NAME: GREGORY A. CAMPBELL

TITLE: Emeritus Professor Chemical Engineering
Clarkson University

DEGREES:

B.S. Chemical Engineering U. of Maine 1964
M.S. Chemical Engineering U. of Maine 1966
Ph.D. Chemical Engineering U. of Maine 1969

PROFESSIONAL EXPERIENCE:

1966	Research Assistant, High Gloss Resin Development, U. of Maine
1967	Research Assistant, Electrostatic Printing Paper, U. of Maine
1968	Associate Senior Research Engineer, G.M. Research
1972	Senior Research Engineer, G.M. Research
1974	Group leader Polymer Process Research
1978	Staff Research Engineer, G.M. Research
1980	Sr. Staff Research Engineer
1981	Supervisor Polymer Fabrication Research Development, Mobil Chemical Corporation
1984	Associate Professor, Chemical Engineering, Clarkson University
1990	Granted Tenure
1991	Director of Extrusion and Mixing Consortium, 1991 to present
1991-1995	Executive Committee International Polymer Processing Society
1992-1993	Sabbatical Research at Eastman Chemical Research
1996	Promoted to rank of Professor
1996-1998	Chairman of Chemical Engineering Department
1997-1998	Acting Chief Information Officer Clarkson University
1998- 2000	Interim Dean of Engineering-Clarkson University

RELATED EXPERIENCE:

1972	AIChE short course on Digital Process Control
1973	Two week accelerated course Assembler Language for Mini Computer
1976	G.M. Management Progression "Salaried Supervisors Seminar"
1977	Staff Wayne State University College of Lifelong Learning
1978	G.M. Management Progression Curriculum "Technical Staff Management"
1979	Industrial Research Institute Course "Research Management"
1991-5	Treasurer of the International Polymer Processing Society
1996-2008	Member Potsdam Rotary Club
2008-	Member Machias Rotary Club
1998-	Editorial Advisory Board - Progress in Polymer Processing
1998-2000	Co-Chair of Potsdam Rotary International Committee
1999-2001	Executive Board of Potsdam Rotary Club
2000-2001	President of Potsdam Rotary Club
2004	Elected SPE Fellow

2005-2006	District Governor District 7040 Rotary International
2002- 2015	Board of Directors Extrusion Division, Society of Plastics Engineers
2007-2010	SPE Councilor Extrusion Division
2011	SPE Honored Service Member
2011	SPE Extrusion Division Bruce Maddock Award
2010-2015	SPE Executive Committee
2020	SPE Extrusion Division Distinguished Achievement Award

HONORS AND AWARDS:

Tau Beta Pi-1963
Phi Kappa Phi-1967
Invited speaker Gordon Research Conference 1970
Invited speaker Gordon Research Conference 1971
Invited speaker ACS Polymer Symposium 1972
GMR Management Award for Distinguished Achievement 1974
SPI Award of Excellence 1975
Invited speaker at ACS Polymer Symposium 1976
Invited speaker Gordon Research Conference 1976
Chairman Gordon Research Conference, Cellular Materials 1980
Invited speaker National Bureau of Standards 1985
Invited speaker Gordon Research Conference 1986
Invited speaker Polymer Processing Society 1986
Invited speaker TAPPI 1986
Invited speaker Sigma Xi Lecture Olin Corporation 1987
Editorial Review Board for "Polymer-Plastics Technology and Engineering 1988
Invited speaker Gordon Research Foams Conference 1988
Co-Program Chairman Polymer Processing Society Meeting 1988
Keynote Speaker Polymer Processing Society Meeting 1988

Invited speaker Gordon Research Foams Conference 1990
Session co-Chair "Fibers and Films I" 1991 Polymer Processing Society Annual Meeting

Session co-Chair "Fibers and Films II" 1991 Polymer Processing Society Annual Meeting
Session Chair "Foams-General" 1991 Society of Plastic Engineers Annual Technical Meeting
Elected Treasurer of the International Polymer Processing Society 1991
Elected Member of the Executive Committee International Polymer Processing Society 1991
Session co-Chair "Fibers and Films " 1993 Polymer Processing Society Annual Meeting, Manchester U.K.
Keynote Speaker Polymer Processing Society Annual Meeting, Manchester U.K. 1993
Invited presentation July 1993 Gordon Research Conference on Elastomers, Networks, and Gels
Invited speaker TAPPI August 1993
Invited Key Note lecture at the 1993 PPS Asia/Australia Regional Meeting, Tokyo, Japan
Session Chair "Extrusion, Fibers and Films," at the 1993 PPS Asia/Australia Regional Meeting, October 9 - 11, 1993, Tokyo, Japan
Invited speaker Gordon Research Foams Conference 1994

Invited lecture; 5th Society of Polymer Science, Japan "INTERNATIONAL POLYMER CONFERENCE" Nov 28 - Dec 2, 1994 Osaka, Japan
Presiding Chair "Polymer Processing"; 5th Society of Polymer Science, Japan "INTERNATIONAL POLYMER CONFERENCE" Nov 28 - Dec 2, 1994 Osaka, Japan
Co Chair-Extrusion Symposium, 11th Annual Meeting of the Polymer Processing Society, Seoul, Korea, March 27-30, 1995.
1994-95 Omega Chi Epsilon - ***Outstanding Teacher of the Year***

Theses, Patents and Publications for Gregory A. Campbell

The following theses were directed by Prof. Gregory A. Campbell while at Clarkson University.

