

NEWSLETTER

An Olympic summer in Paris to be crowned by EUROCORR



"It has grown from a humble event of 500 attendees in around 2000 to more than double the size from 2016 onward"

Dear corrosionists,
I assume you're reading this EFC Newsletter in the beautiful city of Paris ready to attend EUROCORR 2024. Whether you're leaving through it in between talks at the Palais des Congrès, in your hotel room, or in a Parisian café, I am sure you will enjoy being here. CEFRACOR, the French Member Society of EFC, has hosted successful EUROCORR in Nice and Montpellier, but Europe's biggest corrosion conference hasn't visited the French capital since 1973. Only because of the enthusiasm and energy of Philippe Marcus and his team can we savour the event's special atmosphere during this Olympic summer in Paris.

Perhaps it's not immediately obvious, but EUROCORR keeps evolving. It has grown from a humble event of 500 attendees in around 2000 to more than double the size from 2016 onward. Each local organiser - supported by EFC - has expanded the reach of the conference, making it more enjoyable and valuable for attendees from across the world. This year, innovations include a Career Fair, Meeting of Member Societies Representatives, oral presentations, and a new Loyalty Programme for exhibitors and EFC Affiliate Members.

The Young EFC Career Fair aims to build a bridge between young professionals and leading companies, research institutes, and higher education. Taking place on Monday, employers and job seekers are warmly welcome to join.

EFC has 26 Member Societies striving to serve local corrosion communities. To foster collaboration between Member Societies, representatives are invited to meet on Tuesday. In addition, the local organising team has introduced short orals of five minutes to broaden the spectrum of presentation possibilities.

Regular exhibitors have built a strong link with EUROCORR attendees over the years and exchange with visitors at their booths do not necessarily cover all their needs. So, we have offered them the chance to organise lectures and discussion panels during the lunch breaks on Tuesday and Wednesday. A total of 12 are planned during these Loyalty Programme sessions and they can be joined free of charge.

We believe these new elements will only add to your positive experience, which brings you to EUROCORR year after year. I wish you a great time in Paris.

Yours, Tomáš Prošek

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Paris set to host a full schedule at EUROCORR 2024

Final preparations are being made for the congress titled, *A Step Forward in Societal Awareness of Material Degradation Issues*



Wikimedia Commons

Located within walking distance from the Avenue des Champs-Élysées, EUROCORR 2024 will host more than 1,000 presentations across the course of the annual corrosion event

EUROCORR 2024 will take place from Sunday 1st to Thursday 5th September at the Palais des Congrès de Paris, France. Located within walking distance from the Avenue des Champs-Élysées, the theme this year is *A Step Forward in Societal Awareness of Material Degradation Issues*, and will be hosted by CEFRACOR, along with Chimie ParisTech, SFV, and DECHEMA.

This year, more than 1,000 presentations will be given by participants from across the world. Providing a great platform for everyone in the corrosion community to establish a global network and exchange on their latest findings, EUROCORR 2024 will cover all areas of corrosion and corrosion protection. There will also be a focus on new hot topics like materials for green and renewable energies, the challenges of hydrogen energy systems, and materials issues related to zero net emission.

Key to creating links between academia and industry, EUROCORR bridges the gap between science and technology, going from fundamental research on corrosion mechanisms, to knowledge transfer for applications, to innovative technologies.

The EUROCORR 2024 Chair, Prof. Philippe Marcus, and the organising team are looking forward to seeing you in Paris.

EXHIBITION

The exhibit area will be on the same floor as the parallel sessions, making it easily accessible for all participants. The

coffee breaks and lunches will be served in the same area, placing the exhibition at the heart of the venue, where 50 booths have already been reserved. Providing the ideal setting to showcase companies and institutions related to corrosion and corrosion protection, the exhibition will open on **Monday 2nd September**, at 18:00 in Hall Havane.

CONGRESS DINNER

The Conference Dinner will take place on Wednesday 4th September at **La Maison de la Chimie**, located on 28 rue Saint Dominique, 75007 Paris. The world-renowned Maison Lenôtre will be the catering for this highly anticipated event.

YOUNG EFC

The Young EFC will hold its annual meeting on **Monday 2nd September** at 18:00, in room 351, followed by a career fair in the Foyer Bordeaux at 18:45, sponsored by Mankiewicz. The aim is to build a bridge between talented young professionals seeking career opportunities, research institutes and/or higher education organisations within the corrosion-related field. So, if you're looking for new opportunities, your presence will be highly valued.

This year's YEFC Plenary Lecturer is Prof. Emilio Martínez-Pañeda (University of Oxford, UK) who will be presenting his lecture, *Towards a Virtual Corrosion Lab: a new generation of mechanistic, multi-physics models for pitting and stress corrosion cracking*.

PLENARY LECTURES

- *Exploring Corrosion and Passivation in Multi-Principal Element Alloys* by Prof. John Scully (University of Virginia, Charlottesville, VA, USA)
- *An overview of corrosion of additively manufactured alloys* by Prof. Nick Birbilis (Deakin University, Geelong, VIC, Australia)
- *Machine learning assisted performance optimization of corrosion inhibitors and active protective coatings* by Prof. Arjan Mol (Technical University Delft, The Netherlands)
- *Corrosion big data for the design of application of low-alloy steels* by Prof. Xiaogang Li (University of Science and Technology, Beijing, China)

WORKING PARTY AND TASK FORCE SESSIONS

- Corrosion and scale inhibition
- Corrosion by hot gases and combustion products
- Nuclear corrosion
- Environment sensitive fracture
- Corrosion mechanisms, methods and modelling
- Corrosion education
- Marine corrosion
- Microbial corrosion
- Corrosion of steel in concrete
- Corrosion in oil and gas production
- Coatings
- Corrosion in the refining and petrochemical industries
- Cathodic protection
- Automotive corrosion
- Tribo-corrosion
- Polymers and advanced materials
- Corrosion and corrosion protection of drinking water systems
- Corrosion control in aerospace
- Corrosion reliability of electronics
- CO₂-corrosion in industrial-applications
- Atmospheric corrosion
- Corrosion in green and low carbon energy technologies
- Corrosion of medical implants and devices

JOINT SESSIONS

- Hydrogen challenges in energy and transport systems
 - Coatings for high temperatures (posters only)
 - Corrosion sensing, monitoring and prediction
 - Cathodic protection in marine environment
 - Cathodic protection of steel in concrete
 - Polymers in organic coatings
 - Corrosion during manufacturing, transformation, storage, and use of biofuels and bioproducts (posters only)
 - Corrosion issues of electric vehicles and e-mobility systems
 - Multi-scale modelling for design of protective coatings
 - Sustainability of marine structures (posters only)
 - Corrosion in molten salts and ionic liquids for energy applications
 - Microbial corrosion and biofouling issues in marine environments
 - CO₂ reduction measures
- To find out more, explore the technical programme

WORKSHOPS

- Corrosion and corrosion protection issues in additive manufacturing
- Corrosion challenges in the chemical process industry towards sustainability (posters only)
- Design and performance of corrosion resistant high entropy alloys and multi-element alloys
- Certification in corrosion and corrosion protection (posters only)
- Durability issues in photovoltaic modules and solar energy systems
- Corrosion Management Applications in Industry

CONTACT

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Where to find Working Parties and Task Forces at EUROCORR

Your guide to where you can take in the business meetings of the Working Parties and Task Force at the Palais des Congrès de Paris

<p>WP1: Corrosion and Scale Inhibition</p> <p>Monday 2 September, 17:10, Room 336M & 337M</p>	<p>WP3: Corrosion by Hot Gases and Combustion Products</p> <p>Tuesday 3 September, 17:30, Room 364</p>	<p>WP4: Nuclear Corrosion</p> <p>Wednesday 4 September, 12:10, Room 352B</p>	 <p>WP5: Environment Sensitive Fracture</p> <p>Monday 2 September, 17:10, Room 362 & 363</p>	
<p>WP6: Surface Science and Mechanisms of Corrosion and Protection</p> <p>Monday, 2 September, 17:50, Amphitheatre Havane</p>	 <p>WP7: Corrosion Education</p> <p>Details to be announced in September/October</p>	<p>WP8: Physico-chemical Methods of Corrosion Testing</p> <p>Monday, 2 September, 17:50, Amphitheatre Havane</p>	<p>WP9: Marine Corrosion</p> <p>See the EUROCORR programme</p>	
<p>WP10: Microbial Corrosion</p> <p>Monday 2 September, 17:50, Room 313 & 314</p>	<p>WP11: Corrosion of Steel in Concrete</p> <p>Wednesday 4 September, 15:20, Room 313 & 314</p>	 <p>WP13: Corrosion in Oil and Gas Production</p> <p>Wednesday 4 September, 11:30, Room 352A</p>	<p>WP14: Coatings</p> <p>Tuesday 3 September, 12:30, Room 364</p>	
<p>WP15: Corrosion in the Refining and Petrochemical Industries</p> <p>Wednesday 4 September, 09:00, Room 302 & 303</p>	<p>WP16: Cathodic Protection</p> <p>Wednesday 4 September, 11:10, Room 364</p>	<p>WP17: Automotive Corrosion</p> <p>Thursday 5 September, 11:40, Room 343</p>	 <p>WP18: Tribo-Corrosion</p> <p>Tuesday 3 September, 12:30, Room 302 & 303</p>	
<p>WP19: Corrosion of Polymer Materials</p> <p>Tuesday 3 September, 17:10, Room 326M & 327M</p>	 <p>WP20: Corrosion and Corrosion Protection of Drinking Water Systems</p> <p>Tuesday 3 September, 17:10, Room 326M & 327M</p>	<p>WP21: Corrosion of Archaeological and Historical Artefacts</p> <p>Monday 2 September, 17:50, Room 326M & 327M</p>	<p>WP22: Corrosion Control in Aerospace</p> <p>Monday 2 September, 17:30, Room 343</p>	
<p>WP23: Corrosion Reliability of Electronics</p> <p>Monday 2 September, 17:10, Room 364</p>	<p>WP24: CO2-Corrosion in Industrial Applications</p> <p>Monday 2 September, 15:40, Room 326M & 327M</p>	<p>WP25: Atmospheric Corrosion</p> <p>Monday 2 September, 17:50, Room 362 & 363</p>	<p>WP26: Corrosion in Green & Low Carbon Energy Technologies</p> <p>Monday 2 September, 16:50, Room 341</p>	<p>Task Force Corrosion of Medical Implants and Devices</p> <p>Wednesday 4 September, 17:10, Room 336M & 337M</p>

Subject to change – Please consult the EUROCORR programme for further information

The next generation of corrosion scientists honoured

The winners of the EUROCORR Travel Grant and the EFC Young Scientist Grant will be presented with their prize in Paris

The **EUROCORR Travel Grant** 2024 has been awarded to **Jesupelumi Ojumu**, an M.Eng. student in Metallurgical and Materials Engineering at the Federal University of Technology, Akure, Nigeria. The Travel Grant provides financial support to young corrosionists to facilitate their participation at EUROCORR and is intended for students from countries or organisations that might struggle to attend due to financial constraints.

"Winning the EUROCORR Travel Grant means a great deal to me," said Jesupelumi. "As my first ever grant, it represents a milestone in my career and a life-changing experience for me. It gives me the chance to attend a renowned conference, which will broaden my perspectives on corrosion prevention

and research. I also get the opportunity to present my work on an international stage and contribute to the body of knowledge in this field.

"Attending EUROCORR will allow me to engage with leading experts. It will provide me with exposure to the latest trends, allow me to network with my peers, and offer me an understanding of the corrosion science landscape. This grant reinforces my conviction that pursuing a career in corrosion prevention is not just a good choice, but the right one for me."



Presented since 2016, the **EFC Young Scientist Grant** provides financial support to junior corrosionists to enable them to visit and interact with other corrosionists at their home institute abroad, and to discuss research issues of mutual concern relevant to the field. A special EFC Young Scientist Grant Selection Committee makes the selection and this year three young corrosionists will be presented with the Grant at EUROCORR in Paris.

Amber Sykes, University of Leeds, UK, will visit Assistant Prof. Agata Sotniczuk, Narodowe Centrum Badan Jadrowych (National Centre for Nuclear Research) in Otwock, Poland, for *Investigating the protective characteristics of corrosion product layers that form in geothermal environments*.

"I am honoured to receive the EFC Young Scientist Grant," said Amber. "It's extremely gratifying to have my PhD research, investigating iron carbonate corrosion product formation in geothermal environments, recognised by the EFC. An improved understanding of corrosion in these environments will support the delivery of reliable and low-carbon energy generation in Europe. I am excited to begin my work with esteemed researchers and experience life in Warsaw.

