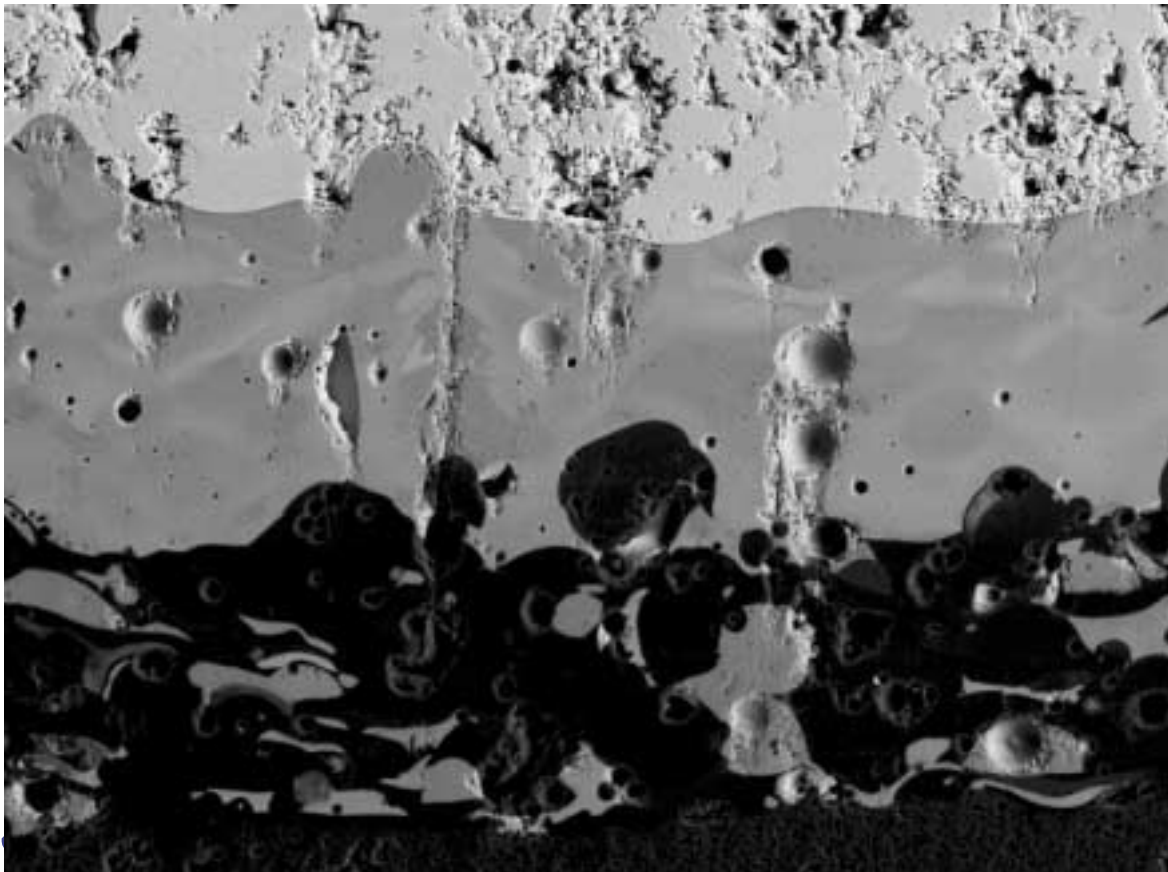




# NEWSBULLETIN

OF THE AUSTRALASIAN CERAMIC SOCIETY

VOLUME 18, NUMBER 1, MARCH 2003



OFFICIAL PUBLICATION OF THE AUSTRALASIAN CERAMIC SOCIETY

## FEDERAL COUNCIL OFFICERS

**President:** V. Lawrie  
**Vice President:** P. Walls  
**Secretary:** D. Perera  
**Treasurer:** J. Cullen  
**Councillors:** R. Bowman, C. Inglis,  
L. Vance, V. Lawrie,  
J. Carter, J. Sellar,  
M. Stuart, D. Taylor  
**Postal Address:** Australasian Ceramic Society  
National Secretariat  
C/- ANSTO  
PMB 1, Menai, NSW 2234  
Phone +61 2 9717 3477  
FAX +61 2 9543 7179

### BRANCH COMMITTEES

#### New South Wales

**President:** C. Inglis  
**Secretary:** M. Hoffman  
**Treasurer:** A. Taylor  
**Membership Secretary:** M. LaRobina  
**Councillors:** I. Stewart, T. Knox,  
J. Taylor, D. Taylor,  
A. Taylor  
**Technical Program:** A. Taylor  
**Postal Address:** C/- Taylor Ceramic Engineering  
65 Anderson Rd  
Mortdale NSW 2223

#### Victoria

**President:** N. Stone  
**(Ex Officio):** S. Zsembury  
**Treasurer:** J. Sellar  
**Secretary:** M. Hulme  
**Councillors:** R. Bowman, J. Cullen,  
G. Ng, M. Curtis,  
Y.B. Cheng, M. Hulme,  
**Postal Address:** Refractory and Ceramic P/L  
50 Geddes St  
Mulgrave VIC 3170

#### Western Australia

**President:** V. Lawrie  
**Vice President:** J. Parsons  
**Secretary:** D. Phillips  
**Treasurer:** R. McConnell  
**Councillors:** G. Carter, J. Carter, Low,  
I. Malley, A. Sheth  
**Postal Address:** School of Applied Chemistry  
PO Box U1987  
Curtin University WA 6845

#### South Australia

**Secretary:** Dr. Nobuyuuki Kawashima  
Surface and Materials  
Processing Group  
University of SA 5095  
Phone ++61 8 83023495  
FAX ++61 8 83023683

#### New Zealand

**Secretary:** V. White  
Industrial Research Ltd  
PO Box 31-310  
Lower Hutt, New Zealand  
Phone +64 4 5690175  
FAX +64 4 5690117

### NEWSBULLETIN

**Editor:**  
Cathy Inglis  
C/- Austral Brick  
PO Box 6650  
Wetherill Park NSW 1851  
cathy@australbrick.com.au

#### Assistant Editor:

Tim Palmer  
C/- Austral Brick  
62 Belmore Rd  
Punchbowl NSW 2196  
tim\_palmer@optusnet.com.au

#### Contributing Editors:

Jeff Seller  
School of Physics & Material Engineering  
PO Box 69M  
Monash University VIC 3800  
jeff.seller@eng.monash.edu.au

David Phillips  
School of Applied Chemistry  
PO Box U1987  
Curtin University WA 6845  
D.Phillips@info.curtin.edu.au

### SOCIETY WEBSITE

<http://www.ozemail.com.au~ausceramsoc>

Subscriptions should be forwarded to the  
National Secretariat

#### COVER PHOTO

Thermal Spray Barrier Coating consisting of a Multi-layered Ceramic System. See WA Branch report for details.

Courtesy of **Dr Kang Lee** of *NASA-Glenn Research*, Ohio and provided by Professor **Chris Berndt** of *Stony Brook University, New York*.

### PRINTING

The *Newsbulletin of the Australian Ceramic Society* is printed by  
Cliff Lewis Printing, Taren Pt, NSW 2229. Tel 02 9525 6588

## A MESSAGE FROM THE PRESIDENT

Welcome to your Ceramics Society Newsbulletin.

Thankyou to the editors for the Newsbulletin, which I am sure, is appreciated by all members with its expanded content. Cathy and Tim welcome contributions from members, so please any time you feel like jotting down an email with news, then send it in. Contributed articles and reports are also highly appreciated.

The Newsbulletin has been identified as important to members whenever we have surveyed member's needs. So I encourage again for you all to give the society its 'oxygen', which is communication.

As an initiative to support our existing members, and to attract new members, the Federal Executive has approved the release of funds to support promotion materials, events, and support for creative ideas. So if you have any suggestions, then contact your local branch committee, have your say, better still offer your help. It is hoped that

the existing members will win from this, and that the society is reinvigorated.

We are supporting ACERs meeting in April, and as a result registration assistance has been provided to 3 of our members. I look forward to the report back from the conference. At this conference Melody Carter is promoting our Society, thankyou.

Since my last message the Journal, Vol 38, No1 has been published and circulated, and I would like to recognise the great job by the editors, especially A/Professors Jim Low and David Phillips. Austceram 2004 planning is underway by the Victorian branch, and so look forward to the first circular for this event to be held late in 2004.

Regards,

*Viv Lawrie  
Federal President  
March 2003*

*viv.lawrie@millenniumchem.com.au*



### CORPORATE MEMBERSHIP

Is your company interested in becoming a Corporate Member?

Corporate Members may nominate two representatives of their organisation as members and receive free advertising space in a Society publication on one occasion.

