

Professor Tim A. Osswald

Professor Emeritus - University of Wisconsin-Madison

Honorary Professor at the Friedrich-Alexander University, Erlangen, Germany

Honorary Professor at the National University, Bogotá, Colombia

co-Director of the Polymer Engineering Center

EDUCATION:

PhD	1987	University of Illinois-Urbana, Mechanical Engineering
MS	1982	South Dakota School of Mines & Tech., Mechanical Engineering
BS	1981	South Dakota School of Mines & Tech., Mechanical Engineering
H.S.	1975	S.D.S.J.C, Cúcuta, Colombia

POSITION HELD:

2008-2009	Interim Chair of Plastics Technology, University of Erlangen-Nuremberg (from August 1, 2008 to February 28, 2009)
1999-2024	Professor, Department of Mechanical Engineering, and co-Director of the Polymer Engineering Center, UW
1995-1999	Associate Professor, Department of Mechanical Engineering, UW
1989-1995	Assistant Professor, Department of Mechanical Engineering, UW
1987-89	Humboldt Fellow: Institute for Plastics Processing (IKV), Technical University of Aachen (RWTH), West Germany
1987-89	Consultant: Dynamit Nobel, Leverkusen, Germany
1986	College Graduate in Training: GM Research Labs
1982-83	Instructor: Mechanical Engineering , SDSM & T, SD

HONORS AND AWARDS:

- Journal of Polymer Composites, Editor (2021-present)
- Advisor to the Colombian President on Science and Technology (2019-present)
- Member of the 2019 Commission to create a Science Ministry in Colombia
- Sabic Educator of the Year - SPE Composites Division (2017)
- Fred E. Schwab Education Award - National SPE Educator Award (2016)
- SPE Educator of the Year Award - Milwaukee, Wisconsin (2016)
- Honorary Professor - National University of Colombia (2010)
- Fellow of the Society of Plastics Engineers (2008)
- Honorary Professor - University of Erlangen-Nuremberg (2006)
- Chaired Professorship: K.K. and Cindy Wang Professor (2005-2015)
- Journal of Polymer Technology, Editor (2004-present)
- Nominated as the first American member of the International Alliance of Polymer Technology Professors (2002)
- Recipient of the VDI-K Dr.-Richard-Escales-Prize (2001)
- Journal of Polymer Engineering, Editor for the Americas, (1999-present)
- Hanser Publishers, Advisory Board, (1998-present)
- Journal of Society of Manufacturing Engineers, Editor -- Plastics
- NSF Presidential Young Investigator Award (1991-96)
- Alexander von Humboldt Fellow (1987-89)

PERSONAL INFORMATION:

Married, two children. Born in Bogotá, Colombia, US Citizen,
Fluent in English, German and Spanish. Communicates in French,
Italian and Portuguese

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BOOKS

1. Osswald, T.A., and Román, A.J., *Understanding Polymer Processing*, 3rd Edition, Hanser Verlag, München, 2024
2. Baur, E., Drummer, D., Osswald, T.A., and Rudolph, N., *Saechtling Kunststoff-Taschenbuch*, 32st Edition, 2022. (German Plastics Handbook that appeared for the first time in 1936)
3. Gandhi, U., Goris, S., Osswald, T.A., and Song, Y.-Y., *Discontinuous Fiber-Reinforced Composites- Fundamentals and Applications*, Hanser Verlag, München, 2020
4. Baur, E., Osswald, T.A., and Rudolph, N., *Plastics Handbook - The Resource for Plastics Engineers*, Hanser Publishers, Munich, 2019
5. Osswald, T.A., *Understanding Polymer Processing*, 2nd Edition, Hanser Verlag, München, 2017
6. Osswald, T.A. and N. Rudolph, *Polymer Rheology, Fundamentals and Applications*, Hanser Publishers, 2015.
7. Osswald, T.A. and G. Menges, *Materials Science of Polymers for Engineers*, 3rd Edition, Hanser Verlag, München, 2012.
8. Osswald, T.A., *Understanding Polymer Processing*, Hanser Verlag, München, 2010
9. Naranjo, A, Noriega, M., Osswald, T.A., Roldán, A. and Sierra, J., *Plastics Testing and Characterization - Industrial Applications*, Hanser Verlag, München, 2006. Spanish Translation, 2013.
10. Osswald, T.A., Schmachtenberg, E. and Baur, E., *Kunststoff-Taschenbuch*, 30th Edition, Hanser Verlag, München, 2007. 31st Edition, 2013. (German Plastics Handbook that appeared for the first time in 1936)
11. Osswald, T.A., Turng, L.-S., and P.J. Gramann, *Injection Molding*, 2nd Edition, Hanser Verlag, München, 2007.
12. Osswald, T.A., Schmachtenberg, E. and Baur, E., *International Plastics Handbook*, Hanser Verlag, München, 2006. Chinese Translation 2008, Italian Translation 2009.
13. Osswald, T.A. and Hernandez, J.P, *Polymer Processing - Modeling and Simulation*, Hanser Verlag, München, 2006. Spanish Translation to be published 2009
14. Osswald, T.A., Turng, L.-S., and P.J. Gramann, *Injection Molding Handbook*, Hanser Verlag, München, 2001, Russian and Chinese translation, 2006.

