mixtures, API Division of Refining, Houston, Texas, May 1970
3. Funk, E.W., and Prausnitz, J.M., "Vapor-Liquid Equilibria for Propane-Propylene," *AIChE Journal*, 17, 254 (1971)
4. Preston, G.T., Funk, E.W., and Prausnitz, J.M., "Solubilities of Hydrocarbons and Carbon Dioxide in Liquid Methane and Liquid Argon," *Journal of Physical Chemistry*, 75, 2345 (1971)
5. Funk, E.W., and Prausnitz, J.M., "Estimation of Binary Parameters (Henry's Constant and van Laar Parameter),"

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6. Funk, E.W., and Prausnitz, J.M., "Entropies of Vaporization for Fluorocarbons and Hydrocarbons from the Hildebrand Rules," *Journal of Physical Chemistry*, 75, 2530 (1971)
  7. Preston, G.T., Funk, E.W., and Prausnitz, J.M., "Effect of Temperature on Henry's Constant for Simple Mixtures," *Physics and Chemistry of Liquids*, 2, 193 (1971)
  8. Funk, E.W., Chai, F.C., and Prausnitz, J.M., "Thermodynamic Properties of Liquid Mixtures Containing Aromatic and Saturated Hydrocarbons," *Journal of Chemical and Engineering Data*, 17, 24 (1972)
  9. Equilibrio de Fases en Sistemas de Petroleo, Congreso de Quimicos, Santiago, Chile, January 1972
  10. Funk, E.W., "Activity Coefficients at High Concentrations in the Hydrochloric Acid-Sodium Chloride-Water System," *IEC Process Design and Development*, 13, 352 (1974)
  11. Vega, R., and Funk, E.W., "Solid-Liquid Equilibria in Concentrated Aqueous Salt Solutions - Systems with a Common Ion," *Desalination*, 15, (1974)
  12. Irani, C., and Funk, E.W., "Supercritical Separations Using Gases," Chapter 3, Volume 4, *Recent Developments in Separation Science*, N.N. Li, Editor, 1976
  13. Extraction of Athabasca Tar Sands, Laboratory Seminar, Imperial Oil, Sarnia, Canada, June 1976
  14. Heavy Hydrocarbon Processing: An Overview, Departmental Seminar, Chemical Engineering, University of California, Berkeley, California, 1977
  15. Solvent Extraction of Tar Sands: The Process and Economics, Syncrude Canada Limited, Edmonton, Canada, November 1977
  16. Funk, E.W., and Gomez, E., "Determination of Vanadium in Athabasca Bitumen and Other Heavy Hydrocarbons by Visible Spectroscopy," *Analytical Chemistry*, 49, 972 (1977)
  17. Funk, E.W., "Study of Heavy Hydrocarbons by Inverse-Phase Chromatography," *I&EC Product Research and Development*, 16, 115 (1977)
  18. Funk, E.W., Irani, C.A., Espino, R.L., "Tar Sands Extraction Process," U.S. Patent 4, 036, 732 (July 1977)
  19. Funk, E.W., "Behavior of Tar Sand Bitumen with Paraffinic Solvents and its application to Separations for Athabasca Tar Sands," *American Chemical Society, Division of Fuel*, 23, 81 (1978)
  20. Funk, E.W., "Athabasca Bitumen recovery Process," *Oilweek Canada*, 44 (October 23, 1978)
  21. Interfacial Effects in Separations for Tar Sands, Departmental Seminar, Chemical Engineering, University of Minnesota, July 1978
  22. Behavior of Athabasca Tar Sand Bitumen, *American Chemical Society, Division of Fuel*, Miami Beach, September 1978
  23. Thermodynamics of Aqueous Salt Systems, NSF Symposium on Thermodynamics Applied to Industrial Needs, Washington, D.C., October 1979
  24. Processing and Recovery of Heavy Hydrocarbons, Departmental seminar, McGill University, Montreal, Canada, November 1979
  25. Funk, E.W., "Behavior of Tar Sand Bitumen with Paraffinic Solvents," *Canadian Journal of Chemical Engineering*, 57, 333 (1979)
  26. Pirkle, J.C., Funk, E.W., and May, W.G., "Computer Design of Multistage Sedimentation Operation for Separation of Asphaltenes, Sand, and Bitumen in Tar Sands," *Proceedings of the 1979 Summer Computer Simulation Conference*, Toronto, Canada, 213 (1979)
  27. Funk, E.W., "Thermodynamics of Concentrated Salt Solutions: A Review of Theory and Applications," Chapter 37, 717-739, *ACS Symposium Series 133*, Washington, D.C., 1980
  28. Electrokinetics and Other Similar Effects, *The Filtration Society*, King of Prussia, Pennsylvania, March 1980