A membership form is available on the *Australasian Ceramic Society* website at the following address:

<http://www.ozemail.com.au/~ausceramsoc>



Millennium Performance Chemicals is a unit within the Growth & Development division of Millennium Chemicals. It was specially created to handle the following inorganic specialty products:

- Cadmium Pigments
- Silicon Dioxide Gels
- Titanium Dioxide - Ultra fine
- Titanium Tetrachloride & Derivatives
- Titanates (Organic)
- Zirconium Chemicals
- Zirconium Dioxide
- Zirconium Dioxide – Yttria-doped

In support of its range of inorganic specialty products Millennium Performance Chemicals provides expertise, information, technology and service - solutions to clients' issues.

**For more details please contact:**

Stephen Harris  
Market Developer  
(e) [stephen.harris@millenniumchem.com](mailto:stephen.harris@millenniumchem.com)  
(T) 08 9411 1239  
(F) 08 9411 1275

## THE WAY FORWARD

The ACS has a long and impressive history, in the early days it was driven by the tireless efforts of Dr. Keith Reeve, as both a President and for many years, Secretary, a duty that Keith performed with an enviable efficiency!

Today Dr. Dan Perera (who accepted the Baton from Keith) with like efficiency, carries on that duty. The strength of our Society is; the generous donation of time by its council and committee members and, the staging of International Conferences for the benefit of members. The primary question here is; is the ACS relevant to today's Ceramic and Materials community and where does the future direction lie?

The focus of the Society, to this time, has been towards Technical and Scientific areas, primarily due to the fact that those members are the ones prepared to do the work, present papers and assist with conferencing. As the profile of our Ceramic and Materials industry slowly evolves, I feel the ACS should be changing its profile also.

From a commercial perspective, there needs to be a more active association with our industrial and corporate partners (considering that industry provides a significant financial support to the ACS). We need

to address this issue and, not by passive statements, but by real effective decisions and results, however, it needs people time/commitment to direct and maintain the THRUST!

If you accept that; to discuss and meet in an enjoyable surround - the passion which drives us forward "Quest of knowledge" and 'one upmanship', then; this vehicle - so carefully assembled some 40 years ago by others - must be sustained and supported.

I urge you to consider the original concept of the ACS - "to provide support to all associated with efforts related to ceramics and materials", let's have some ideas for the format and future direction of the ACS. Remember that it's your society and its there for your benefit. From a personal perspective, I have always enjoyed hearing about the attainments of others and listening to their proud aspirations at local Branch meetings, particularly watching young Ceramists and Potters mature into productive, clever people.

*David Taylor  
Taylor Ceramic Engineering  
March 2003*

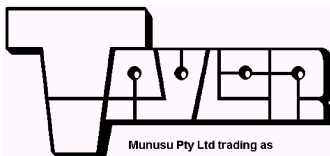
**“A lot of things we do are really hard!”**

*We'd like to do something really hard for you too!*

**WEAR RESISTANT CERAMICS  
CHEMICAL PROCESSING CERAMICS  
ELECTRICAL INSULATORS  
BRICK CORES AND DIES**

Advanced ceramic shape forming and machining

*“We have provided ceramic solutions to wear and process problems for over 30 years”*



Munusu Pty Ltd trading as

**TAYLOR CERAMIC ENGINEERING**

Phone (612) 9534 0000

Fax: (612) 954 6504

Email: [tce@ozemail.com.au](mailto:tce@ozemail.com.au)

## NEW SOUTH WALES BRANCH NEWS

NSW Branch will soon be holding a forum to discuss the way forward for the Society. This event will be held in an enjoyable informal surround and provide the opportunity to hear what you, our members, have to say. The NSW Branch will host this event; provide dinner and a guest speaker.

Final arrangements are just being confirmed and we will notify you soon with the details. We hope you will be able to join the Branch Committee for this forum.

*Cathy Inglis  
NSW Branch President  
March 2003*

## VICTORIAN BRANCH NEWS

Apart from a very successful and well-attended Christmas function at the Potters Cottage Restaurant in Jumping Creek Road, Warrandyte at which a few members of the Ceramic Industry Association (CIAA) joined us; the Victoria Branch activities have been relatively quiet from a local member's perspective.

With the Federal Committee decision to award the organization of AUSTCERAM 2004 to the Victoria Branch, considerable energy has been extended however in getting together a local organising committee and getting the planning of this major event underway.

Following successful discussions with Professor Barry Muddle and colleagues of the Institute of Materials Engineering Australasia (IMEA), I am pleased to announce that it has been agreed that AUSTCERAM 2004 will be run in conjunction with the Third International Conference on Advanced Materials Processing in Melbourne in late November early December 2004. A preliminary

call for papers and major event announcement will be made shortly along with confirmation of dates and venue. Dr. Yi-Bing Chen (ACS) and Dr. Nie (IMEA) will chair the Technical Programs.

On the local front the following future meetings are also provisionally scheduled:

April 2003: Dr. Richard Donelson, CSIRO Manufacturing & Infrastructure Technology will present a talk entitled: Practical Application of Biaxial Flexure to Thin Ceramics

May 2003: State branch AGM

June 2003: Provisional works visit to Alcoa's aluminium smelter at Point Henry, Geelong.

July 2003: Provisional works visit to CSR Wunderlich, Mitcham, Melbourne

*Nigel Stone  
Victorian Branch President  
March 2003*



[www.azom.com](http://www.azom.com)

### **AZoM's Mission**

The aim of AZoM is to become the primary materials information source for the engineering and design community worldwide. It also aims to be the primary publicist of news, views and developments within the materials science community. However, unlike many other materials related organisations AZoM is totally focussed on the needs of the end users of materials. To achieve this aim, all of the educational, informative and news content on AZoM is easy to access and search and is provided on a free of charge, no subscription, no charge per article, totally free basis.

## WESTERN AUSTRALIAN BRANCH NEWS

The Branch meeting held on Tuesday 11<sup>th</sup> February 2002 was addressed by Professor Chris Berndt, Associate Dean and Professor of Materials Science and Engineering at the Department of Materials Science and Engineering, Stony Brook University, New York, USA. Chris was passing through Perth en route to Monash University (where he obtained his PhD) and kindly offered to stop over in Perth to present his talk and meet a few clients.

Chris presented a stimulating talk entitled "Thermal Spray: A Case History for the Integration of Materials Science and Processing". Chris is an international expert in the field of thermal spray – a process involves the injection of particulates into a high flux environment so that momentum and heat transfer can take place. The particles are then accelerated within the gaseous effluent and within several milliseconds impact and splash against a suitably prepared substrate. In this fashion a coating rapidly grows over a time period that may range from minutes to hours. Chris explained how the materials engineering concept comes into play when it is appreciated that the temperature, velocity, and chemical nature of the spray effluent

controls the dispersion, impact phenomenon, and, therefore, the precise nature of the microstructure which is being formed *in situ* and in real time. Unsurprisingly, this is a somewhat random and chaotic process that is seeking practical and theoretical solutions so that some manner of engineering control can be employed. The nature of Chris' presentation was to explore the scientific relationship between materials engineers and mechanical engineers so that a functional product can evolve. He also outlined the current state-of-the-art in this process from the viewpoint of facilitating future progress.

The next meeting will be the Annual General Meeting of the Branch to be held on Tuesday 1<sup>st</sup> April 2003 to be held in the School of Physical Sciences at Curtin University. Following the AGM, the meeting will be addressed by Dr Ian Davies, Department of Mechanical Engineering, Curtin University.

*David Phillips.*  
*WA Branch Secretary*  
*March 2003*



### **THE NEWSBULLETIN**

Members are encouraged to supply news, articles, book reviews, etc, for inclusion in the *Newsbulletin*. Members are also invited to submit interesting images related to ceramics to feature on the front cover of the *Newsbulletin*.

## A SCIENTIFIC APPROACH TO THE CONSERVATION OF ART AND ANTIQUITIES

As of next year The University of Canberra will be terminating their program that offers a degree in Art Conservation

Recently (9/3/03-10/3/03), the Australian Institute for the Conservation of Cultural Materials (AICCM) held a National Training Summit in Canberra to discuss the future of education with regard to the conservation of art and antiquities.

At this summit Joanna Mendelssohn (COFA, UNSW) Richard Thomas (UWS) and Chris Sorrell (UNSW) presented a formal plan for a Coursework Master's program to be conducted at the University of New South Wales, College of Fine Arts. The pretext of the program is to offer a course to train the next generation of conservators.

The presentation was directed towards the conservation of materials relevant to art, culture, and natural history. The program will endeavour to achieve a creative practice hub where conservators will be exposed to artists' techniques, both traditional and contemporary. From this an in-depth understanding of conservation needs for artists will be pursued. Consequently a mutual understanding between conservators, artists, and curators will be developed.

Teaching and research involved in the Masters program will be aimed at preventative conservation; the awareness of historic, cultural and natural history resources; diagnostic conservation and restoration. Fields of expertise available to potential students are painting, drawing, printmaking, paper technology, jewellery, metal casting, textiles, ceramics, digital media, photography, computer graphics animation and time based art.