Masters in Chemical Engineering

1. Sethuram, B., "A Kinetic Study of The Reaction Between 2,4-Toluene Diisocyanate and Water," MS Thesis, Clarkson University, 1986.

2. Adams, M., "A Predictive Model for the Steady Shear Viscosity of Polymer Melts," MS Thesis, Clarkson University, 1987.

3. Zang, R., "Coupling Agents for Polymers," MS Thesis, Clarkson University, 1989.

4. Devanathan, H., "The Effect of Injection Molding Parameters and Rubber Concentration on the Physical Properties of Polystyrene," MS Thesis, Clarkson University, 1990.

5. Narayanaswamy, M., "Development of a New Experimental Technique for the Measurement of Transient Biaxial Extensional Viscosities of Polymer Melts," MS Thesis, Clarkson University, 1990.

6. Wang, C., "Study on the Relationships Between Mechanical Properties and Injection Molding Process Parameters," MS Thesis, Clarkson University, 1990.

7. Babel, A.K., "Two-Phase Simulation of Tubular Film Blowing of Crystalline Polymers," MS Thesis, Clarkson University, 1990.

8. Frias, R.A., "Preparation and Characterization of Narrow Distribution Molecular Weight Polystyrene Solutions Used as an Organic Film," MS Thesis, Clarkson University, 1991.

9. Campbell, S.E., "The Effect of Pressure Processing on the Tensile Properties of Epoxy Resins," MS Thesis, Clarkson University, 1991.

10. Nitta, S.V., "Reactive Compatibilization of Polyethylene/Polystyrene Blends," MS Thesis, Clarkson University, 1994.

11. Hunt, D., "Determination of Flow Rates in Extrusion," MS Thesis, Clarkson University, 1995.

12. Savoca, J.T., "Tensile and Impact Testing of Polypropylene Parts Made Using an Instrumented Injection Molding Machine," MS Thesis, Clarkson University, 1995.

13. Cheng, H., "An Investigation of the Flow Rates and Viscous Dissipation in Extrusion," MS Thesis, Clarkson University, 1997.

14. Chen, J., "Study of the Continuous Extrusion of Microcellular Plastics," MS Thesis, Clarkson University, 1997.

15. Shaji, C., "Theory and Experiments on a Continuous Extrusion Mixer," MS Thesis, Clarkson University, 1999.

16. Tang, Z., "Modeling and Experimental Evaluation of the Melting in Single-Screw Extruders," MS Thesis, Clarkson University, 1999.

17. Zhou, H., "Reactive Blends of Fluoropolymer and Polysiloxanes," MS Thesis, Clarkson University, 1999.

18. Alothman, O.Y. "An Investigation on Effects of High Density Polyethylene Weight Fraction on the Structure of Linear Low Density Polyethylene Blown Films by On-Line Small Angle Light Scattering," MS Thesis, Clarkson University, 2002.

Doctor of Philosophy in Chemical Engineering

1. Cao, B., "Investigation of the Blown Film Process," Ph.D. Thesis, Clarkson University, 1990.

2. Adams, M. "Effect of Processing Parameters on the Adhesion of Carbon Fibers to Thermoplastic Materials," Ph.D. Thesis, Clarkson University, 1992.

3. Ramesh, N.S., "Investigation of the Foaming Characteristics of Nucleation and Growth of Microcellular Foams in Polystyrene Containing Low Glass Transition Particles," Ph.D. Thesis, Clarkson University, 1992.

4. Zak, M.E., "An Investigation of the Shear-Thinning Behavior and Power-Law Modeling of Concentrated, Non-Colloidal Suspensions," Ph.D. Thesis, Clarkson University, 1994.

5. Sweeney, P. "An Experimental and Theoretical Investigation of Blown Film Process Stability," Ph.D. Thesis, Clarkson University, 1994.

6. Gu, J. "Modeling and Measuring the Solvent Removal From Thin Polymer Coatings," Ph.D. Thesis, Clarkson University, 1994.

7. Dontula, N. "An Investigation of Melt Temperature Development in Injection Molding and Extrusion," Ph.D. Thesis, Clarkson University, 1995.

