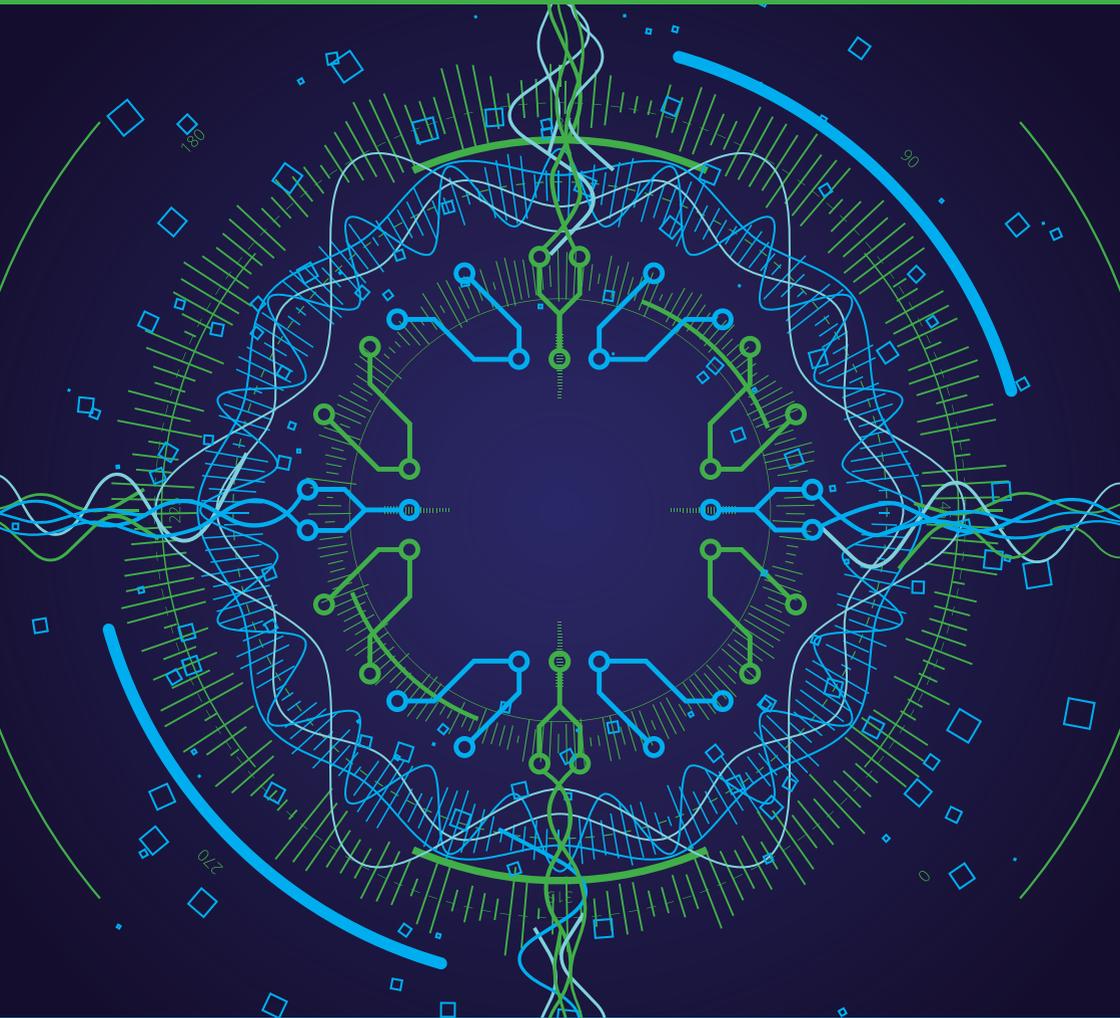




BATTERY TECH EXPO

International Centre,
Telford, UK.
28th March 2019



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WELCOME TO: The Battery Tech & Power Electronics Expo 2019

David Reeks
Managing
Director,
10four Media
Ltd.



Turn to page 12-13 to find the expo floor plan and full list of exhibitors.

Events Team:



Rebekah Ford



Helen Peden

The battery and power electronics markets are on the cusp of a revolution with the industry investing heavily in the next generation of development.

Today you'll have the chance to experience the latest technological developments across the battery technology, energy storage and power electronics sectors. In the main exhibition hall, you'll find leading exhibitors from across the UK and Europe showcasing the very latest innovations. During the day, industry experts will be presenting a variety of topics on the centre stage.

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The Battery Tech & Power Electronics Expo 2019

SPEAKER AGENDA



Speaker: Jacqui Murray
B.Sc. M.Res. MBA C.Eng. C.Env. FIMMM MWES

Subject: Is the UK creating an Electric Vehicle Battery Sector?

