

heat treatment, corrosion, testing and tribology, 2023

MTECH 2023

October 02-05, 2023, Cavtat, Croatia

ORGANISED BY

Croatian Society for Heat Treatment and Sufrace Engineering – HDTOIP Croatian Society for Materials Protection – HDZaMa Croatian Society for Materials and Tribology – HDMT Center for Non-destructiveTesting – CENI









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Tech

INTERNATIONAL CONFERENCE ON MATERIALS

heat treatment, corrosion, testing and tribology, 2023

SCIENTIFIC AND PROGRAM COMMITTEE

Božidar Matijević (President), Ivan Stojanović, Željko Alar, Vesna Alar, Imre Felde University of Obuda, Budapest, HU, Lauralice de Campos Franceschini Canale, University of São Paulo, Faculty of Mechanical Engineering, São Carlos, Brasil, M.T. Mathew, Ph.D., University of Illinois College, Chicago, USA, Nikolai Kobasko, USA, Damir Markučič, Duško Pavletić (RITEH), Angela Topić (FSR Mostar), Danko Ćorić, Zdravko Schauperl, Suzana Jakovljević, Mateja Šnajdar Musa (UniRi), Ivan Juraga, Helena Otmačić Ćurković (FKIT), Marko Katić, Morana Mihaljević, Johgann Wilhelm Erning (BAM), Marijana Serdar, Ivica Kladarić (UNISB), Ivan Samardžić (UNISB), Claus Qvist Jessen (Damstahl).

ORGANIZING COMMITTEE

Dario Iljkić, Suzana Jakovljević, Jurica Jančić, Tomislav Kezele, Ivica Kladarić, Marin Kurtela, Darko Landek, Johgann Wilhelm Erning (BAM), Srećko Godež (SLO), Nikola Knezović (FSR Mostar), Izabela Martinez, Morana Mihaljević, Jurica Jačan, Daniel Pustički, Filip Žanetić

TECHNICAL COMMITTEE

Ante Dizdar (OPT d.o.o.), Marko Rakvin (TUV Croatia), Mladen Franjković (STSI), Karla Rončević (Helios), Ivana Radić Boršić (Cortec Corporation Europe), Robert Iveković (IVEKOVIĆ-TZM), Martin Miculinić (ZIT), Branko Šeparović (Altmont), Krešimir Kekez (PA-EL)

TOPICS

Materials and processes, Materials characterization, Nanomaterials and nanotechnology, Friction, wear and lubrication, Metallurgy, Quenchants and quenching technology, Coatings, Advanced surface modification and coating technologies, Vacuum heat treatment, Heat treatment equipment, Mathematical modeling and process simulation of heat treatment, Corrosion and corrosion protection methods, Corrosion resistant materials, Non-destructive and destructive testing methods, In-service inspection, Certification and accreditation, Measurement and quality assurance

Conference Chairman

rotyce

Prof. dr. sc. Božidar Matijević

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INTERNATIONAL CONFERENCE ON MATERIALS

heat treatment, corrosion, testing and tribology, 2023

VENUE AND DATE

MTECH International Conference will be held at Croatia hotel, Cavtat, from 2-5 October 2023.

Rising above a pine forested peninsula overlooking unspoiled Cavtat Bay, Hotel Croatia Cavtat is the leading five-star resort and conference center in the South Adriatic. Just 5km from Dubrovnik airport, Hotel Croatia Cavtat combines a stunning waterfront location with easy access to the halcyon treasures of the Adriatic coast. Medieval Dubrovnik across the bay is a must and less than half an hour by car, or a relaxed 45-minute boat ride away. Closer to home, we offer access to two quiet beaches – one facing Cavtat Bay, the other the crystal-clear Adriatic – an outdoor pool shaded by pine trees, a spa and excellent restaurants. It is an idyllic, design award-winning base from which to explore the region's historic charm.



To book preferential accommodation the conference participants are kindly asked to follow the link on mtech-conf.hr under "Venue & Accommodation" using promo code MTECH2023 (deadline till 15th Sept 2023.)

