CONTENTS

VOLUME I — PROCESSING

EXTRUSION DIVISION

M2 — Twin Screw Extrusion

Devolatilization of Polymers in a Transparent Double-Screw Extruder (341)......................................................... 2
I. Gestring, D. Mewes, Institute for Process Engineering, University of Hannover

Influence of the Reactive Extrusion Conditions on the Free Radical Induced Carboxylation of Poly(L-Lactide) (595)................................. 7
G.C. Gemeinhardt, R.B. Moore, The University of Southern Mississippi

Deeper Screw Flights Offer New Opportunities For Co-Rotating Twin Screw Extruders (106)................................. 12
K. Kapfer, E. Haring, Coperion Werner & Pfleiderer Stuttgart

Pressurization and Energy Characteristics of Strainer Disk Elements CFD Calculations and Experimental Results (839)................................................................. 17
R. Kuhn, P. Heidemeyer, Coperion Werner & Pfleiderer GmbH & Co.

In-Line Measurement of Local Residence Time Distribution in A Twin Screw Extruder (39)........................................ 28

M3 — TAPPI

Reducing Curl in Multilayer Blown Film. Part I: Experimental Results, Model Development and Strategies (1241). ......................................................... 32
B.A. Morris, DuPont

Reducing Curl in Multilayer Blown Film. Part II: Application of Predictive Modeling to A Barrier Cereal Liner Film (1242)... 40
B.A. Morris, DuPont

Temperature Isolation in Blown Film Dies (1240)... 47
D. Naden, Brampton Engineering

3D FEM Simulation of Feed-Block Profiling for Flat Die Coextrusion (1243)................................................................. 53
J. Perdikoulias, Compuplast Canada Inc.
J. Svabik, Compuplast International Inc.

The Use of Polymer Processing Additives to Improve Melt Processing of m-LLDPE Extrusion (1238)................................................................. 58
K.R. Slusarz, Davis-Standard A Crompton Business
S.E. Amos, Dyneon LLC, A 3M Company

M25 — Single Screw Tutorial

Screws for Plastics Processing (351) ................................................................................................................................. 64
J.D. Frankland, Milacron, Inc

Barrier Screws, Their History and Their Function (129) ........................................................................................................ 69
E. Steward, American Kuhne Corp.

Basic Screw Geometry "Things Your Screw Designer Never Told You About Screws!!" (983)........................................ 74
T.W. Womer, New Castle Industries, Inc.

Screw and Barrel Design for Grooved Feed vs. Smooth Bore Extruders (229)........................................................................ 80
J. Wortberg, Gerhard-Mercator-University of Duisburg

Mixing in Extrusion - Parts One General Considerations (326) ......................................................................................... 85
C. Rauwendaal, Rauwendaal Extrusion Engineering, Inc.

Application of a Single Screw Extruder Simulation Towards Design (436) ................................................................. 100
J. Vlcek, J. Perdikoulias, Compuplast International, Inc

Troubleshooting Dehumidifying Dryers (767) .................................................................................................................. 105
P. Stoughton, Conair
M26—Die Design and Modeling

Melt Flow Instability Studies of Metallocene Catalyzed LLDPE In Pelletizing Dies (361) .......................................................... 112
C.G. Gogos, B. Qian, D.B. Todd, Polymer Processing Institute, and NJ Institute of Technology
T.R. Veariel, ExxonMobil Chemical Company

Die Lip Build-up in the Extrusion of Highly Filled Low Density Polyethylene (264) .......................................................... 117
C.D. Lee, Equistar Chemicals, LP

Optimisation ofthe Flow Distribution in Profile Extrusion Dies (63) .......................................................... 122
J.M. Nobrega, O.S. Carneiro, Universidade do Minho
F.T. Pinho, Faculdade de Engenharia da Universidade do Porto
P.J. Oliveira, Universidade da Beira Interior

Coupled Rheological and Mechanical Design of Stackable Spiral Dies (545) .......................................................... 127
B. Rotter, W. Michaeli, Institut für Kunststoffverarbeitung (IKV)

Numerical Simulations on Multi-Layer Co-Extrusion Process (907) .......................................................... 132
J. Guo, K.S. Hyun, C.G. Gogos, Polymer Processing Institute

Computer Aided Optimization of Extrusion Dies (554) .......................................................... 137
S. Kaul, W. Michaeli, Institut für Kunststoffverarbeitung (IKV)

The Use of Three-Dimensional Computation Fluid Dynamics in the Design of Profile Dies (156) .......................................................... 142
W.A. Gifford, Dieflow

Automated Sheet Die Design (695) .......................................................... 147
L.G. Reifschneider, Illinois State University

M45—Film Extrusion and Properties

* A Tubular Melt Extrusion of Poly(Vinylidene Fluoride): Structure/Process/Property Behavior as a Function of Molecular Weight (Mw) (694) .......................................................... 2390
J. Xu, M. Johnson, G. Wilkes, Virginia Tech

* The Influence of SolidState Morphology on the Impact Strength of Linear Low-Density Polyethylene Blown Films (527) .......................................................... 2395
R.K. Krishnaswamy, A.M. Sukhadia, Chevron Phillips Chemical Company, LP

* Effect of Aging on Film Properties of Ethylene-Alpha Olefin Copolymers (611) .......................................................... 2400
H. Mavridis, Equistar Chemicals, LP

* Measuring Dart Impact Strength of Polyethylene Films (654) .......................................................... 2405
S.K. Goyal, V. Ker, T. Chuang, NOVA Chemicals Corporation
M. Gil, BP Chemicals SNC

* Blocking of LLDPE Films - Effect of Surface Morphology (131) .......................................................... 2410
O. Vincent, E. Osmont, BP Chemicals s.n.c, Research and Technology Centre
F. Sommer, Biophy Research S.A. Village d’Entreprises de Saint Henri

* The Effect of Extrusion Processing Conditions on the Thermal and Mechanical Performance of Extrusion Cast Metallocene Polyethylene Films (291) .......................................................... 2415
B.G. Millar, G.M. McNally, W.R. Murphy, Polymer Processing Research Centre, Queen’s University Belfast

* Modeling of the Temperature Profile in Film Coextrusion (82) .......................................................... 2420
J-P. Puaux, ISTIL, Universite de Lyon, France

T1—Single Screw Extrusion

Improved Screw Design for Maximum Conductive Melting (414) .......................................................... 154
J.A. Myers, R.A. Barr, Barr, Inc

Analysis of the Polymer-Pellet-Flow Into the First Section of a Single Screw (319) .......................................................... 158
H. Potente, T.C. Pohl, University of Paderborn, Institut für Kunststofftechnik

Extruder Output-Pressure Relationships for Power Law Fluids Including Leakage Flow (770) .......................................................... 163
C. Rauwendaal, R. Ortega, Rauwendaal Extrusion Engineering, Inc.

