



CEST is Austria's competence centre for applied electrochemistry and surface technology. We are a jointly industry-academia owned research institute (within the Austrian COMET scheme). Examples for our projects are the postprocessing of 3D-printed parts, developing an artificial smell sensor, creation of functional surfaces for catalysis and electrochemical energy storage or the study of corrosive mechanisms on an atomic scale.

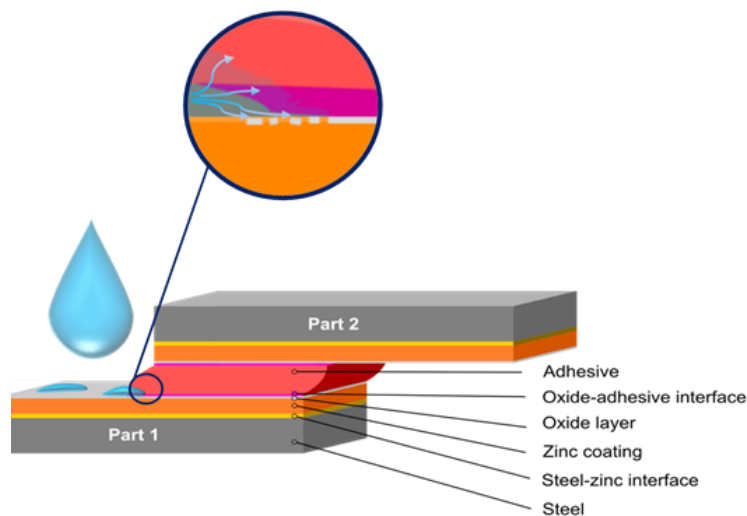
Our vision is to transform high-class research in the field of electrochemistry and surface technology from lab to an industrial scale and enhance therefore the competitiveness of the Austrian and European industry.

To pursue our goal, we are currently searching for our site in Linz (Upper Austria)

## Junior Researchers (PhD-students), master and bachelor students in Applied Interface Science

### Topic 1: Interfacial properties adhesives on zinc-coated steel

Reduction of CO<sub>2</sub> emissions is a huge challenge for society, which forces the automotive industry to invest into technologies to reduce the carbon footprint. Alongside topics like electromobility and optimised engines, lightweight construction is a huge topic for this industry.



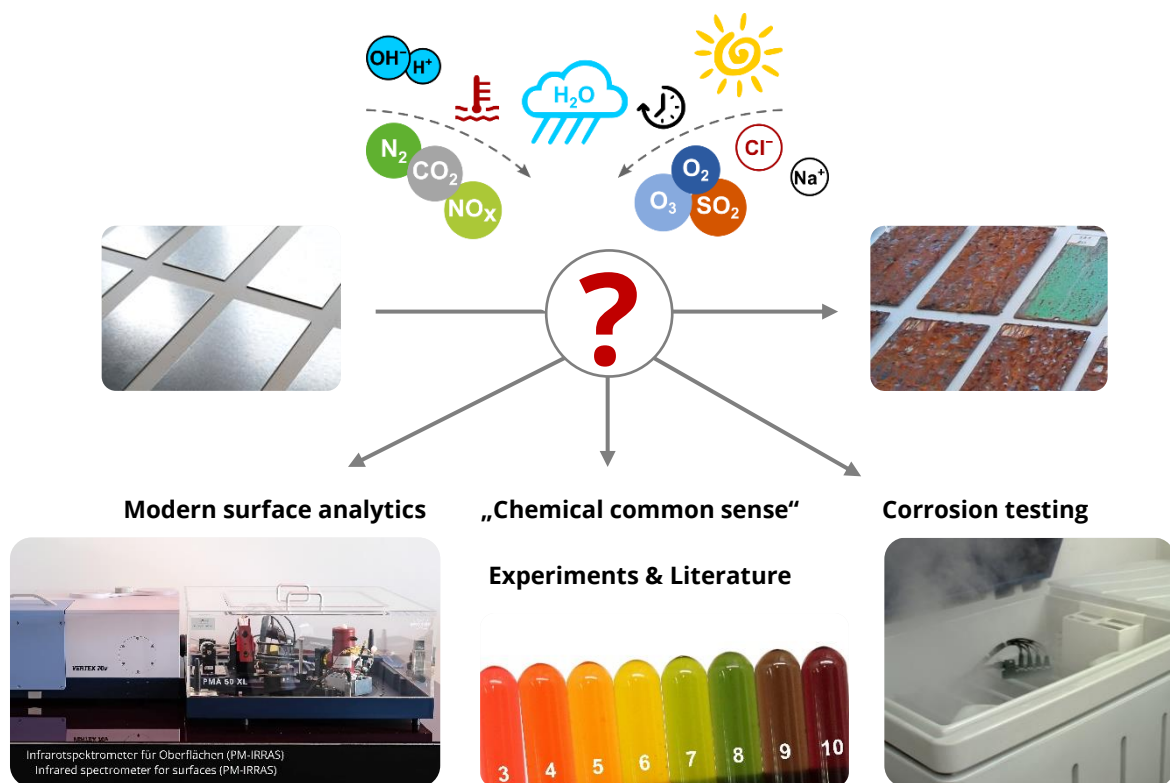
The development of advanced materials and the increase of lightweight constructions requires a complex material mix within components and systems and an increase of adhesive joints as a replacement of classical joining methods like welding. Structural bonding of steel sheets is already very common in the automotive industry, however the knowledge of the interactions between adhesive and metallic substrate, especially in corrosive environments, is limited and further research in this field is needed.