EFC-Event No. 503

CONFERENCE VENUE ADRESS:

Adress: Hotel Croatia Frankopanska 9

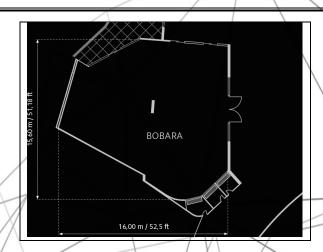
Croatia

20210, Cavtat

Telephone: +385 20 475 555

mail: reservations@alh.hr

Airport distance: Dubrovnik Airport 5,8 km





CONFERENCE HALLS:

Halls and lobbys in Hotel Croatia used for the purpose of the conference are:

- Ragusa conference hall Opening ceremony, Invited and comercial lectures, Workshops, Lectures
- **Bobara** conference hall Lectures, Workshops, more than 500m² of exhibition space



• Cavtat Buffet Restaurant - Lunch







PROGRAMME OVERVIEW

DAY 1 - MONDAY 02. 10. 2023.			
14.00 h	Workshops mtech-conf.hr	Bobara Conference Hall	
18.00 h	REGISTRATION	REGISTRATION DESK	
20.00 h	WELCOME RECEPTION	Di l	
20.00 H	for Conference participants	Piano bar	

DAY 2 - TUESDAY 03. 10. 2023.			
8.00-9.00 h	REGISTRATION DESK	Hotel Croatia Conference Reception desk	
9.00-9.15 h	OPENING CEREMONY	BOBARA HALL	
9.15-10.45 h	INVITED & COMMERCIAL LECTURES	BOBARA HALL	
10.45-11.15 h	COFFEE BREAK	Piano bar, Lobby (Level 1)	
11.15-12.30 h 12.30-13.45 h	LECTURES	BOBARA HALL	
	LUNCH BREAK	Restoran CAVTAT	
13.45-14.45 h	POSTER SESSION	Lobby (Level 1)	
9.00 - 14.45 h	EXHIBITION	Lobby (Level 1)	
15.00 h	Social Event Visit to Dubrovnik	Departure from Hotel Croatia by the Bus Return to Cavtat by Galleon Tirena	

DAY 3 - WEDNESDAY 04. 10. 2023. INVITED 9.00-10.30 h **BOBARA HALL** & COMMERCIAL LECTURES 10.30-11.00 h Piano bar, Lobby (Level 1) **COFFEE BREAK** BOBARA HALL 11.00-12.45 h LECTURES 12.45-14.00 h LUNCH BREAK Restoran Cavtat LECTURES BOBARA HALL 14.00-15.30 h In memoriam izv. prof. dr. sc. Vinko Šimunović Piano bar, Lobby (Level 1) 15.30-16.00 h **COFFEE BREAK** BOBARA HALL 16.00-17.30 h **LECTURES** 9.00-17.30 h **EXHIBITION** Lobby (Level 1) Spinaker Restaurant of Hotel 20.00 h **GALA DINNER** Croatia



DAY 4 - THURSDAY 05. 10. 2023.

9.00-10.30 h	INVITED & COMMERCIAL LECTURES	BOBARA HALL
10.30-11.00 h	COFFEE BREAK	Piano bar, Lobby (Level 1)
9.00 - 11.00 h	EXHIBITION	Lobby (Level 1)
11.00-11.30 h	The Commemoration for prof. dr. sc. Božidar Liščić	BOBARA HALL
11.30-12.00 h	THE CONFERENCE CLOSING CEREMONY	BOBARA HALL

PROGRAMME

DAY 2 - TUESDAY 03. 10. 2023.

TIME / EVENT / LOCATION		
8.30-9.00 h	REGISTRATION DESK	Hotel Croatia Conference Reception desk
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9.15-10.45 h	INVITED & COMMERCIAL LECTURES	BOBARA HALL

CHAIRMEN: dr. sc. Božidar Matijević, dr. sc. Ivan Stojanović

INVITED LECTURE:

Wilhelm Erning: "GRABENKORROSION": HOW SCIENTIFIC DEBATE LEADS TO AN SOLUTION. AND MODERN FAILURES DUE TO NEGLECTION OF WELL DESCRIBED FACTS

INVITED LECTURE:

Imre Felde: APPLICATION OF MACHINE LEARNING FOR CHARACTERIZATION OF TRANSIENT HEAT TRANSFER

COMMERCIAL LECTURES: Trokut Test Group

10.45-11.15 h	COFFEE BREAK	Piano bar, Lobby (Level 1)
11.15-12.30 h	LECTURES	BOBARA HALL

CHAIRMEN: dr. sc. Željko Alar, dr. sc. Damir Markučič

DEPOSITION OF PACVD TIN COATING ON ADDITIVELY MANUFACTURED TITANIUM ALLOY Jurica Jačan, Darko Landek, Miho Klaić

