

## EUROCORR 2022

28<sup>th</sup> August – 1<sup>st</sup> September 2022  
Berlin, Germany

### EUROCORR 2022 European Corrosion Congress

Corrosion in a Changing World –  
Energy, Mobility, Digitalization



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**ANNOUNCEMENT**

[www.eurocorr2022.org](http://www.eurocorr2022.org)

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## A FEW WORDS FROM THE EFC PRESIDENT

*To all the members of the European Federation of Corrosion and EUROCORR participants*

Dear Reader of this brand-new EFC newsletter,

Once again, as in 2020, this year's EUROCORR is a virtual one, perfectly organized primarily by HUNKOR, the Science & Technology Advisory Committee (STAC) of EFC, EuFedNet, Diamond Congress Ltd and DECHEMA e.V. Unfortunately, this is the second year without the chance to meet in person, to meet our friends and colleagues and to have lively discussions about presentations, posters or create some "crazy" ideas for the next research proposals.

We as EFC are thoroughly sorry that our Hungarian hosts, who prepared a wide range of wonderful examples of Hungarian hospitality, will not be able to welcome us.

In this newsletter we present the award winners of the European Corrosion Medal, the Kurt-Schwabe-Prize, and the EFC Honorary Fellows. We are covering our new EFC labeling for corrosion education courses, news from EFC member societies and EFC working parties. We announce the next issue of symposium AETOC in 2022 and even more importantly we provide the first details of EUROCORR2022. With two missed EUROCORR conferences we hope to meet next year in the vibrant capital of Germany for "EUROCORR2022" in Berlin.

The leadership of EFC is on the way to establishing a social collaboration platform called EFC Hub which should facilitate collaboration and interaction between experts in corrosion and corrosion protection with EFC – officials, Working parties and member societies. This platform provides the perfect basis to establish new projects and activities across Europe and even beyond. EFC Hub allows users to post news, to find experts for common ventures, to advertise various kind of events and finally the EFC Hub will allow us easier collaboration, without sending floods of emails.

Documents can be shared easily, these can be commented on and shared further with others like Working Parties or member societies. EFC Hub will be free of charge for experts and member societies; an extra beneficial service for the corrosion community provided by EFC.



All aspects of diversity are currently very much in the awareness of a broad majority of societies. EFC is seeking opportunities to build a roadmap for a more diverse and more inclusive atmosphere in our federation. We know that women are underrepresented in the leading roles of EFC. Individuals with disabilities are not taking part in our events. People of colour are completely missing in steering and leadership teams. This must be changed so that barriers to inclusion are removed. This is certainly a demanding and long term goal. We as a federation must rethink our attitude and rules. We should find better ways to foster minorities and to obtain a balanced and diverse composition of our teams.

I hope you enjoy this newsletter and look forward to meeting you again in person at EUROCORR2022 at the latest.

Kind regards

**Jörg Vogelsang**  
EFC President

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## EFC ADMINISTRATION UPDATE

**President:**

Jörg Vogelsang, Zurich, Switzerland

**Vice-President:**

Tomas Prosek, Prague, Czech Republic

**Science and Technology Advisory Committee Chairman:**

Wolfram Fürbeth, Frankfurt am Main, Germany

**Scientific Secretary:**

Roman Bender, Frankfurt am Main, Germany

**Frankfurt Office:**

Andreas Förster / Ines Honndorf

**Paris Office:**

Philippe Marcus / Pascale Bridou Buffet

**London Office/Honorary Treasurer:**

Colin Church / Julija Bugajeva

**EFC Newsletter Editor/ Assistant Editor:**

Douglas Mills / Louise Atkin



## EUROCORR 2021 NEWS IN BRIEF

Virtual event, 20-23 September 2021

*Motto: Materials science and advanced technologies for better corrosion protection.*

### Programme:

The preliminary scientific programme for Virtual EUROCORR 2021 is online

The programme includes:

- 5 Plenary Lecture, incl. presentation of the European Corrosion Medal and the Kurt Schwabe Prize
- more than 450 oral presentations
- more than 70 poster presentations
- more than 10 sponsors and exhibitors

For details see:

<https://eurocorr.org/EUROCORR+2021/Programme.html>

### Registration:

**Don't miss the opportunity to be part of Virtual EUROCORR 2021!**

The registration is still open. [REGISTER HERE!](#)

### Sponsors & Exhibitors (as of 9 September):

We are pleased to welcome Automa (Gold), Gamry Instruments, HTDS and Metrohm Autolab (Silver) as well as Pietro Fiorentini (Bronze) as our sponsors (see *below and next page*) and AMPP, Comsol, EFC, EUROCORR 2022, KNOVEL, Neftegaz Kompleks, and WCO as additional exhibitors.

*We look forward to meeting you virtually in September!*

*Advertisement EUROCORR 2021 gold sponsor Automa*

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**control**  
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## EUROCORR 2021 SPONSORS

**GOLD  
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**SILVER  
SPONSORS**



**BRONZE  
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## EU FED NET



### The Network for Chemical Engineering, Corrosion and Material Sciences and Biotechnology

**EuFedNet** is a virtual platform for Webinars, Conferences, Panel Discussions and much more, supported by the European Federation of Corrosion. To date, it includes more than 800



recorded lectures from virtual EUROCORR 2020 and other virtual conferences and webinars in the field of corrosion, chemical engineering and biotechnology.

The recorded lectures are available to browse, rate and comment! All attendees of a conference have unlimited access to the respective lectures for 100 days.

***Join our active community. We look forward to meeting you!***

#### **Our Services**

You would like to organise a virtual event and look for a reliable partner who is familiar with the scientific field and technical opportunities? We will be happy to support you!

Contact us! Email: [info@eufed.net](mailto:info@eufed.net)

Website: <https://eufed.net>

# EUROCORR 2022 - THE EUROPEAN CORROSION CONGRESS BERLIN, GERMANY, 28TH AUGUST – 1ST SEPTEMBER 2022



Motto: *Corrosion in a Changing World – Energy, Mobility, Digitalization*

## Invitation

The EUROCORR local conference organising committee is pleased to invite you to the European Corrosion Congress 2022 which is to be held in Berlin, Germany. EUROCORR 2022 is organised by the German EFC member societies DECHEMA (Society for Chemical Engineering & Biotechnology) and GfKORR (Society for Corrosion Protection). The flagship event of the European Federation for Corrosion will take place in the heart of Berlin at the Berlin Central District Hotel (managed by Marriott - [www.hotelberlincentraldistrict.com](http://www.hotelberlincentraldistrict.com)).

**BERLIN IS ATTRACTIVE.  
BERLIN IS DIVERSE.  
BERLIN SETS TRENDS.**

Consequently, the German capital is one of the most visited cities in Europe. First-class museums, international trade fairs, the zoological garden, art galleries and sights of all kinds attract visitors in droves. Whether at Brandenburg Gate and Reichstag building, Potsdamer Platz, Alex, Kurfürstendamm or Prenzlauer Berg: the city has many facets and is full of surprises. Berlin stands for freedom, tolerance and the diversity of lifestyle. Go on a journey through time and discover the scenes of world history and contemporary modern architecture in Berlin.



Brandenburg Gate  
(Copyright: visitBerlin, Foto: Wolfgang Scholvien)



Museum Island  
(Copyright: visitBerlin, Foto: Wolfgang Scholvien)



Reichstag building inside  
(Copyright: visitBerlin, Foto: Wolfgang Scholvien)



Exterior of Reichstag building  
(Copyright: visitBerlin, Foto: Artfully Media, Sven Christian Schramm)

EUROCORR attracts over one thousand corrosion experts from all over the world every year. The high level of scientific expertise of the participants has made EUROCORR the leading global scientific conference on corrosion research and is a permanent item on the agenda of experts from universities and industry. For young colleagues the Young EFC provides a platform to exchange ideas with expert colleagues and to become part of a unique network.

You should therefore already note the date and plan a trip to Berlin in autumn 2022.

### Conference Programme

The conference programme will include **plenary meetings, keynote lectures, oral and poster presentations**, supported by the various **EFC Working Parties** along with **specific workshops**.

Preliminary list of topics:

- Corrosion in Green & Low Carbon Energy Technologies
- Corrosion of Biomaterials
- Corrosion in the Chemical Process Industry
- Corrosion Control in Aerospace
- Automotive Corrosion
- Corrosion Reliability of Electronics
- Corrosion in Oil and Gas Production
- Corrosion Challenges in Nuclear Industry and Waste Disposal
- Corrosion by Hot Gases and Combustion Products
- Marine Corrosion
- Microbial Corrosion
- Corrosion of Steel in Concrete
- Corrosion in Refinery and Petrochemistry
- Coatings
- Cathodic Protection
- Corrosion of Polymer Materials
- Corrosion and Corrosion Protection of Drinking Water Systems
- Corrosion of Archaeological and Historical Artefacts
- CO<sub>2</sub>-Corrosion in Industrial Applications
- Atmospheric Corrosion
- Corrosion Mechanisms, Methods and Modeling
- Corrosion Education
- Corrosion and Scale Inhibition
- Environment Sensitive Fracture
- Tribo-Corrosion

### Exhibition and sponsorship - *Why become an exhibitor or sponsor?*

Sponsoring & exhibition is an integral part of EUROCORR 2022 and offers a unique opportunity to promote your technologies, products and services. Enhance your visibility, introduce new products or

services. EUROCORR 2022 provides a various range of sponsorship and exhibition options that can be tailored to your requirements and to suit your budget. Extensive pre-conference publicity will promote your organisation to the widest possible audience.