The goals for the Masters of Conservation program are:

- to combine art, science and technology in partnership
- educate the next generation of conservators
- create the basis for a centre in conservation research with a strong academic basis
- access expertise in private practice
- access expertise in academic and government laboratories
- facilitate professional access to advanced analytical facilities

- bring universities and public collections into close partnership for mutual benefit



A collective between art and science will provide the unique opportunity to unite academics and other researchers with interests in the examination, treatment and analysis of objects concerned with art, history and material culture. A benefit of this relationship will be the access to modern facilities for the examination of all types of significant objects. This relationship will provide a platform to integrate these technical facilities and expertise within the arts community.

Participating Institutions that have made their facilities available are:

- University of Sydney
- University of Wollongong
- Macquarie University
- Australian Nuclear Science and Technology Organisation (ANSTO)
- Australian Institute of Nuclear Science and Engineering (AINSE)
- Linklab Pty. Ltd
- University of New South Wales Technical Faculties

The role of museums and major public collections will form an integral part in combination with the partnership between COFA and Science.

Conservation Partnerships Include:

- AICCM

- NSW public collections (for example Art Gallery of NSW, Powerhouse Museum, State Library, State Records, Australian Museum)
- Independent conservators
- Art, antique and book dealers
- Regional galleries and museums

The University of New South Wales Art Gallery will be an interface between the public, the arts, and conservation professionals. Prime exhibition space will be available for art, art history, design and art conservation issues. This facility will be a focal point for conservation awareness forums.

For potential students the course will consist of three semesters (fulltime / part-time also available) in addition to bridging subjects. The structure of the program will be articulated as such:

Certificate > Diploma > Coursework Masters

Conclusion of the Masters Degree is a project combined with a closely supervised internship

Joanna Mendelssohn, Richard Thomas and Chris Sorrell would be delighted to hear from people that would be interested in being a provider or end user of such a program.



A/Prof Joanna Mendelssohn  
College of Fine Arts  
University of New South Wales  
J.Mendelssohn@unsw.edu.au

Dr Richard Thomas  
School of Science  
University of Western Sydney  
rg.thomas@uws.edu.au

Prof Chris Sorrell  
School of Materials Science and Engineering  
University of New South Wales  
c.sorrell@unsw.edu.au



## Materials Division

The Australian Nuclear Science and Technology Organisation (ANSTO) is keen to develop collaborative R&D projects, and encourages industry to make use of the facilities and expertise available in the Materials Division.

**Some of Our Current Projects are in the Areas of:**

- Waste Management/Synroc
- Sol-Gel Processing
- High Temperature Materials Fabrication
- Remaining Life Studies of Materials & Structures
- Hot Isostatic Pressing
- Surface Engineering
- Functional Ceramics
- Advanced Ceramics
- Finite Element Analysis

**Our Key Facilities Include:**

- Large Batch Ceramic Powder Processing
- Spray Dryers up to Pilot Plant Size
- Hot Presses & Sinter Hot Isostatic Presses
- Laser Dilatometry of Large Samples
- Particle Size & Surface Area Characterisation
- Electron Microscopy
- X-Ray Diffraction Analysis
- Vibrational Spectrometry
- High Temperature Mechanical Testing

Additional facilities and expertise relevant to materials R&D also exist in other Divisions within ANSTO to complement the above.

**To arrange a visit to ANSTO to discuss your problems or ideas, or for further information please contact:**

**GEORGE COLLINS, Materials Division ANSTO**  
PMB 1, Menai, NSW 2234 Ph: (02) 9717 3400 Fax: (02) 9543 7179

## NEWS FROM FASTS

### FASTS ELECTS NEW EXECUTIVE

Professor Snow Barlow has been elected President-elect of FASTS. He will join the Executive immediately, and begin his two-year term as President in November 2003. The current President, Professor Chris Fell welcomed the election of Professor Barlow. He said the position of President of FASTS was a pivotal one. "Water, new energy sources, the environment, the development of new industries – these are just some of the matters which occupy the minds of Australia's decision-makers, and all of them revolve around science. Science is so important to Government, and FASTS is increasingly being called upon to provide the views of working scientists."

Professor Fell said that Professor Barlow's experience would stand him in good stead. "Snow Barlow is a working scientist in areas such as water use and climate change. Members of Parliament nominated both these issues as being in the top five in our recent 'Science meets Parliament' Day event." Professor Barlow is a member of a CRC, and has been on Boards or Committees for the R&D Corporations, the Academy of Science and the ARC. He has represented Australia at international treaty discussions on matters such as Greenhouse and Climate Change. .

Associate Professor John O'Connor of the University of Newcastle is the other new member of the FASTS Executive. He was elected to the position of Secretary. Professor Fell thanked retiring Executive members Jan Thomas and Peter French.

The full FASTS Executive is:

President:	Professor Chris Fell
President-elect:	Professor Snow Barlow
Vice-Presidents:	Dr David Denham Professor Rob Norris
Secretary:	A/Prof John O'Connor
Treasurer:	Dr John Rice
Chair Policy:	Dr Ken Baldwin
Executive Director:	Mr Toss Gascoigne

### FROM THE PRESIDENT OF FASTS

Missile defence systems, continued poor share-market performance and not a word about science and technology in the run-up to the NSW election... - I felt it had been a bad week for science this month, which was not helped by a leaked report on what is likely to happen from the review of higher education. If the press report is to be relied on, there will be some extra funding for universities, but it will be heavily back-end loaded and of benefit at the research and regional ends of the spectrum. It is hoped that the Government recognises the infrastructure costs in mounting world-quality science, technology and mathematics programs in our universities.

It is moot whether the Government's proposal to "map" Australia's science and innovation will achieve much beyond *Knowledge Nation's* cadastre. If it leads to new initiatives to fix existing weaknesses in the system, particularly those associated with private sector involvement, it will be a useful exercise.

I was heartened at a dinner party in the UK several months ago when a guest, when asked what he did, introduced himself as a scientist. I have not yet heard such a declaration in social circles in Australia and it points to the seriousness with which Britain is taking the role of scientists of all kinds in national development. Notably, BERD and Government support for science in the UK continue to rise. Although there have been promising indications in Australia in recent years, we still have a long way to go.

On March 6, FASTS is hosting a dinner for the heads of groups in Australia with an interest in science and technology policy, including key people from the science Academies, the AVCC, ARC, CSIRO and IE Aust. The purpose is to allow an informal discussion on the direction of the national debate, and where our issues fit. For 2003, FASTS is having a close look at where it should place its principal efforts and how it should be governed.

*Chris Fell  
President of FASTS*

## **MACFARLANE ON POST-DOCTORATES IN INDUSTRY**

Chris Fell and Toss Gascoigne met with Minister Ian Macfarlane to discuss the FASTS' proposal to establish 100 Post-Doctorate positions in industry.

Australian industry has been very slow to invest in R&D, and we thought that an incentive program similar to that offered by the Government of Singapore might demonstrate the value of research to industry. Our proposal is for the Government to support the employment in private industry of new PhD graduates. It would meet some of the costs of employing these graduates over the first two years of their employment. After the two years, the industry partner and the graduates would be released from their obligations, but the company would be free to offer continuing employment to the graduates.

FASTS discussed the idea with people from industry and that helped tighten up aspects of the proposal, before we submitted it. The meeting with Industry Minister Ian Macfarlane was encouraging. The Minister showed healthy scepticism about the benefits of our proposal and pressed us on a number of points. But he could see the benefits of breaking down the cultural barriers between research and industry, and encouraging industry to make use of research to improve existing products and create new ones.

We believe it will also create a cadre of people who understand both research and corporate culture well enough to be able to identify and lobby for R&D opportunities in which Australia is competitive against corporate R&D headquarters overseas. At the end of the meeting he said: "All right - you've convinced me. But don't expect anything in the next Budget." The final outcome is yet to be seen. It may result in changes to existing support programs or the creation of a new program. But an important component in the arguments we put to the Minister was the fact that we had sought the views of people in industry.

### **FASTS' TOP TEN ISSUES FOR 2003**

Ten Issues concentrate on industry, education and developing a national strategy. For instance, we want more scientists working in industry - the 100 Post Doctorates proposal - to open the way to producing new products and improving existing

ones. We're proposing a new program to bring more science into Parliament, with scientists seconded to work for a year with Parliamentarians on crucial issues.

Plus we want to change the HECS scheme. Young science and mathematics graduates who go teaching currently take home less pay than their colleagues teaching history or art or woodwork. At a time when the number of students doing science and maths subjects is falling rapidly, we need to encourage bright young graduates into teaching.

Professor Fell said that Australia was inching towards setting a long-term vision for our national future, with the identification of the national research priorities. "As a country we need to know where we are going, and how science and technology can help us get there. Priority research areas are important, so is proper funding."

### **The Ten Top Issues for 2003:**

#### **1. AUSTRALIA NEEDS A MAP AND A COMPASS**

We have a 10-year plan for defence - why not for science and technology? We should plan for the future, set national goals, and ensure that science serves the national interest.

#### **2. BOOST FUNDING FOR UNIVERSITY SCIENCE**

Science and technology are expensive courses to run but vital to Australia's future. The special funding requirements of these courses need to be recognised by Government and universities.