BORIDE LAYER GROWTH KINETICS ON 42CRMO4 STEEL

Filip Žanetić, Božidar Matijević, Darko Landek, Igor Vukić

VpCI FOR MULTIMETAL PROTECTION IN HEATING SYSTEMS

Ivana Radić Boršić, Ivan Stojanović, Marin Kurtela, Vesna Alar, Boris. A. Mikšić

KONZERVACIJA VATRENOG ORUŽJA PRIMJENOM ISPARAVAJUĆIH INHIBITORA KOROZIJE

Katarina Sabelja, Ivan Leutar, Mirko Jakopčić



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12.30-13.45 h

LUNCH BREAK

13.45-14.45 h

POSTER SESSION

Lobby (Level 1)

THE EFFECT OF SHOT-PEENING ON BENDING FATIGUE FAILURE IN CARBURIZED SPUR GEARS Ivan Čular, Krešimir Vučković, Željko Alar, Srečko Glodež

THE INFLUENCE OF APPLYING PVD COATINGS ON ADHESION WEAR RESISTANCE OF HARDENING AND TEMPERING STEEL C45E

Ivica Kladarić, Stjepan Golubić, Slavica Kladarić, Andrijana Milinović

FAILURE ANALYSIS OF THE HAY TEDDER

Tomislav Vukes, Suzana Jakovljević

PROPERTIES OF WATER-BASED COATINGS FOR WOOD BURNING STOVE PROTECTION Borna Škrlec, Ivan Stojanović, Vesna Alar, Marin Kurtela

EXPERIMENTAL DETERMINATION OF RESIDUAL STRESSES ON BUTT WELDS OF AL-MG ALLOYS OBTAINED WITH MIG WELDING

Mislav Štefok, Ivica Garašić, Maja Jurica, Vedran Jurlina

DEPENDENCE OF SPOT-WELDED JOINT GEOMETRY ON ANTI-CORROSIVE PROPERTIES OF CONVERSION COATING AND EPOXY-POLYESTER POWDER COATING ANNA POROPAT, IVAN STOJANOVIĆ

MATHEMATICAL MODELLING OF TEMPERED HARDNESS OF QUENCHED STEEL

Dario Iljkić, Sunčana Smokvina Hanza, Božo Smoljan, Dario Kvrgić

VERIFICATION OF PAUT SYSTEM FOR AT RAIL WELD TESTING

Morana Mihaljević, Tomislav Kezele, Jure Burnać

EFFECT OF AL AND AG NANOPARTICLES ON THE ANTICORROSION AND ANTIBACTERIAL PROPERTIES OF EPOXY COATING

Marina Samardžija, Vesna Alar, Vedrana Špada, Suzana Jakovljević, Biserka Runje

PROJECT "SMART PLANT FOR DRYING LIQUID COATINGS"

Mirta Logar, Ivan Stojanović, Ivan Juraga, Zdenka Keran

COMPARISON OF DIFFERENT TESTING MACHINE CONTROL IN STATIC TENSILE TESTING DURING COLD DEFORMATION

Tin Brlić, Stoja Rešković, Ivan Jandrlić, Željko Alar, Branko Grizelj, Lorena Mrkobrada

EXPLORING ORGANIZATIONAL COMPETENCE IN LABORATORY ENVIRONMENT: A HOLISTIC APPROACH

Branimir Buntak, Željko Alar

15.00 h



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DAY 3 - WEDNESDAY 04. 10. 2023.

TIME / EVENT / LOCATION

9.00-10.30 h INVITED & COMMERCIAL LECTURES

BOBARA HALL

CHAIRMEN: dr. sc. **Alar Željko**, dr. sc. **Damir Markučič**

INVITED LECTURE

Mathew T. Mathew: TRIBOCORROSION ASPECTS OF BIOMEDICAL IMPLANTS: CURRENT STATUS AND NEW DIRECTIONS

GUEST LECTURE:

Pascal Collet: THE EFC, A FEDERATION FOR ALL CORROSION SPECIALISTS AND EXPERTS IN MATERIAL SUSTAINABILITY

COMMERCIAL LECTURE: Cortec Corporation

10.30-11.00 h COFFEE BREAK Piano bar, Lobby (Level 1)