  29. Selective Absorption of Hydrogen Sulfide and Carbon Dioxide in Aqueous Solutions of Methyl-diethanolamine, *AIChE Meeting*, Houston, Texas, April 1981
  30. Phase Equilibria in Mixtures of Athabasca Bitumen with Alcohol and Paraffin Solvents, *AIChE Meeting*, Houston, Texas, April 1981
  31. Phase Equilibria of Heavy Hydrocarbon Systems, Departmental Seminar, Chemical Engineering, Yale University, February 1982
  32. Li, N.N., and Funk, E.W., "Separations Based Upon Reversible Complexation," *Proceedings of the Joint Meeting of Chemical Engineers of AIChE and CIESC*, Vol. 1, 496 (1982)
  33. Funk, E.W., May, W.G., and Pirkle, J.C., "Solvent Extraction Process for Tar Sands," U.S. Patent 4, 347, 118 (August 1982)
  34. Membrane Separation Processes, U.S. Department of Energy, Washington, D.C., September 1982
  35. Phase Equilibria of Heavy Hydrocarbon Systems, Departmental Seminar, Chemical Engineering, Illinois Institute of Technology, May 1983
  36. Membrane Separation Processes for Acid Gases, *AIChE Summer Meeting*, Denver, Colorado, August 1983

37. Polymeric Membranes for Petrochemical Separations, Departmental Seminar, Chemical Engineering, University of Illinois at Chicago, October 1983
38. Membrane Separations for Liquid Systems, Membrane Symposium, U.S. Department of Energy, University of Texas, Austin, Texas, October 1983
39. Membrane Separations with Polymeric films, ACS Meeting, Rock River Selection, Beloit College, November 1983
40. Separations for Closed-Loop Space Stations, Marshall Spacecraft Center, Huntsville, Alabama, September 1984
41. Membrane Separations for Hydrocarbon Systems, U.S. Department of Energy Symposium, Clemson University, October 1984
42. Membrane Systems for Spacecraft Living, NASA Ames Research Laboratory, San Jose, California, October 1984
43. An Industrial Perspective on Teaching Separation Science, AIChE National Meeting, San Francisco, November 1984
44. Funk, E.W., May, W.G., and Pirkle, J.C., "Processing Approach for the Solvent Extraction of Athabasca Tar Sands," AIChE Energy Progress Quarterly, 4, 12 (1984)
45. Kulkarni, S.S., Funk, E.W., Li, N.N., and Riley, R.L., "Membrane Separation Processes for Acid Gases," AIChE Symposium Series, No. 229, Vol. 79, 172 (1984)
46. Separation of Heavy Oils Using Supercritical Fluids, ACS National Meeting, Chicago, September 1985
47. Membrane Separations in This World and Beyond, Departmental Seminar, Chemical Engineering, Michigan State University, October 1985
48. Membrane Technology for Acid Gas Separation, DOE Membrane Symposium, Knoxville, Tennessee, October 1985
49. Novel Separations with Polymeric Membranes, Departmental Seminar, Chemical Engineering, Northwestern University, Evanston, Illinois, March 1986
50. The Effect of Impurities on Membrane Performance, AIChE Meeting, New Orleans, April 1986
51. Application of Membrane Technology in the Paper and Pulp Industry, American Chemical Society, New York, April 1986
52. Advanced Membranes for Spacelab Water Management, American Chemical Society, New York, April 1986
53. Funk, E.W., Chang, Y.A., and Kulkarni, S.S., "Membrane Separation of Hydrocarbons," U.S. Patent 4, 595, 507 (June 1986)
54. Funk, E.W., Kulkarni, S.S., and Chang, Y.A., "Membrane Separation Process," U.S. Patent 4, 671, 126 (October 1986)
55. Funk, W.S., and May, W.G., "Thermodynamic Analysis of Separation Processes for Athabasca Tar Sands," Energy Sources, 8, 177 (1986)
56. Kulkarni, S.S., Funk, E.W., and Li, N.N., "Hydrocarbon Separations with Polymeric Membranes," AIChE Symposium Series, No. 250, Vol. 82, 78, (1986)
57. Li, N.N., Funk, E.W., and Kulkarni, S.S., "An Industrial Perspective on Teaching Separation Science," AIChE Symposium Series, No. 250, 202 (1986)
58. Funk, E.W., Kulkarni, S.S., and Swamikannu, A.X., "Effect of Impurities on Cellulose Acetate Membrane Performance," AIChE Symposium Series, No. 250, 27 (1986)
