



Advances in ceramic composites: manufacture, performances and applications

Fiber-reinforced ceramic matrix composites (CMCs) are designed for high temperature application under severe environments. Recent achievements helped establishing non-oxide CMCs in aeroengines and all-oxide CMCs in industrial application. In parallel, research focuses on fully understanding the adjustment of properties, evaluating the processing chain and describing and modeling manufacturing routes as well as properties in application relevant environments. Furthermore, multifunctional, smart composite materials are designed and processed with support of artificial intelligence and digital twins. Also, green manufacturing and life cycle assessment will have to be considered in the near future to manufacture sustainable high-performance CMCs.

Dietmar Koch*

University of Augsburg Institute of Materials Resource Management MRM,
Chair of Materials Engineering, Am Technologiezentrum 8, D - 86159,
Augsburg, Germany

Elisabeth Opila

Rolls-Royce Commonwealth Professor of Engineering, University of Virginia,
Department of Materials Science and Engineering, PO Box 400745 395
McCormick Road, Charlottesville, VA, 22904-4745, USA
E-mail address: opila@virginia.edu.

Gerard Vignoles

University of Bordeaux, Lab. des Composites ThermoStructuraux (LCTS), 3,
Allée La Boétie - Dom. Universitaire, F 33600, Pessac, France
E-mail address: vinhola@lcts.u-bordeaux.fr.

* Corresponding author.

E-mail address: dietmar.koch@mrm.uni-augsburg.de (D. Koch).

<https://doi.org/10.1016/j.oceram.2022.100275>

Available online 18 May 2022

2666-5395/© 2022 The Authors. Published by Elsevier Ltd on behalf of European Ceramic Society. This is an open access article under the CC BY license (<http://creativecommons.org/licenses/by/4.0/>).