An Introduction to the Theory and Practice of A New Class of Insert Based Rotor Stator Extruder Mixers (1036) .......................................................... 172
R. Hilder, Kaltor Limited

* Present in a joint session.

x / ANTEC 2002
Pressure Distribution in Screw Extruders (10) ................................................................. 177
C. Rauwendaal, Rauwendaal Extrusion Engineering, Inc

T2—Extrusion Modeling

Analysis of Flow in Single Screw Extruders (256) ......................................................................... 184
J. Sun, Fluent, Inc.
C. Rauwendaal, REE, Inc.
An Experimental Investigation of Screw Configuration on Temperature Rise in Single Screw-Pump
Extruders (237) ....................................................................................................................... 189
G.A. Campbell, H. Cheng, C. Wang, M. Bullwinkel, M.A. Te-Riele, Clarkson University, Polymer
Fabrication and Properties Laboratory
Parametric Study of Mixing Efficiency in a Kneading Block Section of Twin-Screw Extruder (399) ........... 194
B. Alsteens, V. Legat, University of Louvain-la-Neuve
T. Avalosse, T. Marchal, Polyflow, S.A.
Description of the Transport Mechanisms in Planetary Roller Extruders (135) ................................. 199
A. Limper, S. Seibel, University of Paderborn, Institut fuer Kunststofftechnik
Numerical Simulation of Bulk Polymerization of (epsilon)-Caprolacton in Extrusion (738) ................. 204
L. Zhu, K.S. Hyun, New Jersey Institute of Technology

T23—Extrusion Performance Evaluations Using Process Sensor Technologies

In-Line Measurement of Dispersed Phase Properties Using the Scanning Particle Monitor (116) ........... 3416
L.D. Ing, S.T. Balkc, University of Toronto
N.V. Brewster, Novosight Inc.
Application f Ultrasound in the Determination of Fundamental Extrusion Performance: Barrel and
Screw Wear Measurement (935) ................................................................................................. 3421
C-K. Jen, Z. Sun, National Research Council
M. Kobayashi, McGill University
M. Sayer, Queen's University
C-K. Shih, CKS Research & Consulting, LLC
Application f Ultrasound in the Determination of Fundamental Extrusion Performance: Residence
Time Distribution Measurement (939) ......................................................................................... 3426
Z. Sun, C-K. Jen, National Research Council
C-K. Shih, D.A. Denelsbeck, DuPont Science & Engineering
In-Line Monitoring of Polymer Additives During Extrusion Using a UV Spectrometer (1028) ............. 3431
J. Lutzen, S.T. Balkc, University of Toronto
K. Van Veen, Vintex, Inc.
Online Measurements and Heat Transfer Issues in Blown Film Extrusion (664) ................................. 3435
S. Cherukupalli, R. Paradkar, A.A. Ogale, Clemson University
A.J. McHugh, L. Henrichsen, University of Illinois

T28—Nanocomposites

Cartography in Flatland: An Overview of Analytical Techniques for Characterizing Nanocomposite
Morphology (1133) .................................................................................................................... 210
A.P. Andrews, Ferro Corporation
D. Chundury, Ferro Filled and Reinforced Plastics
Nanocomposites: A Single Screw Mixing Study of Nanoclay-filled Polypropylene (565) .................... 214
T.W. Womer, W.S. Smith, New Castle Industries, Inc.
Twin Screw Extrusion Guidelines for Compounding Nanocomposites (108) ....................................... 219
P.G. Anderson, Coperion Corporation
Twin Screw Extrusion of Polyurethane Nanocomposites (727) ......................................................... 224
E.A. McLaughlin, B.E. Koene, Triton Systems, Inc.

* Present in a joint session.
T29—Film Extrusion

The Effect of Extrusion Processing Conditions and Polyisobutylene Concentration on the Properties of Polyethylene for Stretch and Cling Film Applications (344) .................................................. 230
C.M. Small, G.M. McNally, W.R. Murphy, Polymer Processing Research Centre, Queen's University Belfast
Ashby Building
A. Marks, Steve Orr Ltd
Effect of High Density Polyethylene Concentration and Melt Temperature on Crystalization Dynamics During Film Blowing of Linear Low Density Polyethylene (234) .................................................. 235
G.A. Campbell, O.Y. Alothan, M.D. Bullwinkel, Clarkson University
Transient Simulation of Film Blowing Process (801) .................................................. 240
R. Mayavaram, Altair Engineering, Inc
J.N. Reddy, Texas A&M University
The Influence of Small Amounts of LDPE on the Morphology and Resulting Haze of LLDPE Blown Films (1233) .................................................. 245
K. Jordens, Eastman Chemical Company, Texas Eastman Division

W1—Extrusion General

Rheological Properties and Their Influence on Extrusion Characteristics of HDPE-Wood Composite Resins (370) .................................................. 252
K. Xiao, Brampton Engineering Inc.
C. Tzoganakis, University of Waterloo
Characterization of Apparent Viscosity with Respect to a PVC-Wood Fiber Extrusion Process (1079) .................................................. 257
T.M. Bender, Aspen Research Corporation
Structure Development in Fiber Extrusion of Isotactic Polypropylenes of Varying Tacticity (28) .................................................. 263
D. Choi, Institute of Polymer Engineering, University of Akron
Fiber Orientation in Multilayer Tubes from a Conical Extruder (228) .................................................. 268
A. Sarigolu, P-O. Hagstrand, J-A.E. Manson, Laboratoire de Technologie des Composites et Polyméres (LTC) Ecole Polytechnique Federale de Lausanne
Investigation of the Local Residence Time Distribution in Special Mixing Elements for Co-Rotating Twin Screw Extruders (1104) .................................................. 273
H. Potente, K. Kretschmer, T. Preub, Institut fur Kunststofftechnik, University of Paderborn, Germany
J. Flecke, Bayer AG

W2—Inline Compounding

New Developments in Co-Rotating Twin-Screw Extrusion for Production of Long Glass Fiber Composites (109) .................................................. 280
D. Schwendemann, Coperion Werner & Pfleiderer
Thick Composite Extrusion Process (373) .................................................. 285
A. Okerson, Vinyltec, LLC
M. Mack, Berstorff Corporation
The Evolution of Direct Extrusion Using High Speed Twin Screw Extruders (1035) .................................................. 290
C. Martin, Leistritz
In-Line Compounding: Characterization of Melt Pump Performance (1032) .................................................. 295
G.S. Donoian, J.P. Christiano, Davis-Standard Corporation