#### **3. ENHANCE INDUSTRY INNOVATION**

Meet half the cost of employing new PhD graduates in industry for 2 years, to encourage industry make the best use of science in developing new products and improving existing ones.

**4. BRING ON "BACKING AUSTRALIA'S ABILITY"** The Innovation Statement was the first step to re-invest in Australian science, but we continue to lag in international terms. It's time to take the second step and increase our national investment to OECD average by 2012.

#### **5. VIVE LA DIFFERENCE!**

Encourage universities to pursue individual excellence in teaching and research, rather than being clones of each other. Foster institutional cooperation on expensive equipment and joint projects.

#### **6. ENCOURAGE INDUSTRY TO BE INVENTIVE**

Give tax breaks on a sliding scale to companies prepared to invest more in research, because

enterprising and inventive companies grow and provide more jobs.

#### 7. SCIENTISTS ADVISING PARLIAMENT

Place scientists in Parliament for one-year secondments, to advise MPs on science-based issues such as water, salinity, energy sources of the future, climate change, health and resources.

#### 8. EQUAL HECS FOR SCIENCE AND MATHEMATICS TEACHERS

Science and maths teachers are in short supply in Australia, but they still are forced to pay higher HECS fees than teachers in other subjects; and so they take home less pay.

#### 9. ATTRACT VENTURE CAPITAL INTO NEW INDUSTRIES

Venture capital is in short supply. Make it more attractive to invest in new ideas and new industries by introducing new measure such as diminishing annual rates for capital gains tax.

#### 10. IMPLEMENTING NATIONAL RESEARCH PRIORITIES

Australia has adopted research priorities. Now we need to implement them, and find effective ways to measure the progress our science makes to meet the goals.

*All articles reprinted with permission from the March 2003 FASTS Newsletter compiled by:*

*Mr Toss Gascoigne  
Executive Director  
Federation of Australian Scientific  
and Technological Societies*

### **AT LAST! A SCIENCE MINISTER FOR NSW**

Australia's peak body for scientists and technologists welcomed the announcement by Premier Bob Carr that NSW would create a new Ministerial position for Science and Medical Research if his government is re-elected.

Professor Chris Fell, President of the Federation of Australian Scientific and Technological Societies (FASTS) said that the commitment reflected the economic realities of the day. "There are not going to be many worthwhile jobs in this coming century that don't have a strong basis in science and technology," he said. "New ideas mean new products and better ways of doing things and that

ultimately means jobs." Professor Fell said that until now, NSW was widely perceived as lagging in the science stakes in comparison to other State Governments.

"Other States have given science more prominence," he said. "Geoff Gallop is both Premier of WA and Minister for Science. Peter Beattie and Steve Bracks have both pushed their States to the front when it comes to investment in science. "We look forward to seeing the detail of the programs the NSW Government will establish to support scientists and scientific research."

Professor Fell said he had written to the Premier last Friday about the performance of NSW in science. The letter read in part: "As an example of the State's low level of performance; I would cite the results of the recent CRC round, where 10 of the new CRCs are to be headquartered in Queensland, 6 in Victoria and only 4 in NSW. Other examples are the impetus that Queensland has given to biotechnology and Victoria's construction of a synchrotron. Whilst the State's key universities are successful in gaining Australian Research Council grants, there is not evidence of the same level of cooperation as exists in other States where the State Government has provided strong leadership."

He said there was a perception in the science community that NSW was more interested in real estate than science and technology. While other States had put dollars on the table in support of new centres of excellence, the NSW Government support had been equivocal.

Professor Fell said the role and scope of the new Ministry had yet to be defined. "Medical research is critical, but science covers much more than that," he said. "I have discussed the announcement with the Premier's office, and I would hope that FASTS can work with the new Minister should the Carr Government be returned," he said. Professor Fell said it would be useful if all parties in the election made their positions clear on the proposed ministry.

*Press Release  
10 March 2003*

*Mr Toss Gascoigne  
Executive Director  
Federation of Australian Scientific  
and Technological Societies  
PO Box 218  
Deakin West  
ACT 2600 AUSTRALIA  
Phone: +612 6257 2891  
Fax: +612 6257 2897  
Mobile: 0408 704 442  
Email: [fasts@anu.edu.au](mailto:fasts@anu.edu.au) (Toss Gascoigne)*

## WHAT'S NEW

### A TO Z OF MATERIALS

#### **AZoM.com User Figures Soar Setting New Records**

February 2003 saw AZoM.com record a new record for site visitor sessions, with 180,000 visitor sessions and over 2.1 million site hits. This was quickly followed by a record for daily numbers, with over 11,000 visitor sessions recorded for the single day of 12th March. Figures thus far for the month of March indicate that the AZoM.com will continue its rapid and sustained growth, with projected visitor sessions in excess of 200,000 for the month.

AZoM.com CEO Dr. Ian Birkby, commented, "I think these results indicate how significant the web is for engineers and designers who are looking for materials information. Using the smart search tools provided by AZoM.com, our customers such as the global material supplier, Goodfellow, test machine manufacturer Instron and test house Bodycote Material Testing are able to promote their materials and products to both a global and local audience on an incredibly cost effective basis when compared to traditional media."

"For the last three years, all the AZoM team believed that material manufacturers would begin to appreciate the benefits of using AZoM.com for their on-line

marketing, it's obviously very pleasing to see that in the 1st Quarter of 2003, this is now the case."

"The web is a rapidly changing environment. In response to this, we have continued to grow AZoM and offer more services to both materials suppliers and site visitors in our quest to be the most comprehensive materials portal on the web. Our new initiatives have been well received and our increasing user numbers indicate a growing acceptance of the services we are offering," says Dr. Birkby.

Such as been the success of the AZoM.com site, the Australian-based company has extended its range of services to include the design and upgrade of web sites for materials producers and materials related organisations. "Materials marketing professionals now realise the need for their web sites' to be an integral part of their marketing strategy and are coming to us for solutions," Dr. Birkby continued.

*Dr. Ian Birkby  
Chief Executive Officer  
A to Z of Materials  
L67, MLC Centre, Martin Place,  
Sydney  
NSW 2000 AUSTRALIA  
Phone: +612 9236 7235  
Fax: +612 9973 4205  
Email: [ianbirkby@azom.com](mailto:ianbirkby@azom.com)*



**Australia's leading manufacturing industry  
information resource**

[www.dialinfolink.com.au](http://www.dialinfolink.com.au)

## WHAT'S NEW

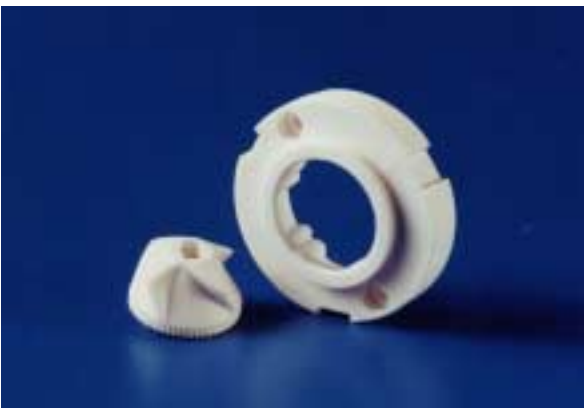
### ADVANCED CERAMETRICS, INC. DEVELOPS BREAKTHROUGH TECHNOLOGIES

Advanced Cerametrics, Inc. (ACI) has evolved over its 53 year history from a small family owned manufacturer of ceramic wear parts for the textile industry (thread guides) to a prominent high tech company manufacturing advanced materials and new products.

ACI's business is divided into three main thrusts. The first being the old line of traditional ceramics, including thread guides, insulators and thermally resistant parts. The second is its advanced line of thick walled and complex injection molded ceramics. The third and most exciting is ACI's line of ceramic fibre.

ACI has specialized in high-pressure injection molding of thick walled and complex shaped oxide ceramics. ACI molds to near net shape with an ability to hold a  $\pm 0.025$  mm tolerance on a 25 mm dimension on some parts. The thickest cross section is 1.7 cm and the largest diameter is 15 cm.

Below: Injection molded ceramic rotors and blades for a consumer spice grinder lasts hundreds of times longer than their metal counterparts while grinding four times as much spice per turn.

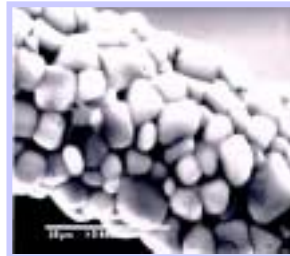


ACI's patented continuous fibre forming process, called Viscous Suspension Spinning Process (VSSP), makes fibres out of nearly any ceramic material that can be provided in powder form. Fibres have been

made of several materials including, but not limited to: very high purity yttria stabilized zirconia (using Tosoh powder), silicon carbide, tin oxide, hydroxy apatite, titanium dioxide (both capacitive and electrically conductive), aluminium oxide, zirconium diboride, lead zirconate titanate (PZT) and single crystal relaxor materials. The technology is a variation of rayon fibre production, is low cost and loads a high volume percentage of the object ceramic powder in the rayon precursor. The fibre is then spun using modified rayon technique and the resultant fibres are handled first as a textile and then in conventional ceramic processing.

