SEM Lab, Inc. provides …

Technical consulting services
Failure analysis services
Scanning electron microscopy (SEM) services

… with a focus on electronic materials and processes

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ENIG Gold Thickness

Estimate gold thickness on ENIG finished PWB features based on ZAF quantification of EDS data?

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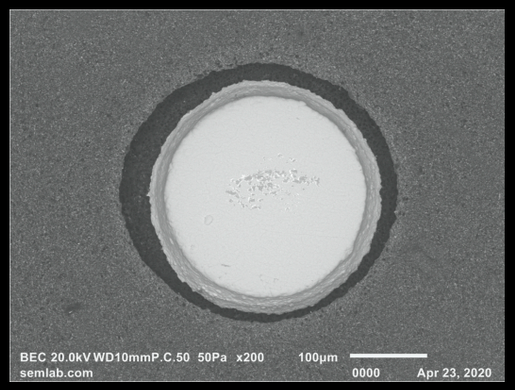
Estimate gold thickness on ENIG finished PWB features based on ZAF quantification of EDS data?

BSE SEM image



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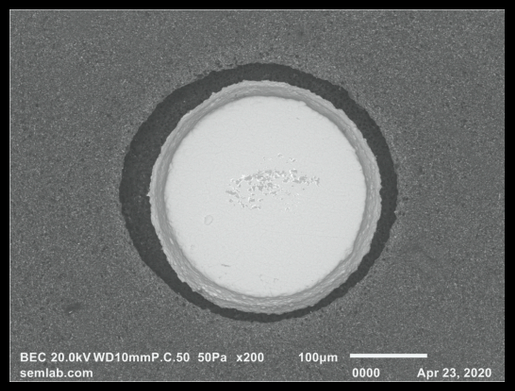
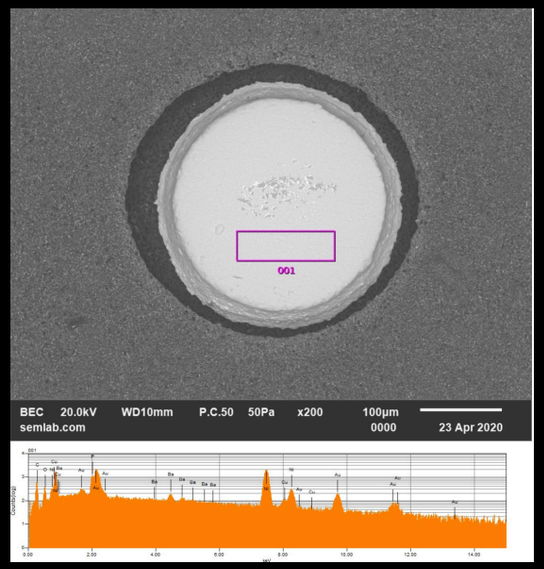


EDS raster scan & spectrum



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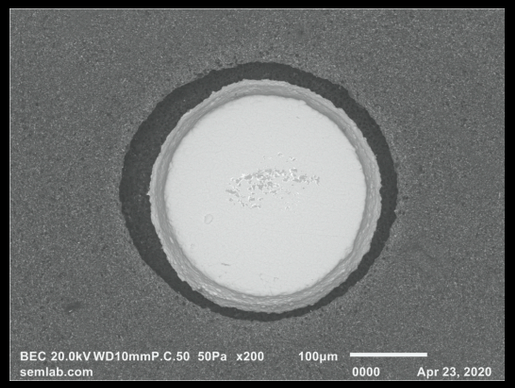

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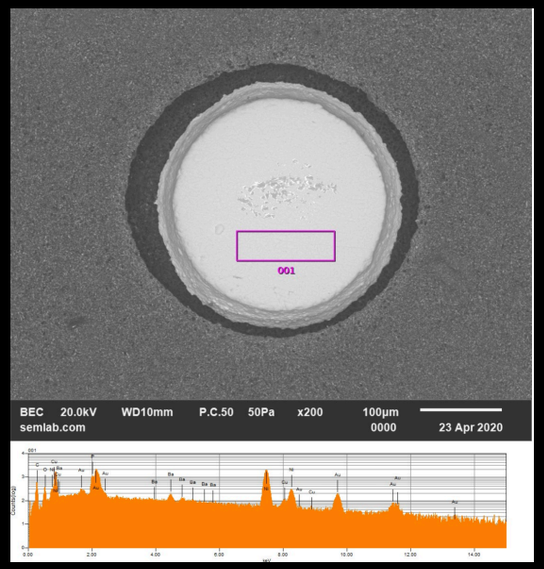

