

# newport scientific news

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## doughLAB™: flexible dough rheology™

Process-related rheological effects during commercial dough mixing play a dominant role in the quality of dough-based products.

The ideal laboratory dough mixer should offer better estimates of dough-mixing parameters, faster tests and mixing rates that are more relevant to modern high-energy commercial dough-mixing processes.

This was the concept we started with when we designed doughLAB™. What we have produced is the ultimate tool for anyone who needs to know the rheological properties of doughs: wheat flour doughs for bread baking, steam bread, noodles and chapatti, and novel doughs containing rye, triticale and durum flour or semolina.

For QA applications doughLAB can be programmed to run standard dough rheology tests using a conventional z-arm mixing action. But doughLAB offers much more for the R & D laboratory, with the flexibility to customise methods to provide solutions to your unique technical questions.

*dough* LAB

## doughLAB™: integrated dough rheology

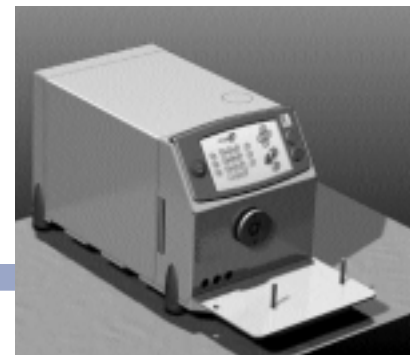
All doughLAB's functionality is housed in a single, compact unit which integrates:

- motor control including instantaneous emergency stop
- internal water pumping system for temperature control
- choice of in-bowl, internal or in-dough temperature monitoring
- automated water dispensing with 'drip' function
- dough mixing using direct drive motor system
- frictionless torque sensing
- user interface
- data management.

doughLAB operates stand-alone: an on-board Pentium series processor and embedded software manages the user interfaces, data storage and system control.

To run a test, the user enters information through a keypad and control buttons on the front of the instrument, and real time results are viewed on a monitor. Printer, PC and LIMS connections are supported.

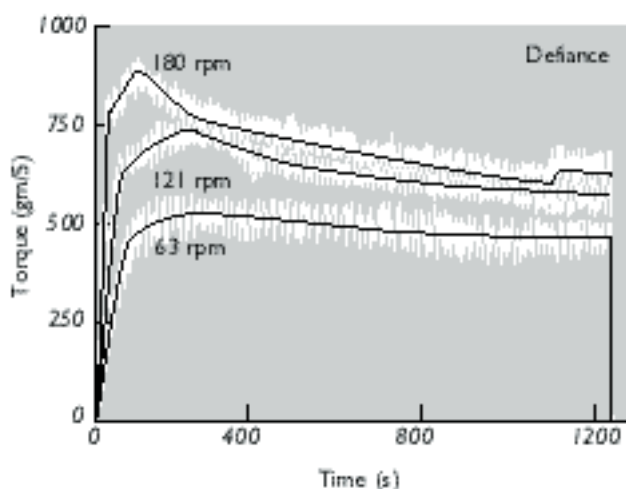
doughLAB is calibrated in standard and traceable torque units (Nm), and can be translated into other unit systems if required. The traceable calibration check satisfies ISO9000 and Quality System requirements.



- high energy mixing: emulates commercial dough mixing; typical mix times of three minutes
- variable speed mixing: research dough response to changing stress
- typical analysis parameters: absorption of water; dough mixing profile; development time; stability; softening
- standard methods: AACC; ICC; RACI
- applications: gluten functionality; carbohydrate functionality; effects of dough ingredients; properties of composite flours; enzyme activity in flour; effects of flour treatments
- can be upgraded: range of mixing bowls; alternative mixing designs.

## When High-energy Mixing Counts

High-energy commercial dough mixers are now in common use in bread bakeries around the world. Typical mix times are three minutes, during which the dough must reach an optimum consistency. The doughLAB high-energy mixing system successfully emulates modern commercial mixing.



In doughLAB, mixing is driven by a 0.55kW three-phase variable frequency electronic drive system providing continuously variable mixer speeds of 0-200 rpm.

Increasing doughLAB mixing speed decreases peak time and bandwidth and increases peak torque, degree of softening or breakdown.

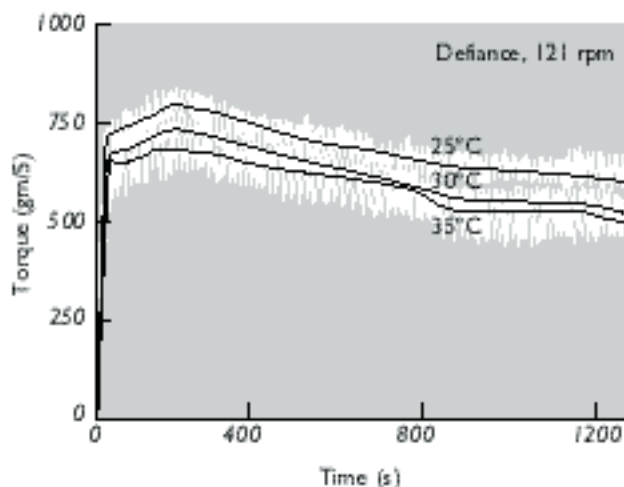
The high-energy mixing capability of doughLAB offers better estimates of dough mixing parameters, faster tests, and mixing rates that are more relevant to today's bakeries.