8. Babel, A.K. "An Experimental and Theoretical Investigation of the Development of Physical Properties in the Tubular Film Blowing of Crystalline Polymers," Ph.D. Thesis, Clarkson University, 1995.

9. Agarwal, S. "Analysis of Impingement Mixing Behavior of Highly-Filled Suspensions," Ph.D. Thesis, Clarkson University, 1995.

10. Nagarajan, G., "Modeling of Blown Film Process: Heat Transfer Analysis and Development of Physical Properties in Crystalline Polymers," Ph.D. Thesis, Clarkson University, 1996.

11. Kweeder, J.A., "Nucleation Mechanisms in Microcellular Polymer Foams," Ph.D. Thesis, Clarkson University, 1997.

12. Bullwinkel, M.D., "Film Shrinkage and Planarization of Coatings in Electronic Integrated Circuit Manufacture," Ph.D. Thesis, Clarkson University, 1997.

13. Shrisha, B., "Chaotic Mixing in Single-Screw Extruders," Ph.D. Thesis, Clarkson University, 2002.

14. Radhakrishnan, J. "Experimental Evaluation of a Power Law Theory for Concentrated Slurries," Ph.D. Thesis, Clarkson University, 2001.

Patents

1. Badesha, S.S., Eddy, C.O., Henry, A.W., and Campbell, G.A., "Compatibilized Blend of Fluoroelastomer and Polysiloxane useful for Printing Machine Component," US Patent 6,035,780 (2000).

2. Campbell, G.A. and Rasmussen, D.H., "Controlled Microcellular Foams of Crystalline and Amorphous Polymers," US Patent 5,369,135 (1994).

3. Campbell, G.A. and Rasmussen, D.H. "Controlling Heterogeneous Nucleation and Growth of Foams," US Patent 5,358,675 (1994).

4. Campbell, G.A. and Sweeney, P.A. "Video Method and Apparatus for Measuring and Controlling Dimensional Stability," US Patent 5,272,649 (1993).

5. Campbell, G.A., Cao, B., and Sweeney, P.A., "Non-Contact Sensing Apparatus and Method for Temperature Profile and Thickness Determination and Control of Radiation Translucent Materials," US Patent 4,989,970 (1991).

6. Campbell, G.A. and Seefried, C.G., "Graft Copolymers of Para-methylstyrene on Polyols and Polyurethanes Prepared Therefrom," US Patent 4,591,607 (1986).

7. Campbell, G.A., Cox, H.W., and Meluch, W.C., "Method of Injection Molding a Thermoset Polyurethane Article" US Patent 4,035,467 (1977).

8. Dearlove, T.J., Campbell, G.A., and Atkins, R.T, "Preparation of Isocyanate Terminated Prepolymer," US Patent 3,933,725 (1976).

9. Campbell, G.A., Dearlove, T.J., and Meluch, W.C., "Preparation of Di(Isocyanato-Tolyl) Urea," US Patent 3,906,019 (1975).

10. Campbell, G.A., “Forming Skin Covered Foam by Expanding a Polyurethane Mixture Containing Excess Blowing Agent in a Closed Mold," US Patent 3,709,965 (1973).

11. Brown, W.B. and Campbell, G.A., "Interrupted Current Electrodeposition of Paints," US Patent 3,809,634 (1974).

12. Campbell, G.A. and Brown, W.B., "Process for the Electrodeposition of Paint," US Patent 3,855,106 (1974).

Contributions to Books

1. "Blown Film Simulation: A Severe Test for Rheological Models," Chapter 11 in "Polymer Rheology and Processing," Edited by A. A. Collyer and L. A. Utracki, Elsevier Applied Sciences, New York, 1990.

2. "Physical Properties and Processing Conditions Correlations of the LDPE & LLDPE Tubular Blown Films," Macromolecular Symposia 101, Edited by Hatada, Huthig & Heidelber, Oxford, CT/USA, 1996.

3. "Film Processing," Edited by T. Kanai and G.A. Campbell, Carl Hanser Verlag, Munich, 1999.

4. Campbell, G.A and Kanai, T., "Film Processing Overview and Introductory Rheology," Chapter 1 of "Film Processing," Edited by T. Kanai and G.A. Campbell, Carl Hanser Verlag, Munich, 1999.

5. Campbell, G.A., Cao, B., and Babel, A.K. "Kinematics, Dynamics, and Physical Properties of Blown Films," Chapter 3.2 of "Film Processing," Edited by T. Kanai and G.A. Campbell, Carl Hanser Verlag, Munich, 1999.

6. Campbell, G.A and Sweeney, P.A., "Bubble Instability: Experimental Evaluation," Chapter 3.3 of "Film Processing," Edited by T. Kanai and G.A. Campbell, Carl Hanser Verlag, Munich, 1999.

7. Campbell, G.A. and Spalding, M.A., "Analyzing and Troubleshooting Single-Screw Extruders," Carl Hanser Verlag, Munich, 2013.