- EUROCORR 2022 sets out to become once more the “place to be” where new developments regarding all facets of corrosion and corrosion protection will be jointly discussed for mutual benefit.
- More than 1.200 international delegates from industry and academia are expected to attend the conference in August 2022. This delegate base offers you access to a truly international audience.
- EUROCORR 2022 will be a unique networking opportunity with personal contact to leading scientists, representatives of research institutions, university and industry and graduate students.
- Connect with the decision makers from research and industry in all fields of corrosion; strengthen your network as you build upon existing and generate new relationships.
- Yet, as each of the involved disciplines has seen amazing progress, the mission of providing an effective platform for exchange is even more important.
- Corrosion is a hot topic in different industries, expand your customer base e.g. in oil & gas, automotive, aerospace and all other areas.
- Lots of time for exchange: All coffee and lunch breaks plus the welcome reception and the poster party will take place in the exhibition area.

For further details see:

[https://dechema.de/Veranstaltungen/EUROCORR+2022/Exhibition+\\_Sponsoring.html](https://dechema.de/Veranstaltungen/EUROCORR+2022/Exhibition+_Sponsoring.html)

### Save the dates

<b>The call for papers will open in Autumn 2021.</b>	
<b>Paper Submission Deadline:</b>	<b>14 January 2022</b>
<b>Early Bird Registration Deadline:</b>	<b>31 May 2022</b>

### Organiser & contact

DECHEMA e.V.

Andrea Köhl / Jacqueline Luque-Hornero

60486 Frankfurt am Main

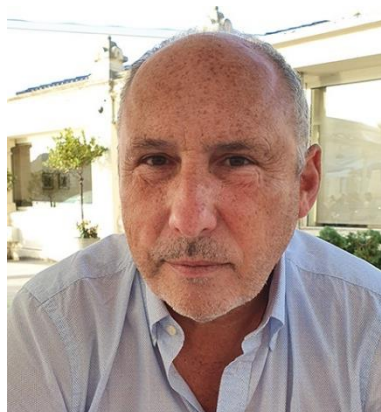
E-mail: [andrea.koehl@dechema.de](mailto:andrea.koehl@dechema.de) /

[jacqueline.luque@dechema.de](mailto:jacqueline.luque@dechema.de)

Website: [www.eurocorr2022.org](http://www.eurocorr2022.org)



## EUROPEAN CORROSION MEDALLIST – PROFESSOR DOMINIQUE THIERRY



**Professor Dominique Thierry** has been announced as this year's laureate of the European Corrosion Medal.

He is being acknowledged for his outstanding contribution and significant research

in the fields of atmospheric corrosion and corrosion protection in different applications, including corrosion in the transport industry (mainly automotive and aerospace), corrosion properties of pre-painted (coil-coated) steel products, corrosion protection of steel by zinc and alloyed zinc coatings, accelerated and field corrosion testing, and sensing, monitoring and modelling. His research also focussed on microbially influenced corrosion and biomaterials, and, in the last decade, corrosion protection for oil and gas and offshore applications.

This is reflected in his recognition as an internationally renowned corrosion scientist with a deep understanding of corrosion mechanisms, who expands the boundaries of our understanding of corrosion processes in different applications as well as his (co-)authorship of more than 200 publications in peer-reviewed journals and a list of invited lectures at the most prestigious corrosion conferences. His ability to communicate easily on any corrosion issue with both industrial and academic communities substantially helped in building bridges and a sustainable business around it.

Moreover, the Jury recognised his committed, long-lasting and ongoing service for the EFC in many

aspects and positions, such as regular attendee of and presenter at EUROCORN Congresses, and as a member and Chairman (1997-2003) of the EFC Working Party 10 on Microbial Corrosion.

Dominique Thierry is the founder (2002) and managing director of the French Corrosion Institute (Institut de la Corrosion), a non-for-profit research institute in Brest, France, with currently around 50 employees. He obtained his PhD in corrosion science from the Pierre and Marie Curie University, Paris, France; in 1988 and was researcher at the Swedish Corrosion Institute in Stockholm, Sweden (1982-1989). After a two-year research stay at IRSID, Saint-Germain-En-Laye, France, in 1991 he returned to the Swedish Corrosion Institute as a researcher and later director (until 2003). Dominique Thierry spent most of his professional carrier at the Swedish Corrosion Institute and later on at the French Corrosion Institute (Institut de la Corrosion), which are now both a part of RISE, a Swedish research organization.

Throughout his career he was the Chairman of a European network on Microbial Induced Corrosion (MIC) (1998–2003), Swedish National secretary of the International Electrochemical Society (1997–2003), Coordinator of about 20 European projects, Chairman of NACE TEG 523X and Vice president of CEFRAFOR. In consideration of his global reputation and the quality of research and teaching, and his communication skills that facilitated the building of a bridge between academia and industry, he is a very worthy recipient of the **European Corrosion Medal**.

Professor Dominique Thierry is invited to give a Plenary at the opening of the virtual EUROCORN 2021 on Monday, 20 September 2021.

### ABOUT THE EUROPEAN CORROSION MEDAL



The purpose of the European Corrosion Medal is to recognise achievements by a scientist, or group of scientists, in the application of corrosion science in the widest sense. The recipient(s) must be of a nationality corresponding to one, or more, of the Member Societies of the EFC and the work must be conducted within a European country.

The award consists of a bronze medal, a diploma, and a sum of 1000 Euros. The European Corrosion Medal is awarded every year, preferably on the occasion of a European Corrosion Congress (EUROCORN). The laureate is invited to give a lecture related to the work for which the medal was attributed.

Website: <https://efcweb.org/Awards/European+Corrosion+Medal.html>

## KURT SCHWABE PRIZE – DR. RICHARD JAMES BARKER



The 2021 Kurt Schwabe Prize has been awarded to **Dr. Richard James Barker** who was selected from among 7 high quality applications for this year's award for young scientists.

He achieved the best evaluation results in terms of knowledge and expertise achieved in corrosion research, number of publications, impact factors, other scientific factors (e.g. h index), years spent on corrosion, awards, teaching activity, activity as reviewer, membership of editorial boards of international journals, plus other information given in the supporting letters. The latter includes his significant engagement with industry and the level of impact generated as a result of the industrial collaborations underpinning his research activities.

Richard James Barker obtained his MEng in Mechanical Engineering in 2009 and his PhD in 2013 on Erosion-corrosion of carbon steel pipework on an offshore oil and gas facility from the University of Leeds, United Kingdom. His further scientific career bonded him to the same university: He held the positions of Research and Teaching Fellow (2013-2017) and Lecturer (2017-2019). In 2019, he was appointed Associate Professor in Corrosion Science and Engineering at the School of

Mechanical Engineering, which includes lecturing at undergraduate and postgraduate level, PhD and PDRA supervision. Moreover, among others, he is an elected Fellow of the Institute of Corrosion (ICorr) and Committee member for ICorr's Corrosion Science Division, member (CEng) of IMechE and Associate Editor of the Journals *Corrosion and Materials Degradation* and *Pipeline Science and Engineering*. He has received ten awards or honors, has authored or co-authored an exceptionally high number of 59 journal papers for someone of his stage career and supervised 15 PhD students, just to mention some achievements.

His main research interests are in the areas of electrochemistry, material and corrosion science with a focus on corrosion measurement in extreme environments, predominantly in the context of the energy and carbon abatement sectors. This includes new areas of Corrosion Science, predominantly in the fields of *in situ* synchrotron studies of corrosion processes, bespoke flow cell design for corrosion analysis/interpretation, corrosion in carbon capture, corrosion in geothermal energy production, corrosion in concrete and numerical corrosion modelling.

Altogether, Dr. Barker's research and scholarly records and practical performance make him a very worthy recipient of the Kurt Schwabe Prize.

Dr. Richard James Barker is invited to give a Plenary at the virtual EUROCORR 2021 on Friday, 24 September 2021.

### ABOUT THE KURT SCHWABE PRIZE

Founded by the Hungarian Corrosion Society "HUNKOR" and delivered by the European Federation of Corrosion at the EUROCORR Conference



Kurt Schwabe.

In honour of the late Professor Kurt Schwabe and on the initiation of the Hungarian Corrosion Society, "HUNKOR", "KURT SCHWABE PRIZE" has been established by financial support of the HUNKOR. The award, which consists of a medal, a diploma of merit and a sum of 500 EURO, is presented every three years to a young scientist in recognition of his/her scientific and technical contribution to the field of corrosion on the basis of records and publications.

Website: <https://efcweb.org/Awards/Kurt+Schwabe+Prize.html>



## HONORARY FELLOWS OF THE EFC – PROFESSOR DAMIEN FÉRON AND PROFESSOR XIAOGANG LI

This year, Honorary Fellowship of the EFC has been awarded to **Professor Damien Féron**, France, and **Professor Xiaogang Li**, PR China.

The Jury recognised **Damien Féron's** outstanding accomplishment in the field of nuclear corrosion for most of his career, helping to develop the field substantially through (co-)authorship of numerous papers and books, the organisation of major conferences and workshops on nuclear corrosion, education and training.



The fellowship particularly emphasizes his highly committed and long-term devotion to the Federation. For more than two decades, he helped to make the EFC a stronger organization that serves its members better and also helped the corrosion community in general through various activities and positions. This includes in particular his commitment to EFC as a member and Chairman (2002-2016) of the Working Party 4 on Nuclear Corrosion, one of the most active EFC Working Parties, his participation to the STAC especially being its Chairman for 6 years (2007-2013), and in the position of Vice-President (2015-2016) and President (2017-2018) of the EFC. Furthermore, he edited several EFC "Green Books". In all these roles and activities, he always managed to build consensus on important developments, strongly supported the initiative to form the Young EFC, was a driving force in cooperation between EFC and the international corrosion community, and secured EFC's legal and financial position.

Currently, Damien Féron holds the positions of Professor at INSTN (Institut National des Sciences et Techniques Nucléaires (French National Institute of Nuclear Techniques and Sciences), France, Director of research at CEA and Deputy Head of the « Service de Corrosion et du Comportement des Matériaux dans leur Environnement, SCCME » (CEA Corrosion Department at CEA-Saclay, France). Furthermore, he is the current President of the World Corrosion Organisation (WCO).

