dr. raymond john roberts
consultant physicist

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rj roberts consulting pty ltd

advanced wetting technologies pty ltd

surfactant technologies australia pty ltd

curriculum vitae

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name:
Dr. Raymond John Roberts

education:
PhD ANU 2004 [Thesis: ***"Liquid penetration into paper"***]
BSc (For) Hons ANU 1977

other qualifications:

- Qualified external auditor for ISO 9001 (PE Batalas London)
- Powderman Class 3 (explosives ticket for road construction)
- Tanker operator, incident controller and former Goobragandra Brigade Captain; Rural Fires Board NSW
- [currently member Potato Point Brigade]
- Vic Class HR drivers license (heavy rigid trucks)
- Electric welding (Farm) Tumut TAFE 1990

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currrent companies:

rj roberts consulting pty ltd

rj roberts consulting pty ltd | abn 891 2849 2080
RJRoberts Consulting was set up to apply the knowledge I had developed working in the Panels industry as well as knowledge gained from studying for my PhD.

advanced wetting technologies pty ltd

advanced wetting technologies pty ltd | abn 986 2530 5615
AWT was established to develop alternatives to the existing surfactant industry which have now been patented worldwide.
This work was primarily carried out at the Department of Applied Mathematics at ANU.

surfactant technologies australia pty ltd

surfactant technologies australia pty ltd | acn 681 111 231
Surfactant Technologies Australia was set up to commercialise the wetting systems developed by Advanced Wetting Technologies

employment history:

2010:
Proline Floors
I was employed by Proline Floors to optimise high-density fibreboard (HDF) for the manufacture of laminated flooring in China specifically in relation to swell and machinability. A list of specifications was drawn up so that Proline Floors can take their specific requirements to HDF substrate manufacturers. I also optimised paper-treating specifications for the decorative overlay.

2009:
Carter Holt Harvey (Panels) Australia
I developed a multi-phase wetting enhancing system Rezex A that improves spreading and penetration of simple and complex water based fluids on previously difficult to wet surfaces. It is very effective in improving blending efficiency with high-speed particleboard blenders, reducing resin use and improving properties.

Employed by Carter Holt Harvey (Panels) to further improve machinability of particleboard at the Gympie site using the newly developed multi-phase wetting system Rezex A - as a result of the detailed resin distribution analysis carried out in 2008 for Carter Holt Harvey, full-scale plant trials were undertaken at the Oberon factory involving the multi-phase wetting system Rezex A made by Oxford Technologies and significant changes to the blender setups to improve blending efficiency resulting in better resin distribution leading to improvements to physical properties and reductions in overall board density.

2008:
Carter Holt Harvey (Panels) Australia
Employed by Carter Holt Harvey (Panels) to conduct a detailed study on resin blending efficiency at all of the particleboard plants of the group, Tumut, Mt Gambier, Oberon and Gympie.

This was done to a detailed level by examining resin distribution at a flake level for both core and surface as opposed to the standard Kjeldahl analysis commonly used.

2007
Rexcel C.A. Zitacuaro Mich Mexico:
Employed by the Rexcel C.A. Zitacuaro Mich Mexico to solve machinability problems in LPM and white spots on dark coloured laminates.

In doing so I also improved the general efficiencies of the impregnation line, laminating presses and the particleboard press particularly blending and pressing cycles.

Just Bench Group Queensland Australia:
Employed by the Just Bench Group in Queensland to improve the efficiency of the pressing of high-pressure laminates onto particleboard substrates to produce benchtops.

This also involved optimising the post-forming of the laminate after pressing. As a result there has been a large reduction in the generation of defective product.

The work involved determining the interfacial energy between the resin and the substrate and optimising it to improve resin efficiency.

2007
Carter Holt Harvey (Gympie) Australia
Consultant for Carter Holt Harvey Panels (Gympie) to improve machinability of LPM particleboard. Gympie board was unusable on flat bed routers. The cause of the problem was found, to be ineffective blending and was more prevalent on the local species used. This was identified through the use of SEM, light microscopy and the use of a goniometer at ANU. It was caused by high interfacial energies between the resin and the surface of the flake.

A solution was found using pre-treatment of the flake as well as modifying the resin. There was no additional capital expenditure required.

The board is now as good as any board in Australia. Savings to Carter Holt Harvey of $6m per year were realised.

2006 - 2007
Consultant for Forest and Wood Products Research and Development Council investigating the need for undergraduates in the Australian wood processing sector and identifying options for establishing an undergraduate education program specifically for wood science and technology in Australia, (report to be published see below).

Consultant for Carter Holt Harvey Pinepanels for impregnation and panels operations.

Visiting fellow Department of Applied Mathematics, Research School of Physical Sciences and Engineering, The Australian National University working on complex fluid flow in paper.