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15. Osswald, T.A. and G. Menges, *Materials Science of Polymers for Engineers*, 2nd Edition, Hanser Verlag, München, 2003. Spanish Translation 2009.
16. Davis, B.A., Gramann, P.J., Osswald, T.A., and Rios, C.A., *Compression Molding*, Hanser Verlag, München, 2003.
17. Osswald, T.A., *Polymer Processing Fundamentals*, Hanser Verlag, München, 1998. Spanish translation 2008.
18. Osswald, T.A. and G. Menges, *Materials Science of Polymers for Engineers*, Hanser Verlag, München, 1996. The book's Japanese edition appeared in 1997, and Korean edition in 1999.
19. Comer, J.J., T.A. Osswald and R.L. Pendleton, *An Introduction to Experimental Analysis of Stress and Strain*, SDSM & T Press, 1983.

Edited the following series (Plastics Pocket Power series)

1. Naranjo/Noriega/Sierra/Sanz *Extrusion Processing Data*, Plastics Pocket Power Series, T.A. Osswald, Editor, Hanser Publishers, Munich, 2001
2. Naranjo/Noriega/Sierra/Sanz, *Injection Molding Processing Data*, Plastics Pocket Power Series, Osswald, T.A. Editor, Hanser Publishers, Munich, 2001
3. Thielen, *Extrusion Blow Molding*, Plastics Pocket Power Series, Osswald, T.A. Editor, Hanser Publishers, Munich, 2001
4. Benatar/Grewell/Bonten Tuechert, *Welding*, Plastics Pocket Power Series, Osswald, T.A. Editor Hanser Publishers, Munich, 2001
5. Bonten, *Aging and Chemical Degradation*, Plastics Pocket Power Series, Osswald, T.A. Editor, Hanser Publishers, Munich, 2001
6. DeGreiff/Naranjo/Castaño, *Applied Rubber Technology*, Plastics Pocket Power Series, Osswald, T.A. Editor, Hanser Publishers, Munich, 2001

New Course Development and Major Course Revisions

Developed ME 310, Manufacturing: Polymers (2021).

This is a course based in part on ME313 and ME314 which are being phased out. The course has 28 lectures and 12 laboratory units ranging from hands-on experiments on polymer processing equipment to process modeling. Professor Osswald wrote the textbook *Understanding Polymer Processing*, Hanser (2010, 2017) that will be used in this course. A new edition of this book is being prepared.

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Revised ME 313, Manufacturing Processes-Plastics (1993).

This is a 7 week course taught two times a semester. It describes fundamentals of plastics manufacturing processes in a series of 14 lectures and 6 laboratories. For this course Osswald wrote the textbook *Polymer Processing Fundamentals*, Hanser Publishers, (1997). The textbook has been adopted at various universities around the world.

Re-developed ME 314, Material Processing - Fundamentals (2007)

This is a 7 week course taught two times a semester. It describes fundamentals of transport phenomena in material processing in a series of 14 lectures and 6 laboratories. This course is a required course in the mechanical engineering curriculum.

Revised ME 417, Introduction to Polymer Processing (1989).

The course describes the physical, thermal, and rheological properties of polymeric materials relevant to processing behavior. The basic transport phenomena equations are reviewed: mass, momentum, and energy. Analysis of various processing operations for the manufacture of polymeric articles, with particular emphasis on extrusion, injection molding, blow molding, thermoforming, and compression molding. Polymer recycling issues are also discussed. For this course Osswald wrote the Textbook *Polymer Processing - Modeling and Simulation*, Hanser Publishers, (2006). Parts I and II of this book will be used in this course.

Developed ME 718, Modeling and Simulation Polymer Processing (1991).

This course is designed to acquaint the student with computer simulation technology used for the engineering of polymer processes, such as compression molding, injection molding, extrusion, blow molding, and many others. The course reviews the basic equations of state, presents flow and heat transfer models used in polymer processing, and illustrates their numerical implementation using finite differences, finite elements, and boundary integral methods. The various numerical techniques are subsequently used to solve problems dealing with fluid flow, heat transfer, and structural development in polymer processing operations. For this course Osswald wrote the Textbook *Polymer Processing - Modeling and Simulation*, Hanser Publishers, (2006). Part III of this book will be used in this course.

Developed ME418, Engineering Design with Polymers (1995).

This course is intended to acquaint the student with a polymers' unique behavior and its relation to design. Molecular structure and basic properties are discussed. The relation between processing and properties of the final part are covered, as are mixing,

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anisotropy, and residual stresses during solidification. Important properties and the behavior of the polymer component are discussed: mechanical behavior, failure, optical properties, permeability, and electrical properties. For this course Osswald wrote the textbook *Materials Science of Polymers for Engineers*, Hanser Publishers, (1996), 2nd Ed. (2003). The textbook has been adopted at various universities around the world. The book was translated into Japanese and Korean.