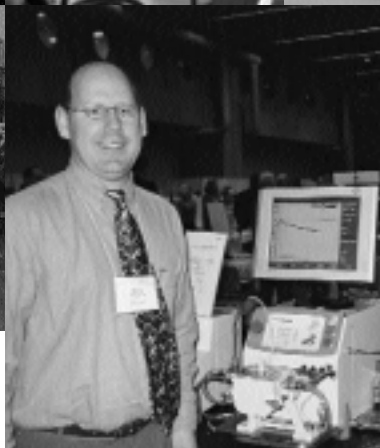
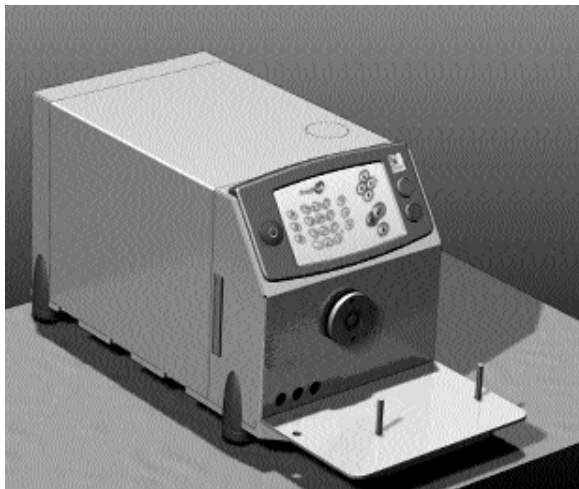
## Maintain the Temperature; Maintain the Results

Good temperature control is essential to producing rapid, reproducible rheological measurements, and doughLAB offers three flexible options for accurate temperature control.

In doughLAB, temperature control is provided through an internal water pumping system in which heating is supplied by regulated electrical resistive elements, and cooling by metered input of cold water. Select from three temperature sensors: one located internally, one located in the mixing bowl and one directly in the dough sample.

Increasing doughLAB temperature decreases peak torque, peak bandwidth and degree of softening, and increases peak time.





Clockwise from top left:

Concept drawing by Stephen Neil.

doughLAB under construction.

doughLAB prototype.

Product Manager Dick Metzger of Foss North America with doughLAB at AACC in Montreal.

The doughLAB development team.

## NEWSFLASH

### First publications featuring doughLAB scientific data are now available.

Booth, R. I., and Bason, M. L., 2002. New tests for new tools in cereal rheology.

Takes a look at how doughLAB can predict flour baking quality using a high-energy dough rheology routine; how the RVA can be used to measure degree of processing of foods; and how a pressurised RVA can teach us more about the effects of high-temperature food processing conditions.

Booth, R. I., Neil, S. J., and Bason, M. L., 2002. A new instrument for measuring bread dough development.

Demonstrates how doughLAB's temperature and speed control features can be used to model surface plots to predict dough behaviour when mixing speed and temperature are varied.

Elliott, B. 2002. New approaches to testing wheat protein quality from Newport Scientific: Rapid Visco Analyser and doughLAB.

Introduces RVA and doughLAB analyses which can give us a better understanding of gluten quality essential to the evaluation of baking flour.

To get your copy of these papers please email us at [support@newport.com.au](mailto:support@newport.com.au)

# What's New at Newport Scientific?

- In May, the Newport Scientific team attended the ICC Conference at Budapest University of Technology and Economics. Mark Bason presented 'A New Instrument for Measuring Bread Dough Development' and Bronwyn Elliott 'New Approaches to Testing Wheat Protein Quality from Newport Scientific: Rapid Visco Analyser and doughLAB', both papers in keeping with the conference theme 'Novel Raw Materials, Technologies and Products — New Challenges for Quality Control'.
- The International Carbohydrate Symposium, the premier meeting for the world's carbohydrate chemists, biochemists and glycobiologists, in Cairns in July, was an ideal forum for Mark Bason's paper 'Effect of High Temperature Processing on the Viscous Behaviour of Food Starches and other Polysaccharide Hydrocolloids'. To learn more about what a prototype high pressure version of the Rapid Visco Analyser can reveal about the viscous behaviour of starches and gums such as guar, CMC and xanthan, email [support@newport.com.au](mailto:support@newport.com.au) for a copy of the paper.
- The inaugural meeting of AACC Downunder was held in July on Australia's Gold Coast. Rodney Booth, Managing Director of Newport Scientific, participated as a panellist on the industry forum, and presented the paper 'New Tools for New Tests in Cereal Rheology' which explored use of a high pressure/high temperature RVA prototype to emulate retorting, jet cooking and extrusion food processing conditions, and doughLAB with rapid mixing capability to emulate modern high energy commercial dough mixing systems. For a copy, email [support@newport.com.au](mailto:support@newport.com.au).
- The popular Newport Scientific Users' Group Meeting made a return in September at RACI Cereal Chemistry Division Conference in Christchurch, New Zealand. We observed the tried-and-true format of presentations and industry open forum followed by 'happy hour'.
- The AACC Montreal meeting from October 13-16 was the first opportunity for researchers and practitioners in the milling and baking industry in North America to experience Newport Scientific's new doughLAB, including operation and analysis. It was also a chance for the Newport Scientific Users' Group to meet with Dick Metzger and Managing Director Rodney Booth who gave a short presentation of the history of the RVA and an update on what's happening at Newport Scientific.

## Meet the People: Robert Patterson

**A**fter studying electronics and computer technology at college, Newport Scientific's Technical Officer Rob Patterson worked for three years servicing and maintaining computer networked POS (Point of Sale) systems used in hotels and restaurants throughout Australia and New Zealand. He managed the hardware servicing department and designed and implemented an access database for logging services and repairs.

In 1999, Rob started at Newport Scientific where his primary role is manufacturing RVAs and mills. He is the Inventory Control Database Manager and is responsible for customer spare parts. Rob is also involved in inventory purchasing and sourcing, as well as on-site servicing for our Australian customers.

Rob says his work gives him the freedom to develop and improve methods and continually increase customer satisfaction. And his goal? 'To continue to evolve — there is always something to learn and room to improve.'

