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**Enhanced operability of nuclear fuel rod cylindrical cladding made with thin protective nanoengineered coatings**

ABSTRACT. Thin coatings made from zirconium-based alloys can increase operability of nuclear fuel cladding but thermal strain between coating and cladding can adversely affect performance. A mathematical model of thin coatings of cylindrical cladding is presented in the form of special boundary conditions for the equations of the theory of elasticity, defining the stress–strain state of the cladding. It is shown that thin coatings can noticeably decrease stresses in cladding made from zirconium-based alloys, widely used in nuclear reactors.

**Keywords:** accident, elasticity, thermal strain

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