Quantified EDS data

Formula	mass%	Atom%
C	3.72	37.74
O	0.97	7.35
P	1.75	6.88
Ni	18.84	39.12
Cu	0.64	1.23
Ba	0.89	0.79
Au	11.12	6.88
Total	37.92	100

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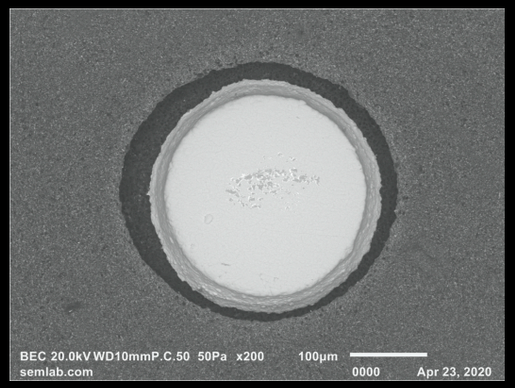

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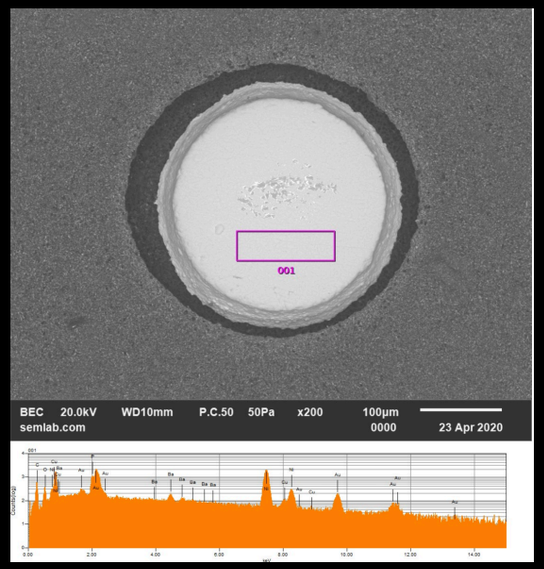

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ENIG Gold Thickness = 0.103 microns
wt% P in EN = 8.5%

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ENIG Gold Thickness

Tool Development …

- **Python 3.13.2**
- **Scientific Computing: NumPy, SciPy**
- **Data Processing: Pandas**
- **User Interface: Streamlit**
- **Physics: XrayLib**

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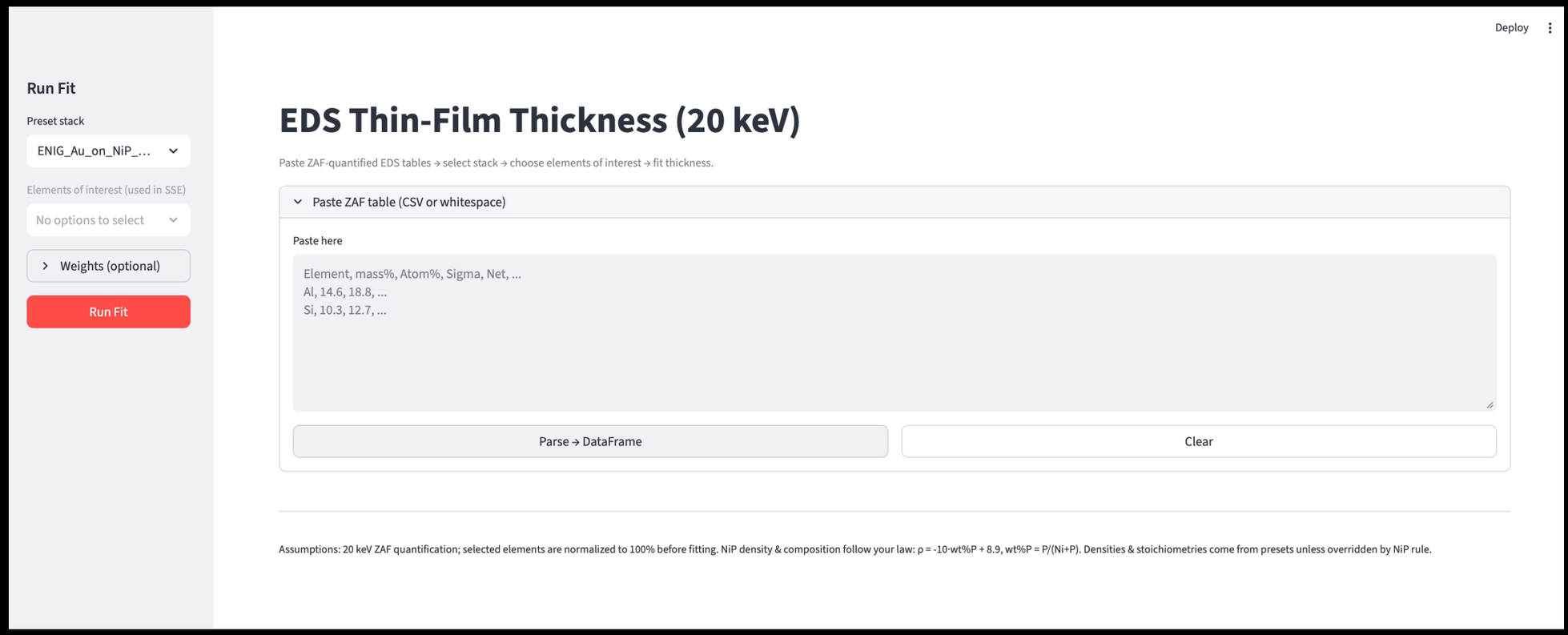
ENIG Gold Thickness

