# **RESEARCH PUBLICATIONS**

# PATENTS, JOURNAL PAPERS CONFERENCE PROCEEDINGS AND TECHNICAL REPORTS

#### **PATENTS**

- 1. Duffy G.G., "A Consistency Measuring Device", N.Z. Patent: 171062, July 1975, U.S.A. Patent: 3,901,070, Aug (1975).
- 2. Duffy G.G., "Method and Apparatus for Measuring the Consistency of Pulp Suspensions", N.Z. Patent: 171063, July (1975).
- 3. Duffy G.G., Gatland H.B., "Method and Apparatus for Measuring Flow Properties of a Magnetic Fluid", N.Z. Patent: 184074 (1977).
- 4. Duffy G.G., (with Moller K., Norman B., de Ruvo A.) "A New Method of Fibre Fractionation" Patents: Sweden 397.772 Germany 2,632,9999.7 Canada 1.035.320 Denmark 3344/76 Finland 76.2164 Norway 76.2580 U.S.A. 708.441.
- 5. Duffy G.G., "A Novel Method of Transporting Particulates and Capsules" Patents: South Africa 83/7936, Spain 526.861, USA 4,605,329, Canada 1,216,615, others Pending.
- 6. Duffy G.G., "A Pulp Quality Analyser" N.Z. Application No.209 160 (1984).
- 7. Duffy G.G., "The Recovery of Dust and in Dry Fibre in Pneumatic Transport" N.Z. *Application* No. 212 270, (1985).
- 8. Duffy G.G., "Hydraulic Transportation of objects" Continuation of U.S. Patent 4,605,329, with new inventions. NZ 202,329 Oct (1985).
- 9. Moller K., Duffy G.G., "A Method of Forming Paper From Defibrated Dry Fibre" N.Z. *Application* No. 216909, July (1986).
- Duffy G.G., "Improvements in or relating to a method of separating discrete articles and/or apparatus for separating discrete article" ('A New Woodchip Thickness Screen') N.Z. Patent Application 218114, Oct (1986).
- 11. Duffy G.G., "Hydraulic Transportation", USA Patent 4,871,284, Oct 1989.
- 12. Duffy G.G., "A New Method of Liquor Removal From Particulate Solids", N.Z. Patent No. 256481, Sept (1993).
- 13. Chen J., Müller-Steinhagen H., Duffy G.G., "Improvements to Heat Exchangers", N.Z. Patent *Application* 240929, Dec (1991).
- Duffy, G.G. "Method of liquor removal from particulate solids", Worldwide Patent Applications through Kvaerner Pulping AB Sweden/UniServices, June 1995. USA Patent April 1998, USA No: 5,736,007.

- Duffy, G.G. "New method of separating wood pulp fibres", NZ Patent application 298,788 December 1998. International Publication number WO 01/75228 A1 October 2001.
- 16. Duffy, G.G. "Apparatus and method for controlling pulp quality", *Filed* N.Z. March 2000.
- 17. Duffy, G.G. "A method of concentrating wood pulp fibre suspensions", *Filed* NZ November 2000.
- 18. Duffy, G.G., (with Burger, R., Lange, W., Veh, G. Schabel, S.) "Process for wet screening fibre suspensions", Filed in Germany, P23385.S02, European Patent DEA 102 17 926.3, 2003, USA Patent 2004/0004032 A1, January, 2004.
- 19. Duffy, G. G., Holyoake, I., Holyoake, B. "A new method of evaluating wood degradation", New Zealand Patent Application, Number 538585, October, 2006.

## **LIST OF JOURNAL PUBLICATIONS - G G DUFFY**

- Duffy, G.G., "Chemistry 5301.S Laboratory Experiments Stage 1" 106pp N.S.W. Institute of Technology, published by N.S.W. University Press Ltd, February (1969).
- 2. Duffy, G.G., Doctoral Dissertation "A Study of the Flow Properties of New Zealand Wood Pulp Suspensions" 235pp University of Auckland (1972).
- 3. Moller, K., Duffy, G.G., Titchener A.L., "The Laminar Plug Flow Regime of Paper Pulp Suspensions in Pipes" Svensk Papperstidn. 74 (24): 829-834 (1971).
- 4. Moller, K., Duffy, G.G., "A Preliminary Investigation of the Settlement of Paper Pulp Suspensions", Auckland Univ. Eng. Soc. 24: 37-43 (1971).
- Moller, K., Duffy, G.G., Titchener, A.L., "The Laminar Plug Flow of Paper Pulp Suspensions in Large Diameter Pipes" Svensk Papperstidn. 75 (8): 311-316 (1972).
- 6. Duffy, G.G., Moller, K., Titchener A.L. "A Study of the Flow Properties of New Zealand Wood Pulp Suspensions", N.Z. Eng. 27 (9): 273-279 (1972).
- 7. Duffy, G.G., Moller, K., Titchener A.L. "The Determination of Pipe Friction Loss" Appita 26 (3): 191-195 (1972).
- 8. Moller, K., Duffy, G.G., Titchener A.L. "A Design Correlation for the Flow of Pulp Suspensions in Pipe", Appita 26 (4): 278-282 (1973).
- 9. Moller, K., Duffy, G.G., Titchener A.L. "The Prediction of Pipe Friction Losses from Rotational Viscometry", Svensk Papperstidn. 76 (13): 439-499 (1973).
- 10. Duffy, G.G., "Consistency Measurement in the Paper Industry", Automation and Control 3 (5): 12-14 (1973).
- 11. Duffy, G.G., Moller, K., Lee, P.F.W., Milne S.W.A., "Design Correlations for Groundwood Pulps and the Effects of minor Variables on Pulp Suspension Flow", Appita 27 (5): 327-333 (1974).
- 12. Duffy, G.G., Titchener, A.L. "Design Procedures for Obtaining Pipe Friction Loss for Chemical Pulps", Tappi 57 (5): 162-166 (1974).
- 13. Moller, K., Duffy, G.G. "Plug Flow of Pulp Suspensions Comment", Tappi 57 (7): 123 (1974).
- 14. Duffy, G.G. "The Development of Two New Consistency Instruments", Appita 28 (5): 309 315 (1975).
- 15. Duffy, G.G., Titchener, A.L. "The Disruptive Shear Stress of Pulp Networks", Svensk Papperstidn. 78 (13): 474-479 (1975).
- 16. Duffy, G.G., Titchener, A.L., Lee, P.F.W., Moller K. "The Mechanisms of Flow of

- Pulp Suspensions in Pipes", Appita 29 (5): 363-370 (1976).
- 17. Turner, J.C., Titchener A.L., Duffy, G.G. "The Flow Characteristics of Deaerated Wood Pulp Suspensions", Appita 30 (1): 41- 47 (1976).
- 18. Lee, P.F.W., Duffy, G.G., "An Analysis of the Drag reducing Regime of Pulp Suspension Flow", Tappi 59 (8): 119-123 (1976).
- 19. Lee, P.F.W., Duffy, G.G., "Relationships Between Velocity Profiles and Drag Reduction in Turbulent Fibre Suspension Flow", A.I.Chem. Eng. J. 22 (4): 750-753 (1976).
- 20. Duffy, G.G., "A Review and Evaluation of Design Methods for Calculating Friction Loss In Stock Piping Systems", Tappi 59 (8): 124-127 (1976).
- 21. Lee P.F.W., Duffy, G.G. "Velocity Profiles in the Drag Reducing Regime of Pulp Suspension Flow", Appita 30 (3): 219-226 (1976).
- 22. Lee P.F.W., Duffy, G.G. "An Analysis of the Transition Regime of Fibre Suspension Flow in Pipes", Can.J.Chem.Eng. 55 (3): 361-363 (1977).
- 23. Duffy, G.G. "Pipe Friction Pressure Loss of Pulp Suspensions Literature Review and Evaluation of Data and Design Methods", Tappi Technical information Sheet, TIS 408-2 April (1978).
- 24. Duffy, G.G. Lee P.F.W. "Drag Reduction in the Turbulent Flow of Wood Pulp Suspensions", Appita 31 (4): 280-286 (1978).
- 25. Duffy, G.G. "Air injection system increases production in the paper industry], Automatic Control and Instrument Soc., N.Z. J. 8 (2): 17 (1978).
- 26. Duffy, G.G. "Measuring Techniques for Fibre Flocculation and Formation Studies in the Paper Industry", Automatic Control and Instrument Soc., N.Z. J. 8 (1): 40-43 (1978)
- Duffy, G.G. "Recommended Methods for Determining the Pipe Friction Loss of Flowing Pulp Suspensions", Tappi Technical Information Sheet, TIS 408-4 April (1978).
- 28. Moller, K., Duffy, G.G. "A Design Equation for Predicting Pipe Friction Loss in the Transition Regime for Pulp Suspensions", Tappi 61 (1): 63-66 (1978).
- 29. Norman B.G., Moller K., Ek R., Duffy, G.G. "Hydrodynamics of Papermaking Fibres in Water Suspension", Trans. Sixth Fundamental Research Symp., Technical Division of the British Paper and Board Industry Federation 1: 195-249 (1978).
- 30. Duffy, G.G. "Suggested Methods for Obtaining Pipe Friction Data for Flowing Pulp Suspension", Tappi Technical Information Sheet, TIS 408-3 April (1978).
- 31. Moller K., Felsvang K., de Ruvo A., Norman B., and Duffy, G.G. "High Consistency sorting with the spray atomiser", "Dickstoffsortierung mit Spruhverfahren",