During my visit to NOMATEN, I will have the opportunity to use state-of-the-art analytical equipment for the advanced characterisation of corrosion product layers. From this, I will gain new technical skills and an appreciation of how these techniques can be applied. The most valuable benefits from this visit will be meeting experts in materials characterisation, learning from their considerable



experience, and starting exciting new collaborations."

Kateryna Popova, University of Chemistry and Technology Prague, Czechia will visit Prof. Annick Hubin, Vrije Universiteit Brussels, Belgium for research on the *combined application of real-time resistometric corrosion monitoring, finite element modelling and machine learning for atmospheric corrosion prediction*.

"In recent years, my research has been devoted to the development and application of the resistometric technique for real-time atmospheric corrosion monitoring," explained Kateryna.

"Thanks to the EFC Young Scientific Grant, I will have an invaluable opportunity to collaborate with the Vrije Universiteit research group, combining my data with their knowledge in corrosion modelling and prediction. I believe the contacts, knowledge, and experience exchanged during my stay will bring interesting results and lead to fruitful collaborations.

At EUROCORR 2024, I'm looking forward to the inspiring scientific programme on different aspects of corrosion science, to the presentation and valuable discussion of my work, and to establishing professional connections in a friendly and open environment."

In addition, the third winner of the Grant, **Nikola Machácková**, University of Chemistry and Technology Prague, Czech Republic will visit Prof. Dominique Thierry from RISE Research Institutes of Sweden, Kista, Sweden, on the project *Corrosion products formation in initial stages of exposure of PHS, link to HE*.



Your new Working Party Chairs in their own words

Following on from interviews in the last Newsletter, two more WP Chairs introduce themselves, beginning with George Winning from WP 13



How I see my role as Chair of [Working Party 13](#) is to steady the ship and get it in a good place for the future. We have Jon Kvarekvål from the Institute for Energy Technology Oslo, Norway as Vice Chair and we have a committee of four of us now. Together we are trying to effectively implement a succession plan for WP 13. So, going forward, we should be in a good position, as we have people ready to step up when needed.



It's not just about now, it's about the future. And that's a focus shared with the EFC, to try and make sure there's a succession plan for the WPs. It's a continuation of what we've done in the past, which has always been good. And to try and make sure there's a smooth transition.

It is an evolution of ideas. It used to be the case that an operator was always Chair, and I'm probably the first person who's not been an operator, so I think the point is that it represents something of a change. There's a change in the way people look at the energy industry now, as there's a refresh of ideas and sharing those ideas across the industry and Working Parties, so that we're not reinventing the wheel all the time.

I remember sitting down with former Chair, Marc Wilms a few years ago and discussing who's going to be the new Chair or Vice Chair. And we didn't have any names. But now we've got a little group of people, so we know that it's going to continue if they all step up to Chair. It's a line of about four people, so we have a security of about 10, 12 years.

Sharing knowledge and collaborating across all the areas of oil and gas is a central focus. It's quite a big, big task to undertake. Our session at EUROCORR this year is probably about 90% focused on oil and gas. But then you've got topics like corrosion management, which are applicable to a lot of industries. There's a big focus on energy transition with Hydrogen and CCS being a hot topic at the moment. Our link with Marc Wilms at WP 26 on Corrosion in Green & Low Carbon Energy Technologies is key to progressing these topics.

Having worked in chemicals, in oil and gas, the materials side of things, integrity management, and corrosion management, I have a broad knowledge, so it's a good position to help bring the group together. And then moving onto EUROCORR 2024 in Paris, we've got about three days

of sessions planned. We've tried to break that up into the sort of traditional oil and gas, materials, sour service, CO2, and then we've got a little bit on renewables and corrosion management as well. I'm a good link between these elements of corrosion prevention.

As for my personal interests, I inherited my dad's MGB Roadster (below). He had done it up from a wreck. So, that's in the garage ready to take on the road. It's not in line with the energy transition or a renewable hydrogen electric car, so doesn't represent the change in focus across the industry, but I will be working on it at the weekend, as I've got a little bit to do on one of the seats and I've got new carpets to put in. So, that's the next big,



GETTING TO KNOW GEORGE WINNING

Based in Staines-upon-Thames, England, George is a corrosion consultant, who is an active member of the corrosion community as a Fellow of the Institute of Corrosion and a Member of AMPP.

CV

- **Engagement Lead** – Wood Group
April 2024 – Present
- **Director** – Corrosion and Chemical Consulting Limited
October 2022 – April 2024
- **Technical Manager** – Africa Clariant
June 2017 – October 2022
- **Lead Materials Corrosion Engineer** – Premier Oil
May 2014 – August 2015
- **Business Manager** – Wood Group Integrity Management
January 2009 – May 2014

There's a new Working Party on Corrosion in Green & Low Carbon Energy Technologies and Marc Wilms is the new Chair with a vision

It's an exciting and interesting time of change for the [Working Party 26](#) on Corrosion in Green & Low Carbon Energy Technologies, as it moves from a Task Force to a Working Party. The Task Force, led by Steve Paterson, initially focused on the energy transition, and the corrosion challenges that go with that. Now it's a formal Working Party and has a permanent place in the conference programme, which is Steve's achievement. And during EUROCORR, we have sessions on many green energy technologies. So, it's a big change and a firmer position for the WP that gives us the opportunity to do a number of additional actions and launch new initiatives.

I think my suitability as Chair of WP 26 goes back to my activities as a youngster, busy with anything to do with nature, environment, and wildlife. But, it's working in the industry for an energy company, in this case Shell, that puts me in a good position to not only focus on the required new technology and science, but also the implementation of the energy transition that is rolling it out on an industrial scale.

And rolling out new technology worldwide requires a different approach. It requires additional skills, insights, and experience compared to the research side of it. Implementation at an industrial scale comes with specific problems. Any new technology being applied in the field, brings a risk of mistakes. You want to do it low cost, you want to do it fast, you want to stay in budget. And the basic engineering, getting a technicality right, solid sound and robust sometimes lacks and that can result in early failures. If you have new technology and roll it out from laboratory scale to pilot plans, then the rollout requires careful technical choices and creativity to overcome challenges.

I think the big challenge with scaling up green technologies is getting the current, new scientific insights applied in the

design of facilities we build. So, being a corrosion engineer in the industry puts me in a good position to address that. Scaling up new technology comes with risks and it's not only the universities, research institutes and Working Parties that need to work together, but we need to make sure we transfer our knowledge to the engineers and designers that build the facilities, thus integrating it in the industry.

Regarding the work field of WP 26, some technologies fit in with WP 26 very well, as they are not addressed in other WPs. An example is solar energy. In other cases, there's a close link with other WPs, like for geothermal energy with WP 13 where George Winning is the Chair. For both WPs the integrity of wells and subsurface equipment is key. Here, joint sessions between Working Parties are the way to go.

The American corrosion association, AMPP, is also active in green energy technologies and has a strong focus on preparing industry standards. This fits very well with our WP 26 strategy, *From Science to Engineering*. Therefore, we will work closely together. For instance, with a joint meeting with AMPP at EUROCORR in Paris. All with the objective to jointly promote technical integrity in the Energy Transition. So, by working together across the globe we hope to help to address corrosion challenges. And we'll have a few announcements in Paris to make.

On Corrosion Awareness Day on 24 April this year, I spoke about the critical role of corrosion engineers in the energy transition at a Bond van Materialenkennis hosted symposium, *Addressing Corrosion Challenges in the Energy Transition*. I discussed how corrosion science and corrosion engineering need to go hand in hand. And while there tend to be gaps between them, especially when scaling up new technology, it's essential to bridge these gaps, which will be one of the key objectives for WP 26.

Away from work, home for me is an old farmhouse in the Dutch countryside, which I've lived in for more than two decades and I'm renovating in my free time. It's basically my second job. And, that's where a lot of my free time goes and has allowed me to apply my knowledge as a scientist and engineer to the building.

GETTING TO KNOW MARC WILMS

Based in Amsterdam, Marc Wilms is a Principal Materials & Corrosion Engineer working at Shell's Technology Centre. Marc supports upstream assets, and new projects, as well as the development of new technology. His research activities include oil and gas production, although his main focus is on New Energy technologies.



Addressing Corrosion Challenges in the Energy Transition - Corrosion Awareness Day 2024

Winner of Henri Coriou Award revealed by Working Party 4

The award for outstanding contribution to corrosion science caps a busy summer for WP 4 that has included a host of different events

This year, the prestigious WP 4 Henri Coriou Award for outstanding contribution to corrosion science and engineering in the nuclear field will be given to Dirk Engelberg (University of Manchester, UK). Dirk's distinguished career and groundbreaking research in corrosion science have significantly advanced our understanding of corrosion mechanisms and its implications for nuclear engineering.

His pioneering work has encompassed a broad spectrum of topics, including stress corrosion cracking, hydrogen embrittlement, materials characterisation, and electrochemistry, with a particular focus on the mitigation of material degradation for radwaste storage, nuclear reactors and related infrastructure. He's at the forefront of developing innovative techniques for rapid corrosion screening and surface decontamination, and has also demonstrated continuing commitment to mentorship, education, and student training. As a dedicated educator and advisor, he has inspired and guided a long list of students, early-career researchers, engineers, and scientists in the field of corrosion science and materials engineering. His mentorship has not only nurtured the talents of future generations but has also fostered a culture of excellence and innovation within the corrosion community. He has held well-received lectures in all three editions of WP 4's Nuclear Corrosion Summer Schools and is well engaged in several EFC WPs, specifically as Vice-Chair of WP5 Environment Sensitive Fracture.

5TH ONLINE SEMINAR ON NUCLEAR CORROSION

To mark Corrosion Awareness Day 2024, WP 4 hosted its fifth edition of the online seminar on nuclear corrosion. After an opening by Stefan Ritter, Jan Stoulil introduced Christofer Leygraf, professor at the KTH Royal Institute of Technology, who presented a study on copper corrosion in synthetic groundwater for months with addition of Na₂S at ambient temperature and 60 °C for application of canister

for long-term storage of nuclear waste. ToF-SIMS, Nano-SIMS, TEM and HEXRD analyses were done. He demonstrated the penetration of O, Cl and S at 60 °C in the grain boundaries of the canister material. O forms oxide phases which distorts the grain boundary region accelerating diffusion of S and H in the grain boundaries. S, O, H and Cl are observed in holes crossing the grain boundaries. The lattice deformation extends several hundred of microns into the bulk at 60 °C leading to metal-metal bond weakening. This study could be performed crossing very sharp analyses. The talk was followed by an interesting Q&A with 15 questions, showing the strong interest in the subject. A good discussion was bookended by Stefan Ritter, after acknowledgments of Jan Stoulil and Christopher Leygraf, who will be giving a talk on this topic at EUROCORR. The webinar was well attended by 62 people and for those who missed it, the recording is available on the [EFC's YouTube channel](#).



Established in 2016, the Henri Coriou Award recognises one person each year for their outstanding contribution to corrosion science and engineering in the nuclear field



Dirk Engelberg (University of Manchester, UK) is the ninth recipient of the prestigious prize and succeeds last year's winner, Prof. Damien Féron (CEA/INSTN, France)

NUCLEAR CORROSION SESSION AT EUROCORR 2024

A record number of 60 abstracts have been submitted for the Nuclear Corrosion session at this year's EUROCORR in Paris. Together with the 15 nuclear corrosion-related abstracts for the joint session, *Corrosion in molten salts and ionic liquids for energy applications*, an engaging array of nuclear corrosion sessions are planned throughout the conference. The WP 4 fall business meeting is planned to take place on 4th September at the Palais des Congrès during EUROCORR.

EFC SUMMER SCHOOL VISITS CEA SACLAY'S CORROSION LABS

The WP 4 is happy to contribute to the EFC Summer School on Corrosion in Green Energy Technologies, preceding this year's EUROCORR, by organising a visit to the Corrosion Laboratories at CEA Saclay. Visit the [WP 4 website](#) for the latest information on all activities.

New EFC Loyalty Programme to be unveiled at EUROCORR

Recognising the commitment of EFC's partners, the initiative will provide 12 companies with better visibility in the community

A renewed Loyalty Programme will be implemented during this year's EUROCORR in Paris, which is dedicated to selected exhibitors that are an EFC Affiliate Member and/or a regular exhibitor that has participated in at least the last three consecutive EUROCORR exhibitions.

