

Plasma-wall erosion rate evaluation by marker tiles

C. P. Lungu¹, I. Mustata¹, C. Surdu-Bob¹, V. Zaruschi¹, A. Anghel¹, A. M. Lungu¹, P. Chiru¹,
C. Porosnicu¹, M. Badulescu¹, M. Rubel², P. Coad³, G. Matthews³, L. Pedrick³, R. Handley³,
T. Hirai⁴, J. Linke⁴, and JET-EFDA Contributors*

¹*National Institute for Laser, Plasma and Radiation Physics: Association EURATOM-MEdC, Bucharest, Romania*

²*Alfvén Laboratory, Royal Institute of Technology (KTH): Association EURATOM-VR, Stockholm, Sweden*

³*Culham Science Centre, EURATOM-UKAEA Fusion Association, Abingdon, UK*

⁴*Forschungszentrum Jülich, Association EURATOM-FZJ, Jülich, Germany*

In order to evaluate the erosion rate of the thick Be wall tiles due to the plasma, was developed the concept of “marker” tile where an interlayer of Ni was used between a bulk beryllium tile and a beryllium outer layer of few micrometers. If the outer layer is eroded at the same rate as the bulk, then the erosion rate can be determined by measuring the distance of the interlayer from the final surface, for an eroded layer of a thickness that of the outer.

The principles of manufacturing processes using plasma ignited in pure metal vapors by Thermionic Vacuum Arc (TVA) method [1] and the properties of the Ni and Be coatings will be presented.

The plasma diagnostic (the ion energy and electron temperature) during deposition was performed using a retarding field analyzer and an optical emission spectrometer.

The Ni and Be films coated on glass, Si and Be were characterized by SEM, TEM, XRD, Auger, RBS and AFM.

References

[1] C. P. Lungu, I. Mustata, V. Zaruschi, A. M. Lungu, A. Anghel, P. Chiru, M. Rubel, P. Coad G. F. Matthews and JET-EFDA contributors, Beryllium Coatings on Metals: Development of Process and Characterizations of Layers, Phys. Scr. **T128** (2007) 157–161.

*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).