- Wochenblatt fur Papierfabrikation, 106 (11/12): 445-448 (1978).
- 32. Duffy, G.G., Longdill G., Lee P.F.W. "High consistency Flow of Pulp Suspensions in Pipes", Tappi 61 (8): 85-88 (1978).
- 33. Moller K., Moller J.T., Foghmar P., Duffy, G.G. "High Consistency Pulp Separation with a spray Atomizer", Tappi 63 (9): 89-91 (1980).
- 34. Duffy, G.G., Pedersen M.L., Petersen J.H. "Efficient Fibre Separation at High Consistency by Spray Atomisation", Appita 35(6): 512-514 (1982).
- 35. Duffy, G.G., Walmsley M.R.W., Smith T. "The Drying of Paper Webs Using a New Infrared Generator", Appita 37 (2): 131-136 (1983).
- 36. Duffy, G.G. "Friction Loss of Pulp Suspensions in Pipes", Goulds Pump Manual, 4<sup>th</sup> Edition, Section 17E-4, 596-602, NY, (1983).
- 37. Duffy, G.G. "A novel transporting medium for coal", New Zealand Coal, 20-32, (1985).
- 38. Duffy, G.G. "A New Method of Hydraulically Transporting Wood Chips", Appita 39(3): 213 217 (1986).
- 39. Duffy, G.G. "New Uses for Wood Pulp Fibre Suspensions", Tappi 70 (5): 107-112 (1987).
- Walmsley, M.R.W., Duffy, G.G. "A New Carrier Medium for the Hydraulic Transport of Coal and Iron Sand by Pipeline", Trans. IPENZ 14 (2 EMCh): 100-110 (1987).
- 41. Walmsley M.R.W., Duffy, G.G., "Hydraulic Transport of Solid Particles and Capsulised materials in Pipelines with Friction Losses Lower than Water", Journal of Pipelines 6: 33-40 (1987).
- 42. Longdill, G.R., Duffy, G.G. "The Shear Behaviour of Medium Consistency Wood Pulp Fibre Suspensions", Appita 41 (6): 456 461 (1988).
- 43. Jablonka, M.S., Munro, P.A., Duffy, G.G. "Use of Light Scattering Techniques to Study the Kinetics of Precipitation of Mineral Acid Casein from skim Milk", J. Dairy Research 55 (2): 179-188 (1988).
- 44. Duffy, G.G., Walmsley, M.R.W., Algers, B., Alfredsson, K., Hedenfalk, L. "Design correlations for pumping high-yield pulps", Appita 42 (5): 358-361 (1989).
- 45. Duffy, G.G., Kibblewhite, R.P.K. "A new method of relating wood density, pulp quality and paper properties". Appita 42 (3): 209-214 (1989).
- 46. Duffy, G.G. "Designing pulp pipelines for the optimum conditions", Appita 42 (5): 358-361 (1989).
- 47. Duffy, G.G. "Fluid Flow- Friction loss of paper stock", Hydraulics Institute of USA,

- Section IIIE-1, 107-114, (1990).
- 48. Smith, R.J., Duffy, G.G. "Pulp washing by dilution thickening without remixing", Appita 44 (4):265-269 (1991).
- 49. Duffy, G.G. "Targeted Research lateral thinking, innovations and applications to the Pulp and Paper Industry", Trans. Inst. of Prof. Eng. 18, 1/GEN:22-26 (1991).
- 50. Duffy, G.G. "Some Human factors in Engineering Education" AEESEAP Journal of Engineering Education 22 (2): 42-45 (1992).
- 51. Duffy, G.G. "Development of Methods for characterising mechanical and chemical wood pulps", Appita 46 (5): 361-365 (1993).
- 52. Middis, J., Duffy, G.G., Müller-Steinhagen, H.M., "Heat transfer to wood pulp fibre suspensions", Appita 46 (1): 49-53 (1993).
- 53. Veilreicher, T., Allen, M.L., Müller-Steinhagen, H.M. and Duffy, G.G. "Non-Steady State Flow Behaviour of Wood Pulp Fibre Suspensions", Appita 47 (3): 221-226 (1994).
- 54. Middis, J., Duffy, G.G., Müller-Steinhagen, H.M. "Heat Transfer and Frictional Pressure drop characteristics of Nylon Model Fibre Suspensions", Appita 47 (2): 154-158 (1994).
- 55. Duffy, G.G. "The Flow of Medium Consistency Wood Pulp Fibre Suspensions", Appita 48 (1): 51-55 (1995).
- 56. Duffy, G.G. "Fluid flow friction loss of paper stock" Section IIIE-1, Hydraulics Institute of the USA, pp107-114, Ohio, USA (1997).
- 57. Wahjudi, U, Kibblewhite, R.P., Duffy, G.G. "An evaluation of three formation testers using radiata pine and spruce (Canadian) pulps", Appita 51 (6): 423-427(1998).
- 58. Middis, J., Paul, S.T., Müller-Steinhagen, H.M., and Duffy, G.G. "Reduction of heat Transfer fouling by the addition of wood pulp fibres", Int. J. Heat Transfer Eng. 19 (2): 36-44 (1998).
- 59. Develter, P. and Duffy, G.G. "Flow of wood pulp fibre suspensions in open channels", Appita 51(5): 356-362 (1998).
- 60. Ellis, M.J., Duffy, G.G., Allison, R.W., Kibblewhite, R.P. "Fibre deformation during medium consistency mixing: role of residence time and impeller geometry", Appita 51 (1): 29-34 (1998).
- 61. Kazi, S., Duffy, G.G., Chen, X.D. "Heat Transfer in the drag reducing regime of wood pulp fibre suspensions", Chem. Eng. J. 73 (3): 247-253 (1999).
- 62. Paul, S.T., Duffy, G. G., Chen, X. D. "Viscosity control as a new way to improve pressure screen performance", Tappi J. 83 (9): 61 (2000).

## http://www.tappi.org/public/t.

- 63. Bremford, D., Muller-Steinhagen, H. M., Duffy, G.G. "Heat transfer to kraft black liquor-solid fluidised bed", Heat Transfer Engineering 21 (6): 57-69 (2000).
- 64. Chen, J., Müller-Steinhagen, H.M., and Duffy, G.G. "Heat transfer enhancement in dimpled tubes", J. Applied Thermal Eng. 21(5): 535 -547 (2001).
- 65. Roux, J-C., Franc, N., Duffy, G.G., Fabry, B. "Shear factor: A new way to characterise fibre suspension shear", Tappi J. 84 (8): 46 Aug. (2001). <a href="http://www.tappi.org/public/t">http://www.tappi.org/public/t</a>
- 66. Fabry, B., Roux, J-C, Carre, B., Duffy, G.G. "Shear factor: a new way to characterise pulper performance", Tappi J. Solutions 1 (3): 51 (2001). <a href="http://www.tappi.org/public/t">http://www.tappi.org/public/t</a>
- 67. Paul, S.T., Duffy, G.G. and Chen, X. D., "New insights into the flow of pulp suspensions", Tappi J. Solutions 1 (1): 94 (2001). <a href="http://www.tappi.org/public/t">http://www.tappi.org/public/t</a>
- 68. Xu, J.Q. and Duffy, G.G. "Operational Parameters in screw press dewatering", Appita 54 (4): 369-375 (2001).
- 69. Wahjudi-Winters, U., Duffy, G.G., Kibblewhite, R.P. "Effect of grammage and concentration on papersheet formation of pinus radiata kraft pulps", Appita 55 (1): 35-42 (2002).
- 70. Chen, X.D., Ai, G.M., Duffy, G.G., "Rules-of-thumb of implementing short electric band heaters (length to diameter ratio < 1.5) for external heating of pipe flows", Int. J. Energy Research 26 (2): 133-141 (2002).
- 71. Kazi, S. N., Duffy, G.G., Chen, X.D. "Fibre-modified scaling in heat transfer fouling mitigation", Chem. Eng. Communications, 189 (6): 742-758 (2002).
- 72. Murton, K. D., Corson, S.R., Duffy, G.G. "Effect of refining intensity on slabwood and thinnings TMP fibres", Appita 55 (2): 155-161 (2002).
- 73. Song, G., Duffy, G.G. "An investigation of fibre deformations in medium consistency processing", Appita 55 (6): 444-452 (2002).
- 74. Duffy, G.G., Kazi, S.N., Chen, X.D. "Pulp fibre quality measurement from flowing wood pulp fibre suspensions", Das Papier J. 7: 39-46 (2002).
- 75. Duffy, G.G. "The significance of mechanistic-based models in fibre suspension flow", Nordic Pulp and Paper Research Journal 18 (1): 74-80 (2003).
- 76. Duffy, G.G., Kazi, S.N., Chen, X.D. "Heat transfer to flowing fibre suspensions". Journal of Pulp and Paper Science 29 (3): 99-105 (2003).
- 77. Duffy, G.G., Abdullah, L. "The flow of fibre suspensions in small diameter pipes", Appita J. 56 (4): 290-295 (2003).