This programme aims to recognise the commitment of the Federation's partner companies by offering them increased visibility within the corrosion community, and a range of better services. Specifically, these eligible companies will benefit from:

- A discount rate on the booth package at EUROCORR
- A free slot during the lunch break of the exhibition will be made available to provide the opportunity to make a presentation. As it is out of the Scientific Programme of EUROCORR, the contents are unrestricted, representing a

chance to optimise the promotion of an organisation's activities, products and services.

ELIGIBLE COMPANIES

Additional benefits like free one-day exhibition passes are also being implemented and this Loyalty Programme will continue to be developed over the coming years.

More than 12 companies are eligible for the Loyalty Programme this year and the company names will be revealed through a specific communication in the congress centre in Paris. If you would like to know more then contact Pascal Collet, coo@efcweb.org or visit the EFC booth.



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Cavallaro Medal winner and Honorary Fellows revealed

Jörg Vogelsang, François Ropital, and Theo Hack are the new Honorary Fellows, while Mikhail Zheludkevich has been awarded the Cavallaro Medal

Dr. Jörg Alfred Vogelsang, Sika Technology AG, Switzerland

"It's a great honour for me and I am very grateful that the EFC has selected me as a new Honorary Fellow. I am particularly pleased as I see the award as a great appreciation and recognition of my work within the EFC management team.

I am proud of many achievements throughout my career, but among those achievements I am perhaps most proud of the fact that I have been able to contribute towards the development of the EFC during my involvement over the past few decades, together with the many dedicated and highly motivated colleagues from across science and the industry.

The EFC, and in particular the annual EUROCORR conference, provides an excellent opportunity for those in the industry to make valuable contacts

Prof. François Ropital, IFP Energies Nouvelles (IFPEN), INSA Lyon, France

"The Honorary Fellow award is a great honour and I would like to associate this recognition with all my colleagues involved in Working Party activities (especially WP 15 and 26) and in the EFC management.

Together, we have established many strong relationships and through fruitful exchanges we have been able to deliver recommendations and updated best practice guidelines to improve the reliability of industrial processes. EFC guidelines 46 (Corrosion in sour gas amine treatment units), EFC 55 (Corrosion under insulation) and EFC 72 (Corrosion management of sea water cooling systems) are some examples.

As I take time to reflect on my career and my time with the EFC, I consider the regular biannual Working Party 15 meetings in spring and at EUROCORR (that allow around 60 specialists to exchange and progress any particular or current corrosion issues) are important for materials



and establish networks with some of the most respected European experts on a range of relevant corrosion topics. The scientific and technical level on show at EUROCORR is outstanding and there are many opportunities for co-operation, be it within the framework of joint European research projects, or as direct contract research.

The EFC is a catalyst for the dissemination of knowledge and information in the field of corrosion research in the broadest sense. And it is precisely these defining characteristics that make the Federation and the Young EFC initiative so invaluable, especially for young researchers."



About EFC Honorary Fellows

Awarded for outstanding accomplishment in corrosion science and engineering and/or an outstanding commitment to the European Federation of Corrosion and support of its mission and activities, the Honorary Fellowship has this year been awarded to three outstanding corrosion scientists. They will be presented with their prize by the President of the EFC or by the Chair of the Science and Technology Advisory Committee at this year's EUROCORR in Paris

reliabilities - and I am really very honoured to have helped fulfil this objective. During the Covid pandemic crisis, we continued these exchanges remotely, and EUROCORR 2022 in Berlin was a great event in order for all of us corrosionists to meet face to face once again.

And I think the EFC is an important asset to all those associated with the Federation, as together we face similar corrosion challenges in each of our respective corners of the

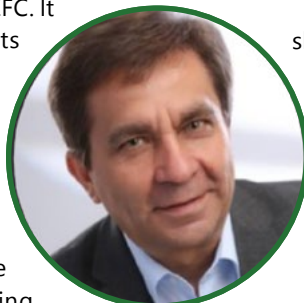
world - and the Federation is an important organisation to help us progress collectively to ensure the safe and reliable management of corrosion for future generations. In addition to this, the EFC is also evolving to meet the new corrosion challenges for a more environmentally friendly industry with the creation of WP 26 on Corrosion in Green & Low Carbon Energy Technologies, for example.

I am also very happy to see that the Young EFC corrosionists remain very active in their research and presentations, and I encourage all of them to contact and even challenge 'senior specialists'. As, in order for the industry to progress as a whole, it is always important to have fresh inputs."

Mr. Theo Hack, Airbus Defence and Space GmbH/TJoH Consulting, Germany

"I am truly honoured to receive the prestigious Fellowship and grateful for the recognition of my work in the aerospace field of corrosion science and engineering. The award gives me a certain confirmation that my efforts had a positive impact on the evolution of EFC. It makes me confident that the results have pushed the boundaries of knowledge for aerospace related corrosion science prepared this progress for application in the industrial environment.

As I reflect, a particularly proud moment was the creation of the Working Party, which was an exciting experience for me. I was a newcomer in the administrative environment of EFC, but the support and patience of the EFC officials helped me overcome this challenge. At EUROCORR 2012 in Istanbul, an aerospace workshop was such a surprising success that it made me very enthusiastic. It was a matter of course to take on this obligation to launch the process for creating a full Working Party. I engaged Prof. Mikhail Zheludkevich, an ambitious and excellent corrosion scientist, as Co-Chair and together we convinced the STAC and EFC Member Societies to establish Working Party 22 on Corrosion Control in



Aerospace. A core group of supporters from aerospace industries, institutes, and universities was formed and it was a pleasure to chair this extraordinary group. WP 22 was created to attract speakers from outside Europe and increase industrial contributions. This was an important part of our mission, as aerospace mainly serves a global market.

As for the next generation of corrosion scientists, they should keep in mind that the answer to corrosion problems are not just about understanding corrosion mechanisms or developing and applying corrosion prevention means. Corrosion science has the obligation to support new concepts for more sustainable applications by proper selection of materials and developing new corrosion protection systems using more and more modelling and ML techniques. Favourable corrosion engineering is required through facilitating progress in data acquisition during testing of in-service conditions and behaviour.

What I'm particularly pleased about related to our WP 22 network is the development of an excellent new generation of young corrosion scientists in the aerospace community. The EFC has made an important contribution to this evolution with its Young EFC initiative, offering them the visibility they deserve. Thanks to the whole team behind WP 22, EFC officials, academic pillars, and the loyal support of industrial contributors. This makes me confident that corrosion challenges will be positively affected in future and my retirement may not need to be challenged!"

First presented in 1965, the Cavallaro Medal will this year be given to **Prof. Mikhail Zheludkevich, Helmholtz-Zentrum Hereon, Germany** for his distinguished activity in the field of corrosion research.

The prestigious medal honours the work of Professor Leo Cavallaro, founder of the Aldo Dacco' Study Centre on Corrosion and Metallurgy of the University of Ferrara and will be presented to Prof. Zheludkevich at this year's EUROCORR in Paris.

"Receiving the Cavallaro Medal is a profound honour, not only as a recognition of my contribution to corrosion research but also as a personal milestone that reflects my dedication to the field," said Prof. Zheludkevich, who is the 29th winner of the medal. "I am deeply honoured to be listed among the recipients of this prestigious medal, which includes world-leading corrosionists. This award symbolises the pinnacle of achievement and commitment to advancing our understanding of corrosion processes and protection strategies. It serves as a reminder of the collaborative spirit of the scientific community. I am thankful to all my academic and industrial collaborators, and especially to Professor Mario Ferreira, who introduced me to corrosion science, as well as to all members of my research groups in Portugal and Germany."

As the current Chair of WP 22, Prof. Zheludkevich is an important figure in the Federation and the award has allowed him the opportunity to reflect on his career.



"I would like to highlight the key role of Theo Hack, who created WP 22 and brought together industrial players along the value chain with academia. This solid foundation was crucial for me when I assumed the role of WP 22 Chair. In close collaboration with the Vice-Chair, Dr. Martin Beneke from Airbus, we have built on this groundwork to develop industry-academia links. Reflecting on my tenure as Chair of WP 22, I am particularly proud of when we organised several joint sessions with colleagues from other Working Parties."

And with the benefit of experience comes a certain element of wisdom.

"The EFC plays a pivotal role in uniting researchers, industry professionals, and policymakers to address the global challenge of corrosion. To young corrosionists, my advice is to embrace the multidisciplinary nature of our field, engage actively with the EFC community through Young EFC, and always seek to innovate. Remember, the solutions you develop today will safeguard the integrity of materials for generations to come."

YEFC continue to empower early career professionals

A busy spring and summer for the Young EFC is set to culminate with a full programme of events at EUROCORR in Paris



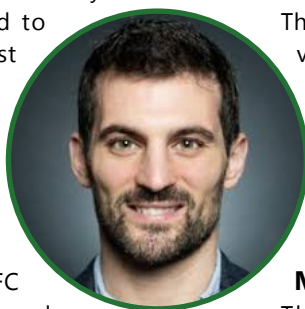
As the first round of the international corrosion mentorship programme, CORmentor, nears its end, some of CORmentors met at the Gordon Research Conference on Aqueous Corrosion

ANNUAL MEETING AND CAREER FAIR

The 10th annual meeting of the Young EFC will take place at EUROCORR on Monday 2nd September at 18.00 in room 351 of the Palais des Congrès de Paris. The meeting will be followed by a get-together and career fair at 18.45 in the Foyer Bordeaux, where the organisers are looking forward to discussing the Young EFC and its activities to a broad audience.

YEFC PLENARY LECTURE

A 3M Plenary Lecture Competition for early career researchers was organised to select the YEFC Plenary. After a first screening based on one minute video, CV, and motivation letter, four participants were selected for the final round. Emilio Martínez-Pañeda (right), Associate Professor of Engineering Science at University of Oxford, UK was selected as the YEFC Plenary by a jury of YEFC board members and seven external jury members, based on a three minute video presentation about his research. His plenary lecture entitled, *Towards a Virtual Corrosion Lab: a new generation of mechanistic, multi-physics models for pitting and stress corrosion cracking* will take place on Tuesday 3rd September.



BEST ORAL PRESENTATION AWARDS

Two oral presentation prizes, recognising outstanding communication skills of early career corrosionists will be awarded at EUROCORR 2024. If warranted by the quality of the presentations, one award is directed to corrosion-related applied/industrial advances and the other to more fundamental research. Check the online programme for selected candidates and to consider attending their oral presentations. The awards are donated by [Mankiewicz](#).

GET TO KNOW THE CORROSION FIGHTERS

This series of short interviews aims to provide increased visibility to the winners of the EFC awards to help attract young researchers and engineers to the field of corrosion, as well as to encourage talented corrosionists to apply for future EFC prizes. The short interviews are posted regularly on LinkedIn and on the EFC website.

MEMBER ACTIVITIES

The YEFC supports and encourages the corrosion community to organise a range of events and activities aimed at raising awareness about the impact of corrosion in our societies and industries. This year, although fewer activities have been registered, a stronger engagement has been observed, as shown by the WCO/AMPP/(Y)EFC social media campaign.

CORmentor

The YEFC is happy to promote the CORmentor programme, which supports corrosion students, early career professionals, and established professionals, embarking on a major career change.

The initiative was created by Yolanda Hedberg (UWO) and aims to further the training and development of early career professionals to prepare them for the corrosion job market, with a particular emphasis on job-readiness in the industrial and academic fields, as well as the promotion of female and under-represented groups in the corrosion domain.

The CORmentor programme will be introduced at EUROCORR on Thursday morning in the Corrosion Education symposium, *An international corrosion mentorship program – insights from the first year*.

On 18th April, CREATE CORRECT and Young EFC presented the first 2024 CORmentor Virtual Event. More than 40 participants could engage in a lecture by Janine Mauzeroll titled, *The Wonderful World of Electrochemistry for Corrosion*, followed by a breakout room event, where they could select:

→ *Good Leadership*, hosted by Noémie Ott

→ *Imposter Syndrome*, hosted by Yolanda Hedberg

→ *Scientific Writing in Corrosion*, hosted by Arjan Mol

→ *Corrosion Industry Career Opportunities*, hosted by Damien Féron

→ *Resumes*, hosted by Lisa Briona

CORmentorship PROGRAMME

The first round of the international corrosion mentorship programme, CORmentor, is nearing its end. Welcoming 50 pairs of mentors and students in 16 countries, the YEFC invites all participants to complete the exit survey so that they can further improve the programme.

For the programme next year, the YEFC hope for many new and old applicants, both as students and mentors - or you could also be both. The application portal is now open, and organisers will start matching new pairs in mid-September 2024.

