# WP PWIE SP B – production, exposure, and analysis of W layers in 2024

## Minutes 6 May 2024

### Sample requirements

* LIBS measurements
* W layers with different thickness (0.5-2 mm) for *in situ* LIBS studies in MAGNUM-PSI
* Porous and nanocolumnar W layers for the *in situ* LIBS studies (thickness 2 mm)
* Multilayer structures (W, Mo, W,…) for depth profiling with top-hat beams (thickness 5 mm)
* W layers with varying H and D concentrations (100%H, 100%D, 50:50 H+D,…) for comparison against data from JET samples (thickness 5 mm)
* Experiments in linear plasma devices
* Mostly focus on samples already produced/agreed on in 2023 🡪 see the 2023 Master Excel
* Additional requirement for nanocolumnar W samples 🡪 comparison against the Madrid samples
* Additional requirement for re-deposited W samples, production in MAGNUM-PSI, exposure in all the contributing devices
* Dust-gun and laboratory experiments
* Also here mostly happy with the samples agreed on in 2023
* Dust experiments: additional requirement for nanocolumnar W coatings (see above)
* Other experiments – W layers with N and O for studying different phases in the materials (as discussed in the midterm meeting)

### Experiments in linear devices

* MAGNUM-PSI
* In situ LIBS investigations (see above)
* Production and erosion studies of re-deposited W layers (see above)
* Comparing W erosion rates in Ar plasmas – continuing the work initiated in 2023
* PSI-2
* Comparing W erosion rates in Ar plasmas – continuing the work initiated in 2023
* Exposure of bulk W and fuzzy W to Ar plasmas, combined with surface analysis activities – continuing the work initiated in 2023
* Erosion studies of re-deposited W layers – samples to be obtained from DIFFER
* GyM
* Exposing all available W samples from 2023 into GyM plasmas
* Comparing W erosion rates in Ar plasmas – continuing the work initiated in 2023
* Next steps
* First tests for the production of re-deposited W layers in MAGNUM-PSI
* Manufacturing “universal PSI-2 samples” for the production of re-deposited W layers (FZJ)
* Dedicated meeting in early/mid-June to decide on parameters for joint MAGNUM-PSI, PSI-2, and GyM exposures

### Sample production

* ENEA-Milan samples
* Nanocolumnar coatings for (i) LIBS studies, (ii) dust experiments, (iii) experiments in linear devices 🡪 estimate ~4 + 3 + 6 🡪 ~15 samples
* Porous coatings for LIBS studies 🡪 estimate ~5 samples
* W layers with different thicknesses for LIBS studies 🡪 estimate ~10 samples
* IAP samples
* Multilayer structures for LIBS studies and characterization 🡪 estimate 5-10 samples
* W layers with varying H and D concentration for LIBS studies and characterization 🡪 estimate ~15 samples
* W layers with N and O for phase-structure studies 🡪 estimate 5-10 samples

### Other points raised in the meeting

* Include optical profilometry among the analysis tools 🡪 ENEA and IPPLM to contribute
* Specify the IPPLM task description to “Characterization by SEM, EDX (enabling Be detection), FIB, TEM, XRD, optical profilometry”