- 78. Duffy, G.G. "Misapplication of the Metzner-Reed non-Newtonian correlation method", Chem. Eng. Communications, 191 (2): 182-188 (2004).
- 79. Paul, T., Duffy, G.G., and Chen, X.D. "Simple evaluation methods for deflocculants and their affects on fibre network structure", Appita J. 57 (4): 286-291 (2004).
- 80. Murton, K., and Duffy, G.G. "The influence of pulp residence time on refining intensity and pulp quality", Appita J. 58 (1): 64-71 (2005).
- 81. Duffy, G. G. "A simple method for evaluating and monitoring fibre quality", Das Papier J. 2: 59-64 (2005).
- 82. Duffy, G. G., Ramachandra, S. "Validation of flow mechanisms of fibre suspensions in small diameter pipes", Appita J. 58 (5): 374-377 (2005).
- 83. Duffy, G. G. "Measurements, mechanisms and models: Some important insights into the mechanisms of flow of fibre suspensions", Annual Transactions Nordic Rheology Soc. 14: 19 31 (2006).
- 84. McShane, K. and Duffy, G. G. 'Heat transfer to flowing model fibre suspensions to elucidate a new method of characterising of wood pulp fibres', Appita J. 60 (1): 48-54 (2007).
- Duffy, G. G. and K. S. McShane, K. S. "Heat Transfer Fouling Mitigation with Model Synthetic Fibre Suspensions", Asia-Pacific J. of Chem. Eng. 2 (5): 407-412 (2007).
- 86. Tham, H.J., Chen, X.D., Young, B., Bansal, B., Zhang, L. and Duffy, G.G. 'The Thermo-hydrodynamics of a concentric ohmic heater for processing dairy fluids', ECI Symposium Series Published Proceedings 7<sup>th</sup> International Conference on Heat Exchanger Fouling and Cleaning, Ed: H Muller- Steinhagen, M R Malayeri, A P Watkinson, Eng. Conf International, Article 22, 162-167 Tomar, Portugal, July 1-6 (2007).
- 87. Rost, M. and Duffy, G.G. 'Fouling mitigation with synthetic fibres in a CaSO<sub>4</sub> supersaturated solution', ECI Symposium Series Published Proceedings 7<sup>th</sup> International Conference on Heat Exchanger Fouling and Cleaning, Ed: H Muller-Steinhagen, M R Malayeri, A P Watkinson, Eng. Conf International, Article 26, 185-194 Tomar, Portugal, July 1-6 (2007).

#### In Press ...

- 88. Richardson. J.R., Corson, S. R., Duffy, G.G. "Optimisation of the Dilution Water Sulphonation Process", Accepted by the Appita Journal January (2007).
- 89. Murton, K., Duffy, G.G., Corson, S.R. "Pulp consistency effects in refining", Accepted by the Appita Journal January (2007).

90. Murton, K. D., Richardson, J.R., Corson, S.R., Duffy, G.G. "TMP refining of radiata pine earlywood and latewood fibres" To be presented to Tappi and Appita (2007).

## **LIST OF CONFERENCE PUBLICATIONS - G G DUFFY**

- 1. Duffy, G.G., Moller, K., Titchener A.L., "An Experimental Programme for the Study of the Hydrodynamic and Rheological Properties of New Zealand Wood Pulp Suspensions" Proc. NZ. Inst. Eng. Conf., 17pp, Christchurch, February (1972).
- 2. Duffy, G.G., Moller, K., Titchener A.L., "The Determination of Pipe Friction Loss of wood pulp fibre suspensions" Proceedings 28th Annual Appita Conference, Melbourne, April (1973).
- 3. Moller, K., Duffy, G.G., Titchener A.L., "A Design Correlation for the Flow of Pulp Suspensions in Pipe", Proceedings 28th Annual Appita Conference, Melbourne, April (1973).
- 4. Duffy, G.G., "Consistency Measurement in the Paper Industry", Proceedings of the Automation and Control Conference, Auckland, September (1973).
- 5. Duffy, G.G., "Two New Consistency Instruments", Proceedings of the Appita Regional Conference, 8pp, Rotorua, November (1973).
- 6. Duffy, G.G., Moller, K., Lee P.F.W., Milne S.W.A., "Design Correlations for Groundwood Pulps and the Effects of minor Variables on Pulp Suspension Flow", Proceedings 29th Annual Appita Conference, Sydney, April (1973).
- 7. Duffy, G.G., Titchener, A.L., "Design Procedures for Obtaining Pipe Friction Loss for Chemical Pulps", Proceedings Tappi Engineering Conference, Boston, October (1973).
- 8. Duffy, G.G., "A Review of the Research programme into the Flow of Pulp Suspensions and Recent Developments of Practical Significance", Proceedings of the Appita Regional Conference, 10pp, Rotorua, November (1974).
- 9. Duffy, G.G., "The Development of Two New Consistency Instruments", Proceedings 29th Annual Appita Conference, 11pp, Sydney, April (1974).
- 10. Duffy, G.G., Titchener, A.L., Lee, P.F.W., "A Review of Research into the Flow Characteristics of Paper Pulp Suspensions", Proceedings N.Z. Inst. Eng. Conf., 10pp, Auckland, February (1974).
- 11. Lee, P.F.W., Duffy, G.G., "Flow Models for the Drag Reducing Regime of Fibre Suspension Flow", Proceedings of the Annual Tappi Engineering Conference, Part 1, 137-142, Toronto, September (1975).
- 12. Duffy, G.G., Titchener, A.L., Lee, P.F.W., Moller K., "The Mechanisms of Flow of Pulp Suspensions in Pipes", Proceedings 30th Annual Appita Conference, Hobart, April (1975).
- Turner, J.C., Titchener A.L., Duffy, G.G., "The Flow Characteristics of Deaerated Wood Pulp Suspensions", Proceedings 30th Annual Appita Conference, Hobart, April (1975).

- 14. Lee, P.F.W., Duffy, G.G., "An Analysis of the Drag reducing Regime of Pulp Suspension Flow", Proceedings Tappi Engineering Conference, 7pp, New Orleans, October (1975).
- 15. Lee, P.F.W., Duffy, G.G., "Relationships Between Velocity Profiles and Drag Reduction in Turbulent Fibre Suspension Flow", Proceedings A.I.Chem. Eng. Conference, San Francisco, August (1975).
- 16. Duffy, G.G., "A Review and Evaluation of Design Methods for Calculating Friction Loss in Stock Piping Systems", Proceedings Tappi Engineering Conference, Part 1, 149-155, Toronto, October (1975).
- 17. Lee P.F.W., Duffy, G.G., "Velocity Profiles in the Drag Reducing Regime of Pulp Suspension Flow", Proceedings 30th Annual Appita Conference, Hobart, April (1975).
- 18. Duffy, G.G., "A New Method of Fibre Fractionation at High Consistency" Presented at the Annual Appita Regional Conference, Rotorua, November (1976).
- 19. Moller K., Felsvang K., de Ruvo A., Norman B., and Duffy, G.G., "High Consistency Fractionation with an Atomiser", "Dickstoffsortierung mit Spruhverfahren", Proceedings of the Eucepa Conf., Vienna, June (1976).
- 20. Duffy, G.G., Lee P.F.W. "Drag Reduction in the Turbulent Flow of Wood Pulp Suspensions", Proceedings 31st Annual Appita Conference, Gold Coast, May (1977).
- 21. Duffy, G.G., "Measuring Techniques for Fibre Flocculation and Formation Studies in the Paper Industry", Proceedings of the Automatic Control and Instrument Society Conference, N.Z. March (1978).
- 22. Norman B.G., Moller K., Ek R., Duffy, G.G., "Hydrodynamics of Papermaking Fibres in Water Suspension", Proceedings 6th Fundamental Research Symposium, Technical Division of the British Paper and Board Industry Federation 1: 195-249 (1978).
- 23. Duffy, G.G., "A New Method of Reducing Power Consumption in High Consistency Pumping", Proceedings of the 32nd Annual Appita Conference, Sydney, April (1978).
- 24. Duffy, G.G., "Sheet Formation and Flocculation Investigations in the Paper Industry", Proceedings of the Annual Appita Regional Conference, Rotorua, November (1978).
- 25. Duffy, G.G., "Flow Models and Pipeline Design Equations for Fibre Suspension Flow". Proceedings of the First National Rheology Conference, British Society of Rheology, 61-65 Melbourne, May (1979).
- 26. Duffy, G.G., "Flow Mechanisms and measuring Techniques Used to Investigate Fibre Suspension Flow in Pipes", Proceedings of the First National Rheology

