



# PWIE kick-off meeting 2021: CIEMAT

SEM and SIMS characterization of selected W reference samples – plans and capabilities

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## Task:

- **Compositional and microstructural characterization of the produced W reference layers**

## Deliverable:

- **D004: SEM and SIMS characterization of selected W reference samples**



**Main:** (well-tested techniques)

- I. **SEM + EDX (+FIB in near future):** Maximum dimensions: 25 mm<sup>2</sup>, 20 mm thickness, 100 g weight.
- II. **SIMS (O<sup>+</sup> milling, qualitative):** Allowed dimensions: 8-15 mm in diameter/side. Maximum thickness: 3-4 mm. Depth profile up to 10 microns.
- III. **Confocal microscopy.** Maximum dimensions: 25 x 25 mm, 10 mm thickness
- IV. **Profilometry.**



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**Secondary:** (some time necessary to adapt or limited access)

- **LIDS-QMS & LIBS (qualitative)**
- **TDS.**
- **Limited accessibility to XPS, XRF, XRD and IBA techniques**



## First batch of 6 samples received:

- **To test CIEMAT analysis capabilities in this WP.**
- **Samples already been analyzed by VTT to compare.**

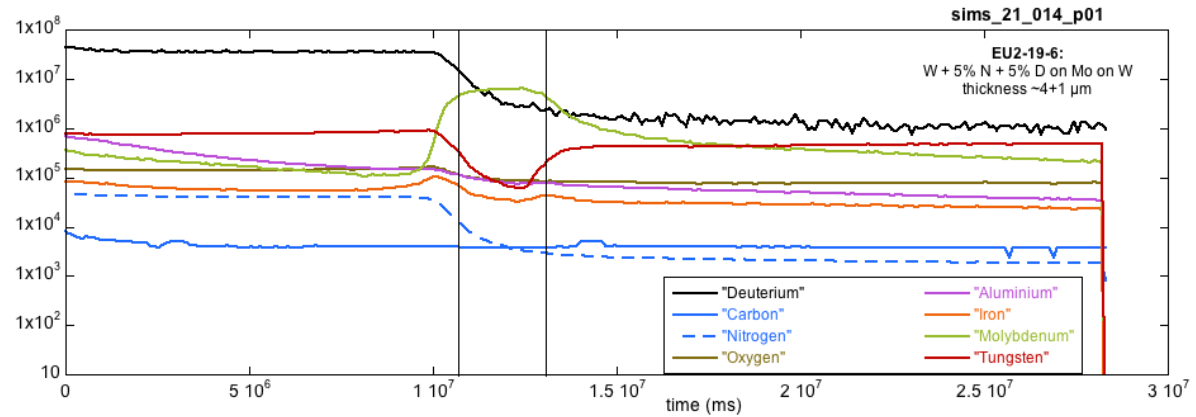
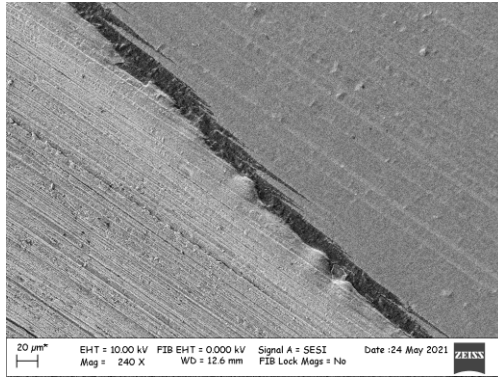
# EXAMPLE



First batch of 6 samples received:

- **Analysis almost finished. Some interesting results (just a taste)**

**W + 5%N +5%D/Mo/W 4+1  $\mu$ m**



- **Film partially delaminated (confirmed by EDX).**
- **Film is homogeneous in N, D.**

# SUMMARY



- **CIEMAT focused in SEM+EDX, SIMS. Confocal microscopy in future.**
- **Analysis of first batch of samples almost completed.**
- **Feedback of analysis in progress to compare with VTT.**
- **Then decide how to continue: more analysis, other samples, etc.**



# Reserve slides





## Hidden workstation

- **O<sup>+</sup> ion milling. Better for metals.**
- **3 keV. 600 nA.**
- **Crater: ~0.6x0.4 mm**
- **P = 4·10<sup>-5</sup> mbar**
- **Cs<sup>+</sup> ion milling, perhaps good for Ne.**

