PEC Technology Days 2018

Battery Testing and Cell Manufacturing Solutions

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Shanghai
November 22

PEC is inviting you and your colleagues to the PEC Technology Days.

During two days, our product managers will present and demonstrate our latest developments including several new product announcements:

Morning Session: PEC Testing Solutions (9:30 am - 12:30 pm)

Keynotes from:

Academician of the Chinese Academy of Engineering
Prof. Wu Feng
Beijing Institute of Technology

Prof. Rachid Yazami
Nanyang Technological University (NTU) Singapore
Founding Director of the KVI PTE LTD

The High Performance Cell Test Lab in an Industry 4.0 World

Mr. Peter Ulrix, VP Sales and Marketing PEC

The continuous race in Li-ION cell development and scale up from material research to large format cells requires battery test labs to be more efficient, automated and organized to manage and analyze Big Data. In this presentation we will focus to the key requirements for such labs in terms of system architecture, data management and analysis capabilities, safety requirements and the necessary accuracy and speed to achieve the newest trends in cell testing.

New Product Announcement: PEC 150V Module Tester

Mr. Stef Leemans, Sr. Product Manager PEC

PEC is announcing its next generation module tester. This machine will be the successor of the SBTXX50 range of machines offering an extended voltage and current capability.

Large Format Cell Testing with PEC's ACT0550 and CT0550

Dr. Xiaoyi Xie, Test Equipment Expert PEC

Dr Xie will introduce PEC Cell Testing solutions and system architecture, including the latest features and developments.

Demonstration of the ACT0550 Cell Tester and its Accuracy

Mr. Stef Leemans, Sr. Product Manager PEC

Stef Leemans will show the complete test cycle starting from test configuration to reporting including demonstration of accuracies, rise times and stability of the PEC test equipment. During the demonstration Stef Leemans will also show the latest new software features in the LifeTest software.

Demonstration of PEC's LifeTest Test Management Software

Mr. Dieter D'Hoker, Sr. Project Manager PEC

Dieter D'Hoker will demonstrate how you can use LifeTest to plan and execute your test plans, analyze test data, integrate climate chambers, schedule aging events, communicate with BMS systems, automatically validate results and compare your results from different test bench suppliers.

Lunch

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Afternoon Session: PEC Cell Finishing Solutions

(13:30 pm - 16:30 pm)

Cell Finishing - The underestimated cost and performance factor

Mr. Raf Goossens, CEO PEC

The cell finishing process is the most costly and critical process during cell manufacturing. The forming of a homogeneous Solid Electrolyte Interface (SEI) is key for the future cell performance and cycle life but often underestimated. The upcoming new silicone based electrodes make the process even more challenging and critical. In this presentation we will discuss how to optimize cell performance with maximum safety, against a reduced manufacturing cost.

Automating your Cell Finishing Operations

Mr. Peter Ulrix, VP Sales and Marketing PEC

This presentation elaborates further on the specific automated cell finishing solutions for different cell types, including large format pouch type cells, prismatic hard case cells, cylindrical cells and batteries for medical and wearable devices.

Validation of new cells on the Formation Station

Mr. Stef Leemans, Sr. Product Manager PEC

During this presentation Stef Leemans will show you how PEC validates new cell types on our formation stations. He will explain how we test and validate contact resistance, homogeneity of the pressure distribution between the cells and temperature consistency of the cells during the formation cycles.

Manufacturing Safety

Mr. Stef Leemans, Sr. Product Manager PEC

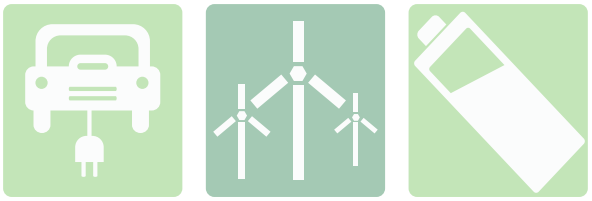
Safety is the key word in PEC's automated cell finishing lines. The whole system has been designed to prevent and mitigate risks related to cell malfunctions, thermal runaways, cell leakages, network failures, PC crashes and even the formation equipment itself.

