

**Richard Skeirik** (Sky' rick)  
873 E Baltimore Pike #742  
Kennett Square, PA 19348  
877-780-0945  
[richardskeirik@richardskeirik.com](mailto:richardskeirik@richardskeirik.com)  
<http://richardskeirik.com/>

**Chemical Process Engineer  
Consultant**

<http://lnkd.in/v3UYgV>

---

**PROCESS ENGINEER** contributing over \$5 million savings over 22 years at DuPont, with experience in process development research, pilot plant, process economic evaluation, technical support to manufacturing, chemical reaction engineering, and process dynamics and control consulting. I have extensive experience in process simulation: flowsheet, distillation, and reactor. In process development, I worked with organometallic chemists, assessing their preliminary reaction tests. I designed and started up a 1 liter high pressure batch synthesis pilot unit. Later I scoped a full process and evaluated the process economics. In later years, I worked as process dynamics and control consultant on 6 sigma teams in a wide range of large continuous/batch chemical/polymer production plants. In addition, I have extensive patent experience, working from invention through drafting, prosecution, and infringement litigation as inventor of 17 US patents, sold by DuPont for \$3 million. My recent work is a dynamic reactor model predicting the full molecular weight distribution in a commercial synthesis of PTMEG (spandex component).

**Key Technology Experience:**

|                               |                        |                                   |
|-------------------------------|------------------------|-----------------------------------|
| Process Development Research  | Pilot Plant            | Steady State Flowsheet Simulation |
| Dynamic Process Simulation    | Six Sigma              | Economic Evaluation               |
| Dynamic Reactor Modeling      | Polymer Kinetics       | Statistical Process Control       |
| Technical/Litigation Analysis | Process Control Design |                                   |

**Key Systems Experience:**

|              |                           |                    |                      |
|--------------|---------------------------|--------------------|----------------------|
| HYSYS        | SimSci PROCESS(simulator) | CPES(SS Flowsheet) | TMODS(Dyn Flowsheet) |
| Speedup      | Aspen IP21                | Honeywell DCS      | Bailey DCS           |
| Matlab       | Aspen Multivariate        | MS Excel           | SQL                  |
| Visual Basic | Visual Studio             | MS Access          | ASP.NET              |

**Selected Project Accomplishments**

**Adipic Acid Process Development** – Worked with organometallic chemists developing reaction chemistry for adipic acid synthesis from butadiene. Offered process concepts and design guidance for creation of a continuous process.

**Pilot Plant Design/Startup** – Designed, reviewed process hazards, oversaw construction, and started up 1 liter high pressure semiworks reactor for the homogeneous catalyzed synthesis of adipic acid.

**Process Economic Evaluation** – Designed a greenfield process for adipic acid synthesis. Developed process flows by steady state simulation, sized and costed equipment, and evaluated overall process economics.

**Dynamic Reactor Model (Independent)** - Reproduced experimental data and produced the full dynamic molecular weight distribution for the acid-initiated polymerization of PTMEG (spandex/elastomer segments.) Manuscript in preparation.

**Topping Column Design Guidance** – Simulated a topping column expansion for TPA dehy column using HYSYS steady state. Recommended process and reflux configuration.

**2002 Optimizing Controls for Oxidation** – Expert system-based controls saved \$400,000/yr and increased plant capacity by adaptively moving oxidation state variables along the optimal edge of the operating space in TPA synthesis (polyester intermediate).

**Dehydration Column Controls** - Saved \$0.5 million/yr, increased plant throughput 5% and stabilized entire plant by designing and implementing model-based controls for a large acetic acid dehydration column with multiple feeds, multiple heat inputs, and ongoing significant load changes. Implemented lower levels on Bailey DCS; flood detection and optimization in expert systems on Vax. Designed using dynamic simulation in HYSYS and Speedup.

**Expert Witness/Litigation Consultant** – Gave expert analysis, prepared expert court reports, and gave expert testimony in support of two infringement lawsuits asserting my inventions.

**Other Projects:** Oxidation Severity Optimization; \$0.6 million/yr, TPA Oxidation area;  
Condenser Balance Optimizing Controls – TPA oxidation area;  
Catalyst Composition Controls – TPA solvent recycle system;  
MeOAc Stripper Column model-based controls – TPA Solvent Recovery Area;  
Catalyst/Promoter Ratio Controls – TPA feed prep area;  
Real-time catalyst/promoter composition estimator - TPA solvent recycle system.

## Professional Experience

|         |                                      |                         |
|---------|--------------------------------------|-------------------------|
| 2012-Pr | Reactor/Kinetic Research Study       | Independent Researcher  |
| 2004-Pr | Founder/President/Author/Consultant  | Dalkeith Press, Inc.    |
| 2004-08 | Litigation Consultant/Expert Witness | Independent Consultant  |
| 1994-04 | Consultant                           | Process Control         |
| 1993-94 | Sr. Specialist                       | Manuf. Software Support |
| 1991-93 | Sr. Engineer                         | Process Control Support |
| 1987-91 | Specialist                           | Artificial Intelligence |
| 1984-87 | Sr. Area Engr                        | Manufacturing Support   |
| 1982-84 | Engineer                             | Process R&D             |

## Education

MS Chemical Engineering, Michigan State U, 1981  
BS Biochemistry, Michigan State U, 1978  
Graduate Certificate Sport Psychology, Capella U, 2004

## Professional Development

|                                            |                                     |
|--------------------------------------------|-------------------------------------|
| 30 Professional Development Hours: 2012-14 | DuPont Control Monitoring - 2003    |
| AIChE Process Development Symposium - 2012 | Design of Chemical Processes - 2001 |
| Registered Engineering Intern, DE - 2007   | 30 years programming experience in  |
| Six Sigma Green Belt Training - 2004       | multiple languages and systems      |

## Publications:

12 Formal DuPont Technical Reports  
8 Technical Presentations/Journal Articles  
(plus one to be submitted soon)  
17 US Patents; 6 Psychology-related books