8. "Film Processing Advances" Edited by T. Kanai and G.A. Campbell, Carl Hanser Verlag, Munich, 2014.

9. Spalding, M.A. and Campbell, G.A., "Extruder and Screw Design for Film Processing," Chapter 1 in "Film Processing Advances," edited by Kanai, T. and Campbell, G.A., Carl Hanser Verlag, Munich, 2014.

10. Campbell, G.A., "Kinematics, Dynamics, Crystallization, and Thermal Characteristics and Their Relationsip to Physical Properties of Blown Film,:" Chapter 2 in "Film Processing Advances," edited by Kanai, T. and Campbell, G.A., Carl Hanser Verlag, Munich, 2014.

11. Campbell, G.A. and Spalding, M.A., "Analyzing and Troubleshooting Single-Screw Extruders, e2" Carl Hanser Verlag, Munich, 2021, **ISBN**: 9781569907849

Publications in Journals (* indicates G.A. Campbell was the Principle Investigator, Students that wrote the first draft of the paper were usually placed as first author)

67* "Residence time in a single screw free helix extruder using a new solution to the biharmonic equation". *Polym Eng Sci*. 2021;61(1):184-200, Campbell GA, Bomma S, St. John S, Wetzel, M, Taylor, R, Powers, D.. doi:10.1002/pen.25567

66* "Comparing the power law constant (n) for mono- and bi-dispersed filled slurries: using percolation theory concepts" *Rheologica Acta*, (2020) 59(4), Campbell, G. A. Radhakrishnan, J. S. Wetzel, M.D. http://dx.doi.org/10.1007/s00397-020-01214-8

65* "Investigation of the Effect of Filler Concentration on the Flow Characteristics of Filled Polyethylene Melts," *International Polymer Processing*, (2018)Vol. 33, No. 5, pp. 619-633 Campbell, G. A., Wetzel, M. D.

64* "Newtonian, power law, and infinite shear flow characteristics of concentrated slurries using percolation theory concepts," *Rheologica Acta*, (2018).57(3), http://dx.doi.org/10.1007/s00397-017-1070-8, Campbell, G. A. Zak, M. E. Wetzel, M.D.

63 "A Study of Concentrated Suspensions in Polyethylene Melts and the Impact on Viscosity and Polymer Processing Operations," *International Polymer Processing*, (2017), Vol. 33, No. 4, pp. 574-587 Wetzel, M. D., Campbell, G. A.

62* "Development of a Predictive Power Law Relationship for Concentrated Slurries, Part 1: Theory," Indianapolis, 2016 SPE ANTEC 725(2016), Campbell, G. A., Zak, M. E., Radhakrishnan, J. S., Wetzel, M. D.

61* "Development of a predictive power law relationship for polymer composites based on Newtonian carrier concentrated slurries," *J. Composites*, (April 2016) DOI: 10.1002/pc.24047 Campbell, G. A. Zak, M. E., Radhakrishnan, J. S.

60* "Development of a Predictive Power Law Relationship for Concentrated Slurries, Part 2: Experiment and Processing Implications," Indianapolis, 2016 SPE ANTEC 735 (2016), Wetzel, M. D., Pettitt, Jr., D. R., Campbell, G. A.

59 "Characterizing the Flow of Slurries using Percolation Theory Based Functions," *Polymer Engineering and Science*, , (Sept. 13, 2016) Campbell, G. A., Wetzel, M. D doi:10.1002/pen.24435.

58* "Investigation of Flow Rate and Viscous Dissipation in a Single Screw Pump-Extruder," International Polymer Processing, 323, Vol. XVI 4 (2001), G.A. Campbell, C. Wang, H. Cheng, M.D. Bullwinkel, and M.A. te-Riele.

57* "Crystallization Studies of LLDPE during Tubular Blown Film Processing,," International Polymer Processing, 39, Vol. XVI 1 (2001), M.D. Bullwinkel, G.A. Campbell, D.H. Rasmussen, J. Krexa, C.J. Brancewitz.

56* "Breakage and Buckling of Fibrous Reinforcements During Fabrication of Thermoplastic Matrix Composites," International Polymer Processing, Vol. XIV, 3 (1999) with A. Cohen, and M.E. Adams.

55 "Stress-Strain and Volume Change Behavior of Polymer Pellets," International Polymer Processing, Vol. XIII, 4 (1998) with J.Yamamuro, J.A. Abrantes, and D. Penumadu.

54 "The Settling of Spheres in a Viscoplastic Fluid," J. Non-Newtonian Fluid Mech. Vol (79), 87 (1998) with M. Hariharaputhiran, R.S. Subramanian, and R.P. Chhabra.