- 27. Duffy, G.G., Norman B.G., "Fibre Flocculation in Conical Contractions Simulating the Papermachine Flow Box Slice", Proceedings of the International Symposium on Papermachine Headboxes, Montreal, June (1979).
- 28. Lee P.F.W., Duffy, G.G., "An Investigation of the Turbulent Flow of Fibre Suspensions". Proceedings of the International Symposium on Papermachine Headboxes, 43-53, Montreal, June (1979).
- 29. Duffy, G.G., "How to Determine Pipe Friction Loss for the Design of Stock Piping Systems", Proceedings of the Tappi Engineering Conference, 247-252, New Orleans, November (1979).
- 30. Duffy, G.G., "Suggested Methods for Obtaining Pipe Friction Data for Flowing Pulp Suspensions", Proceedings of the Tappi Engineering Conference, 243-245, New Orleans, November (1979).
- 31. Duffy, G.G., "Control of Stock Flow Using Specially Designed Butterfly Valves", Presented at the Tappi Engineering Conference, New Orleans, November (1979).
- 32. Duffy, G.G., Lee P.F.W, Moller K., "The Flow of Fibre Suspensions", Symposium on Polyphase Flow and Transport Technology, The American Society of Mechanical Engineers Century 2 Conference, Paper II/4, San Francisco, Aug. (1980).
- 33. Duffy, G.G., "High Consistency, Screening, Cleaning and Fibre Fractionating", Proceedings of the Annual Appita Regional Conference, Rotorua, November (1980).
- 34. Duffy, G.G., "A New Method of Separating Asymmetric Particulates by Spray Atomisation", Proceedings of Chemeca `81, 9th Australasian Conference of Chemical Engineering, 135-142, Christchurch, August (1981).
- 35. Duffy, G.G., Pedersen M.L., Petersen J.H. "Efficient Fibre Separation at High Consistency by Spray Atomisation", Proceedings of the 35th Annual Appita Conference, Melbourne, April (1981).
- 36. Duffy, G.G., Walmsley M.R.W., Smith T. "The Drying of Paper Webs Using a New Infrared Generator", Proceedings of the 35th Annual Appita Conference, Melbourne, April (1981).
- 37. Duffy, G.G., Smith T. "Drying by Radiant Energy Using a New Method of Infrared Generation", Proceedings of the Institution of Engineers of New Zealand Annual Conference, Hamilton, February (1983).
- 38. Duffy, G.G., "Fibre Characterisation and Separation, Suspension Flow, Sheet Formation, Paper Drying, Wood Chip Screening: Review of Research", Proceedings of the 37th Annual Conference, Mt.Gambier, April (1983).
- 39. Duffy, G.G., "A New Method of Hydraulically Transporting Wood Chips",

- Proceedings of the 38th Annual Appita Conference, Surfers Paradise, Queensland, May (1984).
- 40. Duffy, G.G., "A New Method of Hydraulically Transporting Coarse Coal, Minerals and Capsules", Proceedings of the 12th Australasian Chemeca `84 Conference, Innovative Technology, Paper 21e, 725-732, Melbourne, Australia, August (1984).
- 41. Duffy, G.G., "A New Suspending Medium for the Pipeline Transport of Coarse, High-density and Dense-phase Particles and Capsules", Proceedings Hydrotransport 9 Conference, BHRA, paper E2, 227-236, Rome, Italy, Oct. (1984).
- 42. Jablonka M.S., Munro P.A., Duffy, G.G., "Use of Fibre Optics to Study the Kinetics of Iso-electric point of Skim Milk", Proceedings of the 6th Australian Biotechnology Conference, Paper K4, 447-452, Brisbane, Queensland, September (1984).
- 43. Duffy, G.G., Walmsley M.R. "Coal Transportation: A Breakthrough in Slurry Pipeline Flow", Proceedings of Coal Technology `84 Conf., 2: 405-415, Houston, Texas, November (1984).
- 44. Walmsley M.R.W., Duffy, G.G., "Coal and Iron-sand Suspension Flow: A New Innovation in Pipeline Transport", Proceedings Inst. Prof. Eng. N Z Conf., Paper 49, Wellington, N.Z., Feb. (1985).
- 45. Duffy, G.G., Walmsley, M.R.W., "The Pipeline Transport of Solids Using a Novel Stabilising Suspending Medium", Proceedings of the 10th International Slurry Technology Conference, 115-121, Lake Tahoe, Nevada, March (1985).
- 46. Walmsley M.R.W., Duffy, G.G., "Hydraulic Transport of Solid Particles and Capsulised materials in Pipelines with Friction Losses Lower than Water", Proceedings of the 5th International Freight Pipeline Conference, Philadelphia, Pennsylvania, October (1985).
- 47. Jablonka M.S., Munro P.A., Duffy, G.G., "Use of Light Scattering Devices to Study the Kinetics of Casein Precipitation from Skim Milk by Mineral Acid", Proceedings of NZ Dairy Conference, Palmerston North, August (1985).
- 48. Duffy, G.G., "Solids and Capsule Flow in a Fibre Suspension", Proceedings BHRA Hydrotransport 10 Conference, BHRA, Innsbruck, Austria, October (1986).
- 49. Duffy, G.G., "Pumps, Pulp and Paper; New Methods for the Paper Industry", Proceedings of Appita Annual Regional Conference, Rotorua, November (1986).
- 50. Walmsley, M.R.W., Duffy, G.G., "Wood Pulp Fibre Suspensions as a Transporting Medium for Slurries", Proceedings of the 9th Australasian Fluid Mechanics Conference, 78-82, Auckland, December (1986).
- 51. Duffy, G.G., Kibblewhite, R.P.K., "A New Method of Relating Wood, Pulp and Paper Properties using a Fibre Analyser", Proceedings of the 41st Annual Appita General Conference, Paper A18, 1-22, Sydney, Australia, April (1987).
- 52. Walmsley, M.R.W., Duffy, G.G., "A New Carrier Medium for the Hydraulic

- Transport of Coal and Iron Sand by Pipeline", Proceedings Inst. Prof. Eng. N.Z. Conf., Paper 27, Auckland, N.Z., Feb. (1986).
- 53. Duffy, G.G., "The Flow of Fibre Suspensions and the Design of Stock Piping Systems", Process Hydraulics Seminar, Melbourne, Australia, October (1987).
- 54. Duffy, G.G., "Fibre Suspensions Fibres, Flocculation, Flow and the Future", Keynote address in the Proceedings of the Ekman Days Symposium, Stockholm, Sweden, January (1988).
- 55. Duffy, G.G., "Ubiquitous Fibres Suspension Properties and Flow Behaviours", Proceedings of the 42nd Annual Appita Conference, Paper B11, 1-10, Hobart, Tasmania, April (1988).
- 56. Longdill, G.R., Duffy, G.G., "The Shear Behaviour of Medium Consistency Wood Pulp Fibre Suspensions", Proceedings of the 42nd Annual Appita Conference, Paper B13, 1-23, Hobart Tasmania, April (1988).
- 57. Duffy, G.G., "A New Method of Wood Chip Thickness Screening", Proceedings of the 42nd Annual Appita Conference, Paper B15, Hobart, Tasmania (1988).
- 58. Duffy, G.G., "The Shear Behaviour of Wood Pulp Fibre Suspensions", Proceedings of Scanpump Pulp and Paper Convention, Gothenburg, Sweden, September (1988).
- 59. Walsmley, M.R., Duffy, G.G., "Reducing Pipeline Pressure Gradients of Coarse-coal Slurries with Wood Pulp Fibres". Proceedings BHRA Hydrotransport 11 Conference, Paper F3, 295-308, Stratford-upon-Avon, England, October (1988).
- 60. Duffy, G.G., "Optimum Design of pipelines for transporting wood pulp fibre suspensions". Proceedings of the 6th International Freight Pipelines Symposium, Paper 7B-5, 6pp, Columbia, Missouri, USA, May (1989).
- 61. Walmsley, M.R.W., Duffy, G.G., "Drag reduction in slurry flow from wood pulp fibre addition", Proceedings of the 6th International Freight Pipelines Symposium, Paper 7B-2, 7pp, Columbia, Missouri, USA, May (1989).
- 62. Duffy, G.G., Walmsley, M.R.W., Algers, B., Alfredsson, K., Hedenfalk, L., "Design correlations for pumping high-yield pulps", Proceedings of the 43rd Annual Appita Conference, Paper B20, 1-19, Brisbane, May (1989).
- 63. Duffy, G.G., "Designing pulp pipelines for the optimum conditions", Proceedings of the 43rd Annual Appita Conference, Paper B25, 1-20, Brisbane, May (1989).
- 64. Walmsley, M.R.W., Duffy, G.G., "Design correlations for pumping solids-fibre slurries", Proceedings of the 17th Australasian Chem. Eng. Conf., Chemeca '89, Paper 5B, 160-167, Gold Coast, Queensland, August (1989).
- 65. Bigham, J.A., Duffy, G.A., "An investigation of Hammermill variables and fluffed pulp quality", Proceedings of the 44th Annual Appita Conference, Paper C4, 22 pp, Rotorua, April (1990).