W20—Single Screw Extrusion

Fundamental Characterization of Polypropylene Extrusion (448) .................................................. 302
E.E. Stangland, J. Dooley, M.A. Spalding, E.K. Kim, The Dow Chemical Company
K.S. Hyun, Polymer Processing Institute and New Jersey Institute of Technology
An Experimental Study of the Flows in an Energy Transfer Screw (659) .................................................. 307
S.A. Somers, M.A. Spalding, J. Dooley, The Dow Chemical Company
K.S. Hyun, NJIT
Stability of Two-Stage Single-Screw Extruders (206) .................................................. 312
S.J. Derezinski, Eastman Kodak Company
Experiments and Simulations With Barrier Screws (700) .......................................................... 318
R.J. Castillo, Dual Spiral Systems, Inc.
D. Strutt, Polydynamics, Inc.
J. Vlachopoulos, McMaster University

Effect of Groove Geometry on the Performance of Grooved Feed Extruders (762) ......................... 323
C. Ronaghan, J.P. Christiano, Davis-Standard Corporation

An Experimental Investigation of Solids Conveying - Flow Rate and Temperature Rise in Single Screw Extruders (235) .......................................................... 328
G.A. Campbell, J.C. Baird, L. Gillette, J. Stowe, Polymer Fabrication and Properties Laboratory
M. Bullwinkel, Polymer Fabrication and Properties Laboratory

A Plasticating Screw Design for the Reprocessing of Multi-Layer or Multi-Material Plastic Formulations (53) .......................................................... 333
R. Malloy, A. Filip, University of Massachusetts Lowell
M. Colella, Spirex Corporation

Transient Behavior of Extruders: Input Disturbances (676) .......................................................... 339
R. Mudalamane, D. Bigio, University of Maryland

W21—Extrusion Melting

Evaluation of Melting Performance of a Co-Rotating Twin-Screw Extruder (423) .......................................................... 350
P.H. Elemans, P. Bleiman, J. Blanchard, DSM Research

Melting Model For Co-Rotating Twin-Screw Extruders (424) .......................................................... 355
P. Bleiman, M. Bulters, P. Elemans, DSM Research

The Melting Behavior of Amorphous Polyester in a Co-Rotating Twin Screw Extruder (701) ........ 360
B. Qian, C.G. Gogos, D.B. Todd, Polymer Processing Institute and NJ Institute of Technology

Experimental Study of LDPE Melting in a Twin Screw Extruder Using On-Line Visualization and Axial Pressure and Temperature Measurements (912) ........ 365
M.D. Wetzel, E.I. du Pont de Nemours and Co., Inc.

Comparison of the Experimentally Observed TSE Melting Lengths with those Predicted from Simple Plastic Energy Dissipation Compressive Experiments (Part I: Experimental) (362) ........ 370
C.G. Gogos, B. Qian, D.B. Todd, Polymer Processing Institute, and NJ Institute of Technology
M-H. Kim, LG Chemical Ltd.

The Melting Behavior of Polyethylenes Synthesized with Ziegler-Natta and Constrained Geometry Catalysts (186) .......................................................... 375
A.N. Smith, A. Hrymak, McMaster University
J. Dooley, M.A. Spalding, The Dow Chemical Company
K.S. Hyun, Polymer Processing Institute and NJ Institute of Technology

Dispersed Solids Melting Model in Single Screw Extrusion (868) .......................................................... 380
H. Potente, J. Pape, University of Paderborn

The Melting Characteristics of Polycarbonate Resins (454) .......................................................... 384
T.A. Hogan, M.A. Spalding, The Dow Chemical Company
K.S. Cho, C.I. Chung, Rensselaer Polytechnic Institute

INJECTION MOLDING DIVISION

M4—Materials

Gloss Modeling of Injection Molded Rubber-Modified Styrenic Polymers (184) .......................................................... 390
K.A. Koppi, J.M. Ceraso, J.A. Cleven, B.A. Salamon, The Dow Chemical Company

Morphological Development and Mechanical Performance of Injection Molded Starch Based Composites (212) .......................................................... 395
R.A. Sousa, R.L. Reis, A.M. Cunha, University of Minho
M.J. Bevis, Brunel University

The Effect of Pigment Type and Concentration on the Mechanical and Thermal Properties of Injection Moulded Polypropylene (325) .......................................................... 400
P.R. Hanna, G.M. McNally, I. Major, M.P. Kearns, Queen's University Belfast
Effects of Fiber Orientation Upon the Electromagnetic Shielding of Injection Molded Liquid Crystal Polymers (444) ........................................... 405
W.S. Jou, National Kaohsiung University of Applied Sciences

Injection Molding of Glass Fiber Reinforced PA-6 Nanocomposites (536) ........................................... 410
A. Garcia-Rejon, A. Derdouri, J. Denault, K. Cole, National Research Council
P.R. Hornsby, Brunel University

M5—General Session 1

An Evaluation Of Heat Management In Injection Mould Tools (59) ........................................... 416
P.S. Allan, B.A. McCalla, Y. Mubarak, The Wolfson Centre for Materials Processing, Brunel University, Uxbridge, U.K.
D. Mulligan, National Physical Laboratory, Teddington, U.K.
The Effect of Processing Conditions on the Appearance of Flow Lines in Injection Molded Articles Incorporating Pearlescent Pigments (103) ........................................... 421
J. Prasannakumar, P. Ghogomu, R.E. Schott, M. Fiddy, University of Massachusetts Lowell, Lowell, MA

Mechanical Properties of Two Component Injection Molded Parts (145) ........................................... 430
D.B. Tchalimov, A.M. Cunha, University of Minho, Campus de Azurém, 4800-058, Guimarães, Portugal

In-Mold Transient Measurement of Thermal Diffusivity for Foam and Filled Materials Using Injection Molded Cylinders (176) ........................................... 435
M.J. Sullivan, N.R. Schott, University of Massachusetts Lowell

Establishment of Valve Gate System for Sequential Injection Molding (224) ........................................... 439
S-C. Chen, M-S. Chung, H-S. Peng, L-T. Huang, Chung Yuan University, Chung-Li, 32023, Taiwan, R. O. C.