Why is mentorship important? The goal of the mentoring programme is to support corrosion students, early career and established professionals embark on a major career change. It aims to enhance the career development of participants, while contributing to their success by leveraging the knowledge, skills and experiences of mentors.

To learn more about the mentorship programme, let the organisers know how it was this year, or apply as a student or mentor for next year by visiting uwo.ca.

CORROSION AWARENESS DAY

Established by the World Corrosion Organization (WCO), Corrosion Awareness Day was celebrated on 24th April around the world. The YEFC would like to offer a heartfelt thank you to all the organisers and participants.

TWIIN WEBINAR

Noémie Ott, Chair of the YEFC, was invited to present the YEFC and its activities to the TWI Innovation Network webinar: *A Look at Corrosion Science and Engineering: Materials and Coatings Research* by the Materials Innovation Centre (a long-term strategic partnership between TWI and the University of Leicester) on 25th April in front of about 100 attendees.

CORROSION ENGINEERING VS. MANAGEMENT

The first YEFC Corrosion Awareness webinar was held on 24th April, with Corrosion Management Consultant, Ali Morshed sharing his extensive knowledge and practical insights for effective corrosion management strategies. During the course of the webinar he addressed the challenges faced by industrial partners and highlighted potential solutions. The recording can be found on the [YEFC YouTube channel](#).



CORROSION AROUND THE CLOCK SOCIAL MEDIA CAMPAIGN

The YEFC supported the WCO, AMPP and EFC in a campaign of social media posts to raise corrosion awareness. On 24th April at 8.00am in each time zone across the world, a post related to 'iconic structures' was released, preferentially on LinkedIn, by local member societies to engage the public in the importance of corrosion and corrosion prevention. #WCAD and #Corrosionaroundtheclock were definitively trending, and more than 800 million organic impressions were registered.

The YEFC would like to thank once again all EFC members societies or affiliated members, such as Society of Corrosion and Corrosion Protection (Germany), Spanish Society of Materials SOCIEMAT (Spain), Institute of Metals and Technology (Slovenia), Seal for Life (Belgium), Institute of Materials, Minerals, and Mining (UK), Institute of Corrosion (UK), Portuguese Society of Materials (Portugal) and SKY Suomen Korroosioyhdistys (Finland), who participated in the Corrosion Around the Clock social media campaign.

FIND OUT MORE

Curious about the Young EFC's initiatives? Then stay tuned on [LinkedIn](#), the [EFC Hub](#), via youngcorrosion@gmail.com, or join us at the YEFC annual meeting at EUROCORR 2024.

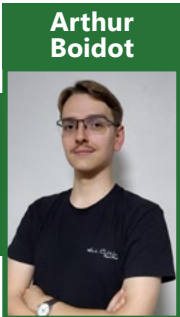
ABOUT THE YEFC

The YEFC board consists of **Sajjad Akbarzadeh** (UMons, Belgium), **Arthur Boidot** (NOF Metal Coatings Europe SA, France), **Fabio Cova Caiazzo** (Petronas Lubricants International, Italy), **Mirsajjad Mousavi** (Teijin Aramid BV, Netherlands), **Noémie Ott** (OST, Switzerland), **Can Özkan** (Delft University of Technology, Netherlands), **Reynier Revilla** (VUB, Belgium) and **Andressa Trentin** (VTT, Finland)

The YEFC board benefits from the support of EFC board members, **Marta Mohedano** (Universidad Complutense de Madrid, Spain) and **Bartłomiej Guzik** (Mankiewicz Gebr. & Co, Poland)



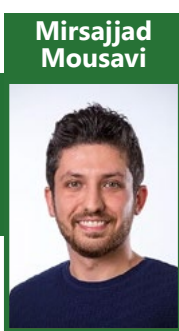
Sajjad Akbarzadeh



Arthur Boidot



Fabio Cova Caiazzo



Mirsajjad Mousavi



Noémie Ott



Can Özkan



Reynier Revilla



Andressa Trentin

WE'RE THE YEFC

A pioneering initiative of the European Federation of Corrosion since its inception in 2016, the Young EFC aims to empower and connect early career professionals in the corrosion and material protection domain beyond traditional boundaries.

Established to help bridge the critical gap between fresh talent and seasoned experts in the field, the YEFC is a thriving community for young and young-at-heart corrosion enthusiasts that arranges engaging events and provides a platform for advocacy.

To find out more, visit efcweb.org/YoungEFC.html

ADVERTISE IN THE EFC NEWSLETTER AND SPREAD YOUR MESSAGE ACROSS EUROPE

The EFC Newsletter is pleased to announce that it is now accepting advertising and welcomes enquiries. If you want to be involved then email the address below

e-mail COO@EFCWEB.ORG to find out more



YEFC attend ICCPA2024 in Chongqing, China

Introducing the YEFC to a Chinese audience, the event attracted 600 scientists and engineers from across China and Europe



ICCPA2024 in Chongqing, China attracted a wide range of keynote lectures from corrosion scientists across the globe, while delegates from EFC Working Parties, Member Societies and Affiliate Members also participated at the event

The International Conference on Corrosion Protection and Application (ICCPA2024) took place in Chongqing, China from 17th to 20th May, and YEFC were in attendance to represent the Federation.

Co-organised by the Chongqing Association for Science and Technology, the Sichuan Association for Science and Technology, the European Federation of Corrosion (EFC), the Chinese Society for Corrosion and Protection (CSCP), and with the support of many Chinese associations and companies, the ICCPA2024 gathered around 600 scientists and engineers from across China and Europe. Delegates from different EFC Working Parties, Member Societies and Affiliate Members attended, gave keynote lectures and participated to many discussions.

Noémie Ott, Chair of the YEFC, and Mirsajjad Mousavi, YEFC board member, acted as jury members at the Academic Exchange Forum for Young Students, where they were able to introduce the YEFC to this community.

Keynote lecturers were delivered by Carsten Blawert (Helmholtz-Zentrum Hereon DE), Dirk Engelberg (University of Manchester UK), Damien Féron (University Paris Saclay FR), Yaiza Gonzalez-Garcia (TU Delft NL), Mirsajjad Mousavi (Teijin Aramid NL, YEFC), Anna Igual Muñoz (EPFL CH), Noémie Ott (OST CH, YEFC), Tomáš Prošek (UCT Prague CZ, EFC), Reynier Revilla (VUB BE, YEFC), Václav Šefl (Technopark Kralupy CZ), Maria Serdechnova (Helmholtz-Zentrum Hereon DE), Jolanta Swiatowska (CNRS Chimie ParisTech FR), Rastko Vasilic (University of Belgrade RS), Peter Visser (AkzoNobel NL), Martin Vosecký (NALCO Water, an Ecolab company CZ), and Mikhail Zheludkevich (Helmholtz-Zentrum Hereon DE).



Noémie Ott and Mirsajjad Mousavi (left) acted as jury members at the Academic Exchange Forum for Young Students during ICCPA2024, which gathered around 600 scientists and engineers from across China and Europe

EFC webinar attracts 140 people from 30 countries

Held in conjunction with World Corrosion Awareness Day, the webinar focused on corrosion performance of additively manufactured metals



The webinar boasted a full schedule that included three presenters and nine speakers across two sessions discussing corrosion performance of additively manufactured metals

Among the many events on World Corrosion Awareness Day, the EFC organised a webinar on the Corrosion performance of additively-manufactured metals on Tuesday 21st May. The two-session, full-day webinar was held with the support of Iris De Graeve and Reynier Revilla Castillo from the Vrije Universiteit Brussel (VUB) and attracted more than 140 participants from 30 different countries.

This successful webinar offered those who attended a range of opportunities to learn more from panelists from academia, research institutes and industry, including University of Science and Technology Beijing (China), RISE (Sweden), University of Bergamo (Italy), CRM group (Belgium), Constellium (France), IMT (Slovenia), CETIM (France) and CEA (France).

During the webinar, participants were able to share different visions, approaches, and results to apprehend the problems of performance to corrosion of metal parts manufactured in 3D, depending on the application process and the influence of the associated post treatments. It covered topics related to different materials (stainless steel, alloys (Al, Ni, Ti, Cu)).

Relating to additively manufactured metal, the webinar provided an opportunity to communicate about future events on the topic taking place during EUROCORR 2024, and also to encourage volunteers and those interested in participating in a future EFC Task Force.

WEBINAR SPEAKERS

→ **Prof. Bowei Zhang** – Corrosion behaviour and oxide film characteristics of laser powder bed fusion copper alloys (University of Science and Technology Beijing)

→ **Mrs. Clara Linder** – Effect of alloy composition and surface treatment on the corrosion and fatigue corrosion resistance of additively manufactured aluminium alloys (RISE Research Institutes of Sweden)

→ **Prof. Sergio Lorenzi** – Additive manufactured nickel alloys and corrosion qualification (University of Bergamo)

→ **Dr. Nicolas Nutal and Mr. Frédéric Novello** – Stress corrosion cracking testing of materials issued of additive manufacturing (CRM group)

→ **Dr. Ravi Shahani** – Aluminium laser powder bed AM solution giving exceptional corrosion performance (Constellium)

→ **Prof. Matjaz Godec** – Corrosion properties of additive manufactured metallic materials (Inštitut za kovinske materiale in tehnologije, IMT)

→ **Mr. Adrien Barroux** – Corrosion behaviour of stainless steels fabricated by various additive manufacturing processes (CETIM)

→ **Dr. Fanny Balbaud** – Corrosion behaviour of additively manufactured stainless steels in nuclear environments (French Alternative Energies and Atomic Energy Commission, CEA)

To find out more, contact [Iris de Graeve](#) (VUB)

Norwegian institute become new EFC Affiliate Member

IFE will benefit from international visibility, exhibitor space at EUROCORR, and a network of like-minded corrosionists



With two locations in Kjeller and Halden in Norway, the Institute for Energy Technology has conducted large international joint industry projects on corrosion in oil and gas wells and pipelines for more than 40 years

The Institute for Energy Technology (IFE) is an independent research institute with about 700 employees and locations in Kjeller and Halden in Norway. The Corrosion Technology department currently has 16 employees and aims to be a world leading influence within corrosion in oil and gas pipelines and pipelines for CO₂ transport.

IFE has a strong position internationally within CO₂ and H₂S corrosion of oil and gas pipelines, and has conducted large international joint industry projects on corrosion in oil and gas wells and pipelines for more than 40 years. Having performed several projects on corrosion control for oil and gas fields all over the world, IFE has extensive custom-made laboratory equipment and can offer a wide range of corrosion tests in both CO₂ and H₂S environments, including testing with very high H₂S content.

The knowledge from research on CO₂ corrosion in oil and gas production is now used in studies of corrosion in pipelines for transport of CO₂ from carbon capture facilities and injection wells for CO₂ storage. This activity is focused

on studies of the effect of impurities in CO₂ captured from fossil fired power plants and industry, like SO₂, NO_x, water and other impurities. IFE has developed an advanced laboratory for studies of effects of small amounts of impurities in dense phase CO₂ and has performed several industry financed projects in this area.

The Norwegian institute is now conducting two large international joint industry projects with the aim to determine a safe operation window for transport of dense phase CO₂ with impurities in ships and carbon steel pipelines and in CO₂ injection wells.

IFE is now taking the knowledge from corrosion control in the petroleum industry in use in other areas, in particular for corrosion in systems for geothermal energy and in units for hydrogen production.

About the Institute for Energy Technology

- Based in Norway, IFE has locations in the south of the country in Halden and Kjeller, north-east of Oslo
- Established in 1948
- IFE employs 720 people from 35 different countries
- 1,3 billion NOK in annual turnover
- 4000 m² of advanced laboratories
- 135 scientific publications
- 200 international projects

EFC Green Book series grows with two new publications

***Corrosion Modelling with Cellular Automata* and *Corrosion Management of Seawater Cooling Systems* are the 71st and 72nd books in the series**

Two new publications have been added to the EFC Green Books roster on Elsevier.

Corrosion Modelling with Cellular Automata (EFC 71) and *Corrosion Management of Seawater Cooling Systems* (EFC 72) are the latest books to be published in EFC's Green Books series, which can be viewed in their entirety on a dedicated EFC page on the Elsevier website.

CORROSION MODELLING WITH CELLULAR AUTOMATA (EFC 71)

Corrosion Modelling with Cellular Automata bridges the gap between finer scales based on atomic physics and the larger-scale based on physico-chemical properties of materials and their environments.