Damien Féron and Xiaogang Li delivered significant benefit and impact to the EFC in their roles and activities and are very worthy recipients of an Honorary Fellowship.

They will be awarded Honorary Fellowship at the virtual EUROCORR 2021.

The Jury recognised **Xiaogang Li's** outstanding and long-lasting contributions to broad aspects in the field of corrosion science and engineering as revealed by the impressive numbers of over 500 peer-reviewed English papers, over 15,000 citations, 12 monographs and over 60 patents.



Particular fruitful achievements of Professor Li are his pivotal technical and economic impacts to numerous industrial sectors which are highly recognized by corrosion professionals and international corrosion organizations. There are also his achievements in corrosion research and education, including mechanistic understanding and accelerated evaluation of corrosion phenomena in natural environments (atmospheric, soil and marine), localized corrosion and stress corrosion cracking of steels as well as the pioneering contribution in developing corrosion databases and data technologies.

Moreover, EFC recognises his involvement as a key liaison and driving force to promote and diversify the collaborations between EFC and the Chinese Society for Corrosion and Protection (CSCP) and among their communities. Among others, he signed the first MoU between EFC and CSCP, was a driving force for CSCP to become an international member society of EFC and to support the Young Scientist Grants, and he co-organised the first EFC-branded conference in China. He thus made EFC and EUROCORR very popular in the Chinese corrosion community.

Currently, Xiaogang Li holds the positions of Professor at the Institute for Advanced Materials and Technology, University of Science and Technology, Beijing, PR China, and director of the National Environmental Corrosion Platform (now known as National Materials Corrosion and Protection Data Center). Since 2018, he is the Deputy Vice President of CSCP.

## WINNERS OF THE EFC YOUNG SCIENTIST GRANT

(PREVIOUSLY CALLED “EUROCORR YOUNG SCIENTIST GRANT”)

Based on a quality-based evaluation of the nominations received, from among 5 applications, 2 recipients have been selected for this year’s **EFC Young Scientist Grant**:

- **Michael Strebl**, Friedrich-Alexander-University of Erlangen-Nuremberg, Germany / Dr. Polina Volovitch, Chimie Paris Tech, PSL Research University, CNRS, Paris, France, for ***Coupling respirometric corrosion monitoring with in-situ Raman***;
- **Joshua Owen**, University of Leeds, UK / Prof. Sigrún Nanna Karlsdóttir, University of Iceland, Reykjavik, for ***Augmented corrosion product layers for enhanced corrosion protection of carbon steel in geothermal environments***.

The objective of this grant, introduced by the EFC in 2016, is to stimulate interaction and collaboration within the international corrosion community by providing financial support to junior corrosionists to enable them to visit and interact with other corrosionists at their home institute abroad.

Each year a maximum of three EUROCORR Young Scientist Grants, up to a maximum of € 1,500 each, are awarded. Further information on the EUROCORR Young Scientist Grant, including the grant criteria and rules, can be found on the EFC website under <https://efcweb.org/YSG.html>.

In 2021, the Award will be presented for the sixth time.



**中国腐蚀与防护学会**  
Chinese Society for Corrosion and Protection

## CORROSION AWARENESS HONOUR WINNER ANNOUNCED

The Corrosion Awareness Honour has been established to celebrate outstanding achievement in raising public awareness of corrosion. In association with the WCO (World Corrosion Organization), the Chinese Society of Corrosion and Prevention (CSCP) and the European Federation of Corrosion (EFC) have collaborated to create this international award.

It is with great pleasure that we inform you that **Professor Baorong Hou** from the National Marine Corrosion Protection Engineering Research Centre in China is the 2021 recipient of the inaugural international award. The international jury, composed of CSCP, EFC and WCO members, has recognised his outstanding contribution to increasing awareness of the importance of corrosion and corrosion protection amongst

government, academia, industry and the public, particularly his leadership in highlighting seawater corrosion protection and control through scientific, technological and dissemination initiatives and his marked impact on educational and industrial activities.



We wish Professor Baorong Hou all the very best and hope he continues to actively promote corrosion awareness.

# NEWS FROM WORKING PARTIES AND TASK FORCES

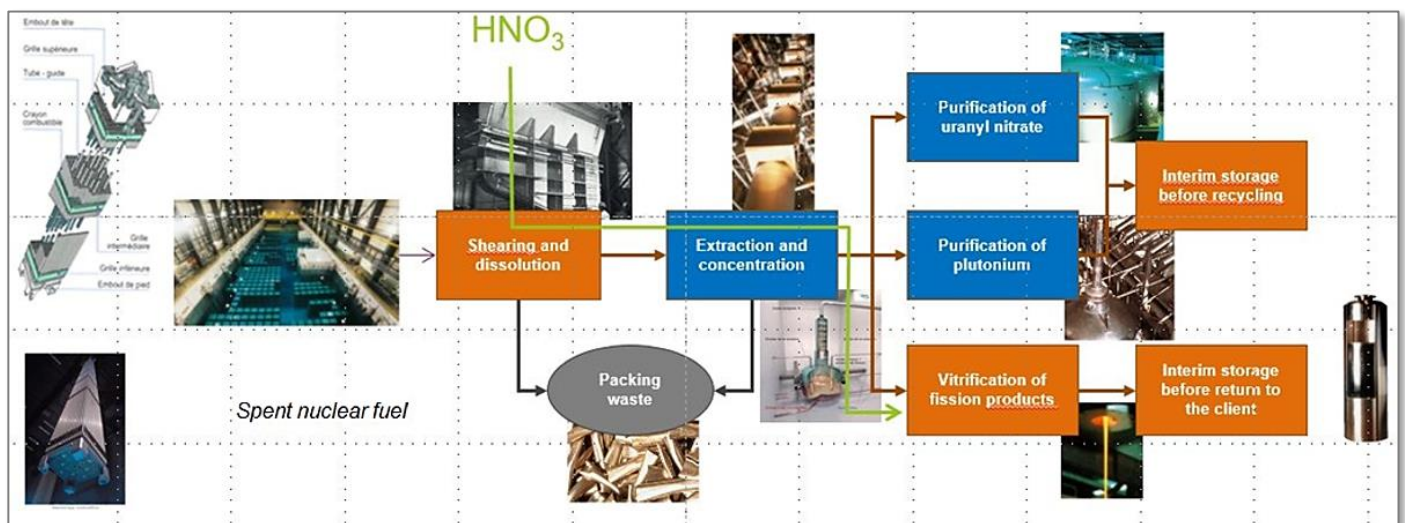
## NEWS FROM THE WORKING PARTY 4 ON NUCLEAR CORROSION

# WP4 Nuclear Corrosion

### 2<sup>nd</sup> Online Seminar on Nuclear Corrosion

Last April, on the occasion of the CORROSION AWARENESS DAY 2021, the WP 4 has organized an online seminar titled “Journey to the heart of the corrosion processes involved in a spent nuclear fuel

recycling plant”. Benoit Gwinner (Université Paris-Saclay, CEA, France) gave this very interesting presentation and almost 50 persons, mostly from Europe and Asia, were registered for this seminar.



### Joint session of WP 3 & 4 on ‘Corrosion in molten salts and ionic liquids for energy applications’ during EUROCORR 2021

Additional to the ‘regular’ nuclear corrosion session, a joint session on corrosion in molten salts and ionic liquids for energy applications has been arranged as part of this year’s online EUROCORR together with WP 3 (Corrosion by Hot Gases and Combustion Products). The aim of this joint session is not only to bring together academics and industrials concerned with material subjected to degradation by molten salts but also to gather scientists and engineers from different industry sectors. Regardless of the varying structural materials and heat-transfer media in different industrial applications, the approaches and methods used to gain new insights on the molten salt-induced corrosion may be of interest to different kinds of industries and academic fields.

### Int. Workshop on Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems (LTC 2022)

Finally, we may announce the 8<sup>th</sup> Int. Workshop on Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems (LTC 2022) which is also co-organized by WP 4 together with the Swiss National Cooperative for the Disposal of Radioactive Waste (Nagra) and which will be held in Baden, Switzerland, on 22-24 June 2022. More information is available on the web:

<http://www.ltc2022.ch/>.

### Working Party website:

<https://efcweb.org/WP4.html>

# NEWS FROM THE WORKING PARTY 14 ON COATINGS

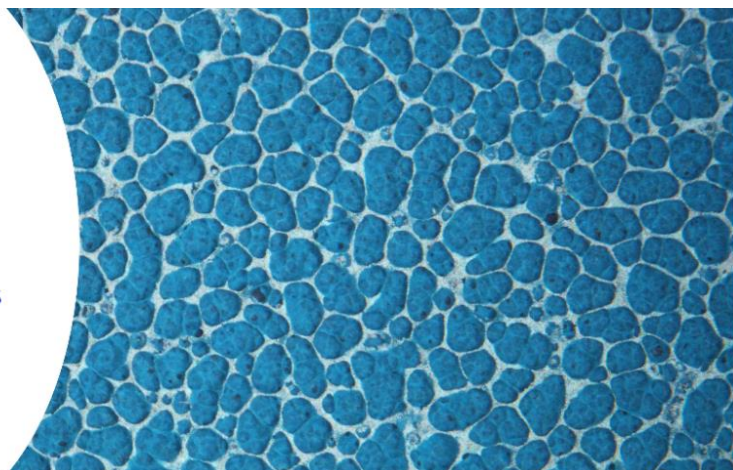
## INVITATION TO AETOC 2022



### 12th International Workshop on Application of Electrochemical Techniques to Organic Coatings

29th March - 1st April 2022

Val di Fiemme, Trentino - Italy



It is our pleasure to invite you to the 12th International Workshop "Application of Electrochemical Techniques to Organic Coatings" (AETOC), Val di Fiemme, Italy, from March 29<sup>th</sup> to April 1<sup>st</sup> 2022.