- Smith, R.J., Duffy, G.G., "Pulp washing by dilution thickening without remixing", Proceedings of the 44th Annual Appita Conference, Paper C7, 14 pp, Rotorua, April (1990).
- 67. Smith, R.J., Duffy, G.G., "Improved pulp washing efficiency by reducing wash liquor temperature", Proceedings of the 44th Annual Appita Conference, Paper C9, 11 pp, Rotorua, April (1990).
- 68. Duffy, G.G., "What Academic Engineers can offer Industry", Proceedings of Control 90, 14th National Conference of the Institute of Measurements and Control N.Z. Inc., Auckland, May (1990).
- 69. Duffy, G.G., "Targeted Research lateral thinking, innovations and applications to the Pulp and Paper Industry", Proceedings of the Annual IPENZ Conference, Auckland, February (1991).
- 70. Duffy, G.G., "Some Human Factors in Engineering Education", Proceedings of the AEESEAP Conference, 179-182, Christchurch, December (1991).
- 71. Duffy, G.G., "A new Postgraduate course in Pulp and Paper Science and Technology", Proceedings of the AEESEAP Conference, 524-528, Christchurch, December (1991).
- 72. Middis, J., Müller-Steinhagen, H.M., Duffy, G.G., "Convective and Nucleate Boiling Heat Transfer to Wood Pulp Fibre Suspensions", Proceedings of the 1st European Thermal Sciences Heat Transfer Conference, Vol. 2, 103, Birmingham, September (1992).
- 73. Duffy, G.G., "Development of Methods for characterising mechanical and chemical wood pulps", Proceedings of the 4th Annual Appita Conference, B141, 537-542, Launceston, April (1992).
- 74. Middis, J., Duffy, G.G., Müller-Steinhagen, H.M., "Heat transfer to wood pulp fibre suspensions", Proceedings of the 46th Annual Appita Conference, B132, 517-523, Launceston, April (1992).
- 75. Veilreicher, T., Allen, M.L., Müller-Steinhagen, H.M. and Duffy, G.G., "Non-Steady State Flow Behaviour of Wood Pulp Fibre Suspensions", Proceedings of the 47th Annual Appita Conference, Vol.2, 515-526, Rotorua, April (1993).
- 76. Duffy, G.G., "The Flow of Medium Consistency Wood Pulp Fibre Suspensions", Proceedings of the 47th Annual Appita Conference, Vol.2, 507-514, Rotorua, April (1993).
- 77. Middis, J., Duffy, G.G. and Müller-Steinhagen, H.M., "Heat Transfer and frictional pressure drop characteristics of Nylon model fibre suspensions", Proceedings of the 47th Annual Appita Conference, Vol.2, 527-532, Rotorua, April (1993).
- 78. Duffy, G.G., "The Design of Piping Systems for the Transport of Wood Pulp Fibre Suspensions", Proceedings BHRA Hydrotransport 12, 629-638, Belgium,

- 79. Duffy, G.G., "Improved drying efficiency of paper, recycled paperboard, coatings and inks", Proceedings of the Tappi Conference, Delaware Valley Section, New Jersey, November (1993).
- 80. Duffy, G.G., "Lateral thinking, innovation and applications in the process industry", Keynote Address, Proceedings of the 7th National Chemical Engineering Conference, Johannesburg, South Africa, August 22-24 (1994).
- 81. Bremford, D., Müller-Steinhagen, H. and Duffy, G.G., "Heat transfer to Kraft black liquor in a fluidized bed", Proceedings of 2nd European Thermal Sciences and 14th UIT National Heat Transfer Conference, pp 1545-1552, Rome 29-31 May (1996).
- Harper, S.R., Wakelin, R.F. and Duffy, G.G., "Relationships for improving hydrocyclone control", Proceedings of the 50th Annual Appita Conference, Vol.1, 389-395, Auckland, May (1996).
- 83. Develter, P. and Duffy, G.G., "Open-channel flow of wood pulp fibre suspensions", Proceedings of the 51st Annual Appita Conference, Vol.2, Paper 3B31, 483-490, Melbourne, April (1997).
- 84. Ellis, M.J., Duffy, G.G., Allison, R.W., Kibblewhite, R.P., "Fibre deformation during medium consistency mixing: role of residence time and impeller geometry", Proceedings of the 51st Annual Appita Conference, Vol. 2, Paper 4B23, 643-649, April (1997).
- 85. Murton, K.D., Corson, S.R., Duffy, G.G. "Effect of primary stage refining consistency on TMP pulp quality and energy consumption", Proceedings of the 51st Appita General Conference, Vol.1, Paper 1B31, 87-94, Melbourne, April (1997).
- 86. Richardson, J., Duffy, G.G. "Sulphonation mechanisms in CTMP and DWS pulping", Proceedings of the 51st Appita General Conference, Vol.1, Paper 1B32, 95-102, Melbourne, April (1997).
- 87. Duffy, G.G. "Wood pulp fibre suspension flocculation, flow and applications in the pulp and paper industry", Proceedings of the 2nd Pacific Rim Conference on Rheology, 59-60, Melbourne, July (1997).
- 88. Duffy, G.G. "The unique flow behaviour of wood pulp fibre suspension", Proceedings of the 9th International Conference on Transport and Sedimentation of solid particles", Part 1, 123-134, Cracow, Poland, September (1997).
- 89. Paul, S.T., Duffy, G.G., Chen, X.D "Reducing fibre flocculation some practical implications", Proceedings of Chemeca'97, Abstract PT2c.Sess.2 p265, text CD-ROM, Rotorua, September, (1997).
- 90. Kazi, S., Duffy, G.G., Chen, X.D. "Heat Transfer to natural fibre suspensions", Proceedings of the IPENZ Conference, Vol. 5, 91-96, Auckland, February (1998).

- 91. Allison,R.W., Ellis, M.J., Kibblewhite, R.P., Duffy, G.G. "The effect of mechanical processing on the strength of oxygen delignified Kraft pulp", Proceedings of the International Pulp Bleaching Conference 1998, Book 1, 159-166, Helsinki, Finland, June (1998).
- 92. Wahjudi, U, Kibblewhite, R.P., Duffy, G.G. "An evaluation of three formation testers using radiata pine and spruce (Canadian) pulps", Book 2, 585-590Proceedings 52nd Annual Appita Conference, Brisbane, May, (1998).
- 93. Kazi, S., Duffy, G.G., Chen, X.D., "Heat exchanger fouling mitigation with flexible fibres", Proceedings of the 26<sup>th</sup> Chemeca Conference, Paper No: 177.6, Port Douglas, September, (1998).
- 94. Duffy,G.G. "Increasing profit through selective fibre treatment", Keynote address paper, Vol. 1, paper 2A41, 205-209, Proceedings of the 53rd Appita Annual Conference, Rotorua, (1999).
- 95. Smith, R.J., Duffy, G.G. "An investigation of factors affecting pulp washing efficiency" Vol. 1, paper 2B31, 275-282, Proceedings of the 53rd Annual Appita Conference, Rotorua, April (1999).
- 96. Paul, S.T., Chen, X.D., Duffy, G.G., Walmsley, M.W. "Improved screening performance with viscous media", Vol.2 paper 4C33, 821-824, Proceedings of the 53rd Annual Appita Conference, Rotorua, April (1999).
- 97. Murton, K.D., Corson, S.R., Duffy, G.G. "Effect of plate coarseness on slabwood and thinnings TMP fibres", Proceedings of the 51st Appita General Conference, Vol. 2, Paper 3A12, 383-390, Rotorua, April (1999).
- 98. Walmsley, M.W, Berry, C., Duffy, G.G. "The flow behaviour of fibre-cement slurries in horizontal pipes", Proceedings BHRA Hydrotransport 14 Conference, 319-332, Maastricht, The Netherlands, September, (1999).
- 99. Kazi, S., Duffy, G.G., Chen, X.D., Müller-Steinhagen, H.M. "Fibre modified scaling mechanisms in heat transfer fouling mitigation with wood pulp fibre suspensions", Proceedings of the Mitigation and Heat Exchanger Fouling Conference, Section V, 1-8, Banff, Canada, July (1999).
- 100. Kazi, S., Duffy, G.G., Chen, X.D., "Heat Transfer Coefficient a new way to relate fibre and paper properties" Proceedings of the 27<sup>th</sup> Chemeca Conference CDRom, Section 6:162, Newcastle, Australia, September, (1999).
- 101. Duffy, G.G. "New developments in fibre suspension processing", Invited lecture, Tappi Engineering Conference, Anaheim, USA, September (1999).
- 102. Duffy, G.G. "The importance of mechanistic-based models in fibre suspension flow" Proceedings of the 54<sup>th</sup> Annual Appita Conference, Paper 2C21, Vol.1, 337-342, Melbourne, April (2000).
- 103. Paul, S.T., Duffy, G.G. and Chen, X. D. "New insights into the flow of pulp