The book, edited by Damien Feron and Di Caprio Dung, describes the simulation and modelling of corrosion phenomena by cellular automata and underlines the collaborative and interdisciplinary relationships that underpin them. It explores the major achievements that have been

performed to date, covering basic knowledge on cellular automata and corrosion phenomena, and includes sections on CA modelling of generalised and uniform corrosion in 2D and 3D under various conditions, including aqueous environments and high temperature processes.

In the final section, examples are presented on the use of cellular automata for modelling localised corrosion, as well as recent developments on intergranular corrosion, and a review on the use of CA for modelling pitting corrosion.

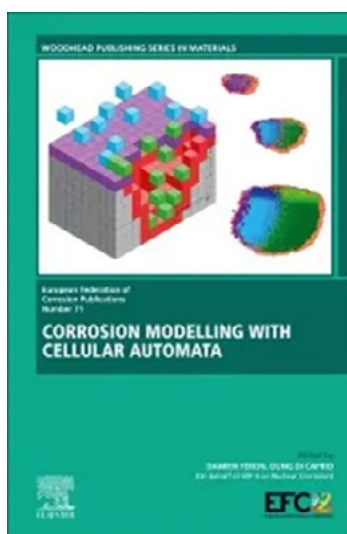
Editors: Damien Feron, Di Caprio Dung

Woodhead Publishing, 230 pages, 18 March 2024, Hardback ISBN:

9780443137860,

eBook ISBN: 9780443137877

Order online at the [Elsevier Book Store](#)



CORROSION MANAGEMENT OF SEAWATER COOLING SYSTEMS (EFC 72)

Corrosion Management of Seawater Cooling Systems, Volume 72 provides an overview on main seawater heat exchanger systems, different forms of corrosion, biocide treatments, corrosion, scale inhibitors, materials used, coatings and cathodic protection, maintenance, and monitoring and control.

Produced by Francois Ropital, Valerie Bour Beucler, and Antoine Surbled, the book will be a valuable reference resource for academics, technicians and engineers who are interested in the corrosion management of seawater cooling systems.

The evolution of practices in terms of sustainability, materials choice, treatment selection and changes to regulations have demonstrated the need to establish this new guide on recommended best practices that support corrosion management and the development of seawater heat exchangers.

Seawater is an attractive resource for utilities in many industries, like power plants, refineries and chemical plants.

Seawater cooling systems are used in heat exchangers, in once-through cooling water systems, and for recirculating cooling water systems. The metallurgy and materials in these facilities need to be compatible with seawater and allow good corrosion control. As seawater and suspended solids can cause corrosion, scaling, fouling, microbiological growth and macrofouling problems, this is a necessary addition to the conversation.

Authors: Francois Ropital, Valerie Bour Beucler, Antoine Surbled

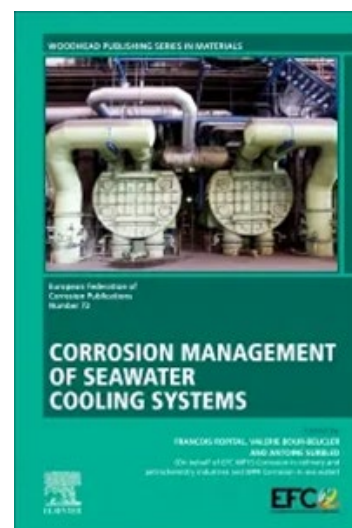
Woodhead Publishing, 350 pages, 15 June 2024,

Hardback ISBN:

9780443152351, eBook

ISBN: 9780443152368

Order online at the [Elsevier Book Store](#)



Education for increased awareness of corrosion

Václav Šefl from the Association of Czech and Slovak Corrosion Engineers outlines the need for a Europe-wide certification scheme



“ After being immersed in study and practice for a couple of years, we frequently forget the sheer breadth of the field we daily employ in our work. This is not true just for corrosion engineers, and it becomes very obvious when meeting with experts from these other fields and engaging in inter-disciplinary tasks. How do we deal with this? Simple; keep educating yourself! But without clear structure, the process of self-study can be painstakingly slow and it is easy to skip significant chapters, mechanisms, or specific issues. In addition, the knowledge needs to be verified by a third-party arbitrator in some complex jobs or tasks. Although this is common in certain parts of the corrosion curriculum, such as paint inspection, a general overview course on corrosion does not exist to this date in the EU.

The need for this type of tertiary education is apparent. To demonstrate this, we can use feedback from corrosion courses organised by the [Association of Czech and Slovak Corrosion Engineers](#) (AKI). Nowadays, most companies operate in large European regions or even globally, and any cross-border corrosion expertise is then subject of scrutiny. In some cases, certain formal education is even required, as companies participating in civil construction tenders in the Czech Republic have to have at least one employee with a



certificate declaring corrosion education. For certain narrow, specialised parts of corrosion, such as inspection of organic coatings or cathodic protection, courses are available and well recognised. However, there is no course that covers all aspects of corrosion. How to educate designers of new facilities and products or producers employing new materials? How to cope with newly emerging issues, methods, materials (3D printing, additive manufacturing, high entropy alloys) and sources of information (AI, big data), how do changes in global environment affect the recognised corrosion protection basics?

In short, there is a clear need for a unified and generally accepted course for professionals for whom corrosion is an important but not central subject, such as mechanical, chemical and civil engineers, maintenance experts, and operators in different industries, to get the basic corrosion curriculum. Why not start working on European education and certification scheme for people of all ages, with the help of the best experts in their respective fields and topics? It is a necessary step on the way to a more sustainable future through better awareness of corrosion at all decision-making levels and possible redirection of huge resources spent each year fighting corrosion to other pressing societal challenges.

If you're ready to start a discussion on corrosion education, feel free to contact vaclav.sefl@vscht.cz

SOCIEMAT give honour to respected scientist

The Spanish Materials Society, SOCIEMAT, has awarded their outstanding scientific achievement honour to a corrosion scientist



Boasting an h-index of 55 according to Google Scholar, Ricardo M. Souto has been honoured as the recipient of the National Award for the Best Scientific Career in Materials Science and Technology 2024

SOCIEMAT has announced Prof. Ricardo M. Souto as the recipient of the National Award for the Best Scientific Career in Materials Science and Technology 2024. Recognising Prof. Souto's outstanding contributions to corrosion research and technical advancements in the field of corrosion science and technology, the award acknowledges his excellence in the field.

Ricardo M. Souto has been a Professor at the University of La Laguna (ULL, Canary Islands) since 2008, after receiving an MSc degree in Chemistry from ULL, and a PhD from the University of Utrecht (Netherlands). His doctoral training focused on the multistep reaction mechanism of electrode processes and the catalytic effect of adsorbable species using first and second order AC electrochemical techniques.

His return to ULL happened with the foundation of the Electrochemistry and Corrosion research group (ELECOR). Research focus was shifted to the study of localised corrosion processes in passive metals by using conventional electrochemical techniques in combination with surface characterisation techniques, whereas also studying corrosion protection by corrosion inhibiting organic substances or applying polymeric barrier coatings.

Aware of the limitations of conventional electrochemical methods to analyse the origins of localised corrosion processes in passivated metals, a fruitful collaboration began in 1994 and would last more than a decade with Prof. G.T. Burstein at the University of Cambridge (UK), where the

use of microelectrodes for the study of nucleation events of individual pitting on steels and titanium-based materials began, using electrochemical noise analysis techniques. Although major advances in the knowledge of the mechanism of localised corrosion were achieved, the need for microelectrochemical techniques with spatial resolution became evident. Then, activities focused on the application of scanning electrochemical microscopes and other combined near-field probes for the investigation of corrosion and corrosion protection processes, expanding from systems of industrial interest to the biocompatibility of implant materials in the human body.

The electrochemical scanning microscope (SECM) was introduced, proposing new operation modes for the study of interfacial reactions on reactive solid surfaces - namely, redox competition mode, combined potentiometric/ amperometric operation, the measurement of impedances in the probe conforming AC-SECM or Scanning Electrochemical Impedance Microscopy, and combined AFM-SECM operation.

A laboratory assembly has been set at ELECOR in the University of La Laguna where SECM instruments designed to cover this wide range of SECM operation modes is distributed with other scanning microelectrochemical techniques, namely the Scanning Vibrating Electrode Technique, Scanning Ion Electrode Technique, Localised Electrochemical Impedance Spectroscopy, and Scanning Kelvin Probe Force Microscopy.

Low carbon energy focus for the French Corrosion Institute

The FCI has announced that it is making its own contribution towards a greener future with a low carbon energy offer



A new test room in Saint-Etienne with the necessary safety for hydrogen handling has been made available and is capable of measuring fracture toughness and fatigue crack growth rate measurements up to 700 bar

With the worldwide demand of new energies as an alternative to fossil fuels to limit the greenhouse emissions, the [French Corrosion Institute](#) (FCI), a subsidiary of [RISE Research Institutes of Sweden](#), has started a change in its historical activities and initiated on all sites the development of a new offer around low carbon energy (hydrogen, CCUS, ammonia, biomass treatment, electrolyzers) to make its own contribution in the fight for climate saving.

Operating from three sites at Brest, Saint-Etienne, and Lyon, the activity at Saint-Etienne has grown since the early 1990s around an offer of tests and R&D services mainly applied to the oil and gas and nuclear industries. From 2018, a development of capacities for material testing under hydrogen pressure has also started. Under the support of some clients, the benches and pressure vessel capabilities already in place at this time were first upgraded to allow for a safe handling of hydrogen under pressure. After this first step of development, testing up to a limited range of pressure and temperature was possible.

INVESTMENT PLAN

From this initial development, a lack in the offer was revealed from benchmarking activities and client's inquiries leading to an investment plan to extend the capabilities and offer new services.

Since 2023, a new test room with the necessary safety for hydrogen handling has been made available at Saint-

Etienne with the following capacities:

- Fracture toughness and fatigue crack growth rate measurements up to 700 bar and temperature range [-10 / 185°C]
- Batch autoclave testing up to 350 bar and 350°C
- Slow strain rate or Ripple load testing at cryogenic temperature (down to -150°C) and up to 700 bar. Elevated temperature is also possible
- High pressure permeation test through metal, polymers or composites
- Thermodesorption spectroscopy

The aim of the FCI has always been to offer tailor-made services and so are making changes to adapt to the demand and develop fit for purpose test benches if requested. A recent example is the construction of a test unit allowing to reproduce the real field conditions of tubes subjected to pressure fatigue under hydrogen over decades and to qualify the products for service after laboratory testing simulating the full operation life.

These capacities are now fully available and currently in use in six European and Industrial projects, for which the FCI has been hired, while most of these projects are linked with the impact of hydrogen contamination on the material properties.

Interested to hear more? Then meet the FCI at booth #30 and talk with their speakers at EUROCORR 2024 (L.Moli, F. Vucko, M.Prestat, N. Larché, and contact C.Mendibide)

ATV-SEMAPP changes name to Teknologisk Videndeling

The name change from the Danish Member Society aims to provide greater understanding of the organisation and their objectives



Following a rebrand in January 2024, ATV-SEMAPP is now known as Teknologisk Videndeling, or Technology Networking - ATV Manufacturing Technology in English, as the previous abbreviation was deemed too challenging to remember

The home of online and in-person seminars and conferences within corrosion technology has a new name in Denmark, as ATV-SEMAPP changed its name to Teknologisk Videndeling in January 2024.

Known in English as Technology Networking - ATV Manufacturing Technology, the association Teknologisk Videndeling has existed since 1982 and has opted for a name change as the previous abbreviation was too challenging to remember and provided little insight into their identity, mission, and values. It is hoped the new name, will foster a clearer understanding of the organisation and their objectives.

