

THE WORLD RESOURCE FOR CERAMIC MANUFACTURING AND TECHNOLOGY

AMERICAN  
CERAMIC  
SOCIETY

# BULLETIN

May 2002

[www.ceramicbulletin.org](http://www.ceramicbulletin.org)

Thin Films via CCVD / 36

Mueller Award Lecture:

Strong Bonds / 46

E-Week: A New Generation  
of Engineers / 53

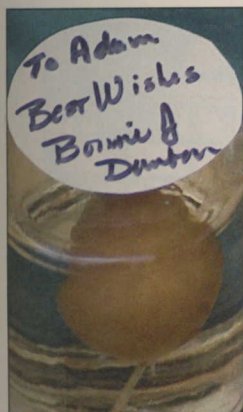
New Developments in  
Refractory Castables / 26

Ref: BT PF 160102/09      Df: 31146295  
AMERICAN CERAMIC SOCIETY BULLETIN  
01.05.02 Vol. 81 No. 5  
0002-7812      22304673      21.05.02  
EDITIONS CHIHAB  
ZI. LOT B5  
B.P.744 REGHAIA  
GG ALGER  
ALGERIE

# CONTENTS

Volume 81, Number 5, May 2002

## feature articles



Direct Ceramic-Metal Joining . . .

### 20 Clayware Mechanical Properties Porosity Dependent

Porosity correlates closely to the mechanical properties (hardness, strength and elastic constant) and Weibull modulus of roofing tile, and empirical relationships have been obtained.

H.S. Kim, T. Guifang and J.Y. Kim

### 26 Enzyme-Coagulated High-Alumina Castables

An enzyme-catalyzed coagulation method was used for the consolidation of refractory castables, using leguminous seeds as an economic source of urease.

A.R. Studart, F.A.O. Valenzuela and V.C. Pandolfelli

### 32 Refractories for Clean Steelmaking

Increased microsilica content in the MgO-based refractory lining of a crucible decreased the Al<sub>2</sub>O<sub>3</sub> inclusion content in the steel through a liquid phase that formed in the refractory lining.

Wei Yaowu and Li Nan

### 36 Thin Films of Advanced Materials Via CCVD

The combustion chemical vapor deposition process and its variations offer a novel way to synthesize coatings of metals, oxides and polymer composites in an open atmosphere, allowing greater flexibility in enabling next-generation products in broadband, electronics and advanced energy applications.

Subu Shanmugham, Andrew Hunt and David Motley

### 42 How Active Silica Affects Slip Properties of Sanitaryware

To show the effect of active silica on slip rheology and casting properties, active silica derived from rice husks was used as a replacement for quartz in the production of sanitaryware. The replacement significantly increased slip viscosity and casting rate.

E. Özel, S. Kurama and N. Ay

### 46 Direct Ceramic-Metal Joining: Strong Bonds

Students and colleagues of Victor Greenhut have created three decades of strong bonds at Rutgers University Ceramic-Metal Systems Group.

Victor A. Greenhut

### 53 E-Week Prepares a New Generation of Engineers

Ryan Daniels



E-Week . . .

## manufacturing briefs

### 64 Emissions Control for the Brick Industry

### 65 Overhaul of ASTM C 1161 Flexural Strength Specimens



# CONTENTS

Volume 81, Number 5, May 2002

## product focus

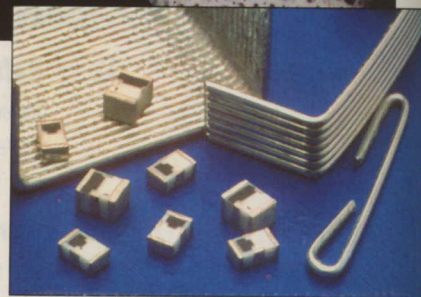
- 66 Mixers and Blenders

## news & views

- 7 **president's letter**  
*Our Future in a Changing Materials World*  
Gary L. Messing, President
- 8 **brick business**  
*48th International Brick Plant Operator's Forum*  
Denis Brosnan, PE, Contributing Editor
- 9 **global news**  
*Tecnargilla Introduces Changes/10*  
*Johnson Matthey Acquires Avocado/16*
- 10 **technology briefs**  
Greg Geiger, Technical Editor
- 14 **refractory hot line**  
Charles G. Marvin, Contributing Editor



global news . . .



global news . . .

## departments

- |    |                     |    |                                     |
|----|---------------------|----|-------------------------------------|
| 3  | calendar            | 60 | online business directory           |
| 12 | business stats      | 69 | business services                   |
| 18 | environmental notes | 79 | career opportunities/classified ads |
| 19 | names in the news   | 80 | information please/ad index         |

## society business

- 58 **section notes**
- 59 **NICE news**  
*You Make the Difference*  
Diane C. Folz

### ACerS Meeting Information www.ceramics.org

Structural Clay Products Division  
Spring Meeting, Augusta,  
Ga., May 19-21, 2002

ACerS Engineering Ceramics Division,  
27th Annual Cocoa Beach Conference  
& Exposition on Advanced Ceramics &  
Composites, Cocoa Beach, Fla.  
Jan. 26-31, 2003

ACerS 105th Annual Meeting  
and Exposition, Nashville,  
Tenn., April 27-30, 2003

THE AMERICAN CERAMIC SOCIETY BULLETIN COVERS NEWS AND ACTIVITIES OF THE SOCIETY AND ITS MEMBERS, INCLUDES ITEMS OF INTEREST TO THE CERAMIC COMMUNITY, AND PROVIDES THE MOST CURRENT INFORMATION CONCERNING ALL ASPECTS OF CERAMIC TECHNOLOGY, INCLUDING RESEARCH AND DEVELOPMENT, MANUFACTURING, ENGINEERING AND MARKETING.

AMERICAN CERAMIC SOCIETY BULLETIN (ISSN No. 0002-7812). ©2002 PUBLISHED MONTHLY, 12 TIMES A YEAR. PRINTED IN THE UNITED STATES OF AMERICA.

EDITORIAL AND SUBSCRIPTION OFFICES: P.O. Box 6136, WESTERVILLE, OH 43086-6136. SUBSCRIPTION INCLUDED WITH AMERICAN CERAMIC SOCIETY MEMBERSHIP. NONMEMBER SUBSCRIBER RATES: NORTH AMERICA, 1-YEAR \$50; INTERNATIONAL (AIR MAIL ONLY), 1-YEAR \$100. BACK ISSUES: NORTH AMERICA, \$9 PER ISSUE; INTERNATIONAL, \$12 PER ISSUE. ALL RATES INCLUDE SHIPPING CHARGES. OUR STANDARD DELIVERY METHOD OUTSIDE NORTH AMERICA IS VIA BULK AIR MAIL PROVIDED BY AN INTERNATIONAL RE-MAIL CARRIER.

POSTMASTER: PLEASE SEND ADDRESS CHANGES TO AMERICAN CERAMIC SOCIETY BULLETIN, P.O. Box 6136, WESTERVILLE, OH 43086-6136. PERIODICAL POSTAGE PAID AT WESTERVILLE, OHIO, AND ADDITIONAL MAILING OFFICES. ALLOW SIX WEEKS FOR ADDRESS CHANGES.

ACSBA7, Vol. 81, No. 5, pp 1-80