- suspensions" Proceedings of the 54<sup>th</sup> Annual Appita Conference, Paper 4B32, Vol.2, 645-654, Melbourne, April (2000).
- 104. Duffy, G.G., Kazi, S.N., Chen, X.D. "Heat transfer coefficient a new way to monitor wood pulp quality", Proceedings of the 54<sup>th</sup> Annual Appita Conference, Paper 4B12, Vol.2, 605-614, Melbourne, April (2000).
- 105. Xu, J.Q. and Duffy, G.G. "Operational parameters in screw press dewatering", Proceedings of the 54<sup>th</sup> Annual Appita Conference, Paper 2B23, Vol.1, 263-270, Melbourne, April (2000).
- 106. Wahjudi-Winters, U., Duffy, G.G., Kibblewhite, R.P. "Effect of grammage and concentration on papersheet formation of pinus radiata kraft pulps", Proceedings of the 54<sup>th</sup> Annual Appita Conference, Paper 4B42, Vol.2, 671-678, Melbourne, April (2000).
- 107. Duffy, G.G. "Mechanistic considerations in fibre suspension flow modelling", Proceedings of the 10<sup>th</sup> International Conference on the Transport and Sedimentation of solid particles", Vol 1: 99-112, Wroclaw, Poland September, (2000).
- 108. Kazi, S., Duffy, G.G., Chen, X.D. "Heat Transfer to fibre suspensions in annular flow" Proceedings of the 28<sup>th</sup> Chemeca Conference 2000, Paper C-4.2, 366-369, Perth, Australia, April, (2000).
- 109. Murton, K. D., Richardson, J.R., Corson, S.R., Duffy, G.G. "TMP refining of radiata pine earlywood and latewood fibres" Proceedings of the International Mechanical Pulping Conference, Vol. 2, 361-371, Helsinki, Finland, June (2001).
- 110. Song, G., Duffy, G.G. "An investigation of fibre deformations in medium consistency processing", Proceedings of the 55<sup>th</sup> Annual Appita Conference, Vol.1, 252-263, Tasmania, April (2001).
- 111. Richardson. J.R., Corson, S. R., Duffy, G.G. "Optimisation of the DWS (Dilution Water Sulphonation) Process", Proceedings of the 55th Appita General Conference, Vol. 1, 193-202, Tasmania, April (2001).
- 112. Kazi, S. N., Duffy, G.G., Chen, X. D. "A study of fouling and fouling mitigation on smooth and roughened metallic surfaces, and a polymer material", Proceedings of the Heat Exchanger Fouling Conference Fundamental Approaches and Technical Solutions, Section III, paper 2, 65-72, Davos, Switzerland, July (2001).
- 113. Kazi, S. N., Duffy, G.G., Chen, X. D. "Heat transfer fouling mitigation with wood pulp fibres" Proceedings of the Heat Exchanger Fouling Conference Fundamental Approaches and Technical Solutions, Section III, paper 5, 73-79, Davos, Switzerland, July (2001).
- 114. Duffy, G.G., Kazi, S.N., Chen, X.D. "Monitoring pulp fibre quality by frictional pressure drop measurement", Proceedings of the 56<sup>th</sup> Annual Appita Conference, Paper 1B42, 119 -126, Rotorua, March (2002).

- 115. Duffy, G.G., Abdullah, L. "Flow of fibre suspensions in small diameter pipes", Proceedings of the 56<sup>th</sup> Annual Appita Conference, Paper 1B43, 127-133, Rotorua, March (2002).
- 116. Duffy, G.G., Chen, X.D., Kazi, S.N. "Fibre particle characterisation in suspension flow" proceedings of the 15<sup>th</sup> International Hydrotransport 15 Conference, Vol. 2, 825-842, Banff, Canada, June (2002).
- 117. Murton, K., Duffy, G.G., Corson, S.R. "Pulp residence time influence on refining intensity and pulp quality", Proceedings of the 56<sup>th</sup> Annual Appita Conference, Paper 2A31, 185-193, Rotorua, March (2002).
- 118. Kazi, S., Chen, X.D., Duffy, G.G. "Cleaning of mineral fouling deposits on heat exchanger surfaces", Proceedings of the 9<sup>th</sup> APCChE-Chemeca Congress, CDRom Paper #854, Christchurch, September (2002).
- 119. Duffy, G.G., Kazi, S., Chen, X.D., "A study of heat transfer and pressure loss of suspensions of synthetic filaments and wood pulp fibres in annular flow", Proceedings of the 9<sup>th</sup> APCChE-Chemeca Congress, CDRom Paper #885, Christchurch, September (2002).
- 120. Kazi, S., Duffy, G.G., Chen, X.D., "Validation of heat transfer data for fibre suspensions in annular flow", Proceedings of the 9<sup>th</sup> APCChE-Chemeca Congress, CDRom, Paper #954, Christchurch, September (2002).
- 121. Paul, T., Duffy, G.G., and Chen, X.D. "Simple evaluation methods for deflocculants and their affect on fibre network structure", Proceedings of the 57<sup>th</sup> Annual Appita Conference, Paper 1A 42, 57-62, Melbourne, May (2003).
- 122. Duffy, G. G. and Nan, K. "The development of a new method of fibre separation", Proceedings of the 57<sup>th</sup> Annual Appita Conference, Paper 2C 41, 349-357, Melbourne, May (2003).
- 123. Duffy, G. G. "A new method of fibre fractionation", Proceedings of the 57<sup>th</sup> Annual Appita Conference, Paper 2D 43, 453-458, Melbourne, May (2003).
- 124. Duffy, G.G. "The importance of mechanistic-based models in fibre suspension flow", CD-ROM Session 2A, Proceedings of the 31st Chemeca Conference 2003, Adelaide, September (2003).
- 125. Bansal, B., Chen, X.D., Hossain, Md. M., Duffy, G.G. "Role of solid membrane characteristics in a supported liquid membrane (SLM)", CD-ROM Session PS 1, Proceedings of the 31st Chemeca Conference 2003, Adelaide, September (2003).
- 126. Duffy, G. G. and Wahjudi Winters, U. "Some developments for characterising wood pulp fibres in pulp and paper mills", Proceedings of the 58<sup>th</sup> Annual Appita Conference, Paper 3B32, 421-431, Canberra, April (2004).
- 127. Duffy, G. G., Ramachandra, S. and Xu, J. Q. "Developments in processing fibre suspensions", Proceedings of the 58<sup>th</sup> Annual Appita Conference, Paper 3B33, 433-442, Canberra, April (2004).