Developed ME601 (ME420), Introduction to Composites Processing (2013)

This course is intended to acquaint the student with composites manufacturing processing. The course introduces basic physical, thermal, rheological and mechanical properties of composite materials and applies these to transport phenomena concepts to solve problems of flow through porous media, fiber orientation, curing reactions, shrinkage and warpage and mechanics of composites. Introduce laboratory material characterization experiments, CAE applied to composites product design, and apply these to a final group project for the design and manufacture of a composites product. The course is a 50-50 class-laboratory course with a strong design component.

UNIVERSITY DEGREES CREATED

Master of Engineering (Polymer Engineering and Science), College of Engineering, University of Wisconsin-Madison, Inaugural Class: Fall 1998, Degree Type: Interdisciplinary. Created with Professor A.J. Giacomin.

NON-ENGINEERING RELATED PAPERS AND BOOKS (HISTORY)

1. Osswald T.A., and S. Bolovari, *Wallace H. Carothers*, (1), 12, 1999.
2. Osswald T.A., *Hermann F. Mark*, *Plastics Insight*, (2), 11, 2000.
3. Osswald T.A., *Leo H. Baekeland*, *Plastics Insight*, (3), 7, 2001.
4. Osswald T.A., *Cellulose Plastics and the \$10,000 Prize*, *Plastics Insight*, (4), 10, 2000.
5. Osswald T.A., *Polyethylene: A Product of Brain and Brawn*, *Plastics Insight*, (5), 4, 2001.
6. Osswald T.A., *Galalith: The Milk Stone*, *Plastics Insight*, (6), 9, 2001.
7. Osswald T.A., *K is for Kunststoffe*, *Plastics Insight*, (7), 1, 2002.
8. Osswald, T.A., Chapter 1 - *Family Memories*, Robert Davidsohn, Eds. M. Ingerdaay, and W. Fastenrath-Vinattieri, Leo S. Olshki Publishing House, Florence, 2003.
9. Osswald, T.A., "In Search for the Right Books - A Historical Perspective of Polymer

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Engineering Education in The United States," *A chapter in Eine «Glenzende» Geschichte* Hanser Publishers, München, 2004.

10. Osswald, T.A., "Del Caucho Natural al Caucho Sintético: un Camino del Amazona a Auschwitz - Asuntos Éticos en Ciencia e Ingeniería," *Revista SLTCaucho*, Vol. 13, 20-30 (2016)
11. The 45 members of the Misión de Sabios, including Osswald, T.A., COLOMBIA HACIA UNA SOCIEDAD DEL CONOCIMIENTO, Misión de Sabios Report to the Colombian Presidency (2020)
12. Forero Pineda, C., Wasserman, M., and Osswald, T.A., Eds., *Colombia on the Path to a Knowledge-Based Society - Reflections and Proposals*, Volume 1, Published by the Vice-Presidency of the Republic of Colombia, 2020

REFEREED JOURNAL PUBLICATIONS

1. Barone, M.R. and T.A. Osswald, "Boundary Integral Equations for Analyzing the Flow of Chopped Fiber Reinforced Polymer Compound in Compression Molding," *J. Non-Newt. Fluid. Mech.*, 26, 185-206, 1987.
2. Barone, M.R. and T.A. Osswald, "A Boundary Element Analysis of Flow in Sheet Molding Compound," *Polymer Composites*, 9, 158-164, 1988.
3. Osswald, T.A. and C.L. Tucker, "A Boundary Element Simulation of Compression Mold Filling," *Polym. Eng. Sci.*, 28, 413-420, 1988.
4. Saßmannshausen, U., W. Essig and T.A. Osswald, "The Density Distribution in Pressed Charges: An Analytical Approach," *Propell., Explos., Pyrothec*, 14, 24-27, 1989.
5. Michaeli, W., V. Hammes, K. Kirberg, R. Kötte, T.A. Osswald, and O. Specker, "Das RTM-Verfahren - Technologie und Anwendungsgebiete (RTM Process, Technology and Applications)," *Kunststoffe*, 79, 7, 586-89, 1989.
6. Michaeli, W., V. Hammes, K. Kirberg, R. Kötte, T.A. Osswald, and O. Specker, "Prozeßsimulation beim RTM-Verfahren (Simulation of the RTM Process)," *Kunststoffe*, 79, 8, 739-42, 1989.
7. Michaeli, W., M. Mahlke and T.A. Osswald, "Analyse Messungen und Simulation des Fließens von SMC mit einem Preßrheometer (Analysis, Measurements and Simulation of the Flow of SMC Using a Compression Rheometer)," *Kunststoffe*, 80, 1, 70-74, 1990.