Jacqui Murray spent the early part of her career as an engineer in the Steel industry and is a specialist in materials engineering, regulation and transformational change. She worked on industrial environmental regulation policy for the Environment Agency and Welsh Government, crediting these experiences as teaching her how to untangle problems, policies and legislation that inhibit successful outcomes in business, Government and regulators.

09:20 – 09:30
Innovate UK

She is now Deputy Director of the Faraday Battery Challenge, the UK Government's £246 million Industrial Strategy Programme. Along with the team, they are transforming the UK into a world-leading centre for automotive battery technology.

Outside of work, she is Formula 1 fan, a mum of two and an active STEM Ambassador. She works with the British Army on a STEM outreach event at Sandhurst. Last year this was front page of the Telegraph and had companies like Dell, Airbus and Amazon working together to make a difference. This year it is 2000 children and has expanded covering blockchain companies like Calastone all the way through to Williams F1.

Member of the WiSTEM Board for Wales, chair of their STEM Women in Industry Subgroup and a newly appointed Freeman of the Worshipful Company of Engineers.



Speaker: Dr Simon Nelms

Subject: Using new analytical technologies to study Li-ion battery degradation products

Simon Nelms is the Regional Marketing Manager for Trace Elemental Analysis in the EMEA region. He has been part of the Thermo Fisher Scientific team for almost 20 years, save for a 2-year postdoctorate sabbatical at the Institute for Reference Materials and Measurements in Geel, Belgium. Simon's instrumentation experience has meandered through the whole range of trace elemental analysis applications, from environmental to chemicals analysis. Simon is now responsible for marketing AA, ICP-OES and ICP-MS products in EMEA for, among others, the industrial and environmental analysis markets. Simon holds a BSc in Analytical Chemistry and a PhD in research involving ICP-MS method development from the University of Hull, UK.

09:35 - 09:55
Thermo Fisher
Scientific



Speaker: Garry Wilson - Director – Business Development, Marketing and Communications

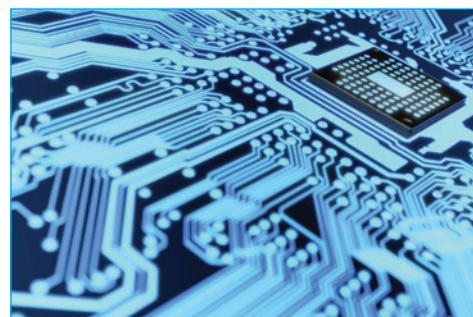
Subject: Opportunities for developing the UK's electrified supply chain

Garry Wilson has more than 30 years experience in the automotive industry working for vehicle manufacturers and suppliers.

He held various leadership roles within BMW, Land Rover, MG and Rover including Chief Engineer for Powertrain Manufacturing Engineering. He has worked for Roush and Delphi and most recently as a Board member at Torotrak and has experience in all aspects of the motor industry and business functions with predominant experience in powertrain engineering and manufacturing.

10:00 - 10:20
Advanced
Propulsion
Centre UK

At the APC, Garry's key focus is Business Development which includes development of the Hub and Spoke Network which will bring together the key technical, regional and specialist skills across the UK.





Speaker: Victoria Doherty & Farhaan Lorgat

Subject: Batteries go bang!

Farhaan is a Power Sources Engineer, supporting defence and industry to undertake test and evaluation of power systems including batteries, fuel cells and renewables used in air, land and sea applications.

Victoria leads the Power Sources, Energy Storage & Energy Distribution team in QinetiQ.



10:25 - 10:45
QINETIQ



Speaker: Richard Stocker

Subject: A Case study in Battery Ageing: Findings and Implications

Richard Stocker works as an Advanced Energy Research Scientist at HORIBA-MIRA, working as part of a team looking at the latest developments in energy vector technology. Richard himself specialises in Li-ion cells, looking at advanced techniques for use in battery cell testing and modelling as well as Battery Management System control strategies.

10:50 - 11:10
HORIBA MIRA



Speaker: Dominik Ludewig

Subject: Environmental chambers for Lithium-Ion battery testing – Approaches for safe operation

Team leader of the Sales Project Department at Weiss' standard competence center in Balingen. Focusing on solutions for Lithium-Ion / Electrical energy storage and ATEX products. Masters degree in Mechanical Engineering and International Sales Management.

11:15 - 11:35
Weiss Technik
UK Ltd



Speaker: Tomasz Stelmach - Application Engineer

Subject: Race to the Clouds - How Battery Performance was critical to Volkswagen's I.D R smashing an Electric vehicle world record

Tomasz Stelmach is a Chartered Mechanical engineer who has been with ANSYS for 6 years. He is working as an application engineer. His speciality is in CFD and Multiphysics problems.