ACI has conducted extensive research on making devices out of piezoelectric materials. Research is ongoing in development of fibres made using relaxor materials with efforts aimed at producing aligned single crystal piezoelectric fibres. ACI has developed a line of products made using its PZT fibres. These devices have shown exceptional performance that may replace the use of bulk PZT in several applications. The piezoelectric fibres are either bundled in a parallel array to make transducers or are laid out in a flat mono-layer to make actuators. When the fibres are bent, flexed or compressed they generate an electrical charge. When the fibres are exposed to an electric field they mechanically deform.

**PZT-5H**



**1200°C**

**PZT-EC76**



**1200°C**

Above: Scanning electron microscopy (SEM) of 15  $\mu\text{m}$  PZT fibres (two formulations) sintered at different temperatures.

ACI currently has several Defence Department R & D initiatives underway, in addition to joint development agreements with several industry partners to build specific products using ACI's piezoelectric fibre composites.

Head Sport introduced their new line of Intellifibre and Intellichip active fibre composite tennis rackets with energy harvesting actuators made from ACI's patented PZT fibre. These self-powered "Smart" products actively dampen the vibration created during a ball strike and use the energy to create electrical force to control the shape of the racket, using ACI's PZT fibre's electrical and mechanical properties to counteract the forces. This active structural control adds up to 15% more power to a ball hit.

This technology has opened the doors to many new sporting goods applications currently under development including: smart fishing rods; actively controlled hockey sticks; smart baseball bats and golf clubs; advanced scoring systems for karate clothing and several other products. Other products, using this basic technology, include smart, actively controlled automotive suspensions, vibration damping in military and industrial systems and energy harvesting footwear.

ACI's piezoelectric fibre programs are currently being funded by the Office of Naval Research and the Defence Advanced Research Projects Agency. In addition, the authors like to acknowledge the hard work and dedication of the ACI's R&D staff members Greg Weitz, Andy Schwager, Diana Esposito, and Dr. Sriram Rangarajan.

*Richard B. Cass and Ivan A. Cornejo*

*Article Taken from a Whitepaper  
Posted on the ACI Website - [www.acitech.net](http://www.acitech.net)  
e-mail: [advcer@aol.com](mailto:advcer@aol.com)*

## **TENNIS RACKETS – LEAD ZIRCONATE TITANATE PIEZOELECTRICS PRODUCE MORE POWERFUL RACKETS**

### **Background**

Although battery powered tennis rackets have been outlawed by the International Tennis Federation, the use of piezoelectrics that themselves generate power have been employed as the most recent development and are deemed legal by the sports' governing body.

For the uninitiated, piezoelectric materials produce an electrical current when subject to a deformation or loading such as a bending or compressive force. Under these circumstances they can be used in detectors and strain gauges. Similarly, if an electric

current is applied to a piezoelectric material, it can induce a mechanical deformation. In this way then can be used in actuators.

### **Incorporating Piezoelectrics Into Tennis Rackets**

Piezoelectrics in the form of lead zirconate titanate (PZT) fibres have been embedded into the bodies of composite tennis racket frames, most notably in the head and throat.

### **How Do They Work?**

When a player impacts a tennis ball with a piezoelectric equipped racket, it undergoes a slight deformation i.e. bending. The piezoelectric fibres generate an electrical current as a direct response to the deformation. The electric current is fed into a microchip located in the top of the handle. The microchip generates amplifies the piezoelectric effect and produces an electrical response that is fed back into the piezoelectric fibres producing a counterforce which in turn reduces bending. All this happening in the milliseconds while the ball is still on the strings.

### **What Are The Advantages of Using Piezoelectrics in Tennis Rackets?**

The incorporation of piezoelectrics in tennis rackets has two advantages:

The counterforce generated effectively produces a stiffer racket, helping the player to generate more power.

The piezoelectric also reduced vibration that reaches the player, reducing the risk of tennis elbow, a common problem encountered by players who used aluminium framed rackets, common in the 1970's. This also makes the racket more comfortable to use.

### **Who Manufactures Rackets Equipped with Piezoelectrics?**

At the time of writing, the only manufacturer known to make rackets with piezoelectric electronics was Head.

*Published with permission:  
AtoZofMaterials  
[www.azom.com](http://www.azom.com)  
January 2003 Newsletter  
Material Thoughts*

# WHAT'S NEW

## KYOCERA INNOVATIONS

### Introduction

The notion that the realms of advanced ceramics are so lofty that they would never impact on the everyday lives of the average person, could not be further from the truth. Often they are working away in the background without us even knowing, like in your computer or mobile phone.

Kyocera, the Japanese advanced ceramics corporation, have over the last few years pioneered a range of ceramic kitchen products that incorporate advanced ceramics. The use of advanced ceramics in key components enables their products to outperform and outlast similar items made from more conventional materials.

### The Ceramic Knife

Kyocera pioneered the ceramic knife, which was one of the first high examples of advanced ceramics in consumer kitchenware. The blade of the knife is made from tetragonal zirconia polycrystals or TZP. Zirconia ( $ZrO_2$ ) has also been called "ceramic steel", of which TZP is a subset.

While there are a number of ceramics now used for ceramic blades and knives, TZP was chosen for its high strength and fracture toughness, as well as its wear resistance, which enabled it to maintain a sharp edge longer than metallic counterparts.

The interesting thing about TZP is that it benefits from a phenomenon called transformation toughening. The transformation toughening mechanism effectively closes cracks by exerting a compressive force as a crack tip approaches. This makes certain materials, including TZP, resistant to cracking and gives them high fracture toughness.

Kyocera's ceramic knife has even won design awards which have taken into account factors such as functionality and design for long term use.

### The Five-in-One Food Slicer

The Five-in-One food slicer, Kyocera's latest kitchenware offering is a purpose designed slicer that uses ceramic blades which offer several advantages over similar slicers which use metallic blades. These include: a blade that does not rust; the wear resistant blade stays sharper longer; can be cleaned using disinfectants and bleaches and does not leave behind a metallic odour on the processed food.

The food slicer (pictured below) is designed for the fine slicing of vegetables and other foods. It comes with a range of slicing attachments that allow the user to slice their food to different thicknesses.



### Peeler with Ceramic Cutting Edge

The ceramic edged peeler (pictured below) also uses a ceramic blade, offering similar advantages as outlined above for the Five-in-One Food Slicer.



## Ceramic Knife Sharpener

Designed to sharpen the metallic blades to the ceramic knives, the Kyocera knife sharpener features a patented whetstone sharpening surface. This material returns metal blades to their former glory with a minimum of effort.

While other materials are used in the design, there are no components that are susceptible to rust or corrosion. Knife sharpener is pictured below.



## CERAMICS STUDY MAY TRIGGER AIRCRAFT DESIGN REVOLUTION

The study of ceramic materials is literally climbing sky-high in a novel project by a team of physicists in the United Kingdom.

Their work could trigger a revolution in commercial aircraft design. This is a likely result from using a novel combination of techniques to examine these materials at extreme temperatures that simulate those experienced when aircraft travel at high speed or when they decelerate rapidly.

For some time ceramics have been used as heat shields in spacecraft re-entering into the atmosphere, and in aircraft engines because the burning temperatures are too high for most metals. For a number of technical reasons it is currently impractical to use these materials for conventional aircraft.

“At present, ceramic linings are not used for normal civil aircraft, although metal-ceramic composites

## Ceramic Salt, Pepper and Spice Mills

Kyocera has produced a range of mills suited to salt, pepper and spices that utilize porcelain grinding surfaces with delicate grooves. The porcelain mill wheels do not contaminate the ground food with any odours and are not attacked by aggressive materials such as rock salt. Furthermore, they do not rust and exhibit good wear resistance ensuring efficient grinding for the life of the product.

*Published with permission:  
AtoZofMaterials  
www.azom.com  
January 2003 Newsletter  
Featured Supplier*

could be used one day for that purpose if the favourable mechanical properties of metals can be married with the good thermal behaviour of ceramics,” Dr Rudi Winter, the project leader in the Department of Physics at the University of Wales Aberystwyth, said.

“That is why it is important to understand the structural response of these materials to mechanical and thermal impact, so that we learn to square the circle.”

With this in mind Dr Winter and CASE Student Malcolm Coleman are applying Nuclear Magnetic Resonance (NMR) together with a new non-contact thermometry technique for the very first time in order to study the stability and structure of these ceramics under real conditions. This will mean at very high temperatures up to 2200 degrees Celsius.

Basically NMR spectroscopy is an analytical chemistry technique that is widely used for

determining the not only the content and purity of a sample as well as its molecular structure.

Once the basic structure is known, NMR can be used to determine molecular conformation in solution as well as studying physical properties at the molecular level such as conformational exchange, phase changes, solubility, and diffusion.