This workshop has been organized every two years and took place previously in Schliffkopf (Germany), Jurata (Poland), Sintra (Portugal), Villard de Lans (France), Bayona (Spain), Grado (Italy), Mons (Belgium), Emmetten (Switzerland), Ile de Ré (France), Billerbeck (Germany) and Valencia (Spain). Unfortunately, due to the COVID19 outbreak, the workshop has not been organized during 2021. However, it is my pleasure to communicate that, at present, we intend to host the 12th International Workshop "Application of Electrochemical Techniques to Organic Coatings" in the surrounding of Trento (Val di Fiemme, [www.visitfiemme.it/en](http://www.visitfiemme.it/en)) from March 29<sup>th</sup> to April 1<sup>st</sup> 2022.

Val di Fiemme (60 km North-East Trento) is surrounded by two natural parks and stunning Dolomite peaks (Unesco World Heritage Site) dominating the South-Tyrolean canyon of Bletterbach, Mountain group of Latemar and the park Paneveggio Pale di San Martino.

The meeting falls under the auspices of the European Federation of Corrosion - Working Party 14 -Coatings.

This workshop has always provided opportunities for the delegates to exchange new ideas, to establish research relations as well as to find global partners for future collaborations.

AETOC workshop is dealing with all the topics related to recent developments in the application of electrochemical techniques to the study and monitoring organic coatings, as well as novel hybrid (i/o) sol-gel and composite coatings with self-healing and protective properties. The language of the workshop will be English.

We sincerely do hope that we will meet in person again, in the fruitful, inspiring and friendly atmosphere that has always distinguished AETOC from the other scientific conferences.

Details on the deadlines, abstract submission and accommodation will be provided soon! The website is under construction. Stay tuned for updates!

Looking forward to meeting you all in person in Italy!

#### Further information:

Conference secretariat: [aetoc2022@unitn.it](mailto:aetoc2022@unitn.it)

Organizing secretariat: [comunicazione-collina@unitn.it](mailto:comunicazione-collina@unitn.it)

Website under construction

## EFC WORKING PARTY INDEX

The EFC currently has twenty-two active Working Parties (WPs) and one Task Force, each concerned with a different aspect of the corrosion of metals, alloys and polymer materials. Activities of the EFC Working Parties/Task Forces include: collaborative research and testing programmes; organisation of workshops, seminars and conferences; preparation of state-of-the-art reports, guidelines and proceedings for publication as volumes in the EFC Series and the organisation of sessions at EUROCORR.

Membership to the EFC Working Parties is available as a right to all EFC members belonging to both European and International EFC Member Societies or to EFC Affiliate Members, including companies or universities/research centres. Anyone wishing to join one of the Working Parties should apply to the appropriate Working Party Chairs. Please refer to the EFC website at <https://efcweb.org/Scientific+Groups> for full details on Working Party activities or contact EFC Scientific Secretary, Roman Bender (e-mail: [roman.bender@dechema.de](mailto:roman.bender@dechema.de)).

# NEWS FROM THE WORKING PARTY 15 ON CORROSION IN REFINERY AND PETROCHEMISTRY INDUSTRY

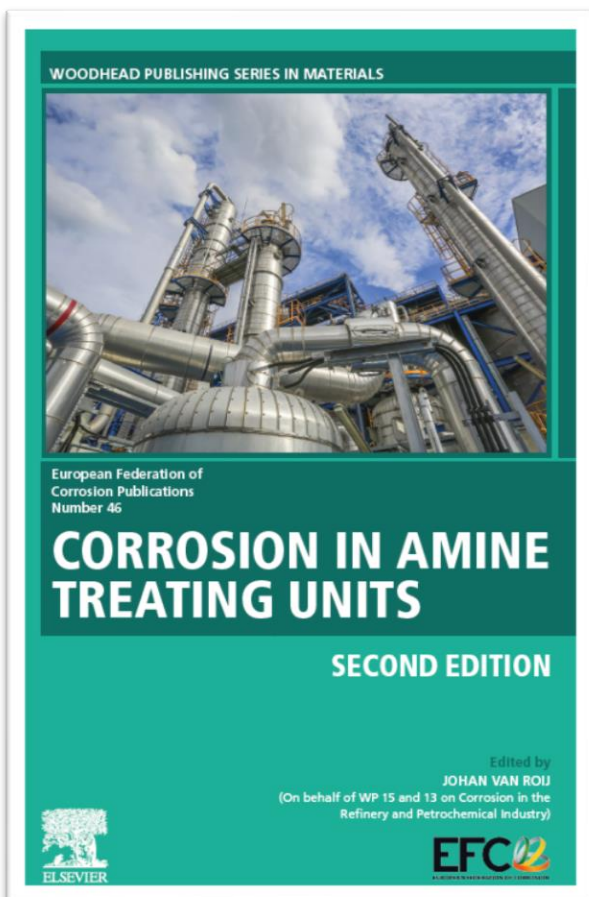
The annual spring meeting of the Working Party 15 "Corrosion in Refinery and Petrochemistry Industry" took place via a Zoom meeting on 23<sup>th</sup> March 2021. The meeting was attended by 53 participants from Europe, the Middle East and Japan. Exchange of information and discussions took place on corrosion under insulation, high temperature hydrogen attack and corrosion in steam generation. Case studies of failures in a crude distillation unit, steam reforming piping and sour water treatment plant were presented. New inspection and monitoring techniques were also covered, and discussions took place regarding new corrosion resistant alloys for refinery and petrochemistry applications. The activities of the joint WP13-WP15 task force were discussed, covering the updates of "Corrosion in amine treating units" and "Corrosion under insulation", EFC publications 46 and

55 respectively (see book cover images), and also the activities of the joint WP9-WP15 task force focusing on new guidance for corrosion in sea water circuits.

The next WP 15 "Corrosion in Refinery and Petrochemistry Industry" meeting will be held virtually during the EUROCORR 2021 week on the 24<sup>th</sup> of September 2021 and will cover the hot topics affecting corrosion in the refinery and petrochemistry industry

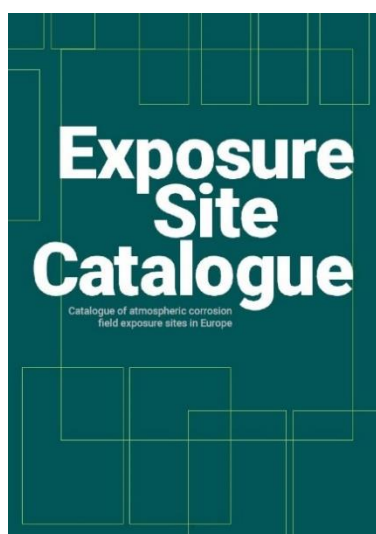
If you wish to have more information on the activities of the group (including all the minutes and presentations of the last meetings) please visit our homepage: <http://efcweb.org/WP15.html>

*EFC WP 15 on Corrosion in the Refinery and Petrochemistry Industry would like to express its thanks to DECHEMA and Ines Honndorf for their excellent organisation of the meeting.*



New editions of EFC guidelines related to the refinery and petrochemistry industries

# NEWS FROM THE WORKING PARTY 25 ON ATMOSPHERIC CORROSION: EXPOSURE SITE CATALOGUE



Corrosion testing is an important part of corrosion work to estimate, assess, predict, and verify the performance and lifetimes of individual materials, systems, and components. This is an essential input for selection of appropriate corrosion protection systems and, in the end, to achieve sustainable products.

Exposure sites and outdoor exposure have always been a part of atmospheric corrosion research providing the “final answer”, although at the cost of long exposure times. Individual exposure programs such as ISOCORRAG, MICAT, and ICP Materials have resulted in collaborative networks of exposure sites. So far, however, there has been no collective effort to put together currently active sites in a comprehensive manner and across programs and nations. Thanks to the work of site managers, members of WP25 Atmospheric Corrosion, financial support of the EFC, and a talented graphic designer, the first edition of a

catalogue of atmospheric corrosion field exposure sites in Europe is now available.

Altogether, 43 sites are described in the Catalogue covering all types of environments (rural, urban, industrial, marine, and high UV), different climatic zones (from Athens to the north of Norway), levels of industrial pollution, chloride deposition, humidity, and, of course, corrosivity. For example, the corrosion rate for copper ranges from 0.6 g·m<sup>-2</sup>·year<sup>-1</sup> in Katowice, Poland to 89 g·m<sup>-2</sup>·year<sup>-1</sup> in Helgoland, Germany, covering the whole scale of corrosivity categories from C1 to CX as defined in ISO 9223.

Each site is carefully described in terms of geographical location, nature, length of operation, corrosivity, environmental parameters, type of available exposure racks and space, and contact details. Principal parameters are summarized in a table and location of the sites is shown in a map.

The Catalogue is available free of charge at <https://efcweb.org/WP25.html>.

With this Catalogue we hope to help industry and researchers find sites with required conditions for outdoor corrosion tests and provide a general overview of what is available.

In the future, we plan to further simplify searching for atmospheric exposure sites by turning the Catalogue into a web service.