User Interface …



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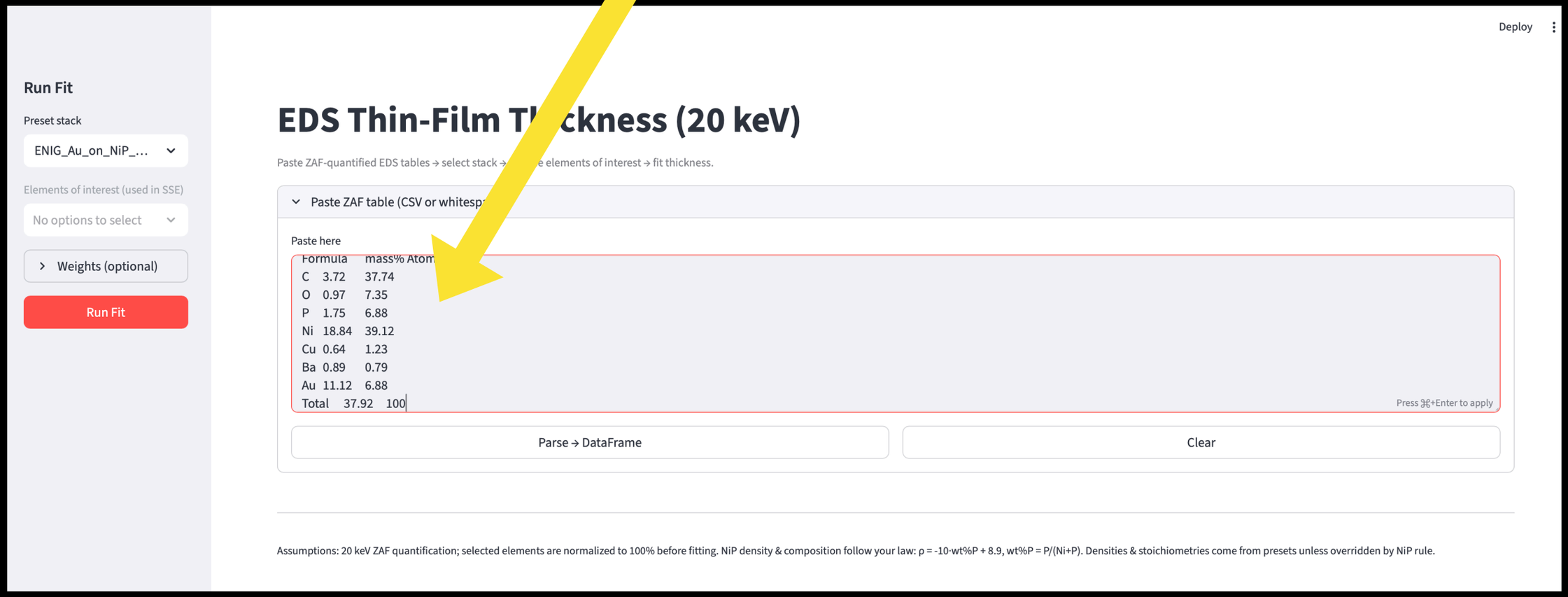
Simply paste EDS data here …



… and press parse button

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Select elements e.g. Au, Ni, P …

… and press <Run Fit> button

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ENIG Gold Thickness

Future development …

- **add module for Al/Ti-W/SiO2/Si3N4 on semiconductors**
- **add module for optical coatings on SiO2**
- **add module for user customized stacks**

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