The principle behind NMR is that many nuclei spin and all nuclei are electrically charged. In a magnetic field, spinning nuclei have lower energy when aligned with the field than when opposed to it because they behave like magnets. This energy difference corresponds to radio frequencies hence the nuclei are able to absorb and reemit radio waves.

The precise resonant frequency is dependent on the effective magnetic field at the nucleus that is affected by electron shielding which is in turn dependent on the chemical environment. This frequency dependence on the chemistry (known as chemical shift, symbol delta) is what makes NMR such a powerful analytical tool.

"NMR allows us to determine the structure of a material (at an atomic level) around probe atoms in a material in a similar manner to which its close relative, MRI - magnetic resonance imaging - exploits the same physics to probe human 'samples' in medicine," Dr Winter observed:

The Aberystwyth breakthrough is to implement a novel technique for contact less temperature measurement, known as laser-absorption radiation thermometry (LART), on an ultra-high temperature aerodynamic levitation-based NMR probe, the only one of its kind in the UK, to determine the atomic structure of these ceramics.

In relatively simple terms LART is a method that can measure the temperature of a sample in a non-contact way without prior knowledge of its emissivity. To achieve this it uses a laser to modulate the temperature of the sample surface. The modulated thermal radiance emitted by the target is measured using a remote detector system.

To measure the temperature of a sample, the LART system uses two lasers, operating at two different wavelengths. By taking a ratio of the two signals it is possible to determine the temperature of the sample without knowing its emissivity. Additionally, errors due to reflection from the surroundings and absorbing gases are eliminated.

The technique has been shown to work in a laboratory environment, and field trials are currently being conducted to assess its ability to measure temperatures in industrial situations and for research applications. These include measurements for the steel and semiconductor processing industries.

At Aberystwyth the NMR probe is able to heat the samples without needing a container to temperatures up to 2200C by means of a 125W infra-red laser. In order to determine the structural changes, the temperature will be measured and controlled with previously unreached precision using the LART technique. This has been developed by another team at the National Physical Laboratory (NPL).

For Dr Andrew Levick in the Thermal Metrology Group at NPL, this work is a showcase for their new laser-absorption radiation thermometry (LART) technique which overcomes many of the problems inherent in conventional pyrometry techniques.

They hope that Dr Winter will be able to demonstrate its feasibility in practical applications in order for them to be able to market it to the industry in the near future.

*Article taken from:  
Dial Info Link Manufacturing  
Products and Services in Manufacturing  
<http://www.dialinfoink.com.au>  
9 January 2003*

## **WHEN CERAMIC WEARS BETTER THAN STEEL**

A ceramic alternative to steel could be used to make better domestic and industrial cutting tools, stronger hip joints and improved medical instruments.

Researchers at the northern England university of Sheffield have overcome a disadvantage which previously hindered the adoption of the new material, opening the door to its wider application.

Zirconia is a ceramic which combines strength and hardness comparable with steel with higher resistance to wear and chemical corrosion. It has been known for some time to be potentially well suited to industrial, medical and other uses. Zirconia blades, for example, are much sharper and smoother than conventional steel ones, are better for precision cutting and last up to 50 times longer.

So far, zirconia's use has been limited by its loss of strength and its subsequent cracking when subjected to temperatures of 100 to 600 degrees Celsius in the

presence of water, a process known as hydrothermal degradation. Sheffield's researchers, funded by the Engineering and Physical Sciences Research Council, have now overcome this problem.

Dr Ian Ross of Sheffield University undertook most of the experimental work, with help from Dr Andy Scott at nearby Leeds University and aided by Dr David McComb, of Glasgow University, and Dr Rik Brydson, of Leeds.

They used advanced research techniques - such as field emission gun TEM (transmission electron microscopy) and high-energy resolution XPS (x-ray photoelectron spectroscopy) - to probe the microstructure of the material at the atomic scale, allowing them to determine atom type, atom position and bonding between atoms.

By using this state-of-the-art technology and working at the nanoscale, the team was able to protect the zirconia by adding trace quantities of materials such as alumina to the zirconia, without compromising its toughness, in a way which prevents degradation from progressing into the material from its surface.

The success of the work has been built on collaboration with Dynamic Ceramic, a small UK company. With scientific support from the university, the company has now developed a production method for a zirconia that is resistant to hydrothermal degradation.

Team leader Professor Mark Rainforth (email: [m.rainforth@sheffield.ac.uk](mailto:m.rainforth@sheffield.ac.uk)), of Sheffield University's Department of Engineering Materials, said: "Increased industrial productivity and improved comfort for hip-replacement patients are just two of the many benefits that could result from overcoming zirconia's Achilles heel."

*Article taken from:  
Dial Info Link Manufacturing  
Products and Services in Manufacturing  
<http://www.dialinfolink.com.au>  
3 March 2003*



## ZIRCAR CERAMICS, INC. INTRODUCES NEW HIGH ALUMINA REFRACTORY ADHESIVE

ZIRCAR Ceramics, Inc. Florida, NY is proud to introduce its new High Alumina Refractory Adhesive Type HITAC-4. HITAC-4 was developed specifically for bonding low-density insulation materials together without adding significant mass to a fibrous ceramic insulation system. HITAC-4 is a single part water based adhesive that exhibits high strength upon drying. Once fired to 425 °C (800 °F) HITAC-4 exhibits a bond that is stable to re-exposure to water or humid conditions. Curing gives HITAC-4 a high dielectric strength.

HITAC-4 contains 73% Al<sub>2</sub>O<sub>3</sub> giving it a maximum use temperature of close to 1427 °C (2600 °F). HITAC-4 is white, creamy and has a specific gravity of 1.8 g.cm<sup>-3</sup>. The Cement can be applied in a thin layer, is sticky, remains workable for an acceptable period of time, contains no organic material and is stable when applied to most types of low density insulating materials.

HITAC-4 is available through the company's e-commerce enabled website at [www.zircar.com](http://www.zircar.com). It is offered in one gallon, five gallon and 55 gallon re-sealable containers. This new adhesive can be applied with a brush, paint roller or sprayer to all porous refractory forms.



Pictured above is a section of an insulating cylinder made with ZIRCAR Ceramics' new HITAC-4 Refractory Adhesive and a moist ceramic fiber blanket. HITAC-4 goes on thin and can be used to temperatures as high as 1427°C (2600 °F).

*David Hamling  
Vice President  
ZIRCAR Ceramics Inc  
Email: [dph@zircarceramics.com](mailto:dph@zircarceramics.com)*

## OPTICAL ANALYSIS SYSTEM MEASURES ROLLER PRESSURES IN LAMINATING PROCESSES

EAST HANOVER, NJ. Sensor Products Inc. introduces the Topaq<sup>®</sup> Pressure Analysis System. Used in conjunction with Pressurex<sup>®</sup> stress indicating films, Topaq provides a unique perspective of the distribution and actual magnitude (PSI) of pressure between any contacting or impacting surfaces. Pressurex<sup>®</sup> film instantaneously and permanently change colour in proportion to the amount of pressure applied to them. Topaq, a Windows based system, scans and interprets the exposed film, rendering high-definition digitally enhanced images and statistical reports.

Topaq is useful, says Daniel Titeica, Product Manager, "in a large variety of applications in R&D and QC, including measuring nip pressure and roll contact pressure in laminating and coating machines. The system actually will aid in determination of uniform loading in a press's cross direction, as well as consistent web compaction. Consistent web compaction and uniform loading are very important issues when dealing with roller pressures in laminating processes, especially in the area of non-woven and industrial textiles."

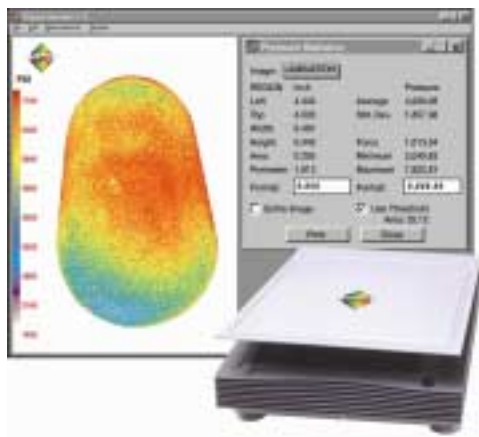
Some of Topaq's features include histograms of pressure levels, enlargement and reduction capabilities, pseudo-colour and 3-D viewing modes and extensive smoothing, filtering and thresholding.

Surface contact area down to 3 mils can be analyzed. Each image and its accompanying statistics can be saved, printed and exported for analysis in other software packages.

Above: Lamination pressure can be easily and quickly interpreted by use of the Topaq optical image analysis system. Red areas reveal the highest levels of contact or roller pressure.



*Bill Ebner  
Sensor Products Inc.  
108, Route 10 West, Suite 307.  
East Hanover  
NJ 07936-2138 USA  
Phone: +1 973 560 9092  
Fax: +1 973 884 1699  
Email: [bebner@sensorprod.com](mailto:bebner@sensorprod.com)  
<http://www.sensorprod.com/topaq.html>  
Released 01 April 2003*



## CORPORATE NEWS

### BRICKWORKS LAUNCHES HOSTILE \$473m BID FOR BRISTILE

Shares in brick and tile maker Bristile shot to a record high on Tuesday after major shareholder and rival brick maker Brickworks announced a hostile \$473m bid for the company.