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8. Michaeli, W., M. Mahlke, T.A. Osswald, and M. Nöhlke, "Simulation des Fließens bei SMC (Flow Simulation for SMC)," *Kunststoffe*, 80, 6, 717-721, 1990.
9. Osswald, T.A. and C.L. Tucker, "Compression Mold Filling Simulation for Non-Planar Parts Using the Finite Element/Control Volume Approach," *Internat. Polym. Process.*, 5, 2, 79-87, 1990.
10. Osswald, T.A., "A Finite Element Analysis of the Thermomechanical Behavior of Fiber Reinforced Composites," *J. Thermoplastic Composite Materials*, 4, 173-189, 1991.
11. Saßmannshausen, W., W. Essig and T.A. Osswald "Predicting the Density in Pressed Charges Using the Finite Element Analysis," *Propell Explos., Pyrothec*, 16, 73-80, 1991.
12. Cohnen, W. and T.A. Osswald, "Experimental Study of High Reynolds' Number Flows Between Narrow Gaps," *Int. J. Polym. Proc.*, VII, 4, 314-319, 1992.
13. Igl, S.A. and T.A. Osswald, "Thermoforming Simulation of Natural Fiber Filled Polyolefins," *J. of Plastic Film and Sheeting*, 8, 4, 302-332, 1992.
14. Gramann, P.J. and T.A. Osswald, "Simulating Polymer Mixing Processes Using the Boundary Element Method," *Int. J. Polym. Proc.*, VII, 4, 303-313, 1992.
15. Cohnen, W. and T.A. Osswald, "Der Werkzeug-Füllvorgang im RIM-Verfahren (Mold filling of the RIM Process," *Kunststoffe*, 82, 11, 1127-1130, 1992.
16. Gramann, P.J., J.C. Mätzig and T.A. Osswald, "Simulating the Non-isothermal Mixing of Polymer Blends Using the Boundary Element Method," *J. of Reinf. Plast. & Composites*, 12, 7, 787-799, 1993.
17. Gramann, P.J., L. Stradins and T.A. Osswald, "Flow and Heat Transfer Simulation of the Mixing of Polymer Blends Using the Boundary Element Method," *Int. J. Polym. Proc.*, (8), 4, 287-293, 1993.
18. Tseng, S.C. and T.A. Osswald, "Predicting Shrinkage and Warpage of Thin Compression Molded Fiber Reinforced Composite Parts," *SAMPE Quarterly*, (24), 4, 40, 1993.
19. Mohammed, R.K., T.A. Osswald, T.J. Spiegelhoff and E.M. Sun, "Modeling and Simulation of High Reynolds Number Flows During Reaction Injection Mold Filling," *Int. J. Polym. Proc.*, 1994.
20. Tseng, S.C. and T.A. Osswald, "Prediction of Shrinkage and Warpage of Thin Fiber Reinforced Thermoset Composite Parts," *J. Reinf. Plast. Comp.*, (13), 8, 698, 1994.

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21. Osswald, T.A., E.M. Sun, and S.C. Tseng, "Experimental Verification on Simulating Shrinkage and Warpage of Thin Compression Moulded SMC Parts," *Polym. & Polym. Compos.*, (2), 3, 187, 1994.
22. Tseng, S.C. and T.A. Osswald, "Predicting Shrinkage and Warpage of Fiber Reinforced Composite Parts," *Polymer Composites*, (15), 4, 270-277, 1994.
23. Ankenman, B., S. Bisgaard and T.A. Osswald, "Experimental Optimization of Computer Models of Manufacturing Processes," *Manufact. Review*, (7), 4, 332-345, 1994.
24. Davis, B.A., P.J. Gramann, J.C. Mätzig and T.A. Osswald, "The Dual Reciprocity Method for Heat Transfer in Polymer Processing," *Engineering Analysis with Boundary Elements*, (13), 3, 249-261, 1994.
25. Stradins, L.U. and T.A. Osswald, "Simulating the Flow of Multi-Domain Systems Using the Boundary Element Method," *Engineering Analysis with Boundary Elements*, (16), 3, 197-202, 1995.
26. Stradins, L., and T.A. Osswald, "Predicting the Effect of Viscosity Ratios on the Mixing of Polymer Blends Using the Boundary Element Method," *Polym. Eng. Sci.*, 36, 979-984, (1996)
27. Theriault, R.P., M. Buchmann and T.A. Osswald, "Polymer Flow Length Simulation during Injection Mold Filling," accepted for publication in *Polym. Eng. Sci.* 37, 3, 667-671, 1997.
28. Gramann, P.J., A.C. Rios and T.A. Osswald, "Comparative Study of Mixing in co-rotating Twin Screw Extruders Using Computer Simulation," *Adv. Poly. Tech.* 17, 107, 1998.
29. Osswald, T.A., M.D. Noriega, P.J. Gramann, and B.A. Davis, "Grooved Feed Single Screw Extruders," *Polym. Eng. Sci.*, 38, 7, 1998.
30. Gramann, P.J., C. Rauwendaal, T.A. Osswald, and G. Tellez, "Kinematics of Flow in Single Screw Extruders," *Int. J. Polym. Proc.*, 13, 4, 327-333, 1998.
31. Osswald, T.A., and E. Baur "BEM in der Kunststoffverarbeitung – Ein Überblick (BEM in Polymer Processing – A Review)," *Kunststoffe*, 89, 2, 1999.
32. Hutchinson, B., A.C. Rios and T.A. Osswald "Modeling the Distributive Mixing in an Internal Batch Mixer," *Int. J. Polym. Proc.*, 16, 315, 1999.
33. Theriault, R.P., T.A. Osswald, and J.M. Castro, "Processing Induced Residual Stress in Asymmetric Laminate Panels," *Polymer Composites*, 20, 493, 1999.
34. Theriault, R.P., T.A. Osswald, and J.M. Castro, "A Numerical Model of the Viscosity