59. Savage, D.W., and Funk, E.W., "Selective Absorption of H<sub>2</sub>S and CO<sub>2</sub> Into Aqueous Solutions of Methyl-diethanolamine," Ind. Eng. Chem. Fundam., 25, 326 (1986)
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62. Funk, E.W., and Kulprathipanja, "Separation of Monosaccharides with Mixed Matrix Membranes," U.S. Patent 4, 735, 193 (April 1988)
63. Funk, E.W., and S.S. Kulkarni, "Multicomponent Membranes," U.S. Patent 4, 737, 165 (April 1988)
64. Funk, E.W., and Kulprathipanja, S., "Preparation of Gas Selective Membranes," U.S. Patent 4,737,104 (June 1988)
65. Funk, E.W., Kulkarni, S.S., and Gatsis, J., "Membrane Separation of Hydrocarbons Using Cycloparaffinic Solvents," U.S. Patent 4, 750, 990 (June 1988)
66. Acid Gas Removal. Sixth Annual Membrane Technology Planning Conference, BCC Communications, Cambridge, Massachusetts, November 1988
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- E.F. and Dewolfs, R., Editors, Elsevier, Amsterdam, 1990
69. Swamikannu, A.X., Funk, E.W., and Li, N.N., "Recovery of Space Station Wash Water by Membrane Technology," International Congress on Membranes and Membrane Processes, Chicago, August 1990
  70. Sedath, R.H., Li, N.N., and Funk, E.W., "Reduction of Fouling in Ultrafiltration Membranes via Surface Fluorination," International Congress on Membranes and Membrane Processes, Chicago, August 1990
  71. Kulprathipanja, S., Funk, E.W., and Li, N.N., "Mixed Matrix Membranes," International Congress on Membranes and Membrane Processes, Chicago, August 1990
  72. Membrane Technology Applications in the Chemical Process Industries, Short Course, International Congress on Membranes and Membrane Processes, Chicago, August 1990
  73. Membrane Separations in the Petrochemical Industry, 8th Annual Membrane Technology Planning Conference; BCC Communications, Newton, Massachusetts, October 1990
  74. New Membrane Processes for Oil Upgrading, Chevron Research Membrane Conference, Richmond, California, November 1990
  75. New Membrane Processes in an Environment of Change, Departmental Seminar, Chemical Engineering, Northwestern University, April 1991
  76. Organic Separations with Membranes, First Hanford Separation Symposium, Richland, Washington, July 1991
  77. New Applications of Membrane Technology for the Chemical Industry, Plenary Lecture, Canadian Chemical Engineering Society, Vancouver, Canada, October 1991
  78. Manufacturing Process for Cellulose Acetate Membranes and Industrial Uses, 7th Symposium on Separation Science and Technology, Knoxville, Tennessee, October 1991
  79. Mixed Matrix Membranes, AIChE National Meeting, Los Angeles, California, November 1991
  80. Ultrafiltration, Chapters 27-31. Membrane Handbook, Van Nostrand Reinhold, New York, 1992.
  81. Process Analysis of Membrane Separations, Departmental Seminar, University of Illinois, Urbana, Illinois, April 1992
  82. Surface Modification of Membranes, 10th Annual Membrane Technology Planning Conference, BCC Communications, Newton, Massachusetts, October 1992
  83. Membranes Tailored for Aqueous Phase Separations, AIChE National Meeting, Miami Beach, November 1992
  84. Inorganic Separation Technology, Invited Lecture, Los Alamos National Laboratory, November 1992
  85. Funk, E.W., Developments in Membrane Reactors, The Catalyst Group, Multi-client Presentation, April 1999.
  86. Funk, E.W., Emerging Reactors-Intensified Processes, The Catalyst Group, Multi-client Presentation, April 2001.
  87. Funk, E.W., Chemical Production Technology: Design, Operation, Optimization and Safety, Dubai, UAE, December 2006
  88. Funk, E.W., "Optimization of Chemical Plants, Haward Technology," Dubai, December 9-15, 2006
  89. Funk, E.W. and Nel, Willem, "Troubleshooting Refinery Problems," Abu Dhabi Petrochemicals LLP, Abu Dhabi, UAE, December 16-22, 2006

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