Established as a private, non-profit foundation, affiliated to ATV – the Danish Academy of Technical Sciences, the aim of Teknologisk Videndeling is:

- To promote training, education and research concerning industrial technology
- To facilitate the frames of professional and scientific activities

→ To facilitate communication on knowledge of industrial technology concerning processing, manufacturing and materials used

→ To extend networking and interaction among industry, universities and organizations

SOCIETY FOCUS

Through technical knowledge sharing, the association aims to support Danish industry to create value in society. The objective of the association's activities is to be a forum for professional activities that benefit the development of the knowledge society. The society has four subjects of particular interest:

- Surface Engineering and Technology
- Polymer Technology
- Corrosion Engineering
- Innovation, Development and Organisation of Production

Visit teknologisk-videndeling.dk, e-mail: teknologiskvidendeling@construct.dtu.dk, or LinkedIn: [Teknologisk Videndeling](https://www.linkedin.com/company/teknologisk-videndeling)

COURSES BY TEKNOLOGISK VIDENDELING

CORROSION CONTROL FOR A GREENER WORLD – A SHORT COURSE ON THEORY AND PRACTICE

Technical University of Denmark, 7-8 October

Teachers: Rajan Ambat and Morten Jellesen

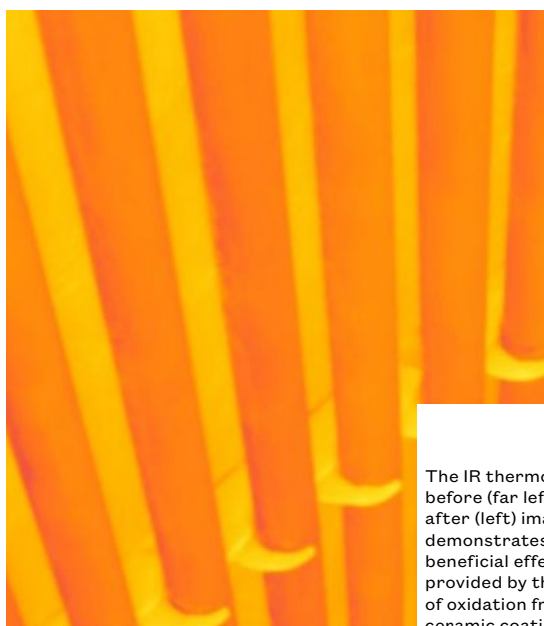
CORROSION MANAGEMENT AND FAILURE ANALYSIS: MICROBIOLOGICALLY INFLUENCED CORROSION (MIC)

Syddanske Forskerparker, 18-19 November

Teachers: Torben Lund Skovhus and Matthias Graff

Radiant tubes in an aromatics plant given ceramic lifeline

EFC Affiliate Member, Integrated Global Services, explore how a ceramic coating on radiant tubes protected against oxidisation



The IR thermography before (far left) and after (left) image demonstrates the beneficial effects provided by the exclusion of oxidation from the ceramic coating

An aromatics plant in operation since 2009 includes a naphtha reforming unit to produce rich stream aromatics and high-purity hydrogen as a valuable by-product. The plant typically experiences varied feed composition, including fluctuating naphthenic content, depending on the imported naphtha. A process temperature (in the range of 515 to 545°C) is required to promote the endothermic chemical reactions to maximise aromatics production. The radiant tubes have a material specification of ASTM 335 Gr P9 (9Cr-1Mo).

The life of radiant tubes is governed by time- and temperature-dependent mechanisms, including tube wall temperature, heat flux itself, as well as heat flux variation factors (FC and FL). Thermal degradation is inherent to the operation. Unfortunately, oxidation of external tube surfaces was responsible for rapid metal loss at around 0.25mm/year, which significantly limited tube life.

The problem arising due to scaling not only affects the mechanical integrity (service life) of the radiant tubes, but it also leads to multiple operational constraints. Scale growth produces an insulating layer that restricts heat transfer to the process fluid and eventually limits throughput. Moreover, severe scaling also interferes with accurate on-stream monitoring of tube skin temperatures negatively impacting reliability.

The client utilised a robust inspection programme to track corrosion rates, tube wall thickness and metal loss. Based

on the recorded thickness measurements for each heater, they routinely calculated the remaining life of the tubes compared to the design life of 100,000 hours. These results allowed for long-term planning of tube replacement and near-term safe operation.

DEGRADATION MECHANISM

One of the main degradation mechanisms in fired heaters is unchecked oxidation, and the application of Cetek Thin Film Coating has stopped this process. Preventing oxidation of radiant tube surfaces eliminates tube wall metal loss during the life of the coating, extending the tube life.

Additionally, the enhancement in radiant efficiency allows for energy (fuel) savings and/or production increase, while providing reliability through uniform heat distribution in the fired heater cells. The unit is no longer limited and running at design capacity or above. Due to this combination of benefits, the project payback period was within six months.

The IGS technologies, including the Cetek ceramic coatings provide multiple opportunities to protect process tubes from oxidation and in many cases are even more beneficial to increasing production rates/throughput and run length in various fired heaters and furnaces, assuming that there are no other factors responsible for reducing the tube life.

To find out more, visit integratedglobal.com

CIDETEC lead four-year exFan research initiative

A consortium led by CIDETEC Surface Engineering is designing an out-of-bath system for the treatment of heat exchanger geometries



The exFan research initiative is funded by the European Union under GA 101138184 and over the course of four years has brought together a consortium of 10 partners from across Europe

The exFan project, short for *Novel Recuperation System to Maximize Exergy from Anergy for Fuel Cell Powered Geared Electric Aircraft Propulsion System*, is a research initiative funded by the European Union under GA 101138184 as part of the HORIZON EUROPE programme. Starting in December 2023, the project has spanned four years and brought together a consortium of 10 partners from five countries.

CIDETEC Surface Engineering leads the project co-ordination, in collaboration with ADT, acting as technical co-ordinator, and TUW as a research co-ordinator, while partners Fraunhofer IAPT, DLR, PowerID, EASN-TIS, IRES, FZG/TUM, and Egile Mechanics contribute expertise and resources to drive the project forward.

In the exFan project, CIDETEC is working on the design of an ad-hoc out-of-bath system for the treatment of the most promising heat exchanger geometries designed and manufactured in the project by the German partner Fraunhofer IAPT. In addition, it will optimise the chemical treatments for polishing and deposition of metal layers, by adjusting parameters, such as temperature, flow rate and electrolyte composition, as well as the process time, to achieve the objectives set. CIDETEC is currently immersed both in the design phase of the experimental system for the application of the chemical treatments, and in the optimisation of the working conditions at laboratory scale in order to, once defined, apply them on the real demonstrators.

The heat exchanger designed in the exFan project will have a bionic design with a suitable surface finish to prevent particle buildup, corrosion and erosion. In addition, a novel thermal management system is being designed to optimise waste heat quality and control the heat flow of the propulsion system. Optimal operating conditions are also being investigated, and a simulation model will be created to optimise operating parameters. The first functional tests of exFan at laboratory scale will be used to verify this model.

CIDETEC SURFACE ENGINEERING

The Coatings and Surface Treatments Unit of CIDETEC Surface Engineering is focused on the design, development, application and characterization of coatings and surfaces to improve the aesthetic and functional properties of materials. It has 4,000m² of facilities equipped with the latest technology. The research to be carried out in the exFan project covers different areas such as the metallization of non-conductive substrates, the development of multi-functional coatings, surface preparation and cleaning, the post-processing of components obtained by AM and the development of coatings for extreme environments. For this purpose, the unit has a highly qualified team in different wet application technologies, such as electrodeposition, electroless deposition, anodizing, electrophoretic deposition, formulation and application of enamels, electro-polishing processes, chemical and mechanical polishing.

HYDROGEN-POWERED ELECTRIC AIRCRAFT

Hydrogen fuel cells produce no CO₂ emissions in flight and are more efficient and sustainable than traditional kerosene-fuelled turbine engines. Moreover, hydrogen is an abundant and renewable natural resource, so hydrogen aircraft propulsion can be key to achieving climate neutrality in aviation by 2050. However, several challenges, such as thermal management and heat dissipation of fuel cells in the aircraft, need to be addressed and solved before fuel cell-based electric aircraft can be a viable solution for air transport.

Although turbine engines produce more heat than fuel cells, they can easily dissipate it in the form of hot exhaust gases. In contrast, a fuel cell, like a battery, heats up during operation and requires a special thermal management system to keep it at its optimum operating temperature. The electrical efficiency of fuel cells is expected to reach 50% by 2030, meaning that every watt of electricity produced in the fuel cell will generate one watt of waste heat. Recovering this heat for further use in the aircraft would be an additional advantage of the technology.

In this context, the European exFan project partners are investigating a solution that allows dissipation of the waste heat generated in the fuel cells, without additional drag losses and the use of this waste heat to generate additional thrust for the aircraft.

HEAT RECOVERY DEVICE BASED ON THE MEREDITH EFFECT

The heat recovery device on which the exFan project focuses is based on the Meredith effect. This effect is a physical phenomenon that takes place in an aircraft duct where the air is flowing through it, which is moving faster than the aircraft, is heated by a heat exchanger. The air is flowing in the duct where the cross section is diverging resulting in a pressure increase of the gas since its speed is reduced. This is called the ramjet effect. As it flows through the exchanger the air is heated, increasing its heat energy and the enthalpy of the flow, i.e. its total energy. This heated and pressurized air exits through an exhaust duct that has a converging design (it becomes narrow towards the end) that accelerates the exiting air with a higher velocity than its inflow (thanks to the energy obtained through the heat exchanger). The difference in the amount of air flow motion between the inlet and outlet of the duct generates a force that by Newton's third law translates into an effective thrust.

The heat recovery device being designed in the exFan project consists of the fan, the aerodynamic components of the flow path and the heat exchanger. The fan is driven by a high-speed electric motor through a gearbox and compresses the aspirated air. This architecture allows the highest specific power to be obtained. The electric motor

and its associated power electronics and controllers are mainly powered by a fuel cell and during peak power demand, a battery shares the load with the fuel cell (e.g. during take-off). A thermal management system is connected to all of the above components to provide suitable thermal operating conditions.

The exFan system encompasses all components that are not related to energy storage and conversion. This proposed new propulsion concept requires heat exchangers with a number of features that make them more efficient and durable.

EFFICIENT, DURABLE HEAT EXCHANGERS PRODUCED BY ADDITIVE MANUFACTURING

In this scenario, one of the objectives of the project is the design and fabrication of an efficient and durable heat exchanger, i.e. high resistance to fouling, wear and corrosion. The design objectives to achieve the balance between thrust and resistance - high heat transfer and low pressure losses - are somewhat opposed in the design of the heat exchanger. Therefore, they must be carefully balanced. High heat transfer in heat exchangers is achieved with structures or geometries that lead to turbulent flow, but low resistance is achieved with structures that lead to laminar flow. The exFan project is working on the efficient design of the heat exchanger to be produced by Additive Manufacturing (AM) using Laser Powder Bed Fusion (LPBF) technology. The use of AM allows the production of more efficient heat exchangers due to the complex geometries and internal channel design that can be produced with this technology and that would not be possible to obtain by conventional methods.

SURFACE TREATMENTS TO INCREASE THE EFFICIENCY AND DURABILITY OF HEAT EXCHANGERS

The use of additive manufacturing makes it possible to produce heat exchangers with complex geometries, which do not allow the application of most of the surface treatments necessary to reduce the roughness of the components and protect them against wear and corrosion. In this context, chemical surface treatments are the only ones that can be used to treat any type of geometry regardless of its internal structure, since they only require contact between the surface to be treated and a specific electrolyte at a specific temperature for a specific time.

Therefore, the application of chemical surface treatments, such as polishing or metallizing, improves the performance of the heat exchanger in terms of efficiency, resistance to corrosion and wear and/or fouling.

To find out more, visit exfan-project.eu.

The European Green Deal: climate-neutral aviation by 2050

Climate change and environmental degradation are an existential threat facing Europe and the rest of the world.

To address this threat, the European Green Deal aims to achieve climate-neutral aviation by 2050, and to achieve this goal hydrogen fuel cell-based propulsion technologies is one of the available alternatives.

Pilot plants point to the future at CIDETEC event

A CIDETEC workshop asks the big questions when it comes to the challenges faced during the scale-up of a surface treatment



The event in the Basque region of Spain was organised within the frame of the Sure2Coat European project and was dedicated to the development of sustainable surface treatments, with the collaboration of the Bilasurf project

A recent CIDETEC Surface Engineering event in San Sebastian hosted a workshop that asked what are the main challenges encountered during the scale-up of a surface treatment and how can we address them to ensure its successful industrialisation?

The workshop, *Surface Treatments Pilot Lines*, offered a detailed view on the need for the use of pilot plants for the scale-up of different surface treatment processes. Leading-edge technologies arise from fundamental research conducted at laboratory scale, which, before being implemented on an industrial scale, must be scaled up and applied in pilot plants.

Organised within the frame of the [Sure2Coat European project](#), the event in the Basque region of Spain was dedicated to the development of sustainable surface treatments, with the collaboration of the Bilasurf project, also funded by the EU. During the workshop, the importance of validating surface treatment methods that are environmentally friendly and can be integrated into production processes with lower energy consumption and environmental impact was highlighted.

The workshop featured presentations by top-level experts from leading companies, centres, and universities. CIDETEC presented an overview of the challenges for the scale up of electrochemical surface treatments with dedicated talks about up-scaling electrodeposition, anodising and e-coating technologies.