Demonstration of PEC's Manufacturing Software

Mr. Dieter D'Hoker, Sr. Project Manager PEC

Dieter D'Hoker will show the complete software cycle starting from process and routing configuration, over process control to reporting including demonstration of the PEC formation towers.

Cocktail



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Biography speakers

- **Prof. Wu Feng**

Wu Feng, a professor and doctoral supervisor of BIT, was elected as a CAE academician in 2017.

He has been engaged in the R&D of new secondary batteries and relevant energy materials for years. He was the first person who proposed the idea to utilize light element, multi-electron, multi-ion reaction system to realize super-high energy density of batteries. He has developed a new system of high specific energy secondary batteries and key materials, receiving attention and high praise from international peers. Moreover, he has independently developed a series of key new lithium-ion battery materials, new battery preparation processing, and battery safety technology, providing technical support for China's lithium-ion battery industry to upgrade and access to international high-end product market. He proposed to improve battery safety by the synergy of a series of key materials and invented safety electrodes, composite ceramic polymer membrane, and an electrolyte system with flame retardancy and electrochemical compatibility. He first put forward the concept of safety threshold boundary of battery system, and developed relevant identification and control technology. He invented a lithium-containing hydrogen storage alloy and its preparation method, breaking the foreign monopoly on hydrogen storage alloy. He presided over the creation of China's first nickel-metal hydride battery pilot base to achieve the integration of key technologies for industrialization. And he designed and completed China's first automatic production line of nickel-metal hydride battery for demonstration. He developed a series of nickel-hydrogen battery packs which are successfully applied to a variety of hybrid vehicles. Centering on major national needs, he explored the technological integration among different secondary battery systems and made breakthroughs in battery reaction theory, key materials, and engineering technologies, and making important contribution to the industrialization of secondary batteries in China. To date, he has cultivated 56 PhDs and 50 masters, many of whom have turned to be the technical backbones of relevant fields in our country. Some of the team members of 973 and 863 basic and applied research teams led by him have become the leaders in the fields of secondary batteries and new energy materials in China.

He won a Second Prize of National Technological Invention Award and a Second Prize of National Science and Technology Progress Award, as well as, 4 international awards and 12 provincial and ministerial science and technology awards. In 1992, he received the special government allowance issued by the State Council. In 2012, he received Science and Technology Progress Award of Ho Leung Ho Lee Foundation. In 2014, he was elected as an IEAS Academician. In 2016, he won the Lifetime Achievement Award issued by IALB for the first time. In 2017, he was elected as an academician of The Asia-Pacific Academy of Materials. He won the titles like First-class Teacher of University of State Commission of Science and Technology for National Defense Industry, Principal Investigator of "511 Talent Program" of Science and Technology Industry of National Defense, Expert with Special Contribution to China's Battery Industry, and Model of Teacher's Professional Ethics of BIT. He had been employed by Ministry of Science and Technology as the chief scientist for the new secondary battery program for three consecutive phases. He was awarded the honorary doctorate of science by the University of Massachusetts Boston. And he had delivered more than 30 reports at relevant international academic conferences. 389 papers had been published on famous academic journals such as Adv. Mater. and Nature Communications, including 176 papers with IF > 4.0. 18 papers had been regarded as highly cited papers by ESI. His papers had been cited by SCI for 6,682 times. He served as the chief editor of two academic books, and participated in the edition of a number of books. He received 81 national invention patent licenses.

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- **Prof. Rachid Yazami**

Yazami is a 1978 graduate of the Grenoble Institute of Technology, (INPG) where he also received a Ph. D. degree in 1985.

Yazami is the co-author involved in over 200 published papers and the co-inventor of over 150 patents related to lithium primary and rechargeable batteries and on new battery chemistry based on fluoride ion.