M6—CAD/Simulation 1

Miniaturized Sensor for the Measurement of Temperatures in a Mold Cavity (71) ........................................... 446
M. Moneke, J. Amberg, German Institute for Polymers (DKI), Technical University of Darmstadt, Germany
N. Holstein, M. Guttmann, K. Seemann, W. Pfleging, Karlsruhe Research Center GmbH (FZK), Karlsruhe, Germany

The Use of a Design of Experiments (Doe) to Optimize Processing Conditions of an Injection Molded Gear (190) ........................................... 451
B.P. Johnson,
To Refine Mesh or Not To ? An Innovative Mesh Generator for 3d Mold Filling Analysis (322) ........................................... 455
R-Y. Chang, National Tsing-Hua University
L. Liu, W-H. Yang, V. Yang, D.C. Hsu, CoreTech System Co., Ltd.

Three-Dimensional Filling and Post-Filling Simulation of Metal Injection Molding (250) ........................................... 460
F. Ilinca, J-F. Hetu, A. Derdouri, National Research Council of Canada
J. Stevenson, Honeywell International, Inc.

Interface and Encapsulation in Simultaneous Co-Injection Molding of Disk: Two-Dimensional Simulation and Experiment (249) ........................................... 465
C.T. Li, A.I. Isayev, Institute of Polymer Engineering, The University of Akron, Akron, OH 44325-0301

M27—Gas Assist

Morphology Development in L-PP Articles Moulded via Cryogenic Gas-Assisted Injection Moulding (87) ........................................... 472
R. Magalhaes, G.F. Smith, University of Warwick, UK
M.C. Cramez, Universidade do Minho, Portugal

Experimental Study of Gas Penetration in the Gas-Assisted Injection Molding (174) ........................................... 477
J-W. Shin, A.I. Isayev, The University of Akron

Control of Gas Direction in Gas Assisted Injection Molding; Definition of Resistance to Velocity (207) ........................................... 482
Y. Soh, K-H. Lim, Taegu University

Design Sensitivity Analysis of Gas-Assisted Injection Molding (251) ........................................... 488
F. Ilinca, J-F. Hetu, National Research Council of Canada
Automated Set-Up for Gas Assisted Injection Moulding (470) .......................................................... 493
L. Mulvaney-Johnson, P.D. Coates, University of Bradford
R.G. Speight, Moldflow Pty. Ltd.
Simulation of Microcellular Foaming in Injection Molding (500) .................................................. 498
R. Zheng, Moldflow Pty. Ltd.
P. Kennedy, Moldflow Corporation
J. Xu, L. Kishbaugh, Trexel Inc
The Effect of Internal Cooling on Fingering in the Gas-Assisted Injection Molding (616) .................. 503
J.S. Lee, S. Cha, F. Lai, University of Massachusetts Lowell
Experimental Studies in Gas-Assist Injection Molding to Investigate Residual Wall Thickness and
Gloss Levels (1115) .......................................................................................................................... 508
C. Cooper, J. Kampian, J. McCanna, R. Proatte, Bayer Corporation

M28—Analysis

Studies on the Influence of the Holding Pressure on the Orientation and Shrinkage of Injection Molded
Parts (98) ........................................................................................................................................ 516
A.J. Pontes, M.J. Oliveira, A.S. Pouzada, Universidade do Minho
Study of Flow Marks during Injection Molding (269) ................................................................. 521
G. Xu, K.W. Koelling, The Ohio State University
Studies of the Process- Property Interaction of the Micromoulding Process (476) ......................... 526
M.T. Martyn, B. Whiteside, P.D. Coates, University of Bradford
P.S. Allen, P. Hornsby, Brunel University
The Effects of Processing Variables on The Weld-Line Strength of Plastics in Aggressive
Environments: Part I – Materials and Solvent Selection (628) .................................................... 531
S. Petrie, M.D. Charbonneau, UMASS Lowell
Warpage Prediction of Latch Housing (752) .................................................................................. 536
R. Han, Delphi Safety & Interior Systems
Experimental and Numerical Analysis of the Flow Imbalance in a Runner System (798) ............ 541
A. Kumar, A. Egelja, E.W. Grald, Fluent, Inc.
J.P. Beaumont, The Pennsylvania State University
Study of Weld-Line Strength and Microstructure of Injection Molded Microcellular Parts (1020) 551
H. Kharbas, L-S. Turng, R. Spindler, B. Burhop, University of Wisconsin - Madison
Investigation of Optimum Conditions of Thin-Wall Injection Molding Process (872) ..................... 556
University
J.T. Wang, Y.C. Su, Pou Yuen Technology

T3—General Session 2

Automated Plastication Setup for Injection Molding Machines (567) ........................................... 562
A.S. Bakharev, R.G. Speight, A.R. Thomas, Moldflow Pty Ltd
Flow Behavior of Core Material in Sandwich Injection Molding with Sequential and Simultaneous
Injection (578) .................................................................................................................................. 567
D. Watanabe, H. Hamada, Kyoto Institute of Technology
K. Tomari, Osaka Municipal Technical Research Institute
Solid-Bed Break-Up During Plastication in Injection Molding (604) ........................................... 572
Z. Jin, F. Gao, Hong Kong University of Science and Technology
Detailed Energy Measurements in Injection Moulding (680) ...................................................... 576
A.J. Dawson, H.S. Rajamani, P.D. Coates, University of Bradford
R. Collis, L. Owen, D. Owen, Mitsui Machine Tool Europe GmbH
The Impact Behavior of Injection Molded Plates With and Without Weld Lines (712) ................. 581
J.C. Viana, A.M. Cunha, University of Minho

T4—CAD/Simulation 2

Three-Dimensional Cae Analysis Of Underfill Flow Of Flip-Chips (374) ....................................... 588
R-Y. Chang, C-C. Hung, W-H. Yang, National Tsing-Hua University, HsinChu, Taiwan 30043, ROC
High Accuracy Shrinkage and Warpage Prediction for Injection Molding (525) ................................................. 593
P. Kennedy, Moldflow Corporation
R. Zheng, Moldflow Pty Ltd.

3D-Fe Simulation of Injection Molding - Calculation of Fiber Orientation and Crystallization (556) .................. 600
W. Michaeli, M. Kratz, Institut fur Kunststoffverarbeitung (IKV)

Closed-Loop Viscosity Control For Injection Molding (563) ................................................................. 604
A.S. Bakharev, R.G. Speight, P.A. Brincat, Moldflow Pty Ltd.