53 "Modeling Solids Conveying in Polymer Extruders" International Polymer Processing, Vol. XIII, (1) 3 (1998) with J.Yamamuro and D. Penumadu.

52 "Kinetics of Formation of Structures in a Three-phase System Water/Lamellar Liquid Crystal/Water-in-oil Microemulsion after Shear," Progr. Colloid Polym. Sci., Vol (108), 9 (1998) with S.E. Friberg, Z. Zhang, R. Patel, and P.A. Aikens.

51* "The Use of Tetraalkylphosphonium-Tetrafluoroborate-Tetrafluoroboric Acid in the Curing of a Liquid Crystalline Epoxy Resin," J. Polymer Science, Chemistry, Vol 36, 1457 (1998) with J. Liu, C. Wang, J.D Earls, and R.D. Priester, Jr.

50* "Screw Design and Newtonian Fluid Flow," J. of Reinforced Plastics and Composites, Vol 16(16), 1436 (1997) with C. Wang, D. Hunt, and E. Leipold.

49* "Effect of Liquid Crystalline Structure Formation on the Curing Kinetics of an Epoxy Resin," J. Polymer Science, Chemistry, Vol 35(6), 1105 (1997) with J. Liu, C. Wang, J.D. Earls, and R.D. Priester, Jr.

48* "Microcellular Foaming of Polypropylene Containing Low Glass Transition Rubber Particles in an Injection Molding Process," Journal of Vinyl and Additive Technology, Vol. 2(2), 167 (1996) with C. Wang and K. Cox.

47* "Study of Thermoplastic Foam Sheet Formation," Polymer Engineering and Science, Vol. 36(19), 2477 (1996) with N.S. Ramesh, and S.T. Lee.

46* ""Frame Indifference, Fluid Flow in Single Screw Pumps and Extruders," International Polymer Processing, Vol. 11 (3), 199 (1996) with P.A. Sweeney, N. Dontula, and C. Wang.

45* "Measurement and Modeling of Solvent Removal for Spin Coating," Polymer Engineering and Science, Vol. 36(7), 1019 (1996) with J. Gu and M.D. Bullwinkel.

44* "A Model Linking Process Variables to the Strength of Blown Films Produced from LDPE and LLDPE," Tappi Journal, Vol 78(5), 199 (1995) with A.K. Babel.

43* "Solvent Concentration Measurement for Spin Coating" J. of Applied Polymer Science, Vol. 57, 717 (1995) With J. Gu and M.D. Bullwinkel.

42* "The Effect of Polymer Molecular Weight and Solvent Type on the Planarization of Spin-Coated Films" J. of the Electrochemical Society, Vol. 142(7), 2389 (1995) With J. Gu, P. Sukanek, and M.D. Bullwinkel.

41* "Solids Transport in Extruders," International Polymer Processing, Vol. 10 (1), 31 (1995) with N. Dontula.

40* "Spin Coating on Substrate with Topography" J. of the Electrochemical Society, Vol. 142(3), 907 (1995) with J. Gu and M.D. Bullwinkel.

39 "Experimental and Theoretical Analysis of the Right Angle Extrusion of Polyethylene at Room Temperature,' J. Polymer Science: Part B: Polymer Physics, Vol. 33, 15 (1995) with B.K. Ashok and J.C. Moosbrugger.

38* "The Heterogeneous Nucleation of Microcellular Foams Assisted by the Survival of Microvoids in Polymer Containing Low Glass Transition Particles, Part I: Mathematical Modeling and Numerical Simulation," Polymer Engineering and Science, Vol. 34(22), 1685 (1994) with N.S. Ramesh and D.H. Rasmussen.

37* "The Heterogeneous Nucleation of Microcellular Foams Assisted by the Survival of Microvoids in Polymer Containing Low Glass Transition Particles, Part II: Experimental Results and Discussion," Polymer Engineering and Science, Vol. 34(22), 1698 (1994) with N.S. Ramesh and D.H. Rasmussen.

36* "An Experimental Study of Polymer-Filler Redistribution in Injection Molded Parts," J. Reinforced Plastic and Composites, Vol.13(2), 98 (1994) with N. Dontula, N.S. Ramesh, D.J. Small, and A.L. Fricke.

35* "Correlating the Plastic Strain with the Properties of the Low Density Polyethylene Blown Film," J. Plastic Film and Sheeting, Vol. 9(3), 246 (1993) with A.K. Babel.

34* "On the Application of a Viscoplastic Elastic Model to Uniaxial Elongational Flow," J. Plastic Film and

Sheeting, Vol. 9(3), 224 (1993) with A.K. Babel and B. Cao.

33 "Copolymerization in a Non-Aqueous Lyotropic Liquid Crystal," J. Disp. Sci. and Tech. Vol. 14(2), 170 (1993) with S.E. Friberg and B. Yu.

