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Study on the effect of Pressure on the Electrical insulation of Plasma-sprayed Alumina Coating

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In this paper, 316LN austenitic stainless steel coated with plasma-sprayed alumina for low-voltage electrical insulation is reported, which used in ITER Magnent Support to prevent eddy current loops. The coating will endure the large pressure and experience the several thermel shocks under practical working environment. SEM shows that coating is dense and good adhesions with base materials, and the surface roughness and texture are uniform. After 50 times thermal shocks, the coating is free from cracks, flakes and debonding. The thermal shock has a little influence on the electrical resistance properities. In addition, though the surface contact resistivity decreases with the increase of pressure, it still more than 109Ω.m when the pressure inceased to 250MPa, which can be concluded that the coating is good electrical insulation enough and can be utilized in the Magnent Support of ITER.

Eligible for student paper award?

No

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