# WP18@EUROCORR 2022

Minutes of the WP18 session at Eurocorr2022 (Berlin, August 28-September 1, 2022)

**Tribocorrosion session**

After two on-line Eurocorr conferences we had the great pleasure to meet again in the lively city of Berlin. As usual, the conference venue was well organized and the scientific program was varied and of high level.

This year the WP18 session at Eurocorr was small in the sense of number of papers presented: we had only six oral presentations and two posters, numbers that are far away from the 27 papers presented in the last "in persona" conference held in Sevilla (Eurocorr2019). There are several explanations for the small number of papers presented in this WP18 edition. Two cancellations were due to COVID restrictions in certain countries. Eurocorr2022 was preceded by two tribology conferences (Nordtrib in June and the 7$^{th}$ World tribology conference in July) where tribocorrosion sessions were hold. This has certainly diverted several tribocorrosion from joining also Eurocorr.

Interestingly, 3 papers directly dealing with tribocorrosion were presented in other sessions at Eurocorr (Corrosion of biomedical devices and CO2 corrosion). Such a dispersion can be seen as a regrettable disturbance but can be also seen as a certain scientific maturity of tribocorrosion with a shift of interest from the fundamentals to the applications.

Nevertheless, the quality was very good, with a real effort by each presenter to get an understanding of the studied tribocorrosion case. The presentation topics included very modern aspects such as hydrogen generation, machine learning as applied to erosion-corrosion, tribocorrosion in carbonate environments, new materials for implants as well as mechanistic investigations and modelling efforts. The discussion was as usual open and constructive with an audience varying between 20 and 27 people. This positive atmosphere is an important asset for attracting experienced as well as young tribocorrosionists. The posters addressed the corrosion properties of synovial fluid lubricants and coatings for protection against tribocorrosion.

**Course**

Unfortunately, the planned course on Tribocorrosion could be not held again (as in the case of Sevilla) because of the lack of an organisational frame necessary to obtain support from the local organizer. Anna Igual Munoz took then contact with Daniela Zander, chair of WP7 on Education, to explore ways to manage in general courses at Eurocorr.

**Business meeting**

The WP18 business meeting held at the Eurocorr 2022 was organized by the WP18 technology transfer manager Manel Rodriguez Ripoll (AC2T research GmbH). The business meeting took place for one hour and comprised the following discussion points:

- Current state of the research in tribocorrosion and actual challenges
- Tribocorrosion in industry today

The two topics were openly discussed within the participants and a summary of the discussion is found in what follows.

Regarding the first topic, it was identified that the tribocorrosion community is highly focused on the tribocorrosion of passive metals, while tribocorrosion also comprises, in general, wear occurring in reactive atmospheres. This includes a vast number of topics ranging from tribochemistry and $CO_2$ tribocorrosion in oil & gas to white etching layers typically found in railways. Several options were discussed to bring this broader community together and make all researchers aware that they are addressing a similar problem. The mentioned solutions included the organization of a tribocorrosion event in 2023 or in the first half of 2024. This event should be carefully planned in order to gather delegates and invited plenary speakers coming from these broader range of tribocorrosion problems.

Regarding "Tribocorrosion in industry today", the main points addressed were:

- Awareness of the tribocorrosion problematic among engineers, managers and customers
- Quality criteria in industry for selecting tribocorrosion resistant materials (test, methodologies, test conditions, lab to field upscale)
- Need for standards

Ultimately, the crucial point seems to be the lack of adequate criteria and standards for selecting tribocorrosion resistant materials. The currently available ASTM G 119-04 is an evaluation standard that is not sufficient for guiding experiments in industry. An experimental procedure covering the following points was considered as required:

- ASTM for testing tribocorrosion
    - Screen materials and coatings
    - Quantitative and reproducible
    - Transferable to application
- Parameters
    - Surface conditions (roughness, surface cleaning)
    - Mechanical conditions (load, sliding velocity/frequency, linear/oscillating)
    - Electrochemical conditions (OCP, potentiostatic)

The main challenge when defining the standard is the blend between having a simple and useful routine for performing tribocorrosion experiments and oversimplification.

The definition of a new tribocorrosion standard is a need that requires a devote working group in order to succeed. In order to perform the initial steps, the definition of a good practice code withing the EFC was considered to be a fast and suitable starting point.

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Chair of WP18 Tribocorrosion

European Federation of Corrosion http://efcweb.org/WP+Tribo_Corrosion-p-104114.html