

Inconel tiles coated with beryllium by thermal evaporation

V. Bailescu¹, G. Burcea¹, N. Balan¹, G. Dinuta¹, G. Serban¹, C. P. Lungu², I. Mustata²,
A. M. Lungu², M. Rubel³, P. Coad⁴, L. Pedrick⁴, R. Handley⁴ and JET-EFDA Contributors*

¹*Nuclear Fuel Plant, Pitesti, Romania*

²*National Institute for Laser, Plasma and Radiation Physics, Bucharest, Romania*

³*Alfvén Laboratory, Royal Institute of Technology (KTH), Stockholm, Sweden*

⁴*Culham Science Centre, EURATOM-UKAEA Fusion Association, Abingdon, UK*

In preparation for ITER, a new ITER-like Wall (ILW) will be installed on Joint European Torus (JET), a wall not having any carbon facing the plasma [1]. In places inconel tiles are to be installed, these tiles shall be coated with Beryllium.

Nuclear Fuel Plant Pitesti in direct cooperation with Association EURATOM-MeDC represented by the National Institute for Laser, Plasma and Radiation Physics, Magurele, Bucharest started to coat Inconel tiles with 7-9 μm of Beryllium in accordance with the requirements of technical specification and fit for installation in the JET machine.

The principles of manufacturing processes using thermal evaporation method in vacuum in order to prepare beryllium coatings on inconel tiles will be presented. The optimization of the prepared films (layer thickness, adherence, structure and purity) has been carried out on inconel substrates (polished and sand blasted)

The prepared beryllium layers were characterized by scanning electron and transmission electron microscopies, X-ray diffraction, X-ray photoelectron spectroscopy and atomic force microscopy.

References

[1] Takeshi Hirai, H. Maier, M. Rubel, Ph. Mertens, R. Neu, O. Neubauer, E. Gauthier, J. Likonen, C. Lungu, G. Maddaluno, G. F. Matthews, R. Mitteau, G. Piazza, V. Philipps, B. Riccardi, C. Ruset, I. Uytendhouwen, R&D on full tungsten divertor and beryllium wall for JET ITER-like Wall Project, 24thSymposium on Fusion Technology - 11-15 September 2006 - Warsaw, Poland

*See the Appendix to the paper of M. Watkins et al., Fusion Energy 2006 (Proc. 21st Int. Fusion Energy Conference, Chengdu, China 2006), IAEA, Vienna (2006).