More Understanding Of CAF (577) .......................................................... 609
J. Wang, Pou Chen Group/Pou Yuen Technology

W3—CAD/Simulation 3

Mathematical Modeling of the In-Mold Coating Process for Injection Molded Thermoplastic Parts
(718) ......................................................................................................................... 614
X. Chen, J.M. Castro, The Ohio State University
E.J. Strauss, ONMOVA Solutions Inc.

Reducing Shrinkage and Warpage For Printer Parts By Injection Molding Simulation Analysis (638) .... 619
S. Ni, Lexmark International Inc.

Development of an Integrated Computer-Aided Engineering and Optimization System for Injection
Molding (660)............................................................................................................ 624
M. Peic, L-S. Turng, University of Wisconsin

Fuzzy Modeling for Injection Molded Part Quality Control (608) ................................................................. 629
Y. Yang, F. Gao, The Hong Kong University of Science & Technology

Prediction of Anisotropic Shrinkage Behavior of Plastic Injection Molded Parts by Experimental
Design Approach (759)......................................................................................... 633
T.C. Chang, A.U. Gadiyar, Iowa State University

W10—Injection Molding Processing

Practical Relationships for Calculating Pressure Drop in Injection Molds (41) ..................................................... 868
N.S. Rao, Plastics Solutions International
G. Schumacher, Forschungszentrum Informatik
N.R. Schott, University of Massachusetts Lowell
R. Edwards, Eastman Chemical Company

On the Prediction of Ejection Force for Tubular Moldings (534) ........................................................................ 873
A.J. Pontes, A.S. Pouzada, G. Titomanlio, University of Minho

Analysis of Parameters Determining the Friction Properties of Thermoplastics in Injection Molding
(94)........................................................................................................................ 878
N.M. Neves, A.S. Pouzada, E.C. Ferreira, R. Muschalle, Universidade de Minho

Compact Slide Action Closure Mold Technology (599) ..................................................................................... 882
E.C. Joseph, Unique Mould Makers

Effect of Pulsed Tool Cooling on The Injection Moulding Process (617) .......................................................... 885
A. Kelly, M. Woodhead, P.D. Coates, University of Bradford
P. Allan, Brunel University
R. Evans, RE Promotion Services Ltd.

W22—General Session 3

Surface Cleaning of Mold Release Compounds from Metals and Non-Metallic Materials (1026) ..................... 640
M.J. Rich, S. Pschigoda, L.T. Drzal, Michigan State University

Co-Injection Molding: Effect of Processing on Material Distribution and Mechanical Properties of
Short Glass Fiber Reinforced Polypropylene Test Bars (754) ........................................................................... 645
D.A. Messaoud, B. Sanschagrin, Ecole Polytechnique de Montreal
A. Derdouri, Industrial Material Institute

Optimize Injection Molding Cycles for HDPE by Considering the Effect of Cooling Times on Part
Performance (916)............................................................................................... 649
C.M. Dickerson, W.G. Todd, T.J. Schwab, D.L. Wise, Equistar Chemicals, LP
Process Capability Comparison of Various Switchover Modes from the Filling to Packing Stages in Injection Molding (968) .................................................. 654
T.C. Chang, Iowa State University
Cavity Based Ultrasonic Resonance Monitoring in Injection Molding (1098) .................................................. 659
R. Edwards, L. Diao, C.L. Thomas, University of Utah
M. Groeleau, RJG, Inc.

W23—Novel Process

Two in One, Inline Compounding and Injection Molding (1111) .................................................. 666
M. Sieverding, Krauss-Maffei
Multi-Component Laminate Moulding (MLM) (55) .................................................. 670
P.S. Allan, M.J. Bevis, A. McCalla, Y. Mubarak, Brunel University
K. Yasuda, Asahi Chemical Co., Ltd.
Foam Injection Molding (FIM) - A New Nozzle For Fluid Injection (552) .................................................. 675
W. Michaeli, S. Habibi-Naini, Institut fur Kunststoffverarbeitung
The Water Injection Technique (WIT) as an Attractive Alternative and Supplement to Gas-Assisted Injection Molding (GAIM) (553) .................................................. 679
T. Juntgen, W. Michaeli, Institut fur Kunststoffverarbeitung (IKV)
Comparison of Effects of Vibration-Assisted Injection Molding on Polystyrene and Polycarbonate (603) .................................................. 684
A. Kikuchi, J.P. Coulter, Lehigh University
Increased Shear Through Weldlines Using Controllable Compliance Accumulator (610) .................................................. 689
D.J. Hallowell, J.P. Coulter, Lehigh University
Horizontal Turntable and Stackmold Technologies - Innovative Technologies in Multi Component Injection Molding (886) .................................................. 693
H. Plank, Ferromatik Milacron
Effects of Processing Conditions on the Hollow Structure of Liquid Gas Assisted Injection-Molded Parts (1049) .................................................. 696
D-H. Kim, Soonchunhyang University
K. Oh, Cheil Industries, Inc.

THERMOFORMING DIVISION

M29—Thermoforming

Direct Sheet Extrusion and Thermoforming of TPO Compounds (630) .................................................. 702
M. Malkani, J. Soneta, J.L. Mead, S.A. Orroth, University of Massachusetts Lowell
Various Plug Assist Materials and Their Effect on the Thermoforming Characteristics of Polymeric Sheet (629) .................................................. 707
B. Hegemann, P. Eyerer. University of Stuttgart, Institute for Polymer Testing and Polymer Science, IKP
N. Tessier, CMT Materials, Inc.
T. Bush, Fabri-Kal Corporation
Solid Finite Elements for the Prediction of Complex Sheet Distortions (645) .................................................. 712
P. Debergeu, D. Laroche, National Research Council of Canada
Thermoforming of Thermoplastic Composite Sheet - Experiments and Modeling (540) .................................................. 717
P. Bates, Royal Military College of Canada
X-T. Pham, National Research Council of Canada
A. Chesney, Queen's University
E. Haque, AZDEL, Inc.
Model-Based Control of Material Distribution in Thermoformed Parts (44) .................................................. 722
R. DiRaddo, P. Girard, S. Chang, Industrial Materials Institute, National Research Council of Canada
Thermoforming-Stamping of Continuous Fiber Thermoplastic: Laminate Deformation Mechanisms, Microstructure and Mechanical Properties (460) .................................................. 727
J. Denault, G. Lebrun, M.N. Bureau, Industrial Materials Institute - National Research Council Canada
Characterising the Biaxial Properties of Materials Used in Thermoforming and Blow Molding (940) .................................................. 732
N. Martin, E.M. Harkin-Jones, P.J. Martin, School of Mechanical and Manufacturing Engineering, The Queen's University of Belfast
THERMOSET DIVISION