32* "A Study of the Degradation of High Density Polyethylene in a Corotating Intermeshing Twin Screw Extruder," Polymer Engineering and Science, Vol. 33(5), 271 (1993) with N. Dontula and R. Connelly.

31* "Analysis of an Alternative Extruder Screw Pump Design," J. International Polymer Processing Vol. VII(4), 240 (1992) with P.A. Sweeney and J.N. Felton.

30* "Experimental Investigation of the Drag Flow Assumption in Extruder Analysis," Polymer Engineering and Science, Vol. 32(23), 1765 (1992) with P.A. Sweeney and J.N. Felton.

29* "Two-Phase Simulation of Tubular Film Blowing of Crystalline Polymers," J. International Polymer Processing Vol. VII(3), 240 (1992) with B.K. Ashok.

28* "Real Time Video Techniques in the Analysis of Blown Film Instability," J. International Polymer Processing Vol. VII(3), 229 (1992) with P.A. Sweeney and F.A. Feeney.

27* "Aerodynamics in the Blown Film Process," Polymer Engineering and Science, Vol. 32(11), 751 (1992) with N.T. Obot and B Cao.

26* "An Experimental and Theoretical Investigation of Transient Melt Temperature During Injection Molding," Polymer Engineering and Science, Vol. 31(23), 1674 (1991) with N. Dontula, P.C. Sukanek, and H. Devanathan.

25* "Numerical and Experimental Study of Bubble Growth During the Microcellular Foaming Process," Polymer Engineering and Science, Vol. 31(23), 1657 (1991) with N.S. Ramesh, and D. Rasmussen.

24* "Thermal Stress Induced Damage in Thermoplastic Matrix Materials for Advanced Composites," Polymer Engineering and Science Vol. 31(18), 1337 (1991) with M.E. Adams and A. Cohen.

23* "Observation of the Morphology of Polystyrenic Materials Using Oxygen Plasma Etching," J. Polymer Science, Part B: Polymer Physics Vol. 29, 1034 (1991) with N.S. Ramesh and S.V. Babu.

22 "Molecular Location in a Non-Aqueous Lyotropic Liquid Crystal Polymer," J. Polymer Science (Chemistry) Vol. 28(13), 3575 (1990) with S.E. Friberg and B. Yu.

21* "Simultaneous Surface and Bulk Temperature Measurement of Polyethylene During Film Blowing," J. Plastic Film and Sheeting, Vol. 6(2), 117 (1990) with B. Cao and P.A. Sweeney.

20* "Infrared Characteristics of Thin Polymer Film: Temperature Measurement of Polyethylene," J. Plastic Film and Sheeting, Vol. 6(2), 153 (1990) B. Cao and P. Sweeney.

19* "A Generalized Power-Law Model for the Steady Shear Viscosity of Polymer Melts," Polymer and Engineering Science, Vol. 30(10), 587 (1990) with M. Adams.

18* "Viscosity of Concentrated Suspensions-An Approach Based on Percolation Theory," Phy. Rev. A, Vol. 41, 4570 (1990) with G. Forgacs.

17* "Viscoplastic-elastic Modeling of the Blown Film Process," AICHE Journal, Vol. 36(3), 420 (1990) with B. Cao.

16* "Blown Film Bubble Shape-the Influence of the Air Ring," J. International Polymer Processing Vol. IV(2), 114-118 (1989) with B. Cao.

15* "The Interaction of Crystallinity, Elastoplasticity and a Two-Phase Model on Blown Film Bubble Shape," J. Plastic Film and Sheeting, Vol. 3(3), 158-170 (1987) with B. Cao.

14* "Modeling the Blown Film Process from Die to Frost Line," TAPPI Journal, Vol. 70(6), 41-44 (1987) with B. Cao.

13* "Deformational and Temperature History Comparison for LLDPE and LDPE Elements in the Bubble Expansion Region of Blown Films," J. Plastics Film & Sheeting, Vol. 2, 30-39 (1986) with T.A. Huang.

12 "Deformational History of LLDPE/LDPE Blends on Blown Film Equipment," Advances in Polymer Technology, Vol 5(3), 181-192 (1985) with T.A. Huang.

11* "Compressive Creep of Flexible Polyurethane Foam," J. Applied Polymer Science, Vol. 24, 709-723 (1979).

10 "Optimizing the Properties of Isocyanate-Terminated Polyurethane Prepolymers by Statistically Designed Experiments," J. Applied Polymer Science, Vol. 22, 927 (1978) with T.J. Dearlove and R.P. Atkins.

9 "Synthesis and Characterization of Isocyanate-Terminated Polyurethane Prepolymers," J. Applied Polymer Science, Vol. 21 (8), 1499-1509 (1977) with T.J. Dearlove.

8* "Polyurethane Waste Disposal Process Development, With Amine Recovery," J. Applied Polymer Science, Vol. 21 (2), 581-584 (1977) with W.C. Meluch.