2005 - 2006
Consultant for Carter Holt Harvey Pinepanels for impregnation and panels operations.

Visiting fellow Department of Applied Mathematics, Research School of Physical Sciences and Engineering, The Australian National University working on complex fluid flow in paper.

2004 - 2005
Post Doctoral Fellow, Department of Applied Mathematics, Research School of Physical Sciences and Engineering, The Australian National University working on complex fluid flow in paper, including consulting for BASF in Germany on the improvement of UF resins, and optimising the absorbency properties of tissue type papers from various manufacturers.

2001 - May 2004
Undertaking full time PhD on "Liquid penetration into paper" at The Department of Applied Mathematics, Research School of Physical Sciences and Engineering, The Australian National University, Canberra. Completion by May 2004, accepted October 2004.

This project came about as a result of resin impregnation problems the company was experiencing during the production of low pressure laminates, the solution of which was identified as a result of the study, resulting in significant cost savings for the company.

- Executive Officer for CRC for Functional Communication Surfaces
- Involved part time in process improvement of decor paper treater at Tumut.

1993 - 2001
Quality/Technical Manager CSR Timber Products (Panels) (later Carter Holt Harvey Pine Panels) Tumut, major areas of responsibility and achievements;

- Leading Technical department (team of 8 people)
- Manage factory's health, safety systems and in doing so improve site safety performance from one of the worst in the whole group to the best
- Manage environment remediation and monitoring systems including groundwater monitoring and extraction of polluted ground water
- Conduct development projects i.e. factorial experimental designs on particleboard furnish carried out in laboratory as a precursor to major capital expansion which was designed to incorporate the changes I recommended as a result of the experimental design work
- Conduct resin trials both on site and at an experimental level in laboratory at Orica Deer Park
- Factorial experimental designs on operations of the paper treater including resin reactivity and relationships between saturating resin solids and paper saturation and drying
- Management of Quality Management System (certified to AS/NZS 9001) which included safety and environmental management systems i.e. job safety analyses for all tasks in a safety behaviour observational system
- Cooperative projects with resin suppliers in process control during manufacturing of resins leading to changes in manufacturing processes to optimise resins for Tumut, including identification of major process control problems at both major resin suppliers ICI and Borden. This included both board and paper treating resins
- Statistical analysis of production data for the site and for resin companies
- Coordinating all plant trials the rawboard lines, the paper treater and laminating presses
- Provide technical data on environmental monitoring of air and water quality around the site
- Lead process improvement on site based on Total Quality Management principles
- Deliver TQM training to both site employees and new graduate trainees and other employees in the company
- Supervise ANU Forestry honours and Rosenheim Wood Technology Institute students with their practical experience during their studies
- Introduce new moisture resistant particleboard resin systems for the Wood Panels group i.e. V313 type board from glue bond durability type board
- Company's representative on AWPA 1993 - 1997
- Participated in rewrite of AS 1859 (Australian and New Zealand Particleboard Standard) as CSR's technical representative on the technical committee TM5
- Introduced stock management system (Inventory Record Accuracy) as part of implementation of MRP2 Class A through Oliver Wright Ltd involving thousands of line items to a better than 99% accuracy
  This enabled the abolition of any stocktakes - this project won CSR's team award for 1996
- Develop resin demand testing on raw paper to predict the amount of resin that will impregnate and coat the paper in the treater
  [To our current knowledge this has not been successfully achieved anywhere else]

1993 - 2001 [cont.]

- Introducing techniques to buffer catalysed resin for future use at the Treater to significantly reduce wastage without loss of product quality
- During Formica divestment all my treater recipes were given to Laminex and worked well
- Started part time PhD at ANU on "Factors affecting penetration of resins into decor papers"
- As a result of learning's from project saved over $500,000 per annum with improvements at treater from improved resin and paper systems
- Designed a number of courses for Deakin University distance education in the timber industry.

1991 - 1993
CSR Softboards (Gilmore) Australia
Built and managed CCA treatment plant for CSR Softwoods at Gilmore (near Tumut NSW) including installation of complete containment systems with a number of fail-safes as well as ground water monitoring systems.

1990 - 1991
CSR Softboards (Tumut) Australia
Harvesting manager for CSR Softwoods and Wood Panels in Tumut NSW.

1987 - 1989
Fibron MDF Plant (Oberon) Australia
Logging Manager Fibron MDF plant Oberon NSW:

- Supervision of construction of woodmill capable of generation of 360,000 chips per annum from roundwood
- Establishing and managing harvesting operation sustaining MDF plant
- 1989 Production and Logging Manager for board production which included introduction of low-density board, which was the first such product in the world
- Managing factory's environmental systems including air monitoring and waste water remediation.