Bristile managing director David Gilham said the \$3.15 per share cash offer from Brickworks subsidiary The Austral Brick Co, "severely undervalued" the company. "It is unsolicited, we think it is their initial position and more importantly we think it severely undervalues the company," Gilham said. "We're advising them (shareholders) at the moment to do nothing, certainly not sell."

Brickworks already hold 22.7% of Bristile shares. It said its bid, aimed at creating one of Australia's largest brick manufacturers, represented an 11.9 times multiple of earnings per share for the year ended June 30, 2002.

It is conditional on acquiring at least 50.1% of Bristile's issued capital. "Our offer provides an opportunity for Bristile's shareholders to realise a premium price for their shares at a time when the residential building cycle has shown signs of peaking and a downturn in building approval statistics has already occurred," Brickworks chairman Robert Millner said.

Millner left Perth on Tuesday after advising Bristile of Brickworks' intention to make an offer. Gilham said no formal talks were held between the two companies.

There had been speculation about a possible merger since Brickworks snapped up Futuris Corp's 19.6% stake in Bristile in 2001.

According to Brickworks' bidder's statement, the expanded group would have total assets of \$1.1bn and national sales revenue in excess of \$420m.

Brickworks said it was confident its offer would receive Australian Competition and Consumer Commission approval as the two companies did not have any competing operations in the states where Bristile operated.

Brickworks have operations in NSW and Queensland, while Bristile owns brick operations in Victoria, South Australia, Western Australia and Tasmania.

The takeover offer comes five months after renowned corporate raider Sir Ron Brierley, who owns 5% of Brickworks, argued for Austral to be merged with the Perth Company.

It would leave Brickworks as an investment company with a takeover by Soul Pattinson a logical next move. Soul Pattinson owns 49% of the ordinary share capital of Brickworks, which also owns 42% of Soul Pattinson.

Analysts described Brickwork's proposed acquisition of Bristile as a "natural fit" but said the surge in Bristile's share price beyond the bid price suggested it may have to sweeten its offer.

This is despite a shortage of potential parties that could make a rival bid.

Paterson Ord Minnett industrial analyst Robert Gee said the other national players in the industry, Boral and CSR, were unlikely to make a move on Bristile.

He said Boral would struggle to win ACCC approval given its share of the WA market, while CSR had been inactive in acquiring local assets in recent years.

"I can't see them now running in and making a bid for Bristile," Gee said.

"So I think it is more a question of is it the right price or not."

*Article taken from:  
Dial Info Link Manufacturing  
Products and Services in Manufacturing  
<http://www.dialinfolink.com.au>  
5 March 2003*

### AMCOR TO BUILD NEW \$125m WINE BOTTLE FURNACE

Packaging giant Amcor announced today it would build a new \$125m glass furnace at its South Australian wine bottle facility.

Amcor said the new furnace will have a capacity of 200 million wine bottles a year, with production phased in to match contractual supply agreements.

The first output from the new facility, at Gawler, will start in the middle of 2005.

The group said strong customer demand for Amcor's premium wine bottles has enabled new long term supply agreements to be extended and upgraded, underpinning demand for the new furnace.

With the addition of the second furnace, the site will be producing 400 million premium wine bottles a year with bottle shapes and colours which cover more than 88 per cent of the total market.

Amcor said it expected its operating costs would fall through lower overheads and better asset utilisation. The working capital to sales ratio will also fall through greater manufacturing flexibility, it added.

"The existing plant was profitable in the first six months of operations and is on target to deliver a 15% return on investment," Amcor managing director Russell Jones said.

"The long term supply agreements that support the second furnace will ensure a return in excess of 15 per cent is achieved for this new investment.

"With the building of the second furnace, Amcor will be a substantial supplier of wine bottles in Australia."

*Article taken from:  
Dial Info Link Manufacturing  
28 March 2003*

## **ACI DOUBTS VIABILITY OF AMCOR GLASS EXPANSION**

Leading glass bottle manufacturer ACI Glass Packaging has cast doubts on the viability of a second furnace at rival Amcor's wine bottle plant at Gawler in South Australia.

ACI chief executive Peter Robinson has pointed out that his company can bring additional capacity equivalent to 200 million wine bottles a year on stream within months and at minimal cost.

Amcor's plan to double its capacity would also add 200 million wine bottles a year to total production, but at a cost of \$125 million.

Clearly, if Australia's rapid growth in wine exports is to continue at rates similar to those of recent years,

wine bottle production capacity must stay ahead of that growth.

But ACI itself can produce more bottles than the entire Australian annual wine production would require, even if all of it went into glass, and the additional 400 million bottles for which the two companies will have capacity, will not be required for several years, even if export growth rates rise.

Yet both producers say they have no intention of entering into a price war. That is a question that may need to be revisited when Amcor's additional capacity comes on line.

ACI's Robinson rather understated the case when he said analysis showed that demand for premium wine bottles was more than adequately serviced by existing industry capacity in the medium term. "After investing heavily in new capacity at our Adelaide plant, ACI also has the ability to meet future growth by bringing on stream additional capacity equivalent to 200 million wine bottles within months and at minimal cost. This will be by far the cheapest incremental capacity available to the glass industry and will underline our position as the lowest cost producer," he said.

"ACI fully supports the Australian wine industry and is absolutely committed to its continued success. We take our leadership in the glass packaging market seriously and have dedicated the world's best technology and expertise to not only maintain but enhance our market position."

ACI had, for over 100 years, been efficiently providing all glass packaging in Australia and had been instrumental in providing new capacity and infrastructure support to the highly successful wine industry. ACI, a subsidiary of the world leading glassmaker Owens Illinois, operates the world's largest and most technologically advanced wine bottle making plant at Adelaide.

"Despite the entry of a second player into this arena, ACI has continued to see substantial growth and has maintained its close relationship with Australia's wine industry through long term contracts with all major wine companies for substantially all of their high volume requirements for premium wine bottles," Robinson said.

*BY CHRISTOPHER SPEARY  
Article taken from:  
Dial Info Link Manufacturing  
1 April 2003*

## WELCOME TO NEW MEMBERS

Prof H Tsubakino,  
Himeji Institute of Technology  
Japan.

P. S. S. R. Krishnan  
Larse & Toubro  
India

Zeya Oo  
Curtin University of Technology  
Malaysia

Arnold Rowntree  
Swinburne TAFE,  
Melbourne

A/Prof Abhi Ray  
UTS  
Sydney

## EMPLOYMENT SECTION

### PEOPLE SEEKING WORK

#### Les Jones

lesdjones@hotmail.com

Qualifications: BSc (Hon) Chemical Physics; Chartered Engineer (CEng); European Engineer (EurIng); Chartered Physicist (CPhys) and Fellowship in Manufacturing Management.

Profile: Over 20 years experience in high-technology (ceramics) materials development, process and product development and manufacturing. This includes over 12 years in senior management and executive positions, leading multi-disciplinary project teams in commercial environments.

Experience: Senior Manufacturing Development Manager, for Ceramic Fuel Cells Limited (CFCL) in Melbourne, developing Solid Oxide Fuel Cells and components. Senior Project Leader and Manufacturing Consultant for The Welding Institute (TWI) in the UK. Project Manager at CSIR in South Africa, involved in technical ceramic development.

Manufacturing Manager and Senior Product / Process Development Engineer in the manufacture of electronic components (ceramic thermistors), at STC in the UK.

CV can be supplied on request.

#### Bose Supratik

kaveri\_440448@rediffmail.com

Qualifications: B.Tech. (Hons 1) in Ceramic Engineering, Institute of Technology, Banaras Hindu University, Varanasi, India, 1982. Postgraduate Diploma in Business Administration, Institute of Management Technology Ghaziabad, India, 2002.

Profile: Ceramic Engineer with extensive hands on experience in Production, Project Administration & Commercial aspects related to High Alumina Industrial Ceramic; refractory (General / Super / Synthetic / Fused Cast); Fused Abrasive Grains and spark plug industries.

CV can be supplied on request.

### **AZOM.COM**

**My AZoM - Free materials newsletter**

Sign up for your materials newsletter from AZoM that brings to your inbox, the latest news and technical information for the materials that interest you.

### **AMAZON.COM**

**<http://www.amazon.com>**

Almost any book can be found in seconds by entering the title, author, subject or keywords into this powerful search engine.



