

3D profiles of erosion wear scars reveal mining industry's high performers

Providing micro and nano fabrication facilities for Australia's researchers, students and industry

Researchers working to extend the performance life of costly drilling components used in Australia's mining industry have measured micrometer wear rates of common high erosion resistant coatings.

Dr Christiane Schulz, a University of South Australia coatings development engineer, has obtained compelling images from a world-class confocal microscope, enabling her to measure the erosive wear resistance of a range of commonly-used laser clad and thermally sprayed coatings.

Dr Schulz said her research findings were made possible only by high resolution visual data she obtained from a cutting-edge Olympus OLS5000 laser confocal microscope housed at the South Australian node of the Australian National Fabrication Facility (ANFF-SA).

"We had such low weight loss occurring through the abrasive wear testing that even the finest scales were not accurate," said Dr Schulz. "With no technology available to weigh less than a milligram I had no choice but to seek out alternatives and ANFF-SA provided us with the only available solution!"

ANFF-SA's confocal microscope provided Dr Schulz and her research team with precise and reliable data.

"The high magnification of ANFF-SA's confocal provided us with visual wear results which enabled us to concisely measure the volume loss through testing and identify the best and worst performers."

High wearing components are a major cost in mining operations with wear occurring in almost every aspect of the operations. A five percent wear reduction means a part can last five percent

longer, so research into methods that extend their life and increase productivity are crucial for Australia's mining industry to remain competitive.

Dr Schulz is part of the University of South Australia cohort collaborating with LaserBond and Boart Longyear on a three-year WearLife Performance Cooperative Research Centre Programme (CRCp) investigating the application of new additive manufacturing technologies (materials, methods and applications) applied to drilling systems that deliver significant advancement in wear life and productivity.

The Commonwealth business-funded CRCp supports industry-led collaboration between industry, researchers and the community to solve industry problems and deliver tangible outcomes.

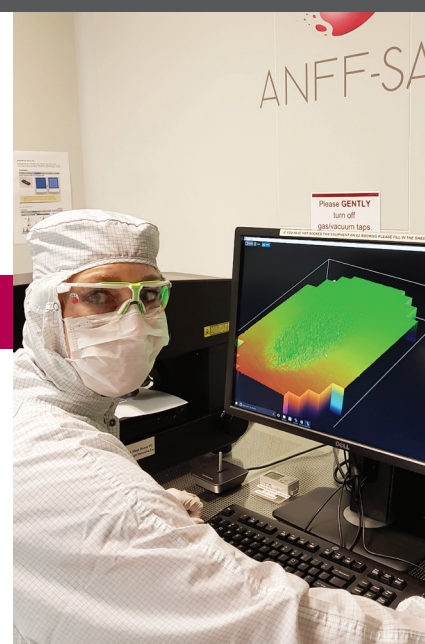
“With no technology available to weigh less than a milligram I had no choice but to seek out alternatives and ANFF-SA provided us with the only available solution!”

Dr Christiane Schulz

The coatings being investigated have many applications within the mining, agriculture, steel, oil and gas industries which would all benefit from reducing wear.

Co-located at the University of South Australia and Flinders University, ANFF-SA specialises in microfluidics, organic electronics, biomaterials, novel semiconductor materials and characterization.

Providing leading-edge research capabilities, equipment and expertise, ANFF-SA is an open access facility for researchers, academics and industry which supports excellence in world-class science research and collaboration.

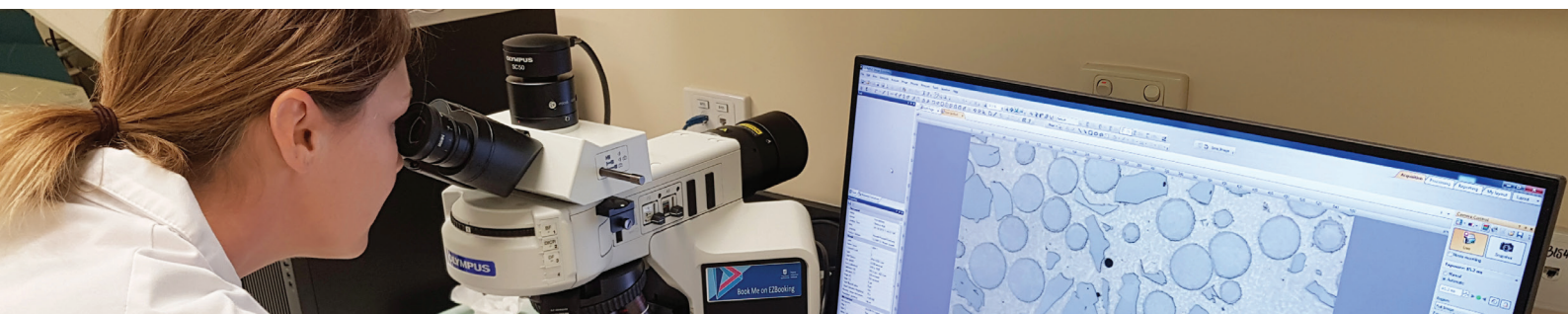


OUR CAPABILITIES:

ANFF-SA's state-of-the-art facilities house more than \$15 million of cutting-edge equipment, including high-quality clean room laboratories and the latest in virtual design and simulation software.

Providing open access to researchers, academics and industry, ANFF-SA offers professional training and collaboration with specialist technicians in the fields of:

- Advanced sensing
- Point-of-care
- Smart interfaces
- Lab on a chip
- Mineral processing
- Biofabrication
- Screening platforms



South Australian Node of the Australian National Fabrication Facility

Future Industries Institute, University of South Australia, Mawson Lakes, SA, 5095 +61 8 8302 5226 www.anff-sa.com.au