7* "Polyurethane Foam Recycling - Superheated Steam Hydrolysis," Environmental Science and Technology, Vol.10 (2), 182-184 (1976) with W.C. Meluch.

6* "Humid Age Compression Set in High Resilience Polyurethane Foams," J. Cellular Plastics, Vol. 12(4), 222-226, (1976).

5* "High Resilience Cold Cure Foam-a Pilot Plant Investigation," J. of Cellular Plastics, 10(3), (1974) with H. J. Couch.

4* "Foam Process Development-A Systems Engineering Approach," J. Applied Polymer Sci., Vol. 16, 1387 (1972).

3* "Integral Skin Foam - A Skin Forming Mechanism," J. Applied Polymer Sci., Vol. 16, 1735 (1972).

2* "The Effect of Water Sorption on Bulk Nylon-6 as Determined by X-Ray Crystallinity," J. Polymer Sci. Part B. Vol. 7, 629 (1969).

1* "Kinetics of Thin Film Polyesterification," J. Applied Polymer Sci., Vol. 14(4), (1970) with E.F. Elton and E.G. Bobalek.

Other Peer Reviewed Papers: (* Principal Author)

91* Campbell, G.A. and Spalding, M.A., "A Mechanism for Solid Bed Breakup in Single-Screw Extruders – Solid Bed - Shape Change," *SPE ANTEC Tech. Papers*, **60**, 1152 (2014).

90 Spalding, M.A., Huang, W., Smith, D., and Campbell, G.A., "Troubleshooting Gear Pump Assisted Single-Screw Extrusion Processes," *SPE ANTEC Tech. Papers*, **60**, 1220 (2014).

89 Spalding, M.A. and Campbell, G.A., "Troubleshooting Black Specks and Color Streaks in Injection Molded Parts," *Plast. Eng.*, **69** (1), 26 (2013).

88* Campbell, G.A. and Spalding, M.A., "A Mechanism for Solid Bed Breakup in Single-Screw Extruders," *SPE ANTEC Tech. Papers*, **59**, 1087 (2013).

87 Spalding, M.A., Garcia-Meitin, E., Kodjie, S.L., and Campbell, G.A., "Troubleshooting and Mitigating Gels in Polyolefin Film Products," *SPE ANTEC Tech. Papers*, **59**, 1205 (2013).

86 Spalding, M.A. and Campbell, G.A., "Upgrading the Capacity of an Existing Extrusion System," *SPE ANTEC Tech. Papers*, **59**, 1220 (2013).

85 Spalding, M.A., Garcia-Meitin, E., Kodjie, S.L., and Campbell, G.A., "Troubleshooting and Mitigating Gels in Polyolefin Film Products," *Plast. Eng.*, **69** (9), 50 (2013).

84* Campbell, G.A., Spalding, M.A., and Sakai, T., "A Review of Fluid Flow and Temperature Dynamics in Single-Screw Extruder Metering Channels (1);" *Plastics Age*, **60** (2) 106 (2014).

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42* "Micromixing in Filled Reaction Injection Molded Composites" SPE ANTEC 95 Technical Papers, p. 839, Boston, MA, May 7-11, 1995, with S. Agarwal.

41* "A Novel Approach to Determining Melt Temperature Profiles in Injection Molding," SPE ANTEC 95 Technical Papers, p. 642, Boston, MA, May 7-11, 1995, with N. Dontula and J.J. Wenskus.

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27* "Temperature Effects on Thermoplastic Foam Sheet Formation," SPE ANTEC '93 Technical Papers, p. 3033, New Orleans, May 9-13, 1993, with N.S. Ramesh and S.T. Lee.

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23* "The Use of Real Time Video Techniques in the Analysis of Blown Film Instability," SPE ANTEC '91 Technical Papers, p. 194, Montreal, May 5-9, 1991, with P.A. Sweeney.

22* "Experimental Investigation of the Drag Flow Assumption in Extruder Analysis," SPE ANTEC '91 Technical Papers, p. 219, Montreal, May 5-9, 1991, with P.A. Sweeney and J.N. Felton.

21* "Comparison of Predicted and Experimental Residual Stress for Injection Molded Polystyrenes," SPE ANTEC '91 Technical Papers, p. 488, Montreal, May 5-9, 1991, with C. Wang.

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19* "Theoretical and Experimental Study of the Dynamics of Foam Growth in Thermoplastic Materials," SPE ANTEC '91 Technical Papers, p. 1292, Montreal, May 5-9, 1991, with N.S. Ramesh, N. Dontula, and D. Rasmussen.

18* "Adhesion of Polymer Systems Using Silyl Peroxides," SPE ANTEC '90 Technical Papers, p. 400, Dallas,May 7-11, 1990 with R. Zang.