HEREON presented a comprehensive guide to PEO process and the challenges for its industrialisation together with Micro-Arc S.C. company. Computer simulations for assisting the upscaling of electrochemical surface treatments processes also had a dedicated presentation by Elyca, explaining successful examples related to simulation of electrochemical processes.

PILOT PLANTS

Attendees were then given the opportunity to visit CIDETEC's facilities and see live demonstrations of surface treatments applied across five pilot plants, including versatile or automated pilot plants for the application of chemical and electrochemical surface treatments, and a robotic painting cabinet. These five pilot plants are responsible for driving innovation and adapting cutting-edge technologies to the needs of the industry, all in line with sustainability and environmental policies.

The second day of the workshop focused on Laser Surface treatments, beginning with a talk from the University of Aveiro on laser processing for synthesis and surface modifications. Ceit, coordinator of the Bilasurf project, discussed industrial applications of Laser Surface Treatments and the workshop concluded with a visit to its facilities. The workshop provided participants with a comprehensive overview of the challenges and opportunities in this crucial field for the industry.

Karaman hosts KORSEM'24 international symposium

Co-hosted by the Corrosion Association of Turkey, the theme of the EFC event was *Corrosion Mitigation for a Sustainable Future*



The 16th International Corrosion Symposium, KORSEM'24 was hosted by Karamanoglu Mehmetbey University from 23rd to 25th May 2024 in Karaman, Turkey by the Corrosion Association of Turkey.

KORSEM'24 once again provided a successful platform for sharing the latest technical, experimental and theoretical developments in corrosion prevention at the conference, which this year was themed around *Corrosion Mitigation for a Sustainable Future*. The symposium was held in both

Turkish and English, and featured participants and speakers from Italy, France, Poland, Serbia, Morocco, Algeria, Egypt, Iran, and Turkey. Two opening presentations, 45 oral presentations, five virtual presentations, and seven poster presentations were absorbed by 114 people across three different conference rooms simultaneously. The main categories of the presentations included microbiologically induced corrosion, inhibitors, corrosion of rebars in concrete and corrosion measurement techniques.



Attendees of the 16th International Corrosion Symposium KORSEM'24 enjoyed 45 oral presentations, five virtual presentations, and seven posters, as well as sightseeing tours to visit the Primary School Museum (top) and Manazan caves (right)



TURKISH DELIGHT

Sightseeing tours and dinners were also organised during the symposium, as participants visited the Primary School Museum (above), which demonstrates the educational system in the Turkish Republic, before enjoying dinner in the province of Mut Sertavul. On the second day, after visits to the Karaman Museum, Madrasa of Hatuniye and Akteke Mosque, Karaman's traditional food was served for dinner. The last day was completed with the tour of Manazan and Incesu caves, along with Taskale Granary. To find out more visit the [KORSEM'24 website](#).

ACA announce Corrosion & Prevention 2024

This year's conference focuses on addressing corrosion challenges in marine and coastal environments



Wikimedia Commons

The city of Cairns (left) on the tropical north east coast of Far North Queensland will host the Corrosion & Prevention 2024 conference in November, which will also include a specific Applicator Day

The Australasian Corrosion Association Inc. has announced details of the Corrosion & Prevention 2024 conference, which is set to take place from 10 to 14 November 2024 at the Cairns Convention Centre, Australia.

The theme of this year's conference focuses on addressing corrosion challenges in marine and coastal environments, with the aim of bringing together industry experts and asset owners for a series of engaging and informative sessions.

CONFERENCE HIGHLIGHTS

The main conference will take place from 10 to 13 November, before the Applicator Day on Thursday 14 November.

The event in the state of Queensland will feature a variety of technical papers, case studies, and presentations from leading professionals in the field of corrosion science and engineering. Providing an excellent platform for networking, the event will also offer opportunities for knowledge exchange and career development.

If you're interested in sponsoring or exhibiting at the Cairns Convention Centre then submit an Expression of Interest on the [ACA website](#) and someone from the team will be in touch.

WHY ATTEND?

Corrosion & Prevention 2024 offers the opportunity to:

- Gain insights into the latest research and developments in corrosion science
- Network with industry experts, asset owners, and fellow professionals
- Participate in discussions and workshops focused on practical solutions to real-world corrosion problems

ABOUT CAIRNS

Nestled in tropical North Queensland, Cairns is renowned for its proximity to the Great Barrier Reef and the Daintree Rainforest. This vibrant city offers stunning coastal scenery, unique wildlife, and thrilling adventures. Enjoy snorkelling, diving, and exploring lush rainforests while networking and unwinding in Cairns' warm, welcoming atmosphere.

HOW TO REGISTER

For more information about the conference, including registration details and submission guidelines for papers, please visit corrosion.com.au/conference/. The organising committee look forward to welcoming you to Cairns for what promises to be an informative and impactful event.

About Corrosion & Prevention 2024

- Main Conference: 10 to 13 November 2024
- Applicator Day: Thursday 14 November 2024
- Location: Cairns Convention Centre, Australia
- This year's theme: *Navigating corrosion challenges in marine and coastal environments*

APCE deliver two courses and address ongoing challenge

The APCE-PoliLaPP courses are recognised for EN certification and form part of their focus on keeping cathodic protection alive in the EFC



Recognised for EN certification in compliance with EN 15257, the APCE-PoliLaPP training courses offer students a career in cathodic protection for a professional development in soil, sea water, concrete, and internal applications

The APCE has delivered two successful EFC approved EN 15257 training courses for extra-European delegation.

The Association for Protection against Electrolytic Currents (Associazione per la Protezione dalle Correnti Elettrolitiche) APCE-PoliLaPP training courses are recognised for EN certification in compliance with EN 15257, and offer students a comprehensive career in cathodic protection for a professional development from level 1, 2 and 3 in soil, sea water, concrete, and internal applications. Certification can be delivered after exams from CICPND recognised authority (accredited by Accredia). The CP level 2 – Cathodic Protection Technician course is an intensive five-day course presenting CP technology, which prepares attendees for EN certification exams.

This course is designed for people with extensive CP field experience and a strong technical background in cathodic protection.

Corrosion of steel used to build the industry's infrastructure, onshore and/or offshore, is a phenomenon well known to all. However, it could be totally invisible and imperceptible until the integrity of the structure is questioned, because it can manifest itself through damage with the rupture of pipes as part of a slow deterioration process over time.

What is often not adequately considered in the full extent of the phenomenon is the economic magnitude of the corrosion. Studies carried out back to the 1970s show an

estimate of 3 to 4% of GDP rather; on the other hand, studies showing that 60% of extraordinary maintenance costs depend precisely on corrosion of infrastructure.

REFERENCE OF QUALITY

For more than 40 years, APCE has supported the water, oil and gas industry to popularise the know-how of cathodic protection to mitigate the corrosion phenomenon. APCE has been recognised by government as a useful reference to increase the level of the quality of an industrial service: safety and operational continuity.

APCE is focused on keeping the collaboration alive in the EFC and on international regulatory tables, which allows APCE Members to stay up to date on the international benchmark, as well as take advantage of opportunities for comparison and collaboration with European partners, and contribute relevant and up to date knowledge of cathodic protection within the EFC.

With established experience in the implementation of cathodic protection for the natural gas transmission distribution and storage industry, APCE believes that those experience can be made available to the water world too, identifying the most appropriate application and maintenance criteria in order to make savings in extraordinary infrastructure maintenance aspects, and achieve an important goal for the future.

To find out more, visit apce.it.

EFC Member Society, HDZAMA host KORMAT 2024 in Croatia

The 26th International Conference of Materials Protection and Industrial Finish led celebrations of a momentous anniversary



In the frame of International Machine Tools and Welding and Anticorrosion Fairs, the Croatian Society for Materials Protection (HDZAMA) organised the 26th International Conference of Materials Protection and Industrial Finish, KORMAT 2024 on 10 April 2024.

The conference presented various methods of corrosion protection of construction materials and modern achievements in the field of surface preparation and protective coatings, application of stainless steels and processing, corrosion inhibitors, cathodic protection, prevention of corrosion in oil industry, welding, failure analysis, testing, and quality assurance.

A total of 17 scientific lectures were held at the conference, which featured guest lectures by Dr. Claus Qvist Jessen from Damstahl A/S, Denmark, Dr. Johann Wilhelm Erning from BAM, Germany, and Dr. Abdelkader Oulhadj from MCTech, Algeria.

Providing a place of connection and co-operation for scientists and experts from the industry in Croatia and abroad, the conference was an EFC approved event. A total of 50 people participated to improve their knowledge of construction materials behaviour, proper materials selection, and modern methods of corrosion protection.

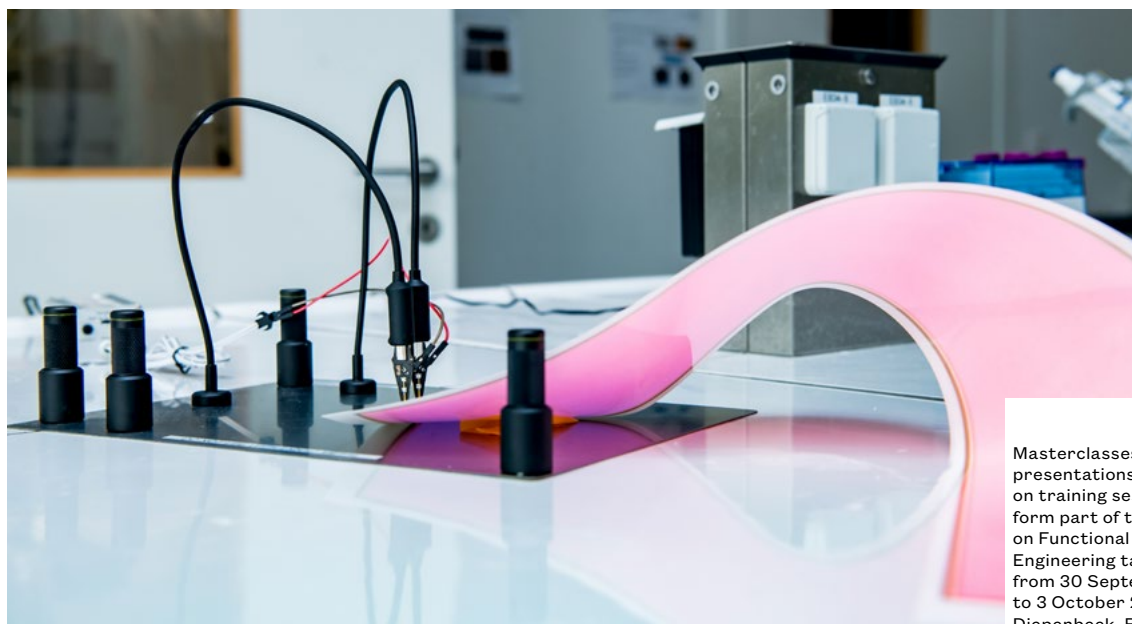
The conference also marked the 70th anniversary of the establishment of the Croatian Society for Materials Protection and was dedicated to the work and memory of Professor Ivan Esih, one of the founders of the Croatian Society for Materials Protection, and long-time president.



On the society's 70th anniversary, Prof. Ivan Juraga held a plenary lecture titled, *The importance of the Croatian Society for Materials Protection in education, knowledge transfer and connection with universities in the Republic of Croatia*

Conference on Functional Materials Engineering

Co-hosted by member organisations of VOM, the conference in Belgium will be co-ordinated by Tom Hauffman and Iris De Graeve



Masterclasses, keynote presentations, and hands-on training sessions will all form part of the conference on Functional Materials Engineering taking place from 30 September to 3 October 2024 in Diepenbeek, Belgium

Details of the conference on Functional Materials Engineering taking place from 30 September to 3 October 2024 in Diepenbeek, Belgium have been announced by the organising committee.

Co-hosted by imo-imomec (Hasselt University), KU Leuven, and Vrije Universiteit Brussel, member organisations of the Belgian EFC Member Society, VOM, the conference will focus on the complete value chain of functional materials engineering. The event will be co-ordinated by Prof. Tom Hauffman, Prof. Wim Deferme, Prof. David Seveno, and Prof. Iris De Graeve, and include an exploration of the deposition and application of functional materials, as well as its characterisation, with a focus on four specific topics related to Functional Materials Engineering.

→ **Materials technologies for engineering liquid-surface interactions**

Mastering the control of liquid/solid interactions is crucial for diversifying the functionalities of surfaces and interfaces, while also ensuring the high-quality implementation of coating and printing processes. This session aims to shed light on mechanisms and processes that help engineer liquid/surface interactions to better design surfaces.