**105<sup>th</sup>**

# Annual Meeting & Exposition

of The American Ceramic Society

April 27-30, 2003

Gaylord Opryland, Nashville, Tennessee

**Endorsed by:**

American Concrete Institute  
American Institute of Chemical Engineers  
American Society for Composites  
ASM International  
Australasian Ceramic Society  
Ceramic Society of Japan

European Ceramic Society  
German Ceramic Society  
International Microelectronics & Packaging Society  
Society for the Advancement of Material and Process Engineering  
Sensors magazine  
The Minerals, Metals & Materials Society

## Today's Research for Tomorrow's Technology

Visit [www.acers.org/AM2003](http://www.acers.org/AM2003) for more information or contact:  
The American Ceramic Society  
P.O. Box 6136  
Westerville, Ohio 43086-6136  
Phone: 614/794-5890  
Fax: 614/899-6109  
E-mail: [customersrvc@acers.org](mailto:customersrvc@acers.org)  
[www.ceramics.org](http://www.ceramics.org)



- **27 topical symposia** focusing on all imaginable areas of ceramic materials, manufacturing and applications including:
  - Nanotechnology
  - Electronics
  - Sensors
  - Defense
  - Biomedical
- **Networking opportunities** and professional growth
- **More than 75 exhibitors** will present their state-of-the-art products and services at the 2003 Research and Development Laboratory Expo

## CORPORATE MEMBERS

ALCOA Australia Ltd  
Applecross  
WA 6167

Austral Bricks  
Wetherill Park  
NSW 1851

Australian Fused Materials  
Rockingham  
WA 6168

AZoM.com.P/L Sydney  
NSW 2000

Boral Bricks P/L  
Winston Hills  
NSW 2153

Bullii Refractories P/L  
Bullii  
NSW 2516

Carpenter Advanced Ceramics  
Clayton  
VIC 3168

Commercial Minerals Ltd  
Parramatta  
NSW 2150

Ferro Corporation Australia P/L  
Moorabin  
VIC 3189

Holmesglen Institute of TAFE  
Chadstone  
VIC 3148

Iluka Resources Ltd  
Perth  
WA 6001

Millenium Performance  
Chemicals  
Henderson  
WA 6166

Mowatt Refractories  
Rockingham  
WA 6967

Rojan Advanced Ceramics P/L  
Spearwood  
WA 6163

Selkirk Brick P/L  
Ballarat  
VIC 3353

Taylor Ceramic Engineering  
Mortdale  
NSW 2223

Tiwest P/L  
Muchea  
WA 6501

Unifrax AUSTRALIA LTD  
Thomastown  
VIC 3074

Unimin Australia LTD  
Parramatta  
NSW 2150

Warman International Ltd  
Artarmon  
NSW 2064

## CALENDER OF EVENTS

### **105<sup>th</sup> Annual Meeting & Exposition of the American Ceramic Society**

April 27-30, 2003, Nashville, Tennessee, USA

### **2003 International Conference on Powder Metallurgy & Particulate Materials**

June 8-12, 2003, Las Vegas, USA

### **9<sup>th</sup> International Conference on Microwave and High Frequency Heating**

September 1-5 2003, Loughborough, UK  
Contact: Prof. Jon Binner  
E-mail: [ampere9@lboro.ac.uk](mailto:ampere9@lboro.ac.uk)

### **PACRIM 5**

September 29 – October 2 2003, Nagoya, Japan

### **FASTS "Science meets Parliament" Day 2003**

October 14-15, 2003, Canberra, Australia

# THE AUSTRALASIAN CERAMIC SOCIETY

## THE SOCIETY

The Australasian Ceramic Society is an organisation that works towards furthering all aspects of ceramics - science, industry, research, trade and in art. The society aims to bring together all those interested and involved in ceramics for mutual cooperation and the exchange of knowledge and ideas.

## FEDERAL COUNCIL OFFICERS

The Society has a Federal Council comprised of representatives from the member branches. These are in New South Wales, Victoria and Western Australia and each operates autonomously with its own Committee. There are corresponding Secretaries in Queensland, South Australia and New Zealand.

## ACTIVITIES

### Meetings

Regular meetings are held by the member branches. The meetings are usually comprised of informal social gatherings and lectures by invited speakers. Occasionally, there are joint meetings with kindred societies.

### Conferences

The Society holds its AUSTCERAM conferences every two years. Since 1988, the AUSTCERAM conferences have become events on the international conference agenda. The conferences cover all aspects of the ceramic area and present both new work and reviews.

### Scholarships & Prizes

Several Society scholarships and prizes are given to students undertaking courses in ceramics at tertiary level.

### Awards

The Australasian Ceramic Society Award is given every two years to a person who has made a major contribution to ceramics in Australasia. The award encompasses all fields of ceramics. Eligibility is not

restricted to Society members. There are also other awards, as determined by the Council.

## Excursions

Visits are regularly organised to ceramic research establishments, manufacturing plants, raw material deposits and so on, often in conjunction with Technical Meetings.

## PUBLICATIONS

### Journal

The Journal of the Society is circulated internationally with a particular concentration in the Australasian region. It contains papers on original ceramic research and industrial development as well as review articles. It is published twice annually and is sent free to members. The Journal may be subscribed to independently of Society membership.

### Newsbulletin

The Newsbulletin is the Society's vehicle for news, information and comment. It contains notices, reports of Society activities and other events, letters, articles, opinions, news of members, industry news and other items of interest and concern. It is published four times a year and is sent free to members. Advertising in the Newsbulletin is available to members and others.

### Conference Proceedings

Conference proceedings contain the papers presented at the AUSTCERAM conferences and are a comprehensive record of progress and developments in ceramics both in the Australasian region and internationally.

## FASTS

The Australasian Ceramic Society is a member of The Federation of Australian and Technological Societies (FASTS). FASTS represent the interests of some 60,000 scientists and technologists in Australia. FASTS works to influence the formulation of science and technology policy to the economic, environmental and social benefit of our nation.

## MEMBERSHIP INFORMATION

Membership is open to all individuals, companies and associations. There are five categories of membership.

### Member

Benefits of Membership include automatic subscription to the Journal, receipt of the Newsbulletin, and notices of Society activities.

### Corporate Member

Corporate Members may nominate two representatives as members and receive free advertising space in a Society publication on one occasion.

### Honorary Life Member

This is an honour awarded by the Federal Council to members who have given long and distinguished service to the Society.

### Retired Member

Persons who have retired from their profession may apply for Retired Membership at a reduced fee. Retired members receive all the benefits of members.

### Student Member

Full time students are entitled to Student membership at a reduced membership fee. Student members receive all the benefits of Membership.

## CURRENT ANNUAL MEMBERSHIP FEES

	Cost	GST	Total
One time joining fee	\$10.00	\$1.00	\$11.00
MEMBER	\$80.00	\$8.00	\$88.00
CORPORATE MEMBER	\$200.00	\$20.00	\$220.00
RETIRED MEMBER	\$40.00	\$4.00	\$44.00
STUDENT(no journal)	\$15.00	\$1.50	\$16.50
STUDENT (inc. journal)	\$25.00	\$2.50	\$27.50

\*No GST for overseas members



## NEWSBULLETIN ADVERTISING CHARGES

The costs for 1/4, 1/2 and full page advertisements in the *Newsbulletin* are \$400, \$600 and \$940 respectively. In addition to this full page colour advertisements cost \$1400. Advertisements are published in the *Newsbulletin* for one year (4 issues).

Companies which advertise in the *Newsbulletin* receive an automatic link to their homepage in the website of the Australasian Ceramic Society.

Please contact the Editor of the News Bulletin if you are interested in advertising in the *Newsbulletin* and receiving a link to your website.



# Australasian Ceramic Society

ABN 81 000 468 708

C/o ANSTO, PMB 1 Menai, NSW 2234, Australia

## Membership Form

### Member Details:

Title	
Surname	
First Name	
Company/Organisation	
Street Address	
Town/Suburb	
State	
Post Code / ZIP	
Country	
Phone (Business)	
Phone (Home)	
Email	
Fax	
Membership Type*	

\*(Member, retired member, corporate member, student member)

### For Corporate Members Only, Please State Company Nominees

1. Title		Name	
2. Title		Name	

### Cost for Membership

One-time Joining Fee:	AUD \$11.00
Membership Fee (Including GST):	AUD \$
Donation to Scholarship Fund:	AUD \$
Postage**	AUD \$
<b>TOTAL AMOUNT DUE:</b>	<b>AUD \$</b>

\*\* (Outside Australia or New Zealand add \$15 for airmail postage, otherwise surface mail)

Please tick:  I wish to receive the Journals

### Method of Payment

Please tick:  Cheque enclosed (Please make cheques payable to the Australasian Ceramic Society)  
 Credit card  
 Money Order enclosed  
 A receipt is required

### Credit Card Details

Charge the following credit card:  VISA       MASTERCARD       BANKCARD  
 Card No.: \_\_\_\_\_ Valid until: \_\_\_\_\_ Today's Date: \_\_\_\_\_  
 Name on Card: \_\_\_\_\_ Signature of the cardholder: \_\_\_\_\_

Post or FAX with your Payment to: Dr. D. S. Perera  
 ACS Federal Secretary  
 C/o ANSTO  
 PMB 1, Menai  
 NSW 2234, Australia  
 Ph: +612 9717 3477  
 Fax: +612 9543 7179  
 Email: dsp@ansto.gov.au



**NEWSBULLETIN**  
of  
**THE AUSTRALASIAN CERAMIC SOCIETY**