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- of an Epoxy Prepreg Resin System," *Polymer Composites*, 20, 628, 1999.
35. Theriault, R.P., T.A. Osswald, and J.M. Castro, "Measurement and Prediction of the Glass Transition Temperature during the Processing of Copper-Clad Epoxy Laminates," *Polymer Composites*, 20, 789, 1999.
 36. Rios, A.C., T.A. Osswald, P.J. Gramann, M.P. Noriega, "Experimental and Numerical Study of Rhomboidal Mixing Sections," *Int. J. Polym. Proc.*, 15, 12, 2000.
 37. Rios, A.C., and T.A. Osswald, "Comparative Study of Rhomboidal Mixing Sections Using the Boundary Element Method," *Engineering Analysis with Boundary Elements*, 24, 89, 2000.
 38. Rios, A.C., and T.A. Osswald, "Novel BEM Simulation of Mixing in Polymer Flows Including Non-Linear Effects," *J. of Reinforced Plastics and Composites*, 19, 1474, 2000
 39. Krawinkel, S., M. Bastian, T.A. Osswald, and H. Potente, Gleichdrall-Doppelschneckenextruder Strömungssimulation mit BEM," *Plastics Special*, 12, 30, 2000.
 40. Sierra J.D., Noriega M.D., Osswald T.A. " Effect of Metallocene Polyethylene on Heat Sealing Properties of Low Density Polyethylene Blends ," *J. Plast. Film Sheet* 16, 33, 2000.
 41. M. Yuan, T.A.Osswald, and J.M. Castro "Simulation of a Continuous Copper-Clad Thermoset Composite laminate Manufacturing Process," *J. Polymer-Composites*, 2002.
 42. DeRose, A.N., M. Yuan, T.A.Osswald, and J.M. Castro "Simulation of Resin Flow During Compression of Copper-Clad Thermoset Composite laminates," *J. Polymer-Plastics Technology and Engineering*, 41, 3, 383-405, 2002.
 43. Hernandez JP, Raush T, Rios A, Strauss S, Osswald TA, "Analysis of fiber damage mechanisms during processing of reinforced polymer melts" *Engineering Analysis with Boundary Elements*, 26, 7, 89, 2002.
 44. Black Nembhard, H., N.J. Ferrier, T.A. Osswald, and J.R. Sanz-Urbe, "An Integrated Model For Statistical and Vision Monitoring in Manufacturing Transitions," *Quality and Reliability Engineering International*, 6 (19), 461-476, 2003.
 45. Osswald, T.A., "Verarbeitungsprozesse mit Modellen beschrieben," *Kunststoffe*, (93), 10, 130-134, 2003.
 46. Hernandez JP, Osswald T.A., and Weiss, D.A., Simulation of Viscous 2D-Planar Cylindrical Geometry Deformation Using DR-BEM, *International J. Num. Methods Heat & Fluid Flow*, 13 (5-6), 698-719, 2003.

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47. Noriega, M.P., Osswald, T.A., and N.J. Ferrier, "In-Line Measurement of the Polymer Melting Behavior in Single Screw Extruders," *J Polymer Engineering*, 24, (6), 557-578, 2004.
48. Hernandez JP, Raush T, Rios A, Strauss S, Osswald TA, "Theoretical analysis of fiber motion and Loads during flow," *J. Polymer-Composites*, 25, (1), 1-11, 2004.
49. Hernandez, J.P., and T.A. Osswald, "Domain Grid Superposition Technique for Non-linear BEM," Accepted in *Engineering Analysis with Boundary Elements*, (2004)
50. Hernandez, J.P., and T.A. Osswald, "A Novel Cure Reaction Model Fitting Technique Based on DSC Scans," *J. Polym. Eng.*, 25 (1), (2005)
51. A., Roldán, N., Chesler, T., Osswald. "Simulation of Blood Flow Through Mechanical Heart Valves Using The Boundary Elements Method" *Engineering Analysis with Boundary Elements*. Accepted for publication (2007)
52. Londoño, A., and Osswald, T.A., "Fiber Jamming and Fiber Matrix Separation During Compression Molding," *J. Plastics Tech.*, (5), 1, (2006)
53. Londoño, A., Hernandez, J.P., and Osswald, T.A., "Mechanisms of Fiber-Matrix Separation in Ribbed Compression Molded Parts," *J. Polym. Composites*, (4), 4, 451-457 (2007)
54. Lopez, L.M., Cosgrove, A.B., Hernandez, J.P., and T.A. Osswald, "Modeling the Vulcanization Reaction of Silicone Rubber," *Polymer Engineering & Science*, (47) 5, 675-683, (2007)
55. Lopez-Gomez, I., Estrada, O., and Osswald, T.A., "Modeling and Simulation of Polymer Processing Using the Radial Functions Method," *J. Plastics Tech.*, (3), 2, (2007)
56. Lopez-Gomez, I., Estrada, O., and Osswald, T.A., "'Radial Basis Functions Interpolation for Non-Isothermal Non-Newtonian Flow, Considering Viscous Dissipation and Inertia Effects'," *International Journal of Numerical Methods for Heat and Fluid Flow*, Accepted for publication, (2007)
57. Cruz, J.C. and Osswald, T.A., "Precise Curing Analysis of Highly Accelerated Unsaturated Polyester Reactions," *J. Plastics Tech.*, 4, 3 (2008)
58. Ralston, B., and Osswald, T.A., "Viscosity of soy protein plastics determined by screw-driven capillary rheometry," *J. of Polym. Environ.*, (3), 16 (2008)
59. García S., Roldán A. and Osswald T., "Thin-Walled Injection Molding - A Dimensional and Scaling Analysis Approach," *J. Plastics Tech.*, 4, 5, (2008)

