Announcement

76th CEEES Meeting, November 30th - December 1st, 2021
Online Meetings

PROGRAM

Tuesday 30th November 2021

Welcome by Giulio D'Emilia, A.I.VE.LA.

09.30 – 13.00 **Technical Advisory Board Reliability and Environmental Stress Screening, (R&ESS)**
Chair Henry Grzeskowiak, ASTE

13.00 – 14.00 Lunch Break

14.00 – 16.30 **Technical Advisory Board Mechanical Environment, (ME)**
Chair Dave Richards, SOE

14.00 – 16.30 **Technical Advisory Board Climatic and Air Pollution Effects, C&AP**
Chair Thomas Reichert, GUS

16.30 – 17.00 Coffee Break

17.00 – 19.00 **General Assembly**
Chaired by CEEES President Thomas Reichert (GUS)

Wednesday 1st December 2021

09.00 – 12.00 **Round Table**
Environmental Engineering: New Challenges for Testing and for Materials
Chaired by Giulio D'Emilia, A.I.VE.LA.

The round table aims at discussing methods and approaches of environmental engineering able to improve reliability performances of materials and systems with respect to the environmental impacts. Based on invited contributions of experts from CEEES, A.I.VE.LA and Polytechnic of Bari (Department Mechanic Mathematic Management), the discussion is expected to merge ideas, actions to carry on and to promote cooperation.

- ***Physical simulation test for the reliable design of manufacturing processes***, Maria Emanuela Palmieri, Polytechnic of Bari, A.I.VE.LA
- ***Vision based defect detection techniques on composite pieces; discussion about measurement uncertainty*** Emanuela Natale, DIIIE-UnivAQ, A. Gaspari, DMMM - PoliBA,

- ***The role of simulation for the assessment of process parameters for efficient and reliable products of composite materials***, A. Stamopoulos, UnivAQ,
- ***Digital Twins in Environmental Testing,*** Markku Juntunnen, EERTECH, KOTEL
- ***Summary and Actions of the TAB Meetings***
- ***Impulse Presentations and Statements from the Audience***

12.00 Wrap up and end of the meeting

Host: A.I.VE.LA., the Italian member of CEEES, promotes this event with the aim of supporting a fruitful exchange of experiences, knowledge and research hints. People involved in topics of environmental engineering - but not only - are networking in Europe and in CEEES.

In order to reach this aim, the participation of interested people to both Technical Advisory Boards (TAB) and to the Round Table is very much appreciated.

Registration

A formal registration is required (see separate document) for each participant in each TAB, General Assembly and Round Table.. Once registered a separate invitation link will be send to the registered person. Participation is free for all CEEES Members (Members of the member association of CEEES, please name in the registration the representing CEEES Member).

76th CEEES Meeting
Draft agenda for R&ESS Technical Advisory Board – Online Meeting
30.11.2021, 9:30 – 13:00 CET
Chairpersons: David Delaux, Henry Grzeskowiak

1. **Stress-Strength approach** (presentation to a paper presented at ESREL 2021)
   by Marco Bonato (VALEO, LJC), ASTE

2. **H2 (Hydrogen) problems in transportation (automobile; trucks; buses; railways; planes)**
   by Daniel Leroy president of ASTE

3. **Reliability and Functional Analysis of IMU systems under environmental stress screening**
   Lorenzo Ciani and Gabriele Patrizi; University of Florence, (A.I.VE.LA)

4. **Batteries**
   a. Test issues:
      i. Types of tests – severities / security aspects (tbc)
      ii. Means of testing; Miguel Marous (IMV, ASTE)
      iii. Reliability aspects: state of the art of reliability assessment: provisional-experimental-operational with a representative of FIDES France (tbc)
      iv. Requirements for vibration testing of large floor mounted batteries of Battery Electric Vehicles (BEV) Benedikt Plaumann, (Hamburg University of Applied Sciences, GUS)

5. **Round table (approximately 11:40 to 12:40):**
      i. E.g. Standards: ISO 19453-6: current vibration coupling test plan
      ii. Other topics arising

6. **CONCLUSION of the TAB (12:40)**
   Summary of:
      i. Emerging ideas
      ii. Actions retained

76th CEEES Meeting
Agenda for ME Technical Advisory Board – Online Meeting
30.11.2021, 14:00 – 16:30 CET
Chairperson: David Richards, SOE

1. Matters Arising From Previous Meeting

2. Presentation on the proposed new IEC 60068-2-68 test procedure for multi-axis and multi-exciter vibration testing. The national bodies, which participate in IEC Technical Committee 104, agreed over a year ago to proceed with a new project to develop a new test procedure (IEC 60068-2-68) on multi-axis and multi-exciter vibration testing. For a number of reasons it has taken some time to develop the scope and intent of that procedure. A proposal is about to be made available to the IEC TC104 project team which sets out a feasible way forward. This presentation is intended to provide visibility of that proposal and allow participants to provide inputs.

   i. Background and reason for the new test procedure

   ii. Existing test procedures and common issues

   iii. The intended uses of the new procedure

   iv. The types of vibration test to be encompassed

   v. The proposed way forward.

   vi. Open discussion

3. Update on the revision of IEC 60721-2-6 Classification of environmental conditions. Environmental conditions appearing in nature. Earthquake vibration and shock.