*Tomáš Prošek & Johan Tidblad, WP25*



CZ, Kopisty				
Site name	Kopisty u Mostu			
Country, region	Czech Republic, Northern Bohemia			
Atmosphere	Industrial			
Location (GPS)	50.6442559N, 13.8231767E			
Altitude	240 m			
Address	Meteorologická observatoř Kopisty, ÚFA AV ČR v.v.i., 434 01 Most, Czech Republic			
Description	Green field located near an industrial plant (ca 3 km, Chempark, UNIPETROL) and town Most			
Photographs				
Operational since	1999			
Corrosivity (ISO 9223)	Steel	Zinc	Copper	Aluminium
	131	4.9	11.9	0.2
	Corrosivity category: C2 C2 C3 C2			
	Measurement period: 2017-2018			
Environmental parameters	Parameter	Value	Measurement period	
	Rainfall [mm/year]	489	2014-2019	
	Temperature [°C]	10.4	2014-2019	
	SO <sub>2</sub> [µg/m <sup>3</sup> ]	11.7	2014-2019	
	NO <sub>x</sub> [µg/m <sup>3</sup> ]	22.9	2014-2019	
	Chloride deposition [mg/m <sup>2</sup> day]	2.3	2016-2019	
	pH of rain	6.1	2014-2019	
Relative humidity [%]	73	2014-2019		
Exposure racks	☞ 5° ☞ 45° ☞ 90° ☞ Possible to install customized racks Other: Exposure under shelter			
Available space	250 m <sup>2</sup>			
Additional information	Atmospheric test site is included in the UN ECE IOP Materials programme since 1986. All environmental parameters are measured on site. The chloride deposition is measured using the wet candle method.			
Managing organization	SVUOM Ltd., U Městanského pivovaru 934/4, 170 00 Prague, Czech Republic			
Contact person	Kateřina Knešlová ☎ knešlova@svuom.cz ☎ +420 775 159 552			

# NEWS FROM THE EFC MEMBER SOCIETIES

## NEWS FROM THE FRENCH CORROSION SOCIETY -CEFRACOR



### Scientific and Technical Committee

Despite the very complex health situation for all of us, the 14 topical committees of CEFRACOR have been very active along different axes: 1) Support for Young Researchers, 2) Project focused on standardization, 3) Establishment of new Working Groups (WG), 4) Support and organization of national and international conferences, 5) Training actions, 6) Writing and edition of books and recommendations guides.

#### Highlights

- The newly created WG on Additive Manufacturing and High Temperature Corrosion, within the "High Temperature Corrosion and Protection" Committee, a scientific event organized on July 7 and 8, 2021 in La Rochelle around the themes "Oxidation with an external mechanical loading" and "Genesis of deformations in high temperature oxidation of metals".
- The Stress Corrosion Cracking Committee recently organized a CEFRACOR Meeting dedicated to the "Methods and Techniques adapted to the detection and localization of hydrogen in metallic materials". This virtual event gathered more than 80 persons, from both industrial and academic sectors.

### Events

The 7<sup>èmes</sup> Journées Protection Cathodique et Revêtements Associés (7th Cathodic Protection and Associated Coatings conference) in Antibes Juan-les-Pins scheduled for June 14 to 16, 2020 has been rescheduled again to **June 14 to 16, 2022**. This EFC Event No. 455 is devoted to end users as well as suppliers of equipment, designers, service companies, authorities, laboratories, universities and research centres. An exhibition will complete this event.

**EUROCORR 2024** - It has been a pleasure and a great honour to learn that France's application for **EUROCORR 2024** had been selected by the EFC Board. It will take place from **September 1 to 5, 2024** at the **Palais des Congrès of Paris**.

### Training

The Training Division has been working on acquiring the certification "**QUALIOPI**", that will be required for all French training bodies from January 2022 so that their activities remain eligible for funding. An audit in view of this certification by *AFNOR Certification* is scheduled by the end of the year.

Training on **Industrial Water Treatment** is scheduled to take place on **12-13 October 2021**, in Paris.

The organization of Training sessions on *Tribocorrosion* and *Biodeterioration of Materials* is being finalized and will be proposed by the end of 2021 or early 2022.

In 2022, CEFRACOR with its "High Temperature Corrosion and Protection" Committee will organize **CorroHT 2022** school in June. This event will gather people from the academic and industrial sectors.

### Certification

News about a new, third, certification scheme: It concerns the certification of continuing professional education courses in corrosion and corrosion protection and prevention. It will be operated by the CFFC (Comité Français de la Formation en Corrosion – French Committee on Corrosion Training) under the brand name CEFRACOR CERTIFICATION – Formation. The CEFRACOR CFFC will be the entry point for obtaining the "EFC approved course" label. This scheme will be operated alongside 1) the certification of the competence of persons active in cathodic protection under the brand name CEFRACOR CERTIFICATION – Protection Cathodique, operated by the CFPC (Comité Français de la Protection Cathodique- French Committee on Cathodic Protection) and 2) the certification of the competence of persons who apply or inspect pipe coatings based on polymeric tapes, petrolatum and wax tapes under the brand name CEFRACOR CERTIFICATION – Revêtement, operated by the CFR (Comité Français du Revêtement – French Committee on Coatings).

More information on CEFRACOR's activities can be found on its web site: <http://www.cefracor.org>

# NEWS FROM THE SOCIETY FOR CORROSION PROTECTION - GFKORR

*Join our online events in Autumn 2021!*



## WEBINAR

**Corrosion of Nickel Alloys in Aqueous Solutions and under High Temperature Corrosion Conditions and their Applications**

Online-Event, 3<sup>rd</sup> and 4<sup>th</sup> November 2021  
(EFC Event No. 478)



This webinar takes the audience into the world of nickel alloys. It outlines the different mechanisms of the corrosion of nickel alloys in aqueous solutions and at high temperatures. Applications of nickel alloys in different industrial sectors are presented. Furthermore, the attendants will receive an insight into the recent development of new alloys.

[Programme / Registration](#)

**Website:** <https://gfkorr.de/Nickel2021.html>

image source: VDM Metals Gruppe

## ANNUAL CONFERENCE

**“Aluminium and Magnesium - The Bridge to a Sustainable Future”**

Online-Event, 23<sup>rd</sup> and 24<sup>th</sup> November 2021  
(EFC Event No. 479)



Schwansbell-Brücke (image source: GDA)

Aluminium and magnesium, two materials that have only been used on a large scale for just over 100 years, are now found in many applications and are indispensable, especially in terms of sustainable lightweight construction. However, in many of the established applications, the resistance and protection of materials in corrosive environments plays an essential role, and this is especially important when expanding their use into new applications.

The conference "Aluminium and Magnesium – Lightweight, Sustainable and Innovative" provides insights into new findings and developments on the use of the two materials and on recent developments in innovative corrosion protection concepts for applications in aviation, automotive, construction and medical technology.

[Programme / Registration](#)

**Website:** <https://gfkorr.de/JT2021.html>



## EUROCORR 2021 IS BOOSTING HUNKOR'S ACTIVITIES IN HUNGARY



Years ago the Hungarian Corrosion Society HUNKOR was granted the privilege of hosting the annual EFC Conference for 2021. This will take place online due to the pandemic, though during the years of preparation, the plan was host this important event as before, and Hungary's charming capital city Budapest was also ready to host the attendees in person. Towards that aim, HUNKOR mobilized all of its members and also set up the Local Scientific Organizing Committee by inviting well-recognized experts and leaders working both in the academia and industry, for example, by reaching out to an important centre of metal and vehicle industries in Győr city in the northwest corner of Hungary and quite close to two neighboring capital cities of Vienna in Austria and Bratislava in Slovakia. Going in the opposite direction towards the southeast region of the country, HUNKOR activists were able to find new partners also from near the newly established large laser research centre ELI-ALPS in Szeged. In the north there were contributions from the growing new centre of materials science and metals technologies at the University in the city of Miskolc. Here, several Hungarian and governmental scholarship holder foreign PhD students

started working on corrosion related research topics due to the vivid revival of this field in Hungary.

As with many other significant headquarters in Hungary, the Hungarian Corrosion Society HUNKOR is situated close to the capital city Budapest. This is where one of the country's best and most prestigious Universities, the Budapest University of Technology and Economics provides a home for several research and educational units dealing also with corrosion-related topics, often in close collaboration with research centres like the Research Centre for Natural Sciences, the Wigner Research Centre for Physics, and the Centre for Energy Research. The latter one has also been the centre of atomic energy research activities in the country. From these institutions, not only the interested research experts but also many young PhD students found it worthwhile to join the EUROCORR 2021 event and contribute to its preparation. Some of them have also become active members of the HUNKOR Corrosion Society.

*Miskolc, 2021. 06. 25. /Tamás Török/*

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## NEWS FOR THE INSTITUTE OF CORROSION – ICORR



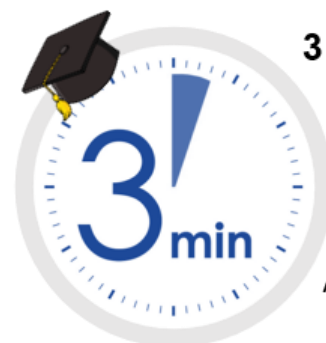
### YOUNG ICORR

Young ICORR is a network of younger professionals who are either working or interested in the field of corrosion. The Young ICORR committee have worked hard to maintain activities to increase networking opportunities and support in the past 12 months, the most recent of which was the **Young ICORR "Thesis in 3 Minutes Competition"**, which was held online on 29th April, 2021, to celebrate Corrosion Awareness Day 2021 in collaboration with the European Federation of Corrosion and World Corrosion Organisation, and 4 PhD students presented their research in 3 minutes.

We were treated to four informative and diverse presentations that left the judges with the difficult choice of picking a winner in what was an intense 20 minutes. The competition was fierce and the standard of presentation was excellent. However, there had to be a

winner, and Qingyan Liu from Leeds University's whistle-stop presentation on corrosion resistance of alloys to molten nitrate salt environments to support their use in solar power plants was the winner!

Many thanks to the judges, Bill Hedges, David Mobbs, and Trevor Osborne on what was an extremely difficult decision to make.



### 3 Minute Thesis Competition

3 Minutes

1 Slide

Amazing Ideas

Young ICorr have been exploring options for future events in 2021, including a series of online events over a 12-month period called, “**Meet your Mentors**”. These events will allow young engineers to network and engage with experienced industry and academic professionals across a number of disciplines. In addition to this, depending on local restrictions, an event will be held in London, UK, in person towards the end of 2021.

You can follow **Young ICorr** on LinkedIn, to find out more information about previous events, and to ensure you do not miss out on future events.

