

ADVANCED ENGINEERING WITH CERAMICS

Edited by
R. MORRELL
*National Physical Laboratory,
Teddington, Middlesex, TW11 0LW, U.K.*

BRITISH CERAMIC PROCEEDINGS
No. 46 **APRIL 1990**

UNIVERSITÄTSBIBLIOTHEK
HANNOVER
TECHNISCHE
INFORMATIONSBIBLIOTHEK

Published by The Institute of Ceramics
Shelton, Stoke-on-Trent, Staffs. U.K.

Contents

Invited Presentations:

1. Engineering Ceramics into the 1990's 1
R. Morrell
2. Overview of the ACT Programme 13
A. Bennett
3. An Overview of the U.K. National Programme for Ceramic Applications in Reciprocating Engines (CARE) 21
D. A. Parker
4. United States Automotive Ceramic Programs 37
R. B. Schulz
5. Current Progress in Advanced Ceramics for High Temperature Application in Japan 53
K. Kobayashi
6. Advanced Ceramics for Structural Applications — R. & D. in the Federal Republic of Germany 71
E. Seitz
7. Current Progress in Engineering Ceramics and Ceramic Composites in France 85
P. Boch and J. Castaing
8. Application of Engineering Ceramics in Gas Turbines 93
K. Devendra and G. Syers
9. Processing, Properties and Applications of Structural Silicon Carbides . . . 113
M. A. Hepworth
10. High-Temperature Glass-Ceramic Composites 127
B. J. Norman and B. P. Tilley
11. The Application of Glass-Ceramics to Diesel Engine Piston Crowns . . . 141
F. J. Wallace, W. D. Alexander, H. Reiter and M. Wilson
12. Experience with Ceramics and Ceramic Coatings Applied to a Low Heat Loss Diesel Engine (abstract only) 149
K. Holmes
13. Engineering Applications of Transformation-Toughened Magnesia Partially Stabilised Zirconia 151
George T. Robertson
14. Advanced Structural Ceramics — Critical Needs 157
J. D. Birchall and D. R. Stanley
15. Future Prospects for Engineering Ceramics 165
C. C. J. French

Poster Papers:

16. Injection Moulded Sintered Turbocharger Rotors; a Comparison of SSiC with SSN and SRBSN 173
J. Greim, K. Hunold, K. A. Schwetz and A. Lipp
17. Sintered Silicon Carbide Medium Lubricated Bearings for Pumps 183
Russell T. Wendover
18. State of the Art in "Damage-Free" Grinding of Advanced Engineering Ceramics 189
Paul Shore
19. High-Temperature Creep of Ceramics at NEL 201
E. F. Chandler, A. Hardie and J. D. Snedden
20. Fracture of Ceramic Bars due to Shear and Normal Forces 217
T. Dickerson, H. Fessler and J. J. Webster
21. High-Temperature Si₃N₄-Based Ceramics 231
I. P. Tuersley, G. Leng-Ward and M. H. Lewis
22. Carbonitride Ceramics for High-Temperature Applications 247
R. J. Oscroft and D. P. Thompson
23. Oxidation of Silicon Nitride during High Temperature Thermal Cycling 259
P. Andrews and F. L. Riley
24. Oxidation of HIP-Si₃N₄ with Low Amounts of Sintering Aids 271
Anders Micksi and Bill Bergman
25. Wear Mechanisms for Ceramics 287
M. G. Gee
26. SENB Toughness Measurement of Oxide Ceramics 297
J. Wang, M. W. Rainforth, I. Wadsworth and R. Stevens
27. The Edge Flaking of Brittle Materials 307
N. J. McCormick
28. Interfacial Mechanical Properties of Glass and Glass-Ceramic Matrix Composites 319
A. Fletcher and B. Derby
29. Non-Destructive and Mechanical Characterization of CAS/Nicalon (abstract only) 331
J. K. Currie and D. Wright
30. Ceramic Matrix Composites Reinforced with Continuous Fibres: Mechanical Performance Related to Engineering Applications 333
J. J. R. Davies and R. W. Davidge

31. Reactive Sintering of Al ₂ O ₃ /Ni Composites	335
<i>W. H. Tuan and R. J. Brook</i>	
32. Composite Coating of Metals	345
<i>A. R. Hyde and G. Partridge</i>	
33. The Brazing of Silicon Carbide to Silicon Carbide and Niobium	351
<i>J. R. McDermid, M. D. Pugh, K. Shanker and R. A. L. Drew</i>	
Author Index	359
Subject Index	361