- 128. Duffy, G.G., Chen, X.D., and Kazi, S.N. "The flow behaviour of asymmetric synthetic fibres", Proceedings of the 12<sup>th</sup> International Conference on Transport and Sedimentation of Solid Particles, 237-255, Prague, Czech Republic, September (2004).
- 129. McShane, K. and Duffy, G. G. "Fibre suspension characterisation using heat transfer measurements with model synthetic fibres in flowing suspension", Proceedings of the 59<sup>th</sup> Annual Appita Conference, Paper 1A23, 13-21, Auckland, April (2005).
- 130. Duffy, G. G. "A simple method for evaluating and monitoring fibre quality", Proceedings of the Tappi Engineering Conference, Paper 27-2, 9pp CD-Rom, Philadelphia, USA, August (2005).
- 131. Duffy, G. G. "A panoramic overview of fibre suspension flow and flow mechanisms", Proceedings of the 15<sup>th</sup> Nordic Rheology Conference, 13pp, June 12-14, Stockholm, Sweden (2006).
- 132. Duffy, G. G. and McShane, K. S. "Heat Transfer Fouling Mitigation with Model Synthetic Fibre Suspensions", Proceedings of the 34<sup>th</sup> Chemeca Conference Auckland September, (2006).
- 133. Duffy, G.G. "Fibre suspensions flow, mechanisms and models, and application of some unique suspension behaviours", 13pp, Presented at the University of Coimbra, Portugal Seminar Series, Portugal, July, (2007).
- 134. Rost, M. and Duffy, G. G. 'Fouling Mitigation with Synthetic Fibres in a CaSO<sub>4</sub> Supersaturated Solution', Session 5, Paper 4, 9pp, Heat Exchanger Fouling and Cleaning VII Conference, 1-6, Tomar, Portugal, July (2007).
- 135. Tham, H.J., Chen, X.D., Young, B., Bansal, B., Zhang, L. and Duffy, G.G. 'The Thermo-hydrodynamics of a concentric ohmic heater for processing dairy fluids', Session 4, Paper 5, 7pp, Heat Exchanger Fouling and Cleaning VII Conference, Tomar, Portugal, July (2007).

#### REPORTS ON SPECIAL INVESTIGATIONS CARRIED OUT FOR THE INDUSTRY

- REPORT ON AN EVALUATION OF AN IN-LINE FOXBORO 19C STYLE D AND A DEZURIK 710 BC CONSISTENCY TRANSMITTER, Duffy G.G., Milne S.W.A., Moller K., Titchener A.L., Report No. 76, 24 pp, University of Auckland June (1971).
- 2. REPORT ON THE FLOW BEHAVIOUR OF N.Z.F.P. TAWA NSSC PULP, Duffy G.G., Moller K., Report for NZ Forest Products Ltd., University of Auckland, October (1971).
- 3. DESIGN MANUAL AND FRICTION LOSS DATA FOR THE FLOW OF NEW ZEALAND WOOD PULP SUSPENSIONS IN PIPES, Duffy G.G., Moller K., University of Auckland, July (1972).
- 4. REPORT ON DESIGN CORRELATIONS FOR AN ASPEN SULPHITE PULP FOR PROCTOR AND GAMBLE COMPANY OF THE U.S.A., Duffy G.G., University of Auckland, February (1974).
- 5. AN INVESTIGATION OF TEN PULPS USING LABORATORY TECHNIQUES TO PREDICT PIPE FRICTION LOSS DESIGN CORRELATIONS FOR THE PROCTOR AND GAMBLE COMPANY OF THE U.S.A., Duffy G.G., University of Auckland, May (1974).
- 6. REPORT ON A SCALE-UP DESIGN CORRELATION FOR AN ASPEN SULPHITE PULP FOR THE PROCTOR AND GAMBLE COMPANY OF THE U.S.A., Duffy G.G., University of Auckland, October (1974).
- 7. REPORT ON THE DESIGN CORRELATIONS FOR A WASTE PAPER PULP FOR AUSTRALIAN PAPER MANUFACTURERS LTD, Duffy G.G., University of Auckland, October (1974).
- 8. THE EFFECT OF DEAERATION ON THE TURBULENT FLOW OF WOOD PULP FIBRE SUSPENSIONS, Duffy G.G., 30pp, Report No.121, School of Engineering, University of Auckland, December (1975).
- 9. INVESTIGATION OF THE EFFECT OF DEAERATION ON THE FLOW BEHAVIOUR OF TURBULENT WOOD FIBRE SUSPENSIONS FOR CLARK AND VICARIO OF THE U.S.A., Lee P.F.W., Duffy G.G., University of Auckland, December (1975).
- 10. DESIGN CORRELATIONS FOR FIVE AUSTRALIAN PULPS DEVELOPED FROM PIPE FRICTION DATA OBTAINED FROM LARGE DIAMETER PIPES AT THE AUSTRALIAN NEWSPRINT MILLS LIMITED, BOYER, TASMANIA, Duffy G.G., Report No. 128 School of Engineering, University of Auckland, June (1976).
- 11. INVESTIGATION OF DRY-FORMED DIAPER PADS FOR CAXTON PRINTING WORKS LTD, Duffy G.G., University of Auckland, June (1976).
- 12. HYDRODYNAMICS OF PAPERMAKING FIBRES IN WATER SUSPENSION,

- Norman B.G., Moller K., Ek R., Duffy, G.G., Swedish Forest Products Research Institute Report, Meddelande B451, April (1977).
- 13. AN INVESTIGATION OF THE MASS DISTRIBUTION (SHEET FORMATION) OF PAPER SHEETS NZ FOREST PRODUCTS LTD., Duffy G.G., School of Engineering Report No.183, 216pp, University of Auckland, October (1978).
- 14. MEASUREMENT OF FIBRE FLOCCULATION USING FIBRE OPTICS AND THE OPTICAL SYSTEM OF A LASER DOPPLER ANEMOMETER, Duffy G.G., School of Engineering Report No.189, 83pp, University of Auckland, December (1978).
- 15. THE FLOW THROUGH BUTTERFLY CONTROL VALVES FOR KEYSTONE VALVES LTD NOWRA, N.S.W. AND KEYSTONE INTERNATIONAL, ATLANTA, GEORGIA, U.S.A., Duffy G.G., University of Auckland, June (1979).
- 16. THE FLOW BEHAVIOUR OF PULP SUSPENSIONS THROUGH BUTTERFLY VALVES, Duffy G.G., Cheng C.L., Ooi S.K., School of Engineering Report, No.202, University of Auckland, June (1979).
- 17. A TECHNICAL REVIEW OF PIPE FRICTION LOSS METHODS AND DESIGN PROCEDURES FOR GOULDS PUMPS INC, SENECA FALLS, N.Y., Duffy G.G., University of Auckland, December (1980).
- A REVIEW AND EVALUATION OF PIPE FRICTION LOSS METHODS AND CORRELATIONS FOR AHLSTROM PUMPS, KARHULA, FINLAND, Duffy G.G., University of Auckland, March (1980).
- 19. A TECHNICAL REVIEW OF PAPER STOCK PIPE FRICTION DATA CORRELATIONS AND PROCEDURES, Duffy G.G., School of Engineering, Report No.291, September (1981).
- 20. EXPERIMENTAL DATA FROM AN INVESIGATION OF THE FLOW BEHAVIOUR OF PARTICULATE SOLIDS AND CAPSULES IN WOOD PULP FIBRE SUSPENSIONS, Duffy G.G., Walmsley M.R.W., Engineering School Report No. 448, University of Auckland, November (1988).
- 21. PIPE FRICTION LOSS DATA AND DESIGN CORRELATIONS FOR FIVE HIGH-YIELD SOFTWOOD PULPS, Duffy, G.G., Walmsley, M.R.W., Engineering School Report No. 456, University of Auckland, November (1988).
- 22. PIPE FRICTION LOSS DATA AND DESIGN CORRELATIONS FOR FIVE HIGH-YIELD SOFTWOOD PULPS FOR SCANPUMP, GOTEBORG, SWEDEN, Duffy G.G., Walmsley M.R.W., University of Auckland, November (1988).
- 23. DESIGN CORRELATIONS AND PIPE FRICTION LOSS DATA FOUR CTMP AND TMP SPRUCE/PINE PULPS FOR NYSTROM, KOBAYASHI, LEE AND ASSOCIATES, VANCOUVER, CANADA, Duffy G.G., Walmsley M.R., University of Auckland, May (1989).
- 24. PIPE FRICTION LOSS DATA AND DESIGN CORRELATIONS AND EQUATIONS FOR A BLEACHED SODIUM BISULPHITE PINE PULP AND A BLEACHED TMP