## MEMBERS NEWS

2021 has been a busy year for the Institute of Corrosion (ICorr). We have updated all of our cathodic protection (CP) courses which now meet the ISO/IEC 17024 standard. We have also opened a new, state of the art CP training facility in Telford, UK where students can obtain hands-on experience for buried, marine and concrete CP systems. We are working hard on updating our passive fire protection courses which will begin to become available in the second half of the year. Our membership continues to increase at a steady pace and we now have 1,600 members, of which 500 are based outside of the UK. ICorr has moved into the digital world and now has a very active presence on social media platforms with a current following of over 5,000 practitioners. Other improvements being worked on

include an upgrade to our membership database and website which will take place in a staged approach over three years.

As a result of Covid-19 we have moved many of our regular branch meetings to an on-line format which has worked very well and actually enabled a larger proportion of our membership to attend virtually. We are planning to move back to in-person meetings but expect to retain some level of virtual availability as well.

ICorr has recently passed two audits. The first was with the Science Council, through whom we offer the Chartered Scientist(CSci) accreditation. The second was our annual ISO 9001 audit which we passed with no findings or actions.

We recently signed a contract with the UK’s National Physical Laboratory (NPL) to take over the running of the UK’s national corrosion helpline. This is a service where anyone can ask a corrosion related question and be directed to relevant experts with no charge.

During 6<sup>th</sup> - 9<sup>th</sup> September the Corrosion Science Symposium (CSS) and 7<sup>th</sup> International Conference for Advances in Corrosion Protection by Organic coatings (ACPOC) was held at the University of Manchester, UK. At the CSS **Dr. Mary Ryan** of Imperial College, London, UK, was awarded the ICorr U.R. Evans award – the most prestigious award the institute has.

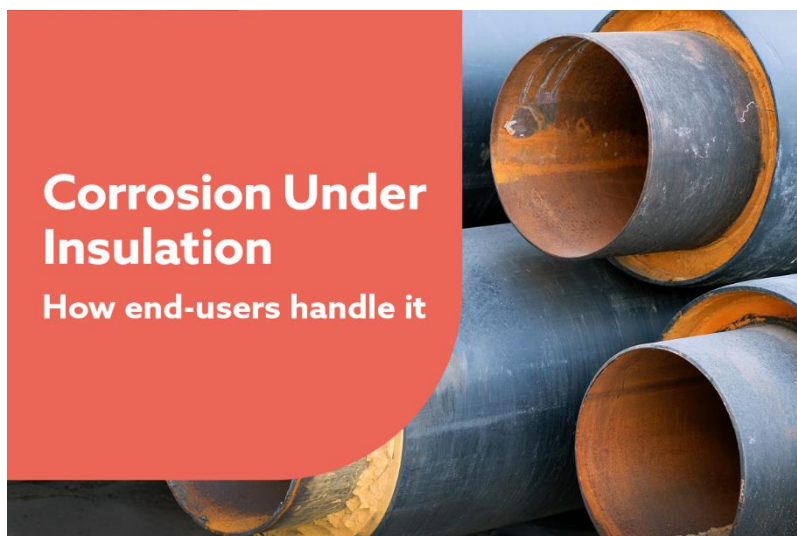
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## IOM3 NEWS “CATCH UP ON DEMAND – CORROSION UNDER INSULATION: HOW END-USERS HANDLE IT”

# I·M3

Corrosion Under Insulation (CUI) is a widely known phenomenon related to the development of a corrosive environment on a components external surface that has been thermally insulated by means of a protective layer. IOM3 held a webinar on 14th May focused on the experiences of end users in the oil & gas sector, highlighting the strategies adopted to manage this corrosion threat. This webinar also looked at examples of the latest technologies developed to identify areas at higher risk of CUI.

If you missed it, you can still catch the webinar on demand, just register online to gain free access at <https://bit.ly/2U0EX65>



## POLISH CORROSION SOCIETY ACTIVITIES: 04.2021 - 06.2021.



**POLSKIE  
STOWARZYSZENIE  
KOROZYJNE**

Polish Corrosion Society keeps in touch with its members, organizing webinars, conferences, contest, developing website and being present in social media.

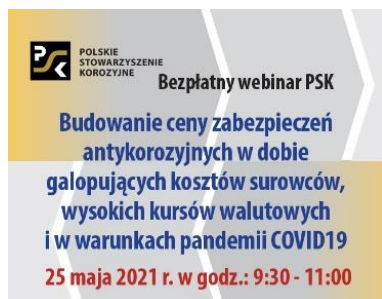
In March 2021 PSK started with short, interesting free webinars.



The free webinar titled “A brief history of corrosion protection” was held to highlight Corrosion Awareness Day on April 24. Michał Jaczewski (PSK expert), who led the

meeting, provided the participants with knowledge of the history of, and current issues around, paints, metallization coatings and cathodic protection. The meeting took about one hour and was very well received.

Highlighting the Corrosion Awareness Day PSK also published on its website some interesting, surprising and funny stories from the professional practice of PSK members.



The next webinar “Pricing anti-corrosion protection in the era of galloping raw material costs, high exchange rates and in the conditions of the COVID19

pandemic” was led by Anna Białecka (ZINKPOWER Szczecin). The aim of the meeting was to find an answer to the question: how to shape the prices of products and services in order to adapt to micro and macroeconomic events on the market. We had a lot of participants and great feedback.

Next webinars will be announced soon.



**Konferencja PSK STARE JABŁONKI'2021  
20–22 października 2021 r.**

The annual PSK conference in Stare Jabłonki is planned for 20-22 October 2021.

Registration is open at:

<https://psk.org.pl/konferencje-psk2/konferencja-psk-stare-jablonki-2021-liczba-osob-ograniczona>

Each year, PSK runs the **contest for the best doctoral, master's, engineering or bachelor thesis.**

In 2021, the results of the competition for the best engineering, master and doctoral dissertations will be presented during the PSK conference. The winners will briefly present the awarded works.

A new, improved PSK website is being created and will be launched soon.

As far as social media is concerned, PSK made progress in Linked In, posting current content and attracting new members.

Summarizing briefly the PSK activity from 04-06.2021: two webinars, conference planned, annual contest, progress in social media.

## NEWS FROM RISE RESEARCH INSTITUTES

RISE Research Institutes of Sweden, and its subsidiary the French Corrosion Institute, have a team of 100 engineers and technicians in Sweden and France dedicated to applied corrosion research and corrosion protection. RISE and FCI are conducting twelve membership programs in corrosion (so called member research consortia – MRC) engaging more than 150 companies, large and small, from different sectors, industries and countries, to find efficient solutions to joint challenges. By gathering stakeholders through the value chain, from the material producers to the end users, with interests in the same research area, we offer a platform for collaboration as well as cost effective R&D. Within our MRC, we conduct collaborative research projects, give our members access to recent knowledge and know-how in corrosion and promote technical exchanges in discussion forums. Membership also enables members to access reduced consultancy and testing fees on any direct consultancy jobs carried out.

A new MRC focusing on the “**Hydrogen Industry**” (MRC-H2) will be created in 2021 and led in collaboration with IFP Energies Nouvelles (IFPEN). IFPEN is a major research and training player in the fields of energy, transport and the environment. From research to industry, technological innovation is central to all its activities, structured around three strategic priorities: sustainable mobility, new energies and responsible oil and gas. This partnership aims to complement the experimental capabilities of FCI with IFPEN expertise in the fields of materials, mechanics, modeling etc.

To gauge the level of interest, a first information meeting was held the 4<sup>th</sup> of May 2021 gathering delegates from 37 different companies and 10 different countries. The objective of this new MRC was introduced and possible scopes of studies to be conducted within the framework of the group were discussed. The interested companies are now invited to officially commit to join the group, which more than 10 already have. Considering the commitment received to date, a kick-off meeting will be scheduled in Q4-2021 with all participating companies to validate the scope and the organization of the work for the next three years. Given the level of interest, two different projects will be run in parallel. The first project is on carbon steel use in hydrogen transportation and storage, with a specific focus on the definition of accurate test methods for material qualification (permeation, SSRT, toughness, etc.) before performing a material screening in in-service conditions. The second project will focus on corrosion resistant alloys following a scope to be defined by the members. The fee to join this MRC is 6500 euros/year with a minimum commitment of three years. This fee is deliberately low as the objectives of our MRCs are to bring together as many delegates as possible from a range of industrial sectors (from the alloy maker to the end-user) and create a forum for networking and progressing R&D (two face-to-face meetings per year are organized for each of our MRCs).

To join the group or for any question regarding this MRC, please contact Christophe Mendibide ([christophe.mendibide@institut-corrosion.fr](mailto:christophe.mendibide@institut-corrosion.fr))



### EFC MEMBER SOCIETIES AND AFFILIATE MEMBERS

A full listing of our European and International EFC Member Societies and Affiliate Members can be found on the EFC website at:

<https://efcweb.org/About+us/Membership.html>

## CASE STUDY

### TRUSTFUL AND ECOFRIENDLY REPLACEMENT TO HEXAVALENT HARD CHROME



Hard chromium coatings (HCC), based on hexavalent chromium salts (Cr VI), have been widely used in the automotive and aerospace sectors for those components subjected to highly demanding operating conditions due to their unrivaled features, especially in terms of mechanical properties and corrosion protection ability. However, the toxic and carcinogenic character of hexavalent chromium compounds endorsed its inclusion in the annex XIV of REACH regulation, banning its use unless specifically authorized, and being becoming more restricted beyond 2024. In this scenario, the Eurostars-2 project “*trustful and ecofriendly replacement to hexavalent hard chrome, TRU-REPLACE*”, will implement Cr VI-free protective coatings based on low P electroless nickel composite multilayers.