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60. T. Beiss, M. Menacher, R. Feulner, G. Huelder, Osswald T., "Kleben von duroplastischen Verbundwerkstoffen - Kurzer Prozess dank Vibrationsschweißtechnik", *Adhäsion, Kleben und Dichten*, 10, 22, (2008)
61. Roldán A., Weiben O., Haughton V., Chesler N. and Osswald T., "Characterization of CSF hydrodynamics in the presence and absence of tonsillar ectopia by means of computational flow analysis (CFA)," *Americal Journal of Neuroradiology*, 30, 941 (2009)
62. Cruz, J.C. and Osswald, T.A., "Monitoring Epoxy and Unsaturated Polyester Reactions Under Pressure-Reaction Rates and Mechanical Properties," *Polymer Engineering and Science*, 49 (11), 2099-2108 (2009)
63. Londoño, A., and Osswald, T.A., "Modeling of the Fiber Jamming Phenomena during Processing of Fiber-Reinforced Composite Parts," *Key Eng. Mater.*, (425), 33 (2010)
64. Beiss, T.; Menacher, M.; Feulner, R., Hülder, G., and Osswald, T. A., "Vibration Joining of Fiber-Reinforced Thermosets," *Polymer Composites*, 31, 7, p. 1205-1212 (2010)
65. Stark, N., White, R.H., Mueller, S.A., and Osswald, T.A., "Evaluation of Various Fire Retardants for Use in Wood Flourepolyethylene Composites" *Polymer Degradation and Stability*, (95) pp. 1903-1910 (2010)
66. Feulner, R., Brocka, Z., Seefried, A., Kobes, M., Hülder, G., and Osswald, T.A., "The effects of e-beam irradiation induced cross linking on the friction and wear of polyamide 66 in sliding contact," *Wear*, (268), 7-8, 905-910 (2010)
67. Hernández, J.P., and T.A. Osswald, "Modeling Processing of Silicone Rubber: Liquid Versus Hard Silicone Rubbers," *Journal of Applied Polymer Science*, (119), 1864-1871 (2011)
68. Londoño, A., Osswald, T.A., and Hernandez, J.P. "Modeling the Behavior of fiber suspensions in the Molding of Polymer Composites," *J.Reinf.Plust.& Comp.*, (30), 781-790 (2011)
69. Rudolph, N., Osswald, T.A., Ehrenstein, G.W., "Influence of Pressure on Volume, Temperature and Crystallization of Thermoplastics during Polymer Processing", *International Polymer Processing* (26) 3, 239-248 (2011)
70. Aquite, W. and Osswald, T.A., "Producción de micropellets para procesos de sinterizado," *Avances - Investigación en Ingeniería* (15) 97-102 (2011)
71. Osswald, T.A., "An Educational and Scientific Renaissance in Colombia - A Strong Start of the 21st Century," *DYNA-COLOMBIA*, 78 (170): 5-6 (2011)

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72. Holmes, L., Favero, J. and Osswald, T.A., "Numerical simulation of three-dimensional viscoelastic planar contraction flow using the software OpenFOAM," *Computers and Chemical Engineering* (37) 64-73 (2012)
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193 Duddleston, L., and Osswald, T.A., “Differential Scanning Calorimetry (DSC) Quantification of Polyamide 12 (Nylon 12) Degradation during the Selective Laser Sintering (SLS) Process,” ANTEC, Annual Technical Conference Proceedings, Indianapolis, IN 2016.

194 Schäfer, C., and Osswald, T.A., “Micropelletiation and Their Application to Manufacturing Porous Plastic Parts,” ANTEC, Annual Technical Conference Proceedings, Indianapolis, IN 2016.

195 Brill, A., and Osswald, T.A., “Viscoelastic Shear Analysis of Polymeric Foam Midsoles,” ANTEC, Annual Technical Conference Proceedings, Indianapolis, IN 2016.

196 Goris, S., and Osswald, T.A., “Analysis of the Process-Induced Microstructure in Injection Molding of Long Glass Fiber-Reinforced Thermoplastics,” ANTEC, Annual Technical Conference Proceedings, Indianapolis, IN 2016.