11.00-12.45 h LECTURES BOBARA HALL

CHAIRMEN: dr. sc. Darko Landek, dr. sc. Morana Mihaljević

COMPARISON OF VARIOUS MINERAL AND VEGETABLE OILS AS QUENCHING MEDIA IN THE HARDENING PROCESS

Izabela Martinez, Božidar Matijević, Tonća Ćaleta Prolić

EFFECT OF HEAT TREATMENT ON MECHANICAL AND CORROSION PROPERTIES OF ALSI1MGMN ALUMINUM ALLOY

Darko Landek, Marin Kurtela, Domagoj Fekonja, Jurica Jačan

COMMENTS ON ULTRASONIC THICKNESS MEASUREMENT DEVIATIONS

Damir Markučič

PA ULTRASONIC TESTING OF AT WELD JOINTS IN RAILS

Aleksandar Dragojević, Ivica Garašić, Tomislav Kezele

ULTRASONIC CHARACTERIZATION OF ADDITIVELY MANUFACTURED SAMPLE Maria Grozdanić, Morana Mihaljević

RISK ASSESSMENT OF PRESSURE VESSELS BY USING FRACTURE MECHANICS AND ADVANCED ULTRASONIC TESTING

Mirjana Opačić, Aleksanda Sedmak, Gordana Bakić, Nenad Milošević, Nikola Milovanović

12.45-14.00 h

LUNCH BREAK





heat treatment, corrosion, testing and tribology, 2023

DAY 3 - WEDNESDAY 04. 10. 2023.

14.00-15.30 h LECTURES BOBARA HALL

CHAIRMEN: dr. sc. Ivan Stojanović, dr. sc. Vesna Alar

In memoriam izv. prof. dr. sc Vinko Šimunović

ANALYISIS OF ELECTRICAL RESISTANCE OF ELASTOMER COMPONENTS OF THE FASTENING SYSTEMS IN URBAN RAILWAY TRACKS

Katarina Vranešić, Stjepan Lakušić, Marijana Serdar, Vesna Alar

TESTING OF GALVANIC CORROSION IN A SALT ATMOSPHERE

Ivan Stojanović, Vesna Alar, Marin Kurtela

ALUMINIUM NANOCOMPOSITES EPOXY COATING FOR ANTICORROSION AND ANTIBACTERIAL PROTECTION

Marina Samardžija, Vesna Alar, Ivan Stojanović, Vedrana Špada, Marin Kurtela

DRYING PARAMETERS OF WATER-BORNE COATINGS

Ivan Stojanović, Vesna Alar, Marin Kurtela, Ivan Juraga, Mirta Logar, Ivan Fatović

CORROSION PROPERTIES OF AA5083 IN MARINE ENVIRONMENT UNDER STAGNANT AND FLOW CONDITIONS

Lea Lokas, Vesna Alar

15.30-16.00 h COFFEE BREAK Piano bar, Lobby (Level 1)

16.00-17.30 h LECTURES BOBARA HALL

CHAIRMEN: dr. sc. Ivica Kladarić, dr. sc. Danko Ćorić

SURFACE HARDNESS UNIFORMITY OF THE HARDNESS REFERENCE BLOCKS PRODUCED BY SLM TECHNOLOGY AND HEAT TREATMENT

Daniel Pustički, Željko Alar

ANNEALING OF THICK-SOLID WELDED SHEETS TO REDUCE RESIDUAL STRESSES

Darko Landek, Ivica Garašić, Mislav Štefok, Jurica Jačan

THE INFLUENCE OF DIFFERENT FOAMING AGENTS ON ALUMINIUM FOAM PORE SIZE Tomislav Rodinger, Danko Ćorić

ANALYSIS OF WELDED LAYER WEAR ON HELICOPTER SLIDE LINER

Darko Landek, Anita Peran, Mirko Jakopčić

MATERIAL CHARACTERIZATION OF THE FREE-FORGED MACHETE

Andrija Cestar, Vera Rede, Helena Lukšić

9.00 - 17.30 h EXHIBITION

20.00 h GALA DINNER Spinaker Restaurant of Hotel Croatia



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DAY 4 - THURSDAY 05. 10. 2023.