17* "Transient Melt Temperatures in Screw Injection Molding," SPE ANTEC '90 Technical Papers, p. 89, Dallas, May 7-11, 1990, with P.C. Sukanek.

16* "Biaxial Rheological Analysis Using the Blown Film Process," SPE ANTEC '90 Technical Papers, p. 312, Dallas, May 7-11, 1990, with P.A. Sweeney and K. Klewicki.

15* "The Effect of Injection Molding Parameters on the Properties of molded Parts," SPE ANTEC '89 Technical Papers, p. 312, New York, May 1-4, 1989, with P.A. Sweeney, H. Devanathan, S. Settlemire, K. Klewicki, T Kenny, D.J. Small, and A.L. Fricke.

14* "Infrared Characteristics of Thin Polymer Film: Temperature Measurement of Polyethylene," SPE ANTEC '89 Technical Papers, p. 172, New York, May 1-4, 1989, with B. Cao and P.A. Sweeney.

13* "Simultaneous Surface and Bulk Temperature Measurement of Polyethylene During Film Blowing," SPE ANTEC '89 Technical Papers, p. 35, New York, May 1-4, 1989, with B. Cao and P.A. Sweeney.

12* "A Predictive Model for the Steady Shear Viscosity of Polystyrene," SPE ANTEC '89 Technical Papers, p. 1671, New York, May 1-4, 1989, with M. Adams.

11* "Blown Film Modeling-Die to Frostline," Technical Papers of the TAPPI Polymer Conference, Nashville, TN, 1986, with B. Cao.

10* "Blown Film Modeling-Die to Frostline," Technical Papers of the SPE ANTEC Boston, MA, 1986, with B. Cao.

9* "Determination of Polystyrene Molecular Weight and Distribution From Steady Shear Viscosity Data," Technical Papers of the SPE ANTEC, Washington, D.C., 1985.

8 "Improved Physical Property Control of Injection Molded Test Specimens," Technical Papers of the SPE ANTEC, Washington, D.C., 1985, with D.J. Sandell.

7 "Deformational and Temperature History Comparison for LLDPE and LDPE Elements in the Bubble Expansion Region of Blown Films," Technical Papers of SPE ANTEC, Washington, D.C., 1985, with T.A. Huang.

6* "Limiting Shear Viscosity of Slurries: A Statistical Model," AIChE Annual Meeting Preprints, Washington, D.C., 1982.

5 "Polyurethane Waste Disposal Process Development, Amine Recovery," AIChE Preprints, Boston, MA, September 7-10, 1975, with W.C. Meluch.

4* "Development of Polymeric Materials for Human Like Neck Simulations," 1974 SAE Transactions, No 740993 with others.

3* "Variables Affecting Kinetics of Polymer Electrodeposition," pp. 167-77 of Advances in Chemistry series 119, edited by George Brewer, Am. Chem. Soc. (1973), with W.B. Brown.

2* "Dynamic Simulation of the Electrodeposition of Polymers," pp 178-185 of Advances in Chemistry Series 199, edited by George Brewer, Am. Chem. Soc. (1973) A collection of invited papers presented at the 161 National Meeting ACS 1971.

1* "Effect of Water Sorption and Crystallinity on the Dynamic Properties of Nylon-6" ACS Polymer Preprints, New York, September, 1969, with others.

90 + CONTRIBUTIONS TO PROCEEDINGS

240 + PRESENTATIONS:

University/Department Service

Service	Dates
Chairman of Chemical Engineering Department	1996 - 1998
Acting Chief Information Officer Clarkson University	1997 - 1998
Dean of Engineering-Clarkson University	1998 - 2000
President of Phi Kappa Phi	1988 - 1989
Department Undergraduate Curriculum Committee	1985 - 1987
Board of Directors "Center for Advanced Materials Processing"	1986 - 1991
Department Library Representative	1988 - 1991
Advisor Clarkson Equestrian Team	1986 - 1991
Formal Hearing Committee	1991
Chairman Department Safety Committee	1992
Chairman Department Curriculum Task Force	1991 - 1993
Chemical Engineering Graduate Committee	1993 - 1995
Chairman Department Graduate Committee	1995 - 1996
University Graduate Representatives Committee	1994 - 1995
Conflict of Interest Policy Committee	1994 - 1995
Administrative Council	1996 - 2000
Presidents Cabinet	1997 - 1998
University Honors Council	1998 - 2008
University Honors Admissions Committee	1998 - 2008
Chairman Honors Admissions Committee	2004 - 2008

Courses Taught and Developed

Thermodynamics
Polymer Materials
Microprocessor Applications
Developed Graduate Course (Engineering Applications of Digital Electronics)
Chemical Process Calculations
Polymer Engineering a Graduate Course
Special Topics in Polymer Materials a Graduate Course
Chemical Reaction Engineering
Chemical Reaction Engineering II a Graduate course