T33—Advances in Thermoset Materials

Rheological and Thermoanalytical Investigations of a "Class A" LP-SMC Paste (139) ........................................... 738
M. Wacker, G.W. Ehrenstein, Institute of Polymer Technology, University of Erlangen-Nuremberg

Epoxy Resins from Vegetable Oils (421) ......................................................... 743
Z.S. Petrovic, W. Zhang, R. Miller, I. Javni, Kansas Polymer Research Center, Pittsburg State University

Shrinking Control and Residual Styrene of Unsaturated Polyester Resins Cured at Low Temperatures (441) ................. 746
X. Cao, L.J. Lee, Ohio State University

Isotropic Residual Stresses in Thermosetting Resins: A New Instrument for Direct Measurement (1003) ..................................................... 755
M. Iza, S.L. Simon, G.B. McKenna, Texas Tech University

BLOW MOLDING DIVISION

T10—Concepts and Cooperation for Blow Molding and Design

*DuPont Dow Elastomers L.L.C. (646). ......................................................... 762
D. Laroche, P. Debergue, National Research Council of Canada

Design and Optimization of Planar Automotive Blow Moulded Parts (45) ................................................................. 767
F. Thibault, P. Debergue, D. Laroche, R. DiRaddo, Industrial Materials Institute

A Web Based Stretch Blow Moulding Simulation (958) ........................................................................................................ 772
P.S. Kwo, G.H. Menary, C.G. Armstrong, The Queen’s University of Belfast

An Experimental Study of Antioxidants Effects on the Performance of Blow Molded HDPE Homopolymer Packagin Containers (1171) ........................................................................................................ 777
E. Hoover, Pittsburg State University

T35—Innovations in Blow Molding 2002

Performance and Properties of Modified Pet Produced by Solid State Polymerization of Low IV Pet Prepolymer (393) ........................................................................................................ 784
R.J. Schiavone, Wellman, Inc.

Molecular Orientation in Injection-Blow-Molded Bottles (825) .......................................................................................... 789
H.B. Daly, Ecole Nationale d'Ingenieurs de Monastir, Tunisia

High Barrier Blow Molded Containers Based On Nano Clay Composites (34) ................................................................. 794
S. Kenig, A. Ophir, O. Shepelev, F. Weiner, Israel Plastics & Rubber Center

The Influence of Operating Conditions on the Cooling Phase of the Extrusion Blow Molding Process (287) ........................................................................................................ 799
A. Kipping, University of Siegen

A. Garcia-Rejon, A. Bendada, Industrial Materials Institute

Prediction of Parison Swell in Extrusion Blow Molding Using Neural Network Method (1101) ................................................... 804
H-X. Huang, C-M. Liao, South China University of Technology

Control of State Parameters in Blow Moulding (43) ............................................................................................................. 808
R. DiRaddo, P. Girard, I. Laroche, Industrial Materials Institute, National Research Council of Canada

MOLD MAKING/MOLD DESIGN DIVISION

T13—Advances in Hot Runner Technology

Optimization of a Thermal Sprue for Hot Runner Mold (585) ................................................................................................ 814
A. Boudouara, B. Sanschagrin, Ecole Polytechnique de Montreal

A. Bouti, Husky Injection Molding System

* Present in a joint session.
A New Hot Runner Nozzle Speeds Color Change and Eliminates Flowlines (Part I) (529) ............................. 819
A. Bouti, Husky Injection Molding Systems, Inc.

A New Hot Runner Nozzle Speeds Color Change and Eliminates Flowlines (Part II) (673) ............................. 824
A. Bouti, Husky Injection Molding Systems, Inc.

Advanced Sequencing and Protection of Valve Gate Systems (814) ......................................................... 829
T. Linehan, DME Company

Melt Mixing Improves Hot Runner Balance and Improves Part Quality (531) .................................................. 833
A. Bouti, Husky Injection Molding Systems, Inc.

T38—Innovations in Mold Making and Mold Design

Rapid and Alternative Tooling - Update 2002 (884) ............................................................................. 840
B.J. Arnold-Feret, PARTS

Size Does Matter: Minimization of Gate Wear (633) ......................................................................... 845
K. Hayden, P. Engelmann, P. Guichelaar, Western Michigan University
M. Monfore, Johnson Controls
J. Shoemaker, Moldflow Corporation

Undercutting Mold Performance: Ejection Wear (710) ........................................................................... 850
P. Engelmann, K. Hayden, P. Guichelaar, Western Michigan University
M. Monfore, Johnson Controls

Using Castings for Molds for Competitive Advantage. (821) .............................................................. 855
J. McIntyre, Sarcol Inc.

Direct Rapid Tooling of Injection Moulds Using Electro-Discharge Machining (442) ....................... 858
S.H. Masood, S. Thatiot, Swinburne University of Technology
I. Harianton, The Polytechnic of Manufacturing

Mold Design and Manufacture – an approach to innovation and sustained development (278) .... 863
A.S. Pouzada, A. Brito, Universidade de Minho
J. Menezes, Centimfe

INJECTION MOLDING DIVISION

W10—Injection Molding Processing

Practical Relationships for Calculating Pressure Drop in Injection Molds (41) ......................................... 868
N.S. Rao, Plastics Solutions International
G. Schumacher, Forschungszentrum Informatik
N.R. Schott, University of Massachusetts Lowell
R. Edwards, Eastman Chemical Company

On the Prediction of Ejection Force for Tubular Moldings (534) ............................................................. 873
A.J. Pontes, A.S. Pouzada, G. Titomanlio, University of Minho

Analysis of Parameters Determining the Friction Properties of Thermoplastics in Injection Molding (94) ........................................................................................................ 878
N.M. Neves, A.S. Pouzada, E.C. Ferreira, R. Muschalle, Universidade de Minho

Compact Slide Action Closure Mold Technology (599) ........................................................................ 882
E.C. Joseph, Unique Mould Makers

Effect of Pulsed Tool Cooling on the Injection Moulding Process (617) ................................................. 885
A. Kelly, M. Woodhead, P.D. Coates, University of Bradford
P. Allan, Brunel University
R. Evans, RE Promotion Services Ltd.

APPLIED RHEOLOGY DIVISION

M22—Applied Rheology Extensional

A Comparison of the Axisymmetric and Planar Elongational Viscosities of a Polymer (327) ................. 892
P. Beaupre, M. Gupta, Michigan Technological University, Houghton, MI 49931

Analysis of Extensional Viscosity Techniques for the Characterization of Fluoropolymers (566) .... 897
C. Puttamprom, N. Nekhilef, Atofina Chemicals, Inc.