197 Goris, S., and Osswald, T.A., “Progress on the Characterization of the Process-Induced Fiber Microstructure of Long Glass Fiber-Reinforced Thermoplastics,” Automotive Composites Conference and Expo (ACCE), (**Best Paper Award**) Detroit, MI 2016

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Professor Tim A. Osswald

Fiber Matrix Separation," Automotive Composites Conference and Expo (ACCE) (Third Best Paper Award), Detroit, MI 2016

199.Simon, S., Goris, S., Bechara, A., and Osswald, T.A. "Study on Fiber Attrition of Long Glass Fiber-Reinforced Thermoplastics under Controlled Conditions in a Couette Flow," Automotive Composites Conference and Expo (ACCE), (Best Poster Award) Detroit, MI 2016

200.Duddleston, L.J.D., Woznick, K., Koch, C., Mazzei Capote, G., Rudolph, N., and Osswald, T.A., "Extrudate Mass Flow Rate Analysis in Fused Filament Fabrication (FFF): A Cursory Investigation of the Effects of Print Parameters," ANTEC, Annual Technical Conference Proceedings, Anaheim, CA 2017

201.Schäfer, C., Bryant, J. S., Meyer, S. P. and Osswald, T., "Micropelletization of Virgin and Recycled Thermoplastic Materials," ANTEC, Annual Technical Conference Proceedings, Anaheim, CA 2017

202.Goris, S., Simon, S., Montoya, C., Bechara, A., Brands, D., Angel, Y., Candal, M.V., Osswald, T.A., "Experimental Study on Fiber Attrition of Long Glass Fiber-Reinforced Thermoplastics under Controlled Conditions in a Couette Flow", ANTEC, Annual Technical Conference Proceedings, Anaheim, CA 2017

203.Walter, I., Goris, S., Teuwsen, J., Tapia, A., Perez C., Osswald, T.A., "A Direct Particle Level Simulation Coupled with The Folgar-Tucker RSC Model to Predict Fiber Orientation in Injection Molding of Long Glass Fiber Reinforced Thermoplastics", ANTEC, Annual Technical Conference Proceedings, Anaheim, CA 2017

204.Teuwsen, J., Goris, S., Osswald, T.A., "Impact of the Process-Induced Microstructure on the Mechanical Performance of Injection Molded Long Glass Fiber Reinforced PP", ANTEC, Annual Technical Conference Proceedings, Anaheim, CA 2017

205.Obst, P., Launhardt, M., Drummer, D., Osswald, P.V., and Osswald, T.A., "Failure Criterion for SLS Additive Manufactured Parts", ANTEC, Annual Technical Conference Proceedings, Anaheim, CA 2017

206.Werner, S., Knoeppel, A., Goris, S., and Osswald, T.A., "Effect of Initial Fiber Length on Fiber Attrition During Processing of Long Glass Fiber-Reinforced Polypropylene", Automotive Composites Conference and Expo (ACCE), (1st Place in Best Poster Award Competition) Detroit, MI 2017

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207. Walter, I., Kuhn, C., and Osswald, T.A., "Investigation of Fiber-Matrix Separation in Rib Filling During Compression Using a Direct Fiber Simulation", Automotive Composites Conference and Expo (ACCE), (3rd Place in Best Poster Award Competition) Detroit, MI 2017
208. Osswald, T.A., "Fused Filament Fabrication Melting Model," RAPID 2018, Ft Worth, TX, April 25, 2018
209. Mazzei, G., and Osswald, T.A., "A Tensor Based Failure Criterion for Fused Filament Fabrication Manufactured Parts," RAPID 2018, Ft Worth, TX, April 25, 2018
210. Mulholland, T., Rudolph, N., and Osswald, T.A., "Fused Filament Fabrication for Manufacturing of Air-Cooled Heat Exchangers," RAPID 2018, Ft Worth, TX, April 25, 2018
211. Johnson, C., Herrera, R., Osswald, T.A. (2018). "Strength Analysis of Fused Filament Fabricated Continuous Carbon Fiber Composite Test Samples," SPE ANTEC, Orlando, 2018.
212. Colón, J., Heckner, T., Chrupala, A., Goris, S., Pollock, J., Osswald, T.A. (2018). "Observed Particle Migration During Processing of Polypropylene with Glass Beads," SPE ANTEC, Orlando, 2018.
213. Simon, S., Bechara, A., and Osswald, T.A., "Fiber Orientation Evolution in Injection Molded Parts," SPE Automotive Composites Conference and Expo, Detroit, MI, September 6, 2018 (Best Paper Award)
214. Redmann, A., and Osswald, T.A., "3D Printed B-Stage Epoxy for Composite Joining and Feature Integration," SPE Automotive Composites Conference and Expo, Detroit, MI, September 6, 2018 (Second Best Paper Award)
215. Osswald, T.A., "Procesamiento y Reología de Polímeros," IV Simposio de Materiales Poliméricos (4th Symposium for Polymeric Materials) Cali, Colombia, September 13, 2018 (Plenary Lecture)
216. Mazzei Capote, G. A., Osswald T. A., "A novel failure criterion applied for Fused Filament Fabrication parts", AMUG, Chicago, IL, April 3rd, 2019
217. Osswald, T.A., "Hermann Mark – The Father of Polymer Science," Plastics Heritage Congress - 2019, 2Lisbon, Portugal, 9-31 May, 2019.
218. Oehlmann, P., Redmann, A., and Osswald, T.A., "3D Printed Dual Cure Epoxy for Hybrid Composite Structures," SPE Automotive Composites Conference and Expo, Detroit, MI, September 6, 2019 (Second Best Paper Award)