TIME / EVENT / LOCATION

9.00-10.30 h INVITED & COMMERCIAL LECTURES

BOBARA HALL

CHAIRMEN: dr. sc. Alar Željko, dr. sc. Damir Markučič

INVITED LECTURE

Stefan Valkov: ELECTRON-BEAM PROCESSING OF METALS AND ALLOYS - TECHNIQUES AND TRENDS

Zoltan Koloszvary

COMMERCIAL LECTURE: MESA Electronic GmbH

APPLICATION OF VISCOELASTIC COATINGS BASED ON POLYISOBUTENE

Sven Radimiri

QUALITY EVALUATION OF CORROSION PROTECTIVE SYSTEMS IN EXPLOITATION CONDITIONS IN

INDUSTRY

Zoran Čeralinac, Tomislav Karažija, Dijana Vrsaljko

OVERVIEW OF MODIFICATION AND COATING OF SURFACE

Božidar Matijević, Izabela Martinez

10.30-11.00 h COFFEE BREAK Piano bar, Lobby (Level 1)

11.00-11.30 h The Commemoration for BOBARA HALL

Prof. dr. sc. Božidar Liščić

11.30-12.00 h

THE CONFERENCE CLOSING
CEREMONY

BOBARA HALL

Participants are invited to visit the

EXHIBITION

Trokut Test Group

IDEF d.o.o.

Cortec Corporation & EcoCortec

CorteCros d.o.o.

Ina maziva d.o.o,

EDC d.o.o.

MESA Electronic GmbH

Gracotech Grupa d.o.o.

Instrumentacija ELI-MP d.o.o.

IRT3000 ADRIA

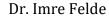
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INVITED LECTURERS



Dr. rer. Nat. Johann Wilhelm Erning

Works at Bundesanstalt für Materialforschung und –prüfung (BAM), Berlin, Germany. Studied Chemistry in Cologne and Bonn. Worked for the research centre Jülich from 1993 – 1996. Worked as post-doc at South Westphalia University of Applied Sciences from 1996-1998. Currently working at Bundesanstalt für Materialforschung und -prüfung (BAM) since 1998. Topics: electrochemistry, metals in contact with drinking water, failure analysis. Participation in various committees at EFC, CEN, DIN, DVGW...



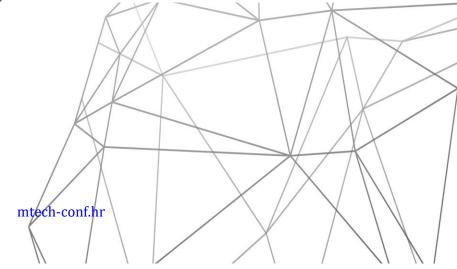


Dr. Imre Felde was born 19.07.1973. in Hungary. He achieved his PhD in Materials Science and Technology from Miskolc University (Hungary) in 2007. From 1995. to 2008. he was head of department and from 2008 to 2012. CEO of Bay Zoltán Foundation for Applied Research, Budapest, Hungary. From 2012. he is Vice Dean of Faculty of Informatics, Obuda University in Budapest, hungary. He has published more than 100 scientific and technical papers in field of engineering, computer science, mathemathics and process modeling. He is member of editorial board of Strojniski Vestnik-Journal of Mechanical Engineering, International Journal of Microstructure and Mechanical Properties, Surface Engineering and Hindawi Advanced Materials Science and Technology.

Dr. Mathew Mathew

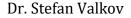


Mathew is a faculty at Department of Biomedical Science, UIC School of Medicine at Rockford and leading Disability Research lab. He holding adjunct position at Department of Bionegineering at UIC, Chicago and Department of Orthopedic Surgery, Rush University Medical Center, Chicago. His research is supported by the federal agencies (NIH and NSF) and research foundations. He is also Editor- in- chief of Journal of Bio and Tribo-corrosion by Springer. He was an instrumental for initiating an international research institute called "Institute of Biomaterials, Tribocorrosion, and Nanomedicine" (IBTN), which is a joint venture of University of Illinois (UIC) and UNESP, Brazil. Currently, he actively involved in the IBTN and the director of tribocorrosion division.





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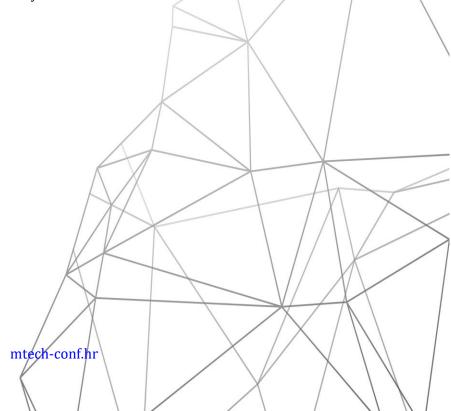
Dr. Stefan Valkov is Associate Professor at the Technical University of Gabrovo and Institute of Electronics of the Bulgarian Academy of Sciences. Currently, he is a team leader of the laboratory "Physical technologies" located at the Institute of Electronics, Bulgarian Academy of Sciences. His scientific interests are related to the modern materials science: thin films and coatings deposition, electron-beam surface treatment and modification of metals and alloys, materials characterization, X-ray diffraction, crystallography.