- PINE PULP FOR APCEL LIMITED, MILLICENT, AUSTRALIA, Duffy G.G., Walmsley M.R., University of Auckland, June (1989).
- 25. NOVEL DEVELOPMENTS IN PULP WASHING FOR NZFP LIMITED, Smith R.J., Duffy G.G., University of Auckland, July (1989).
- 26. THE EFFECT OF PAD BASIS WEIGHT ON VAPOUR-PHASE PRESSURE WASHING EFFICIENCY, Smith R.J., Duffy G.G., University of Auckland, December (1989).
- 27. VAPOUR-PHASE PRESSURE WASHING, Smith R.J., Duffy G.G., University of Auckland, August (1990).
- 28. AN INVESTIGATION OF THE RADIANT TRANSFER EFFICIENCY OF TWO FIBRE MATRIX EMITTERS, Duffy G.G., University of Auckland for Marsden Inc., Pennsauken, N.J., USA, December (1992).
- 29. HEAT TRANSFER DYNAMICS, Duffy G.G., Report for Marsden Manufacturing Incorporated, Pennsauken, N.J., USA, October (1993).
- 30. INVESTIGATION OF HEAT TRANSFER MEASURING METHODS AND DATA FOR IMPROVEMENT OF FIBRE MATRIX HEATERS, Duffy, G.G., Confidential Report to Marsden Incorp., Pennsauken, N.J., U.S.A, December (1993).
- 31. EVALUATION OF HANDSHEET DATA FOR NORBULKY GRADES USING BLEACHED ASPEN CTMP PULP, Duffy, G.G., Report to Norske Skog Industrier AS, Hønefoss, Norway, March (1994).
- 32. PILOT MACHINE TRIALS AT NTH TRONDHEIM FOR NORBULKY GRADES WITH BLEACHED ASPEN CTMP (and some Aspen CTMP products), Duffy, G.G., Report to Norske Skog Industrier AS, Hønefoss, Norway, March (1994).
- 33. DEVELOPMENT OF BULKY NEWSPRINT GRADES USING BLEACHED CTMP SPRUCE and OTHER SELECTED PULPS, Duffy, G.G. Report to Norske Skog Industrier AS, Hønefoss, Norway, April (1994).
- 34. HANDSHEET TESTING FOR FINEPAPERS MADE FROM PEROXIDE BLEACHED SPRUCE TMP AND CTMP SULPHITE PULPS WITH 15% CaCO<sub>3</sub> ADDITION, Duffy, G.G. Report to Norske Skog Industrier AS, Hønefoss, Norway, May (1994).
- 35. PRODUCT DEVELOPMENT FOR UNION PM6 MACHINE FOR THE SHORT-TO-MEDIUM TERM (1994-2000) Duffy, G.G. Report 157, Norske Skog Industrier AS, Hønefoss, Norway, June (1994).
- DWS PROCESS PART 2: THE EFFECT OF WOOD TYPE AND SULPHITE pH ON PULP QUALITY, Richardson, J.D., Corson, S.R., Duffy, G.G. Confidential PAPRO NZ Report C 547, April (1995).
- 37. ASSESSMENT OF MEDIUM CONSISTENCY MIXING EFFECTS ON COMMERCIAL KRAFT PULP, Ellis, M.J., Duffy, G.G., PAPRO NZ Report D343,

- May (1995).
- 38. THE DEVELOPMENT OF A RAPID RESPONDING GAS-FIRED RADIANT WATER HEATER, Duffy, G.G., Research Report to Marsden Incorporated, Pennsauken, USA, October (1955).
- 39. THE RESPONSE OF A BLACKENED MILD-STEEL PLATE TO RADIANT HEAT TRANSFER, Duffy, G.G., Research Report to Blue Heron Company, New Jersey, USA, NOVEMBER (1995).
- 40. PRESSURE FORMING OF BOND FIBRE PADS, Duffy, G.G., Research Report submitted to Marsden Incorporated, Pennsauken, USA, October (1995).
- 41. FIBRE NETWORK CONSOLIDATION OF CHEMICALLY BONDED FIBRE STRUCTURES, Duffy, G.G. Research Report submitted to Marsden Incorporated, Pennsauken, USA, November (1995).
- 42. THE EFFECT OF PRODUCTION RATE ON TMP PULP QUALITY AND ENERGY CONSUMPTION, Murton, K.D., Corson, S., Duffy, G.G. Confidential PAPRO NZ Report C 565, November (1995).
- 43. CORRELATION OF COMMERCIAL AND LABORATORY MEDIUM CONSISTENCY MIXING PART A: EFFECT OF MIXING TIME, Ellis, M.J., Duffy, G.G., Allison, R.W., Kibblewhite, R.P., PAPRO NZ Report C597, PAPRO, Rotorua, April (1996).
- 44. CORRELATION OF COMMERCIAL AND LABORATORY MEDIUM CONSISTENCY MIXING PART B: EFFECT OF MIXING GEOMETRY, Ellis, M.J., Duffy, G.G., Allison, R.W., Kibblewhite, R.P., PAPRO NZ Report C616, PAPRO Rotorua, June (1996).
- 45. SULPHONATION MECHANISMS IN DWS AND CTMP PULPING, Richardson, J.D. Corson, S.R., Duffy, G.G. PAPRO NZ Report C641, 37pages, PAPRO Rotorua, May (1997).
- 46. PALLET DESIGN LITERATURE REVIEW AND THE INVESTIGATION OF CONE ANGLES, Patterson, E., Duffy, G.G. Report I to Hawk Packaging Ltd Hamilton, pp 14, June (1997).
- 47. INVESTIGATION OF VACUUM FORMED PULP PALLETS, Patterson, E., Duffy, G.G. Report II to Hawk Packaging Ltd Hamilton, pp 33, July (1997).
- 48. THE OPTIMUM DESIGN OF CERAMIC FIBRE PADS FOR RADIANT HEATERS, Duffy G.G. Confidential Report 3, Marsden Inc., Delran, N.J, USA, 17pages, May (1997).
- 49. FIBRE DEFORMATION DURING MEDIUM CONSISTENCY MIXING, Ellis, M.E., Duffy, G.G., Allison, R.W., Kibblewhite, R.P. PAPRO NZ Report No. B215, 21 pages, April (1997).
- 50. THE DWS PROCESS PART 3:INFLUENCE OF REFINING CONDITIONS ON

- SULPHITE DECOMPOSITION AND PULP QUALITY, Richardson, J.R., Corson, S.R., Duffy, G.G., PAPRO Report C689, 34pages, PAPRO NZ, Rotorua, December (1997).
- 51. THE DWS PROCESS: PART 4: Two-stage sulphite application, Richardson, J.R., Burrell, C., Robson, C., Duffy, G.G. PAPRO NZ Report D438, 68 pages, PAPRO NZ Rotorua, June (1997).
- 52. THE DWS PROCESS; THE INFLUENCE OF REFINING ON SULPHONATION AND PULP QUALITY, Richardson, J.R., Corson, S.R., Duffy, G.G. PAPRO NZ Report C689, June (1998).
- 53. AN EVALUATION OF THREE FORMATION TESTERS USING PINUS RADIATA PINE AND SPRUCE PULPS, Wahjudi, U., Duffy, G.G., Kibblewhite, R. P. PAPRO NZ Report B236, May (1998).
- 54. TMP PULP RESIDENCE TIME DETERMINATION, Murton, K., Burrel, P., Hawken, R., Yeates, M., Anderson, M., Duffy, G.G., Corson, S.R., Smith, M. PAPRO NZ Report D467, July (1999).
- 55. THE EFFECT OF SO<sub>2</sub> CHIP PRE-TREATMENT ON RADAIATA PINE TMP, Murton, K., Duffy, G.G. PAPRO NZ Report C771, 15 pages, December (1999.).
- 56. EFFECT OF REFINING INTENSITY ON SLABWOOD AND THINNINGS TMP PULP QUALITY AND ENERGY CONSUMPTION, Murton, K., Corson, S.R., Duffy, G.G. PAPRO NZ Report C777, 23 pages, December (1999).
- 57. REPORT ON THE RESULTS OF THE FIBRE SEPARATOR TRIALS AT VOITH PAPER TECHNOLOGY, Duffy, G.G. Voith Paper Research Report, Ravensburg, Germany 11 pages, June (2001).
- 58. PRELIMINARY REPORT ON THE RESULTS OF A NEW METHOD OF FIBRE SEPARATION, Schabel, S., Duffy, G.G. Voith Paper Research Report, Ravensburg, Germany 6 pages, November (2001).
- 59. FIBRE SUSPENSION FLOW PHENOMENA AND APPLICATIONS IN STOCK PREPRATION INCLUDING SCREENS, HYDROCYCLONES, RAFFINATORS, MIXING CHESTS, AND REFINERS, Duffy, G.G. Voith Paper Research Report, Ravensburg, Germany, 85 pages, June (2001).
- 60. OPTIMAL USE OF SOUTHERN U.S.A. FIBRES IN PAPER PRODUCTS, Duffy, G.G., International Paper Technical Report, Tuxedo, U.S.A., 27 pages, November (2001).
- AN INVESTIGATION INTO THE DEFIBERISING OF PINE PULPS, Duffy, G.G. International Paper Technical Report, Tuxedo, U.S.A., 22 pages, November (2001).
- 62. AN INVESTIGATION INTO THE LAMINATION OF TISSUE AND PLASTIC FOR MEAT PACKAGING, Duffy, G.G. Fabri-cell International Ltd., Auckland, 4 pages, September (2003).