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219.Simon, S.A., Bechara, A.S., and Osswald, T.A., "Direct Fiber Model Validation: Orientation Evolution in Simple Shear Flow," SPE Automotive Composites Conference and Exhibition, Novi, MI, September 4, 2019 (Best Paper Award)

220.Osswald, T.A., Román, A., and Travis, J.Z., "Análisis estacional y caracterización de plantaciones de caucho natural: Propiedades térmicas, mecánicas, químicas y reológicas de látices obtenidos," ("Seasonal Analysis and Characterization of Natural Rubber Plantations: Thermal, Mechanical, Chemical and Rheological Properties") XV Jornadas Latinoamericanas de Tecnología del Caucho, Querétaro, Mexico, 11-15 November, 2019 (Invited presentation)

PATENTS

1. US 5,971,603 Static Mixer Head
2. US 6,136,246 Screw extruder with improved dispersive mixing elements
3. US 7,314,363 Device to visualize in-line and quantify the polymer melting in plasticating screw machines without significantly affecting its thermal regime
4. US 9,321,207 Polymer Pelletization Via Melt Fracture
5. US 9,205,590 Micropelletizer Using Rayleigh Disturbances
6. US 9,895,844 System for Use with Three Dimensional Printer and Method for Using the Same (applied 2015, granted 2018)
7. WO2015126733 System for Use with Three Dimensional Printer and Method for Using the Same
8. US11,207,799 B2 Pelletization Gas Guide
9. United States Patent Application 20230339155, METHOD FOR SIMULATING A FIBER ORIENTATION IN AN INJECTION-MOLDED PART MADE OF A FIBER-REINFORCED PLASTIC, AND DESIGN METHOD FOR DESIGNING AN INJECTION-MOLDED PART MADE OF A FIBER-REINFORCED PLASTIC
10. WO2023144631 Ammonia-Free Latex Compositions
11. US 11,911,949 Rotating Nozzle Structure and Method

EXTENSION/OUTREACH/SEMINARS

Professor Tim A. Osswald

Extrusion Seminar at UW-Milwaukee Extension
Manufacturing with Plastics - College for Kids Workshop at UW

Basic Manufacturing Engineering - Engineering Professional Development at UW

Polymers 101 - Engineering Professional Development at UW

Modeling in Polymer Processing - LKT, University of Erlangen, Germany

Simulation in Polymer Processing - LKT, University of Erlangen, Germany

Molding Processes Simulations - Neue Materialien Fürth GmbH, Germany

Polymer Processing - ICIPC, Colombia

Polymer Physics for Engineers - ICIPC, Colombia

Presents several seminars and courses at various industries and institutes in German, Spanish and English.

PROFESSIONAL SERVICE

1. International and National Committees and Boards

International advisory committee member of the International Society for Boundary Elements. 1994-2001.

Co-chair of the 17th International Boundary Element Conference sponsored by the International Society for Boundary Elements. (1995)

Editorial Board of *Engineering Analysis with Boundary Elements*. 1996-2001

Board of the Society of Plastics Engineers – Extrusion Division. 1997-2000

Editor for the Americas of *Journal of Polymer Engineering*. 1998-present.

Chief English Language Editor (Prof. G.W. Ehrenstein, Chief German Language Editor) for the *Journal of Polymer Technology (Archival Journal of the WAK)*, 2005-present

Editorial Board of *Journal of Composites Science*. 2017-Present

Editorial Board of *Polymers*. 2019-present

Editorial Manager for *Science and Engineering of Composite Materials*

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Advisory Board of Hanser Publishers, 1998-present.

Technical Advisory Board Member, Teel Plastics, Baraboo, WI, 2009-present

Scientific Advisory Board, SABIC, 2016-present

Editor of Polymer Composites (SPE archival journal) 2021-present

Scientific Advisory Board Member, RWTH-Aachen (Technical University-Aachen), Cluster of Excellence Integrative Production Technology for High-Wage Countries, Aachen, Germany, 2011-present
Editorial Board of *Journal of Science and Engineering of Composite Materials*, 2016-present

2. Professional Society Memberships

Polymer Processing Society (Treasurer)
Society of Rheology
Society of Plastic Engineers (Fellow)
ACS - Rubber Division
WAK, Scientific Alliance of Polymer Technology Professors

3. Technical Reviewer Activities

National Science Foundation
1990-present Have served one review panels yearly in the DMII Division, Engineering Directorate
Reviewer for the J. of Non-Newtonian Fluid Mech
Reviewer for the Int. J. of Polymer Processing
Reviewer for the Ohio Supercomputing Grant Awards
Reviewer for ASME WAM papers
Reviewer for ASME J. of Engineering for Industry
Reviewer for Int. J. of Polymer Proc., and Polym. Eng. and Sci.
Reviewer for J. Polym. Composites.

4. Faculty Advisor

Theta Tau Professional Fraternity
Society of Hispanic Professional Engineers (SHPE)
Society of Plastics Engineers