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**Damping Performance of Alumina and Zirconia-Based Plasma Sprayed Coatings**

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**Abstract**

Alumina and zirconia coatings along with three combinations of alumina-zirconia (AZ) composite coatings are deposited on AISI304 by atmospheric plasma spraying (APS) technique. The AZ coatings are developed on the alumina rich side by varying zirconia content (e.g. 5%, 15% and 25%). To investigate the phases, X-ray diffraction technique is utilized. Scanning electron microscopy technique is used to study the microstructures. The damping behaviors are studied by dynamic mechanical analyzer (DMA). It is observed that, zirconia has much better damping property than alumina and the damping capacity (i.e. tan *δ*) is increased with an increase in zirconia content in AZ coatings. However, it is interesting to note that the variation of complex modulus of AZ coating showed opposite trend as it showed in damping capacity. The damping capacities of all deposited coatings show a stable response over time and frequencies up to 60 Hz.

**Keywords:**

[Alumina-zirconia composite coatings](https://www.tandfonline.com/keyword/Alumina-zirconia%2BComposite%2BCoatings), [atmospheric plasma spraying](https://www.tandfonline.com/keyword/Atmospheric%2BPlasma%2BSpraying), [microstructure](https://www.tandfonline.com/keyword/Microstructure), [damping properties](https://www.tandfonline.com/keyword/Damping%2BProperties)

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