Electroless nickel plating (ENP) is a well-known and is a REACH compliant surface finishing technology, based on the reduction of metallic cations by a reducer (i.e. Sodium hypophosphite) present in the same electrolyte without the need of electrical current, giving rise to a Ni-P alloy. ENP coatings exhibit composition-derived properties based on the phosphorous content of the alloy. Low phosphorous coatings (LP) stand-out for their excellent mechanical properties whereas high phosphorous coatings (HP) provide superior corrosion resistance resulting in barrier-type protection to the base material (~1000h NSS). Medium phosphorus coatings offer a good compromise. However, to match the features exhibited by HCC, both mechanical properties and corrosion resistance, further development of electroless nickel plating technology is required. The TRU-REPLACE project has addressed this challenge through 2 different strategies: 1) incorporating a blend of nanoparticles (PTFE and SiC) as reinforcing materials into a LP matrix and 2) a multilayer approach for combining different ENP layers in the same coating architecture to boost the performance of ENP coatings.

The work carried out so far in the TRU-REPLACE project impacts the whole value-chain of the plating process, including the definition of suitable pre-treatment, the development of a novel LP ENP formulation, the investigation of a suitable dispersion based on SiC and PTFE nanoparticles and the validation of the new process for both applications. The scale-up of the different processes involved is also being addressed.



Figure 1. Pilot line and automatic monitoring system for the scaling-up of the new processes developed in the TRU-REPLACE project at CIDETEC.

To date, the pretreatment stage has been optimized based on regular procedures, easily implementable at the industrial scale, allowing perfect adhesion of the forthcoming ENP coatings on low carbon and 300M steels for the automotive and aeronautic sectors. One of the main outcomes of the project is the development of a novel REACH compliant LP formulation capable of producing ENP coatings exhibiting excellent mechanical properties in the as-deposited state, such as hardness (900 Hv), close to those offered by HCC coatings (~1000 Hv) proving the feasibility of HCC substitution by ENP coatings. This new LP formulation is being used for the development of new ENP multilayer coatings as well as a new range of ENP composite coatings. Currently the new suspension, comprising SiC and PTFE nanoparticles, is being engineered for its incorporation into the new LP electrolyte. The presence of nanoparticles is expected to enhance the mechanical properties and, under corrosion conditions, block the advance of aggressive species through the coating thickness, delaying corrosion progress and thus enhancing the corrosion performance of these coatings.

Additionally, the combination with HP layers will improve the corrosion performance beyond that of HCC coatings. The scaling-up of the processes involved are being tackled.

The project's consortium joins 2 Spanish SMEs and 1 Portuguese partner, namely Electroless Hard Coat S.A (ELHCO), Chemplate Materials and Smallmatek. TRUE-REPLACE project is led by ELHCO, specialist in the application of ENP coatings for different industrial sectors and holder of several certifications in the aerospace sector. CHEMPLATE are a R&D intensive

Spanish SME who supply chemicals and manufacturing systems for different industrial sectors. Smallmatek are a Portuguese company specialized in the development of smart additives. Spanish partners are supported by CIDETEC Surface Engineering (Spain), a research center holding a deep background and expertise in the field of surface finishing, the scaling-up of different coating processes and the development of novel surface modification technologies and novel advanced coatings for enhancing the performance of a wide range of materials. This project has been funded in the frame of the EUROSTARS-2 program (project ID: 113340).

## EFC APPROVED COURSE LABEL

The EFC has introduced a new tool to help its Member Societies active in corrosion education by granting **the EFC Approved Course Label** to courses with high professional standards. The purpose of the Course Approval is to support the education and training of corrosion professionals in limiting the detrimental impacts of corrosion on assets, the environment, and health.

The Approval is granted to courses reviewed in detail and proposed by European Member Societies of the EFC, or European developed courses supported by the European Member Societies, who are responsible for the course content and delivery.

When approved, Member Societies can use the EFC Course Approval and the logo for promotion of the endorsed courses for a period of 3 years. The Course

Approval assures high professional standards of any training activity, thus helping Member Societies attract more attendees. All

approved courses will be listed on the EFC website with links to course providers, which will simplify the access of corrosionists to the appropriate training.

The Member Societies are welcome to submit their applications. More information about the scheme is available at the EFC webpage <https://efcweb.org/Events/EFC+Approved+Course+Label.html>.



## EFC ONLINE

**Website:** <https://efcweb.org>

### LinkedIn



Company page: <https://www.linkedin.com/company/efc-european-federation-of-corrosion/>

EFC discussion page: <https://www.linkedin.com/groups/8947120/>

**EFC Hub:** <https://efc.solved.fi>

# EFC EVENT REPORTS

## GNC 2021 - GIORNATE NAZIONALI SULLA CORROSIONE E PROTEZIONE 2021 – ITALIAN NATIONAL CONFERENCE ON CORROSION AND PROTECTION (EFC Event No. 468)

The 14<sup>th</sup> edition of the *Giornate Nazionali di Corrosione e Protezione* - the Italian Conference on Corrosion and Protection - was held virtually from 29<sup>th</sup> June to 2<sup>nd</sup> July 2021, chaired by Prof. Emma Angelini of Politecnico di Torino.

The conference, which was first held in Milano in 1992, is the main national event for researchers from academia and industry interested on scientific and technological issues in the field of corrosion and protection of metals. The conference is organised every two years by the Italian Association of Metallurgy (AIM) in collaboration with APCE (Italian association, EFC member, devoted to the study of cathodic protection) and NACE Milano Italia section, and this year by Politecnico di Torino as well.

The 2021 full four-day event, sponsored by AUTOMA, attracted more than 120 attendees and the presentation of over 60 papers on different topics such as coatings and surface treatments, corrosion of aluminium, corrosion and additive manufacturing, corrosion in concrete and microbial corrosion. Moreover, considering the long experience on corrosion and protection of cultural heritage of the research group of Politecnico di Torino, special attention was paid to this topic. The Vice-Chair of EFC Working Party 21: Corrosion of Archaeological and Historical Artefacts, Prof. David Watkinson, Cardiff University (UK) gave a plenary lecture on “*Archaeological iron: post-excavation corrosion and its control*”, highlighting the latest advances in the study of corrosion of ancient iron after burial and the importance of its monitoring and control for the long-lasting preservation of these important witnesses of our history. During the conference, industry experts and researchers participated in interesting discussions, in particular within the NACE Workshop on Corrosion in Oil and Gas Production and in the Workshop on Cathodic Protection Monitoring

organised by APCE. Selected papers presented in the conference will be published in a special issue of “*La Metallurgia Italiana*”.

A large participation of PhD students and young researchers was encouraged by the Scientific Committee who decided to present the Best Oral Presentation Award for Young Researcher to Massimo Calovi of University of Trento, who presented a paper focused on cathodic disbonding and abrasion resistance of organic cataphoretic coatings. For this year’s conference, the award was named in memory of Prof. Venice Kamel Gouda, National Research Centre, Cairo, Egypt, to commemorate an uncommon person who was able to combine interest in science and corrosion with political and social commitment.

The conference was also the occasion to present the Cavallaro Medal, 2020 edition, to Prof. Fabrizio Zucchi of the Aldo Daccò Study Centre on Corrosion and Metallurgy of the University of Ferrara, who was invited to give a lecture related to his scientific contribution in the study of corrosion and inhibitors.



During the Conference, many interesting discussions arose concerning future events in corrosion science, electrochemical techniques for corrosion assessment and in industrial corrosion control.

The next GNC will be in Torino in June 2023!



**INSTITUTE OF CORROSION CED WORKING DAY AND SYMPOSIUM**  
**'MANAGING CORROSION IN LOW-CARBON ENERGY TECHNOLOGIES'**  
**28<sup>TH</sup> APRIL 2021**  
**(EFC Event No. 470)**

This one-day meeting was the latest in a series of working days held by the Institute of Corrosion's Corrosion Engineering Division (CED). This year's meeting had the theme of 'Managing Corrosion in Low-Carbon Energy Technologies'. Over one hundred people registered for the on-line event, which was chaired by Nick Smart (Jacobs). Managing corrosion in the evolving low carbon technologies is vital to their future success. The symposium covered the management of corrosion in five such technologies, namely hydrogen, wind, nuclear, biofuels, and carbon capture and storage.

The first talk on "Pipeline Materials in a Hydrogen Environment", was given jointly by Nancy Thomson (SGN) and Julia Race (University of Strathclyde). SGN are responsible for the operation of many of the local gas transport networks in the UK and there is a plan to reuse the same transmission system for pure hydrogen. For this to happen it is necessary to test legacy materials used in the manufacture of the original pipelines for their susceptibility to hydrogen embrittlement, fatigue cracking or uncontrolled fracture. In the second talk, Birit Buhr Jensen (Ørsted) discussed "Cathodic Protection of Offshore Wind Power - Design using upcoming ISO 24656". Wind power has expanded remarkably in Denmark over the last 40 years. Cathodic protection of concrete gravity structures placed on the seabed may be needed in cases where premature deterioration has been observed, or if there is an unacceptable risk of corrosion. The speaker described the ongoing development of the ISO 24656 standard to assist wind power operators to maintain these key assets. In the third talk Francois Ropital (IFP Energies Nouvelles) described "Corrosion Challenges for reliable Biorefineries". Having pointed out how biofuels such as ethanol and methyl esters derived from plant-based source materials (e.g. sugar beet and cane, oil from rape seed and sunflower seed), have a key role to play as part of the energy mix of future supplies, this led on to corrosion issues associated with processing such materials. The development of suitable corrosion resistant materials is a significant challenge with each novel process needing to be considered individual. In the fourth talk, Stuart Medway, Jacobs, described "A Range of Test Methods for Investigating the SCC and Corrosion Fatigue Behaviour of Structural Materials for a Nuclear PWR environment". He showed techniques for testing multiple specimens in a single test, using DC potential drop technology to monitor crack growth, and the application of thermal cycling and thermal shock

simulation. Similar tests could be used to evaluate materials in other low carbon energy technologies where strict control of the environmental chemistry required. The final talk was given by Ivan Gutierrez (OGC Energy) on "A Methodology for Corrosion and Environmental Assisted Cracking Risk Assessment for Industrial Carbon Capture, Utilisation and Storage (CCUS)". The CCUS technology is important for (i) controlling carbon emissions from energy-intensive industrial processes, (ii) extracting carbon from the atmosphere, and (iii) controlling carbon emissions during hydrogen manufacture. A risk-based approach that is used to perform corrosion assessments of CCUS technology, by taking account of more than twenty possible corrosion mechanisms was demonstrated. Recordings of the talks are available in the members' area of the Institute's website. (<https://www.icorr.org/members-area/>).