* Present in a joint session.
Advances in Techniques to Determine Extensional Rheology from Capillary Measurements (209) .................................................. 903
M. Zatloukal, P. Saha, Tomas Bata University in Zlin, TGM 275, 762 72 Zlin, Czech Republic
J. Vleek, Compuplast International, Inc. Nerudova 158, P. O. Box 24, 760 01 Zlin, Czech Republic
C. Tzoganakis, University of Waterloo, Waterloo, Ontario, Canada N2L 3G1

Viscoelasticity of New Molecularly Designed Polypropylenes (805) ................................................................. 908

Rheological And Tensile Strength Characteristics Of Polymer Melts (208) .......................................................... 913
M. Zatloukal, P. Stach, P. Saha, Tomas Bata University in Zlin
J. Vleek, Compuplast International
P. Liu, Sichuan University

M44—Applied Rheology Experimental and Numerical Flow Modeling

Full Field Stress and Velocity Measurements for Polymer Melts in Extrusion Dies (763) .............................................. 920
T. Gough, R. Spares, M.T. Martyn, P.D. Coates, University of Bradford

Numerical and Experimental Analysis of the Material Behavior during a Bubble Inflation Test (570) ......................................... 925
F. Erchiqui, Universite du Quebec Abitibi-Timiskamingue
A. Derdouri, A. Garcia-Rejon, National Research Council Canada

A Novel Approach To Modeling Viscoelastic Properties of Thermoplastic Polymer Melts, with Applications to Polyactides (758) .................. 929
J. Janzen, J.R. Dorgan, Colorado School of Mines

Capillary Rheometer Pressure Transients for Lubricated Flows Through Straight and Semi-Hyperboloidal Dies (779) ......................... 932
B. Patham, K. Jayaraman, Michigan State University

Visualisation And Analysis Of LDPE Melt Flows in a Coextrusion Geometry (744) ..................................................... 937
M.T. Martyn, T. Gough, R. Spares, P.D. Coates, University of Bradford
M. Zatloukal, Brno University of Technology

Melt Processing of Polymers Using Supercritical Fluids (1042) ............................................................................. 942
S.O. Matthews, Brunel University

Heat Transfer in Polymer Processing Measured with a Capillary Rheometer (631) .................................................. 946
A. Gottfert, J. Sunder, Gottfert GmbH

Rheology and Microstructure of Thermotropic Liquid Crystalline Copolyesters (661) ............................................. 949
T. Guo, G.M. Harrison, A.A. Ogale, Clemson University

T12—Viscoelastic Characterization of Polymers

The Effect of Carbon Dioxide on the Viscoelastic Properties Of An Epoxy Resin: CO2 Pressure Jumps (1085) ................. 1988
F. Briatico-Vangosa, M. Alcoutlabi, G.B. McKenna, Texas Tech University

Effect of Structural Relaxation on Dynamic Mechanical Properties of Poly(Methyl Methacrylate) (501) .................. 1993
B.R. Davis, N. Mekhilef, Atofina Chemicals, Inc

P. Bernazzani, S.L. Simon, Texas Tech University

Physical Aging During Creep and Recovery of PET Bottle Grade Material (404) .............................................. 2003
A.Y. Goldman, Alcoa CSI, Inc
K. Venkateshan, Bodycote Broutman, Inc

T50—Applied Rheology Rheometry and General Rheology

On-Line Viscosity Measurements on Fiber Forming Polymers (665) ................................................................. 956
D. De Laney, Polymer Consulting Services
S. Oliver, Dynisco Polymer Test

Application of an Online Rheometer to Evaluate the Melt Properties of PVC (136) ............................................. 960
G. Fattmann, A. Limper, Institut für Kunststofftechnik
W17—Applied Rheology Wall Slip, Instabilities and Processing Aids

Effect of Wall Slip of Polymer Melts on their Relaxation Modulus Behavior (377) ........................................ 1004
D.M. Kalyon, Stevens Institute of Technology

Analysis of Melt Instabilities of Poly(Vinylidene Fluoride) In Shear and Extensional Flows (795) ............... 1008
N. Mekhilef, E. Rondeau, C. Pattamaprom, Atofina Chemicals, Inc.

Catastrophic Failure of the No-Slip Condition at the Wall During Torsional Flows and Development of Gross Surface Irregularities During Capillary Flow Of Three Polymers (376) ......................... 1019
H. Gevgilili, Stevens Institute of Technology

Rheology And Extrusion of Co2 Plasticized Acrylic Copolymers (782) .......................................................... 1024
M.J. Bortner, D.G. Baird, Virginia Polytechnic Institute and State University

Rheological Behavior of Blends Based On Polypropylene and Commercial Ethylene-Octene Copolymers (653) ............................................ 1029
A.L. Da Silva, M.C. Rocha, F.M. Coutinho, Universidade do Estado do Rio de Janeiro
R.E. Bretas, Universidade Federal de Sao Carlos

W36—Applied Rheology Structure-Property Relationships

Temperature Sensitivity ofthe Linear Viscoelastic Properties of Long Chain Branched Metalloocene Polyethylene (1073) .......................... 1036
P. Wood-Adams, Concordia University
S. Costeux, McGill University

The Effect of Molecular Weight and Polydispersity on the Rheological Properties of Pigmented Polypropylene (742) .................................... 1041
A.F. Marks, P. Orr, Steve Orr Ltd.
G.M. McNally, W.R. Murphy, The Queen's University of Belfast

Spectrum Determination for A Very Broad Molecular Weight Distribution Polyethylene (1030) ....................... 1046
S. Depire, M-C. Heuzey, Ecole Polytechnique de Montreal
P. Wood-Adams, Concordia University
C. He, McGill University

Single Capillary Rheometer Technique for Determining Molecular Weight Distribution of Conventional and Metalloocene Catalysed Polyethylenes (922) ................................................. 1051
B.G. Miller, G.M. McNally, W.R. Murphy, Queen's University Belfast

Determination of Molecular Weight and Molecular Weight Distribution Of I-PP by Rheological Measurements - A Comparative Study (799) ............ 1056
C.H. Scuracchio, Universidade Federal de Sao Carlos

