World Academy of Science, Engineering and Technology
International Journal of Mathematical and Computational Sciences
Vol:14, No:12, 2020

Evaluation of Thermal Barrier Coating According to Temperature and Curvature

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Abstract : To avoid the damage of gas turbine blade from high-temperature, thermal barrier coating (TBC) is applied on the blade. However, it is damaged by thermal fatigue during the operation of gas turbine, and this damage lead to delamination of TBC between top coat and bond coat. The blade can be damaged after the failure of TBC, so durability evaluation of TBC should be performed. The durability of thermal barrier coating was decreased according to the increase of temperature, because thermal stress according to increase of temperature. Also, the curvature can be affect to durability of TBC, because the stress is determined by the shape of the TBC. Therefore, the effect of temperature and curvature on the stress should be evaluated. In this study, finite element analysis according to temperature and curvature were performed in the same condition of Kim et al. Finally, the stress was evaluated from the finite element analysis results according to temperature and curvature.

Keywords : curvature, finite element analysis, thermal barrier coating, thermal fatigue, temperature
Conference Title : ICSRD 2020 : International Conference on Scientific Research and Development
Conference Location : Chicago, United States
Conference Dates : December 12-13, 2020