#### **PAUL MCINTYRE AWARD**

A highlight of the meeting was the presentation of the Institute's annual Paul McIntyre Award for achievements in the field of corrosion engineering to **Bijan Kermani**, Managing Director of KeyTech and a visiting professor at the



University of Leeds. He has been involved for over forty years across the materials, metallurgy and corrosion disciplines within the oil and gas, geothermal, carbon capture and steel industries. He has a particular focus on materials optimisation, corrosion mitigation and integrity management. Bijan is a leading authority on oilfield corrosion and materials and has more than sixty publications on his field of expertise related to environmental sensitive cracking, structural integrity and degradation, materials selection, steel development and corrosion control strategy. He has edited two prominent publications on CO<sub>2</sub> corrosion, established a new methodology in material design for sour service duties which is now included in ISO15156. He has conducted many materials and corrosion control projects and training courses for leading oil companies, and has managed innovative projects for multinational companies globally. A very worthy recipient.



# ACTIVITIES PROMOTED BY THE YOUNGEFC FOR CORROSION AWARENESS DAY 2021

*Leonardo B. Coelho, Andressa Trentin, Marta M. Sánchez*

On 24<sup>th</sup> April 2021, the Corrosion Awareness Day (organised by the EFC and the World Corrosion Organization) helped increase the awareness of corrosion in our community. 50 researchers, students and industry professionals from different parts of the globe (Spain, Pakistan, UK, Sweden, France, Hungary, India, Israel, France, Korea, Morocco, Kazakhstan, Turkey, Canada, Germany) attended 32 activities, including webinars, a coffee break for Corrosion Under Insulation (CUI), master classes, photo competitions (winning entries shown below) and conferences.

The Corrosion Awareness Day 2021 was strongly supported by the Young EFC, who invited the young corrosion community to participate in the organisation of activities. As for the previous event, online activities were promoted by email to the YEFC members, and to the broader community via the YEFC site/EFC LinkedIn account.

**Want to join the YEFC?**

→ <https://efcweb.org/YoungEFC.html>

→ [YoungEFC@efcweb.org](mailto:YoungEFC@efcweb.org)



Winning pictures of the photo competitions: (a) Hunkor/Keserú Dorka; (b) FOTOCORR/Adrián Jérez; (c) The University of Manchester/Julie Cler.

# FUTURE EUROCORR – THE EUROPEAN CORROSION CONGRESS

Each year EUROCORR attracts over one thousand corrosion experts from all over the world. The high level of scientific expertise of the participants has made EUROCORR a permanent fixture on the agenda of experts from universities and industry. For young colleagues the Young EFC provides a platform to exchange ideas with expert colleagues and to become part of a unique network.



## SAVE THESE DATES!



## EUROCORR 2023

*The Annual Congress of the European Federation of Corrosion*  
**Brussels, Belgium, 27-31 August 2023**

**Topic:** *Closing the gap between industry and academia in corrosion science and prediction*

**Venue:** SQUARE – BRUSSELS MEETING CENTRE

Brussels will become the Capital of Corrosion in 2023, with the EFC's annual congress EUROCORR, Europe's most renowned corrosion event.

**Website:** [www.eurocorr2023.org](http://www.eurocorr2023.org)



## EUROCORR 2024

**Paris, France, 1-5 September 2024**

EUROCORR 2024 will be organised by CEFRACOR in cooperation with Chimie ParisTech.

**Venue:** PARIS Congress Center

Organised by:



ParisTech

# FORTHCOMING EFC EVENTS 2021/2022



Please check the respective event websites for postponements and formats!

## EFC Event No. 481

Online, 8 September 2021

### Mobile corrosion test for automotive materials

Organised by RISE - Research Institutes of Sweden  
**Scope:** Mobile test bed for automotive corrosion: RISE have a unique testing facility consisting in 10 truck trailers in traffic between Stockholm and Gothenburg, one of the world's most corrosive road environments.

During this webinar we will give you an introduction to how it works and share results from several studies performed at RISE, related to mobile exposure on trailers in Sweden and worldwide. You will also get practical examples of the benefit of this type of exposure compared to laboratory exposure and the possibility to ask questions and discuss with other stakeholders and experts.

<https://www.ri.se/en/event/webinar-mobile-corrosion-test-for-automotive-materials>

## EFC Event No. 471

Šibenik, Croatia, 6-9 October 2021

### 3rd International Conference on Materials "MTECH 2021"

Organized by the Croatian Society for Materials Protection, the Croatian Center for Non-destructive Testing, the Croatian Society for Materials and Tribology and the Croatian Society for Heat Treatment and Surface Engineering.

**Scope:** Exchanging experience in the fields of innovation, materials development and testing methods, as well as linking all those who are engaged in experimental research with those whose activities include design, production, quality control and other aspects of industrial production.

<https://mtech-conf.hr/>

## EFC Event No. 478

Online, 3-4 November 2021

### Corrosion of Nickel Alloys in Aqueous Solutions and under High Temperature Corrosion Conditions and their Applications

Organised by GfKORR

**Scope:** This webinar outlines the different mechanisms of the corrosion of nickel alloys in aqueous solutions and at high temperatures. Applications of nickel alloys in different industrial sectors are presented. Furthermore, the attendants will receive an insight into the recent development of new alloys.

<https://gfkorr.de/Nickel2021.html>

## EFC Event No. 482

Online, 09-10 November 2021

### International Course on Corrosion And Scale Inhibition

The course, organised by IFINKOR in cooperation with EFC WP1, summarizes the present day knowledge in theory, testing and application of corrosion inhibitors and scale inhibitors with emphasis on application and environmental aspects. Course language: English

<https://www.ifinkor.de>

## EFC Event No. 476

Online, 15-26 November 2021

### SURF Electrochemical Doctoral School

Organised by: Vrije Universiteit Brussel, VOM - Beyond treatment of surfaces

**Scope:** The Doctoral School is open for PhD students and academia/industrial researchers seeking for in-depth understanding of electrochemical phenomena (novel insights into EIS, a global package of complementary surface analysis, an introduction to micro-electrochemical techniques). Lectures by academic experts and industrial stakeholders, mini-conferences and Q&A sessions.

<https://www.surfgroup.be/events/online-electrochemical-doctoral-school>

## EFC Event No. 479

Online, 23-24 November 2021

### GfKORR Annual Conference "Aluminium and Magnesium - The Bridge to a Sustainable Future"

**Scope:** The conference provides insights into new findings and developments on the use of the two materials and on recent developments in innovative corrosion protection concepts for applications in aviation, automotive, construction and medical technology.

<https://gfkorr.de/JT2021.html>

## EFC Event No. 466

Frankfurt am Main, Germany, 4-8 April 2022 (NEW DATE!)

### ACHEMA 2022

**Scope:** Future production: modular, connected and smart; Industrial intelligence and sensor-based process control; Plant design and maintenance; Pumps, compressors, valves and fittings: state of the art in fluid handling; Innovative mixing and separation solutions; Bioprocessing: bioreactors, process development and control; Pharma meets production;

Renewing the chemical & pharma supply chain; Materials and material processing; Additive manufacturing; Innovative product design in mechanical process engineering; The digital lab: laboratory and analytical techniques; Raw materials; Water technologies; Future energy use in process industries; Product and process security; Safety First!  
<https://www.achema.de/>

#### **EFC Event No. 475**

Val di Fiemme, Trentino, Italy, 29 March – 1 April 2022

#### **Application of Electrochemical Techniques to Organic Coatings – AETOC 2022**

**Scope:** AETOC workshop is covering all the topics related to recent developments in the application of electrochemical techniques to the study and monitoring organic coatings.

<https://webmagazine.unitn.it/en/evento/dii/97056/aetoc-2022>

#### **EFC Event No. 477**

Chengdu, PR China, 27-29 May 2022,

#### **2022 International Conference on Corrosion Protection and Application (ICCPA2022)**

Organised by Chongqing Wujiu Periodicals Press, Affiliate membership of EFC

Conference language: English and Chinese (simultaneous translation available)

**Scope:** 1. Corrosion protection in oil & gas industry; 2. Corrosion protection in marine environments; 3. Corrosion protection in aerospace industry; 4. Corrosion protection in nuclear power generation; 5. Corrosion testing and monitoring

<https://iccpa.medmeeting.org/8823?lang=en>

For full details of these and a complete listing of many other future corrosion events held in Europe and throughout the world, go to the EFC Calendar of Events at: <https://www.efcweb.org/Events.html>

#### **EFC Event No. 480**

Baden, Switzerland, 22-24 June 2022

#### **8<sup>th</sup> International Workshop on Long-Term Prediction of Corrosion Damage in Nuclear Waste Systems (LTC 2022)**

Co-organised by EFC WP4 on Nuclear Corrosion together with the Swiss National Cooperative for the Disposal of Radioactive Waste (Nagra).

**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.

<https://www.ltc2022.ch>

#### **EFC Event No. 455**

Antibes Juan-les-Pins, France, 14-16 June 2022 (NEW DATE!)

#### **7<sup>èmes</sup> Journées Protection Cathodique et Revêtements Associés**

Organised by CEFRACOR.

**Scope:** This event on cathodic protection and associated coatings is devoted to end users as well as suppliers of equipment, designers, service companies, authorities, laboratories, universities and research centres. An exhibition will complete this event.

<https://www.cefracor.org/en/7emes-journees-protection-cathodique-et-revetements-associes-reportees-2022>

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The statements and opinions expressed in the e-newsletter are those of the contributors; the EFC assumes no responsibility for them.

#### **LEGAL NOTICE:**

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You will find our data privacy policy on our website