JOINING OF PLASTICS & COMPOSITES DIVISION

M21—New Technologies

Cast-In-Place (CIP) for Joining and Repairing Live, Polyethylene, Gas Lines - I. Basic Process Description (1119) ........................................ 1062
R.A. Grimm, Edison Welding Institute
Relationship Between Optical Properties and Optimized Processing Parameters for Through-
Transmission Laser Welding of Thermoplastics (902) .......................................................... 1170
D.A. Grewell, Ohio State University
P. Rooney, Branson Ultrasonics Corporation
V.A. Kagan, Honeywell Plastics

W16—Ultrasonics and Hot Plate

Ultrasonic Weld Shear Strength of Mineral Filled and Glass Fiber Reinforced Polypropylene Blends
(96) ........................................................................................................................................ 1176
M.S. Carlone, University of Massachusetts Lowell
Ultrasonic Riveting and Hot-Air-Sticking of Fibre-Reinforced Thermoplastics (266) .................. 1181
O. Hahn, C. Finkeldey, University of Paderborn
Experimental Evaluation of Methods for Characterization of Power Output of High Power Ultrasonic
Transducers (802) .................................................................................................................. 1186
D. Grewell, A. Benatar, The Ohio State University
K. Graff, Edison Welding Institute
Photoelastic Measurement of Residual Stresses in Hot Plate Welded Polycarbonate (1007) ........ 1192
S. Anantharaman, A. Benatar, The Ohio State University
Gas-Assisted Non-Contact Hot Plate Welding of HDPE (879) ............................................. 1197
B. Poopat, King Mongkut's University of Technology Thonburi
A. Benatar, Welding and Systems Engineering, The Ohio State University

W35—Vibration

Strength of Vibration Welds Made from Dissimilar Nylons (542) ......................................... 1204
C. Dyck, M. Osti, Queen's University
P.J. Bates, Royal Military College of Canada
Improving Vibration Weld Strength by Equipment Modification (544) .................................. 1209
B. Tucker, P.J. Bates, Royal Military College of Canada
V. Sidiropoulos, Centre for Automotive Materials and Manufacturing
Neuro-Fuzzy Quality Recognition in Vibration Welding of Thermoplastics (243) .............. 1214
J. Vetter, Branson Ultraschall
Vibration Welding of Thermoplastic Polyolefins (420) ......................................................... 1219
C-Y. Wu, L. Trevino, Visteon Corporation
The Effects of Weld Geometry and Glass-Fiber Orientation on the Mechanical Performance of Joints –
Part I: Weld Design Issues (273) .......................................................................................... 1224
V.A. Kagan, C. Roth, Honeywell Plastics

ROTATIONAL MOLDING DIVISION

M17—Processing

Powder Flow During Rotational Molding (67) ........................................................................ 1230
J.L. Throne, Sherwood Technologies, Inc.
The Sintering Behavior of Ethylene/(alpha)-Olefin Copolymers Powder and Cylinders (990) 1235
S.A. Guillen-Castellanos, C.T. Bellehumeur, University of Calgary
M. Weber, NOVA Chemicals Corporation
Sintering of Thermotropic Liquid Crystalline Polymers (997) ............................................... 1240
E. Scribben, D. Baird, Virginia Tech
An Investigation of the Impact Behaviour of Rotomoulded Polyethylenes Over a Wide Temperature
Range (35) ................................................................................................................................. 1245
L.T. Pick, E. Harkin-Jones, Queen's University Belfast
The Importance of Monitoring Mold Pressure During Rotational Molding (32) .................. 1250
R. Crawford, Queen's University Belfast
M.C. Cramez, M.J. Oliveira, Universidade do Minho, Portugal
A. Spence, Centro Inc
M38—Materials

Measurement of Peroxide Content of Crosslinkable Polyethylene by Differential Scanning Calorimetry
(1076) 1256
E. Boudreaux, R.K. Krishnaswamy, J.D. Ratzlaff, Chevron Phillips Chemical Company LP Phillips Research Center

Rotational Moulding of a Dicyclopentadiene Reactive Liquid Polymer (519) 1261
N. Corrigan, E. Harkin-Jones, R.J. Crawford, Queen’s University of Belfast

Rotational Molding of Polyolefin Plastomers and TPOs (724) 1266
W. Wang, M. Kontopoulou, Queen's University

Foaming with Microspheres in Rotational Molding (479) 1271
E. Takacs, J. Vlachopoulos, McMaster University
C. Rosenbush, Akco Nobel, Expanscel Inc.

Single-Step Rotational Foaming of Skin-Surrounded Polyethylene Foams (1158) 1276
R. Pop-Iliev, C.B. Park, University of Toronto

Investigation of the Processing Characteristics and Mechanical Properties of Metallocene Polyethylene Foams for Rotational Moulding (26) 1281
E. Archer, E. Harkin-Jones, M.P. Kearns, The Queens University of Belfast
A-M. Fatnes, Borealis AS

Improving Polyethylene Performance - The Use of Nanocomposites in Ziegler-Natta Polyethylene for Rotational Moulding (272) 1286
M.J. Murphy, D.J. Martin, R. Truss, P. Halley, The University of Queensland
The Development of Nanocomposites to Enhance Functionality of Materials for Rotational Molding (6) 1292
D. Martin, P. Halley, R. Truss, M. Murphy, S. Meusburger, The University of Queensland
O. Oliver Jackson, The Queensland Manufacturing Institute

VOLUME II – MATERIALS

ELECTRICAL & ELECTRONIC DIVISION

M7—Plastic Applications

Electrical Conductivity Changes of Silicone or Polyurethane Rubber/Carbon Black Composites During Cyclic Pressure Deformation (509) 1298
J. Vilcakova, A. Lengalove, P. Saha, Tomas Bata University in Zlin
O. Quadrat, Academy of Sciences of Czech Republic
T. Kitano, National Institute of Advanced Industrial Science and Technology

Three-Dimensional Simulation of Thermoset Molding Applied to Semiconductor-Chip Encapsulation (730) 1302
S. Han, F. Costa, P. Cook, S. Ray, Moldflow

Application of a New Internal Reflection Wave-Guide Coupling Technique to the Study of Polyaniline (601) 1308
T. Liu, R.J. Samuels, Georgia Institute of Technology

Numerical and Experimental Investigation of Three-Dimensional Flow in Microchip Encapsulation (729) 1313
R. Han, M. Gupta, Michigan Technological University

New Injection Moldable ESD Thermoplastic Composites Containing Conducting Networks Formed Through Structuring in Melt Processing (517) 1318
M. Narkis, Technion - Institute of Technology
G. Lidor, A. Vaxman, Carmel Olefins Ltd.