1986 - 1987
NSW Forestry Commission (Oberon) Australia
Forester NSW Forestry Commission Oberon:

- Managing planning, road survey and construction for plantation establishment roads up to Class 1: 100 km/h design speed
- Managing plantation harvesting
- Managing fire protection including large area aerial hazard reduction operations
- Managing environmental monitoring (water quality and soil movement) and optimising harvesting and road construction operations accordingly particularly in Jenolan Caves catchment area where there existed karst features in the areas to be roaded, established and harvested.

1980 - 1985
NSW Forestry Commission of NSW (Bombala) Australia
Forester Forestry Commission of NSW Bombala:

- Managing harvesting and planning for hardwood operations for wood supply to Harris Daishowa wood chip mill at Eden and Tablelands Sawmill at Bombala
- Managing planning, road survey and construction for plantation establishment and hardwood harvesting up to Class 1: 100 km/h design speed roads. including locating and planning for large areas of native forest in Bondi SF
- Conducted Preferred Management Priority Planning for Coolangubra State Forest including identification of areas of significant environmental value i.e. rare sites of Telopea oriades (Gippsland Waratah) as well as sites specific to Mountain pygmy possums, Feathertail gliders and other endangered species
- Managing radiata plantation establishment, maintenance and harvesting for Bondi and Coolangubra State Forests including introduction of helicopter spraying of any description for woody weeds for the first time in Australia
- Fire fighting operations around Bombala including many Section 41F emergency situations in 1980, 1983 (Ash Wednesday) and 1985 involving hardwood, plantation and grass fires
- Monitoring revegetation and streamside stabilisation after wildfire events
- Managed fire prevention strategies including aerial hazard reduction and construction of fire tower on Kelly's Mt south of Bombala
- Involved in establishment of E. nitens and E. fastigata plantations in the Bombala forestry district
- Conducting environmental remediation of log dumps by re-establishing native flora on dumps.

1979
Forestry Commission of Tasmania (Devonport) Australia
Assistant District Forester Forestry Commission of Tasmania Devonport

- Managed hardwood and plantation harvesting operations
- Managed plantation subdivision road construction
- Managed plantation establishment and maintenance
- Managed fire protection for district including setting up aerial detection systems involving fixed wing aircraft
- Involved in forestry extension activities with local schools and community.

1978
Forestry Commission of Tasmania (Hobart) Australia
Forester Forestry Commission of Tasmania Hobart

- Involved in assessing areas for suitability for plantation establishment in NE Tasmania
- Hardwood resources assessment on Bruny Island.

publications:

published

Spreading of Aqueous Liquids in Unsized Papers is by Film Flow.
Roberts R. J., Senden T. J, Knackstedt M.A. and Lyne M. B.
Journal of Pulp and Paper Science Vol. 29 No. 4 April 2003

Effects of Manufacturing Variables on Surface Quality and Distribution of Melamine Formaldehyde Resin in Paper Laminates
Roberts R. J. and Evans P. E.
Composites - Part A: Applied Science and Manufacturing Vol. 36 No.1 Jan. 2005

The Role of Graduates and their Education for the Australian Wood Processing Sector – from a Forest Industry Survey. R.J. Roberts. Forest and Wood Products Research and Development Corporation. 2007

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to be published

A new technique for imaging under cryogenic conditions with confocal microscopy.
Roberts R.J., Senden T. J., and Hyde A.
Journal of Microscopy

3D imaging of the spreading and penetration of aqueous liquids into unsized and sized papers.
Roberts R.J., Senden T.J., Knackstedt M.A., Lyne M.B. and Schrof W.
Journal of Pulp and Paper Science

Experimental Imaging of fluid penetration into Papers.
T.J. Senden, A. Bauer, R. J. Roberts, L. Salminen, S. Champ, M. Bruce Lyne, M.A. Knackstedt

Fluid Penetration into Filled Papers
R.J. Roberts, T.J. Senden, M.B. Lyne and M.A. Knackstedt

presentations at international conferences

Effects of Paper Type and UF Resin Treatment on Surface Quality and MF Resin Distribution in Treated Pressed Decor Papers
Roberts R. J., Senden T. J. and Evans P.E.
5th Pacific Rim Bio-Based Composites Symposium, Canberra 2000

3D Imaging of the Spreading and Penetration of Aqueous Liquids into Unsized and Sized Papers
Roberts R. J., Senden T. J., Knackstedt M. A. Lyne M. B. and Schrof W.
5th International Paper and Coating Chemistry Symposium, Montreal June 2003

Fluid Penetration into Filled Papers
R. J. Roberts, T. J. Senden, M. B. Lyne and M. A. Knackstedt.
2004 Progress in Paper Physics Seminar, Trondheim June 2004

Imaging of Fluid Flow in Paper
R.J. Roberts, T.J. Senden
2007 International Paper Physics Conference Gold Coast April 2007

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referee

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