4. Update on the new technical report IEC TR 62131-8 Environmental conditions, Vibration and shock of electro-technical equipment. Transportation by ship.

5. Any Other Business

76th CEEES Meeting
Agenda for C&AP Technical Advisory Board – Online Meeting
30.11.2021, 14:00 – 16:30 CET
Chairperson: Thomas Reichert, GUS

Welcome and Tour de Table

Atmospheric Corrosion

Trend of one-year atmospheric corrosion rate of copper exposed in Europe
Namurata Pålsson; RISE Research Institutes of Sweden, Department Corrosion (SEES)

Comparison of corrosion test methods
Laura Frisk; Trelic (KOTEL)

Solar Radiation Experiments and Standards

Laboratory Weathering Automotive Standards
Artur Schönlein, Rüsselsheim Advanced Weathering Solutions, (GUS)
Weathering, irradiation – weather factors, testing methods of the automotive industry, outdoor weathering– reference climates, stress factors, laboratory weathering xenon technology, metal halide technology (MHG), current standardization projects (new reference sun).

Standards on solar radiation, weathering and UV
N.N, Jorrit Hillaert, Rycobel (PLOT)
- Difference between the tests in terms of Physics of Failure
- Test capabilities
- Experiences with the different tests

Next events 2022
- Ultrafine Particles 2022
- EWS 2022
- ….
-

Any other business

Additional Information
Presentations / Abstracts implemented in the TABs/Round Table

Starting Presentation in Round Table Discussion

Physical simulation test for the reliable design of manufacturing processes

Maria Emanuela Palmieri, Department of Mechanics, Mathematics and Management, Polytechnic of Bari

Abstract: Physical simulation is a powerful tool able to reproduce a real thermo-mechanical manufacturing process at the laboratory scale.
This presentation focus on the application of physical simulation (using Gleeble 3180 system) to reproduce both rapid thermal cycles typical of laser material processing and thermo-mechanical cycles typical of hot-stamping processes.
A case study of Press-Hardening process of an automotive component will be shown in detail with the aim of defining the optimal process parameters to obtain desired mechanical properties. For this purpose, different thermo-mechanical cycles have been carried out for different values of process parameters. Moreover, hardness test and tensile test combined with digital image correlation technique (using Aramis 3D provided by GOM) have been performed on samples. Such tests allowed to evaluate the mechanical properties at the end of the physical simulation tests. The proposed approach can be exploited to design a real Press-Hardening process in an efficient and reliable way.

Presentation in Reliability TAB draft:

Reliability and Functional Analysis of IMU systems under environmental stress screening

Lorenzo Ciani and Gabriele Patrizi; University of Florence

Abstract: Nowadays, the Micro Electro-Mechanical Systems (MEMS) are widely employed in both consumer and industrial applications. One of the most important fields adopting MEMS device is the inertial measurement sector, where this kind of technology is employed to produce Inertial Measurement Unit (IMU), that are typically composed by a triaxial accelerometer, a triaxial gyroscope, and a triaxial magnetometer. This presentation is focused on a test procedure for Environmental Stress Screening (ESS) to determine any mechanical and electrical weakness or early degradation in a MEMS-based inertial measurement unit, when subjected to mechanical vibration and thermal cycling temperature tests.

Presentation in Reliability TAB:

Requirements for vibration testing of large floor mounted batteries of Battery Electric Vehicles (BEV)

Benedikt Plaumann; Hamburg University of Applied Sciences, Department Automotive and Aeronautical Engineering,

Abstract: This contribution shows an analysis of vibration measurement on large floor-mounted traction batteries of Battery Electric Vehicles (BEV) from some pre-study measurements for a larger test campaign plan. The focus lies on the requirements for a realistic replication of the mechanical environments in a testing laboratory. Especially the analysis on global bending transfer functions and local corner bending coherence indicate that neither a fully stiff fixation of the battery nor a completely independent movement on the four corners yields a realistic and conservative test scenario.
The contribution will further show what implication these findings have on future vibration & shock testing equipment for large traction batteries. Additionally, it will cover a look on the needed frequency range regarding potential fatigue damage. For this, a Fatigue Damage Spectrum (FDS) on the measured signals is used with respect to potential faults of the batteries.

Presentation in Climatic TAB:

Trend of one-year atmospheric corrosion rate of copper exposed in Europe

Namurata Pålsson; RISE Research Institutes of Sweden, Department Corrosion

Abstract: This presentation focuses on corrosion of copper, which has been exposed for one year in 1987, 1997, 2002, 2011, 2014 and 2017 at several test sites in Europe. Atmospheric variables, including SO_2, NO_2, O_3, HNO_3, temperature, relative humidity, amount of precipitation, pH of precipitation, particle deposition and PM10, were also monitored to evaluate their effect on one-year corrosion rate of copper. The results indicate that general trend of one-year mass loss of copper lessened from 1987 to 2017, in which a drastic decrease was observed from 1987 to 1997, particularly at industrial zones. Linear regression analysis suggests that only SO_2, relative humidity and pH of precipitation exhibit strong effect on one-year mass loss of copper. Higher SO_2 and relative humidity lead to higher atmospheric corrosion of copper, while lower copper mass loss was observed when pH of precipitation increases.