Yazami's research project included a study of graphite intercalation compounds for lithium battery applications. In 1985 he joined the French National Centre for Scientific Research (CNRS) as Research Associate. He was later promoted to Research Director (Professor) position in 1998. In 1980 Yazami was the first scientist to establish the reversible intercalation of lithium into graphite in an electrochemical cell using a polymer electrolyte. Eventually, his discovery led to the lithium-graphite anode now used in commercial lithium ion batteries, an over US$40B value market. Yazami also worked on other forms of graphite materials for cathode application in lithium batteries, including graphite oxide and graphite fluoride.

After serving for 10 years as visiting associate with the California Institute of technology, in collaboration with NASA's JPL, Yazami joined the Nanyang Technological University as Director of the Energy Storage Programs.
Currently, he is the Founding Director of the KVI PTE LTD a startup company on smart batteries.

In 2014 Rachid Yazami, John Goodenough, Yoshio Nishi and Akira Yoshino were awarded the Draper Prize by The National Academy of Engineering for pioneering and leading the groundwork for today's lithium ion battery.

Yazami received the Royal Medal (Wissam Malaki) of Intellectual Competency from HM the King of Morocco Mohamed VI, during the Throne Day on July 30, 2014.
On July 14, 2014 Yazami was awarded the title of Chevalier de la Legion of honor of France. In March 2017 he received the Honors Award of the Moroccans of the World.
In November 2018, Yazami was elected the Arab Scientist of the Year an award he received in Kuwait City.

- **Mr. Raphael (Raf) Goossens**

After a short technical career with ST system, Raf became co-founder and CEO from PEC. After a few years in Robotics and industrial IT, with IBM as a shareholder, PEC started to involve in the Battery industry during the late eighties. Since then the Company has gradually more and more focused to battery test and manufacturing.

As a consultant and system provider, Raf was involved in the early stage of the development of the Battery industry in Korea in the mid-nineties (Samsung) and has been working with most leading battery Manufacturers, worldwide.

Besides his technical skills, Raf is a Manager and Director in several companies in Europe, The United States and Asia. Raf is a frequent speaker at leading conferences and holds MSc. degree in Electrical Engineering.

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- **Mr. Peter Ulrix**

Peter Ulrix started his career at PEC in 1992 and has held different management roles in the development, sales and marketing of PEC's industry solutions. Peter has more than 20 years experience in battery testing and cell manufacturing. He has a strong background in manufacturing systems, including MES, ERP, quality control, material handling and logistics. Peter graduated as a MSc. in Industrial Engineering, and currently holds the position of Vice President Sales and Marketing at PEC.

- **Dr. Xiaoyi Xie**

Xiaoyi is Test Equipment Expert for PEC and has been working in the Research field for Materials and Batteries for almost ten years. Xiaoyi was a Researcher and Project Director at the State Development Center of Green Materials until 2012.

She currently still does work as a Post Doc Researcher for Tshinghua University. Xiaoyi graduated as MSc./Phd. from Prof. Wu Feng at BIT.

- **Mr. Stef Leemans**

Stef joined PEC in 2006. Stef started his career with PEC in the sales division, where he worked on the international sales and marketing of PEC's test and formation systems. Stef is currently Senior Product Manager at PEC and has been working with all major battery makers and OEM's. He is an expert in Cell Formation and Testing. Stef has Master degrees in Mechatronics and Finance.

- **Mr. Dieter D'Hoker**

Dieter Joined PEC in 2008. From the start of his career with PEC, Dieter worked as Software Engineer in different industrial automation projects worldwide and currently is the Senior Software Expert at PEC. Dieter has been working with all major battery makers and is a specialist in Cell Formation and Testing. Dieter has Master degrees in Applied Computer Science and Applied Economics.

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Enrollment form

Please complete the following form and email this back to enrollment@peccorp.com

If you want to participate at this event, please complete the following fields.

Please fill out one for each participant.

Company: .....

First Name: .....

Last Name: .....

Title: .....

E-mail: .....

Phone: .....

Address: .....

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O I will Attend in **Shanghai** on November 22, 2018

O Morning Session - Testing Solutions

O Afternoon Session - Cell Finishing Solutions

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Venues

Shanghai on November 22, 2018

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（靠近纪翟路， 延北翟路高架，到北青平公路