The interface between zinc-coated steel and adhesives, which are subject to corrosive processes and their interfacial properties, are the main topic of this work.

The main research question is the quantification of the water/ion-diffusion at the metal-adhesive-interface and the study of the influence of adhesive composition, surface chemistry and structure of the metal as well as the corrosive environment. Here we will use modern analytical methods (XPS, AES, SKP, IRRAS, ICP-OES and ICP-MS, Raman) together with mechanical testing to characterise the interface at an atomic and macroscopic level.

## Topic 2: In-situ analytics of metal surfaces

Each day we are in contact with metallic surfaces. They surround us in buildings and accompany us on each journey, in cars, trains, airplanes and on the bicycle. Optical and technical properties are hereby equally important as well as the durability of the surface. Especially the resistance of certain surfaces against corrosive media is currently not well understood and allows further research.



We are performing research about the durability of zinc-plated steel surfaces. An important question of this topic is which processes and reactions are taking place during atmospheric corrosion of zinc-plated surfaces?

The cleaning of metal surfaces is also an important area. We want to understand the efficiency of different cleaning solutions for degreasing in terms of surface chemistry. Furthermore, these processes we aim to monitor these processes by in-situ methods (e.g. flow cells, probes).

Methods used for this research range from simple experiments in a beaker, to standard corrosion tests, combined with modern analytical methods (IRRAS, XPS, RAMAN, QCM, ICP-OES, REM). This project provides the opportunity to learn about different techniques, materials as well a career building path in close collaboration with companies like voestalpine Stahl GmbH.



## Conditions of work

We plan to hire 2 PhD students (one for each topic) and several master and bachelor students.

### Your qualification

- Master's degree in the field of chemistry/physics/material science or similar (for PhD candidates), for bachelor- and master students current enrolment at university in those fields
- Experience in scientific lab work (e.g. during internships, bachelor or master thesis)
- Ideally you have experience in writing a paper and/or present your work at a conference
- You are eager to learn new things; you are ambitious and creative to pursue your goals together with our research team
- You are proficient in English; ideally combined with knowledge of German

### Your tasks

- Work on the different tasks of the research project
- Write your thesis as part of this project (for master and PhD students)
- Develop your own ideas within the project and for future ones
- Learn project management, funding acquisition and scientific communication (for PhD students)
- Represent your work and our institute and communicate with stakeholders from industry and academia at project meetings, workshops and conferences (for master and PhD students)

### What to expect from us

As a research institute we are searching for creative and enthusiastic colleagues who like to think outside the box. We provide various challenges and a high degree of autonomy in your work – we are convinced that the best ideas are created by providing an innovative and flexible work environment.

This position has a fixed-term contract (3 years with possible extension for PhD, 6 months for master students, 1-2 months for bachelor). Your thesis will be supervised by Prof. Markus Valtiner (TU Vienna), who is a renowned expert in this field.

The gross monthly salary according to the collective agreement is 2162.40 € (gross, 14 times a year) for PhD students and 2675 € (gross) for 6 months for master students. If you are interested in working with us, we would be glad to receive your application including your CV and references at [bewerbung@cest.at](mailto:bewerbung@cest.at) (Application period until End of July 2019)