GUEST SPEAKER

Mr. Pascal Collet



Mr. Pascal Collet received a degree in chemical engineering at Hautes Etudes Industrielles in Lille, France. He has over 30 year-experience in technical services, sales, business development and marketing in the chemicals and protective coatings industries for markets which have included the oil & gas, water sectors, the nuclear industry, the automotive sector and building. His main current employment is the European Federation of Corrosion (EFC) as Chief Operating Officer from April, 2023. He is also involved with the French Corrosion Society Cefracor.





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WORKSHOPS

Monday 02.10.2023.

14.00 - 19.00

WORKSHOP 1

PRIMJENA HLAPIVIH INHIBITORA KOROZIJE U INDUSTRIJI

Organizator: Hrvatsko društvo za zaštitu materijala i Cortec Corporation Predavač: **Ivana Radić Boršić** Kontakt i slanje prijava: <u>dubravka.ulaga@fsb.hr</u>

WORKSHOP 2

OCJENE ULTRAZVUČNIH INDIKACIJA NEPRAVILNOSTI U ZAVARIMA PREMA ISO 17640

Organizator: Hrvatski centar za nerazorna ispitivanaja – CeNI Kontakt i slanje prijava: <u>info@ceni.hr</u>

WORKSHOP 3

TRIBOCORROSION BASICS

Organizator: Hrvatsko društvo za toplinsku obradu – HDTOIP Predavač: M.T. Mathew, Ph.D., Professor, Department of Biomedical Engineering, UIC, Chicago Kontakt i slanje prijava: <u>bozidar.matijevic@fsb.hr</u>

WORKSHOP 4

ISPITIVANJA MEHANIČKIH SVOJSTAVA MATERIJALA I UMJERAVANJA OPREME

Organizator: Hrvatsko društvo za materijale i tribologiju – HDMT Prijava za seminar putem e-mail adrese: <u>zeljko.alar@fsb.hr</u>



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OFFICIAL LANGUAGES:

Official languages of the Conference are Croatian and English.

CONFERENCE BADGE:

Everyone is kindly requested to wear her/his name badge during the Conference as it provides access to the scientific sessions, poster session, coffee breaks and gala dinner.

COFFEE BREAKS:

Coffee breaks will be served at the Lobby (Level 1) according to the program timetable.

DURATION OF PRESENTATION:

Due to the tight presentation schedule each participant selected for presentation is kindly asked to present his work in max. 12 min. Additional 3 min is left for the discussion of each presentation. All speakers are kindly asked to prepare the presentation in English in a Power Point format and to bring it on a USB memory device.

POSTER PRESENTATION:

Posters will be exhibited in the Cuiet Salon in front of the Bobara Hall.

All authors participating at MTECH 2023 with posters must print posters and bring them to the conference. The Conference Secretariat will provide tapes to fix posters. Poster size should be 70 cm x 100 cm (that is width x height; portrait format). Organizing Committee is unfortunately not able to offer a Poster Printing Service.

REGISTRATION:

All participants at MTECH 2023 must register via https://mtech-conf.hr/?page_id=513&lang=en.

ENDORSED BY:

European Federation of Corrosion, EFC-Event No. 503

CONFERENCE WELCOME DRINK:

Date and time: Monday, 2th October, 20:00 Venue: Piano bar Lobby, Hotel Croatia

The Organizers invite all guests to enjoy a breathtaking panorama, together with the appropriate

welcome drink and snack in the terrace of the Hotel.

Dress code: Casual

CONFERENCE SOCIAL EVENT:

Date and time: Thusday, 3th October, 15:00 Venue: Vistit old town of Dubrovnik **Departure:** from Hotel Croatia with bus

CONFERENCE GALA DINNER:

Date and time: Wednesday, 4th October, 19:00 **Venue:** Spinaker Restaurant of Hotel Croatia

Consistently oted one of the best restaurants at Hotel Croatia Cavtat.

Dress code: Formal / **Accompanying person fee:** price on request



NOTES	BILJEŠKE	-
	mtech-conf.hr	



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