→ **Materials technologies for durable coatings**

For the creation and/or improvement of metal surface properties, advanced coating systems are developed based on durable chemistries and processing. This development requires an interdisciplinary approach combining organic,

inorganic and hybrid chemistries, dedicated surface and interface analyses, and properties' experimental investigations combined with advanced modelling.

→ **Materials technologies for flexible and stretchable electronics**

Integration of sensors and electronic components into products make them smart for use in Internet-of-Things applications. To seamlessly embed the electronic components and circuitry, ultrathin deposition of (conductive) materials is necessary. In this session, the focus lies on the deposition of conductive circuits, (printed) sensors and integration of electronic components on flexible and stretchable substrates, or for their (hybrid) integration in 3D applications.

→ **Materials technologies for organic and perovskite electronics**

Organic materials are widespread alternatives to their inorganic variants for applications such as photovoltaics, light emitting devices, photodetectors, and thermoelectrics. In this session, the application of these organic materials, device architectures for energy applications and their characterisation are focal points. Combining the organic materials expertise with large-area deposition techniques makes these materials ultimate candidates for renewable energy applications of the future.

The conference will include masterclasses, keynote presentations, and hands-on training sessions. To find out more, visit uhasselt.be/en/instituten-en/imo-imomec/.

Tradition takes AETOC 2024 to Dutch coastal town

Hosted by Delft University of Technology, the 13th AETOC included a range of scientific talks, networking, and social activities



The Dutch coastal town of Egmond aan Zee provided the location for the 13th edition of AETOC, which welcomed 40 international participants in the field of electrochemical techniques from 12 countries and three continents

The 13th International Workshop on Application of Electrochemical Techniques to Organic Coatings ([AETOC](#)) was hosted by Delft University of Technology in Egmond aan Zee, the Netherlands from 28 to 31 May 2024.

The [Working Party 14](#) umbrella event is recognised for providing opportunities to exchange new ideas, establish research relations, and find global partners for future collaborations. And following a long tradition of biannual AETOC conferences organised somewhere in the hills or by the sea, the Dutch coast proved an ideal location for the 13th edition of AETOC.

The local organising committee, representing the Department of Materials Science and Engineering (Faculty of Mechanical Engineering) and the Department of Aerospace Structures and Materials (Faculty of Aerospace Engineering) of Delft University of Technology, welcomed 40 dedicated international participants in the field of electrochemical techniques applied to organic coatings, traveling from 12 countries and three continents.

Former EFC President and AETOC organiser, Jörg Vogelsang, presented the history of AETOC during a pre-dinner speech at the three-day event that included 24 scientific talks, networking activities, and a few much-needed social events in a friendly environment.

During the first conference day, scientific sessions were alternated with a network activity, consisting of a lecture by Peter Visser (AkzoNobel) about trends for sustainable

coatings, and a Virtual Paint Spray Experience using an advanced virtual reality training technology provided by his colleagues. In addition, industrial sponsors, BioLogic, Bruker, and Metrohm, showcased their latest developments in techniques useful for researchers in the field.

The AETOC workshops deal with topics related to recent developments in the application of electrochemical techniques to the study and monitoring of organic coatings, as well as novel developments in coating technologies and techniques complementary to electrochemistry. Among other topics, AETOC24 brought smart insights and interesting observations on local electrochemical evaluation of corrosion (inhibition) activity within coating defects and delaminations, ongoing debates on the interpretation of electrochemical impedance spectroscopy results, and challenges and opportunities provided by electrochemical noise analysis. Also, the need and strengths of complementary and in-situ analysis by spectroscopic and microscopic imaging techniques were highlighted.

AETOC 2024 will be remembered for its valuable scientific discussions and enjoyable social interactions near the sea, organised by Arjan Mol, Santiago Garcia, Can Özkan, Reina Boerrigter and Deborah Dongor of Delft University of Technology, with the support of Elsevier and the Dutch Research Council (NWO). The next edition will take place in Portugal in two years, organised by Alexandre Bastos (University of Aveiro) and this team.

A collaborative focus for EUROCORR 2025

Focusing on smart and sustainable solutions for fighting corrosion in society, it will be the first EUROCORR in Norway since 1997



EFC COO, Pascal Collet (left) together with EUROCORR 2025 Chair, Torfinn Havn, on the top of the world where they planned the last few details for next year's highly anticipated conference in Stavanger

The Norwegian Corrosion Society (NKF) is continuing its preparations for EUROCORR 2025, which will be hosted in Stavanger, Norway from 7 to 11 September.

Located on the southwest corner of Norway, Stavanger offers easy access from mainland Europe and across the world, so be sure to save the date.

The conference will be held in Stavanger Forum, one of the largest and modern conference and exhibition centres in Norway, while the conference dinner will be arranged in the beautiful harbour of Stavanger.

Throughout 2025 there will be a range of special events taking place in Stavanger, as the historic city and its cathedral celebrate their 900th year. The magnificent cathedral is currently under renewal and is well worth a visit, and the city's rich and interesting history makes Stavanger the city that in many ways, forged Norway.

The title of the EUROCORR 2025 is *Joining forces for smart and sustainable solutions for fighting corrosion in society*, and the Norwegian Corrosion Society believe that corrosion and electrochemistry will be a contributing factor in solving the collective challenges of our future.

Efforts are currently being made to ensure that EUROCORR 2025 is a memorable event. In addition to the technical presentations and discussions, the conference will be supported by interesting and up-to-date plenary lectures, as well as workshops on stainless steels based on the latest research in the field.

The small city of Stavanger, with its long history and impressive surrounding nature is sure to make the stay an unforgettable one. Guests will also have the option to take in the Lysefjord cruise to Pulpit Rock, from where views of the deep cold blue fjord and its high, steep surrounding mountains provide an unforgettable vista for those willing to make the climb.

It was from here that the last details for EUROCORR 2025 were put together on top of Pulpit Rock by EFC COO, Pascal Collet and EUROCORR 2025 Chair, Torfinn Havn (pictured above) in June 2024.

IMPORTANT DATES

Abstract submission: **15 January 2025**

Notification of acceptance to authors: **Mid-April 2025**

Reduced fee for early registration: **End of May 2025**

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EUROCORR 2025

NKF conference offers glimpse of future EUROCORR

The Norwegian Corrosion Society, NKF Norway arranged their bi-annual Conference on Materials and Corrosion prevention



The University of Stavanger was the location for the NKF Norway organised conference on Materials and Corrosion prevention, which this year was titled, Noble Future

On 13th and 14th June, the Norwegian Corrosion Society, NKF Norway arranged their bi-annual Conference on Materials and Corrosion prevention. Titled *Noble Future*, the conference intended to reflect the increased use of high alloyed stainless steels, like duplex and superaustenitic, as well as Titanium in various industries.

The University of Stavanger hosted the conference, with presentations in a mix of Norwegian and English, (with English text on Power Point presentations) from big names active in the energy sector, acting as operators, contractors, service providers, manufacturers, and working in universities.

Representatives from Equinor, Winterstall, SINTEF, Subsea7, FORCE Technology Norway AS, TUBACEX, DNV, SFF Group, ICR-world, International Paints by Akzo Nobel, Effe, Norwegian University of Science and Technology all presented at the conference.

Experiences from recent new build oil and gas projects like Johan Castberg (pictured above) were highlighted, as



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well as the use of aluminium alloys offshore, and how to avoid galvanic corrosion. One part of the session focused on how to cope with un-expected happenings impacting quality and schedule.

DISCUSSION TOPICS

New technologies and standards were explained, while the old hydrogen embrittlement of steel phenomena was discussed. This time the background was transportation of hydrogen through existing gas pipelines, and the possible impact of hydrogen to the steel manufactured 30 to 40 years ago.

EFC COO, Pascal Collet was also present in Stavanger and provided an overview of how the Federation can contribute and how its members can benefit from the association.

The conference has been arranged in Stavanger bi-annually since 1992 and offered participants of this EFC event a taste of what can be expected at EUROCORR 2025, which will be held in Stavanger in September next year.

Stay up to date with EFC events 2024-2025

Make a date in your corrosion calendar for all the latest EFC events and conferences from around the world



EFC SUMMER SCHOOL ON CORROSION IN GREEN ENERGY TECHNOLOGIES

Paris, France, 28-30 August 2024

Scope: This EFC Summer School provides a great opportunity for graduate students and post-docs from both, renewable energy technology and corrosion science, for further specialised training interfacing the principles of green energy technologies and corrosion science approaches.

Visit: eurocorr2024.org/efc-summer-school

EUROCORR 2024

Paris, France, 1-5 September 2024

EFC Event No. 495

EFC's annual EUROCORR conference in 2024 is hosted by CEFRACOR, the French Corrosion Society.

Scope: The programme will include plenary lectures, keynote lectures oral and poster presentations in all the areas covered by the EFC Working Parties and Task Forces and other hot topics.

Visit: eurocorr2024.org

29TH INTERNATIONAL CONFERENCE ON MATERIALS AND TECHNOLOGY (29 ICM&T)

Portoroz, Slovenia, 2-4 October 2024

EFC Event No. 515

Organised by the Institute of Metals and Technology

Scope: Materials development and characterisation, biomaterials, materials for extreme environments, additive manufacturing and advance processing, materials and sustainable development. In addition, there will be a traditional session that's dedicated to young researchers and a meeting of Slovenian companies and research institutes.

Visit: icmt29.com/en/

1ST INTERNATIONAL SYMPOSIUM ON SOLAR STRUCTURE DURABILITY

Parma, Italy, 20 November 2024

EFC Event No. 516

Organised by the Swedish EFC Member Society RISE

Scope: Corrosion degradation of PV solar support structures including different materials in both soil and atmosphere.

Visit: ri.se for programme and registration information

INTENSIVE COURSE ON CORROSION AND SCALE-INHIBITION

Iserlohn, Germany, 18-20 February 2025

EFC Event No. 519

The course is organised by the EFC Working Party 1 on Corrosion and Scale Inhibition and summarises the present-day knowledge in theory, testing and application of corrosion and scale inhibitors. The emphasis is on

application in selected technical fields and discussion of environmental aspects. One focus is on explaining basic principles of registration of inhibitor chemicals within the European REACH regulation (Registration, Evaluation, Authorisation and Restriction of CHemicals). Questions will be discussed which chemicals will remain in future in the list of environmentally accepted substances and what strategies are available to select alternatives for presently still needed, however, environmentally less-friendly inhibitor compounds.

For more information contact: office@infinkor.de

EUROCORR 2025

Stavanger, Norway, 7-11 September 2025

EFC's annual EUROCORR conference in 2025 will be hosted by the Norwegian Corrosion Society (NKF) in the Stavanger Forum, Stavanger, in Norway, where there will be a focus on smart and sustainable solutions for fighting corrosion in society.

Visit: eurocorr2025.org

9TH INTERNATIONAL WORKSHOP ON LONG-TERM PREDICTION OF CORROSION DAMAGE IN NUCLEAR WASTE SYSTEMS (LTC 2025)

Sendai, Tohoku Region, Japan, 4-6 November 2025

EFC Event No. 501

Japan Society of Corrosion Engineering (JSCE), Nuclear Waste Management Organization of Japan (NUMO) and EFC WP4 on Nuclear Corrosion

Scope: Overview on national disposal programmes with emphasis on similarities, common challenges and different approaches, regulatory issues, retrievability, etc. Development of and long-term performance assessment of high-level waste disposal containers. Experimentation with

candidate materials, including laboratory tests, full-scale demonstration, in-situ testing, methodology, modelling, monitoring and design.

EUROCORR 2026

Dublin, Ireland, 6-10 September 2026

EFC Event No. 510

EFC APPROVED COURSES 2024

Milano, Italy, 16-17 September 2024

Course: ADDETTO alla Protezione Catodica di strutture metalliche interrate e immerse

Lyon, France, 24-26 September 2024

Course: Traitement des eaux industrielles: générateurs de vapeur et circuits de refroidissement (Niveau 1)

Milano, Italy, 7-11 October 2024

Course: TECNICO addetto alla Protezione Catodica di strutture metalliche interrate e immerse

Milano, Italy, 21-25 October 2024

Course: TECNICO SENIOR addetto alla Protezione Catodica di Strutture metalliche interrate e immerse

Lyon, France, 26-28 November 2024

Course: Traitement des eaux industrielles: générateurs de vapeur et circuits de refroidissement – Approfondissement (Niveau 2)



ADMINISTRATION UPDATE

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LEGAL NOTICE

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