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Research interests

Relations between properties, chemistry and structure of various metal and ceramic coatings on metallic substrates.

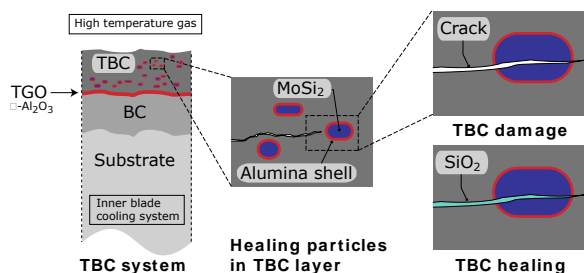
High temperature thermal barrier coating systems, oxidation of metals, protective coatings on high strength steels and self-healing materials.

Electron Microscopy, Electron Backscattered Diffraction, X-ray Micro Analysis, Mass Spectroscopy, Auger and X-ray photoelectron spectroscopy and Ellipsometry

Surface and Interface Research

Recent Research activities

- Selective oxidation of advanced high strength steels
- Modelling adhesion
- Self healing MAX phase ceramics
- Self healing Thermal Barrier coatings
- Spark Plasma Sintering of novel materials



Schematic of crack-healing mechanism in a thermal barrier coating (TBC) with encapsulated Mo-Si based particles. The TBC system comprises a superalloy substrate with a bond coating (BC), which produces a thermally grown oxide (TGO) during service, and the modified yttria-stabilized zirconia (TBC). Upon oxidation of a cracked Mo-Si based particle, silica (SiO_2) fills the crack over a long distance.

Key publications 2016

W.G. Sloof, R. Pei, S.A. McDonald, J.L. Fife, L. Shen, L. Boatemaa, A.S. Farle, K. Yan, X. Zhang, S. Van Der Zwaag, P.D. Lee, P.J. Withers. *Repeated crack healing in MAX-phase ceramics revealed by 4D in situ synchrotron X-ray tomographic microscopy*, Scientific Reports 6 (2016). doi:10.1038/srep23040.

L. Boatemaa, C. Kwakernaak, S. van der Zwaag, W.G. Sloof. *Selection of healing agents for autonomous healing of alumina at high temperatures*, J Eur Ceram Soc 36 (2016) 4141-4145. doi:10.1016/j.jeurceramsoc.2016.05.038

L. Shen, D. Eichner, S. van der Zwaag, C. Leyens, W.G. Sloof. *Reducing the erosive wear rate of Cr_2AlC MAX phase ceramic by oxidative healing of local impact damage*, Wear 358-359 (2016) 1-6. doi:10.1016/j.wear.2016.03.019.

W. Mao, W.G. Sloof. *Relation between oxygen activity gradient in the internal oxidation zone of Mn alloyed steel and the composition of oxide precipitates*, Scripta Mater 135 (2017) 29-32. doi:10.1016/j.scriptamat.2017.03.009.

Other Achievements

Visiting professor at Harbin Institute of Technology, China.

International Advisory board of the Journal "Oxidation of Metals", Springer, New York.