11:40 - 12:00
ANSYS UK Ltd



Speaker: Gary Bentley

Subject: Fuse Protection in the Automotive Sector

Gary Bentley is the European Field Application Manager for Littelfuse. Since joining Littelfuse in 2004 Gary has been providing customers around the world with knowledge and assistance in the application of Littelfuse products from their vast portfolio of sensors, semiconductors, overvoltage technologies, overcurrent protection, condition monitoring and fuse products. His background is power semiconductors and power conversion starting back in the 1970's and the most recent 15 years at Littelfuse has enhanced a previous understanding of fuses with materials, technologies and know how. Gary has a keen interest in Automotive Electronics since his first basis ECU's of the 1980's and maintains an interest in operating environment protection for AE through Littelfuse products.

12:05 - 12:25
Littelfuse



Speaker: Robert Millar

Subject: Racetrack to Road - Commercialisation of Williams Formula 1 battery technology driving a unique approach to high performance batteries.

Rob started his career as an electronics engineer, working on automotive body control systems before moving into an electrical integration role in automotive systems with TWR Engineering in 1992.

In 2004, he became involved with vehicle electrification when he founded his own company which developed electronic systems for Modec, Tata and Daimler vehicles amongst others. Having first worked with Williams in 2010, when he was part of the team that delivered the Jaguar C-X75 programme, he joined the company as a full time employee in 2016 to head up the company's batteries and electronics programmes.

12:30 - 12:50
Williams
Advanced
Engineering



Speaker: Dr Mark Crittenden

Subject: Lithium Sulfur - Next generation battery technology

Mark is Head of Battery Development and Integration at OXIS Energy, which has been at the forefront of Lithium Sulfur battery technology since 2004. Mark holds a first-class Masters degree and a PhD in Electronic Engineering from the University of Nottingham and is a Chartered Engineer. Previously he has worked in the semiconductor industry, managing the development of several materials characterisation and metrology products. Dr Crittenden joined OXIS Energy in January 2012 as Head of Business Development, commercialising the technology and he now leads the battery department, developing lithium sulfur batteries for a wide range of applications and customers.

12:55 - 13:15
Steatite Ltd
| OXIS Energy



Speaker: Mohamed Al-Alami

Subject: Understanding Power Inductor efficiency and losses using Redexpert

Mohamed comes from a power supply design and development background. He worked in the Aerospace Industry for 10 years designing power supplies for various civilian and military projects. In addition, he was responsible for EMC testing, filter design and compliance. Mohamed moved on to hold the position of Principal Engineer and Project Lead Engineer on different programmes. In the past 4 years before joining Würth Electronics, he taught a variety of subjects at University towards a BTEC degree in electronics engineering. He joined Würth in April 2015 as a Field Applications Engineer responsible for the South of the England, Wales and Ireland.

13:20 - 13:40
Würth
Electronics UK



Speaker: Lee White

Subject: Mechanical Testing Solutions for Lithium-Ion batteries in Automotive applications

Lee White has over 10 years commercial experience in the materials testing market after completing his degree in motorsport engineering & aerodynamics. Primarily experienced in Automotive, Aerospace and Medical testing requirements Lee is now a Business Development Manager for the UK & Ireland working with CXX contacts on strategic requirements for the future in addition to business strategy & marketing for the ZwickRoell Group.

13:45 - 14:05
ZwickRoell

ZwickRoell are a market leader in materials testing equipment.

Notable project: Lee was responsible for the Energy Innovation Centre at the WMG (University of Warwick) state of the art facility in testing batteries in automotive applications.



Speaker: David Pflanzl, Power Applications Engineer, Dewetron

Subject: On-vehicle testing of high voltage batteries and electric drivetrains

Ing. David Pflanzl BSc graduated from the University of Applied Sciences in Burgenland (Eastern Austria) in Energy and Environmental Management and is currently finishing his Master's Course in Sustainable Energy Systems. Prior to working at Dewetron he was employed as a high voltage test field engineer at a well-known manufacturer of electrical hydro and turbo generators. Now he is working as an Application Engineer and Technical Sales Specialist in the field of Power Analysis, Power Quality, E-Mobility, General Test and Measurement and Sustainable Energy Systems for Dewetron since 2013. David works closely with StrainSense Ltd, the UK partner of Dewetron, on installations of power analyser systems for electric drivetrain testing including test rig installations.

14:10 - 14:30
StrainSense
Limited



Speaker: John G Murley - B.Sc (Hons) Materials Science

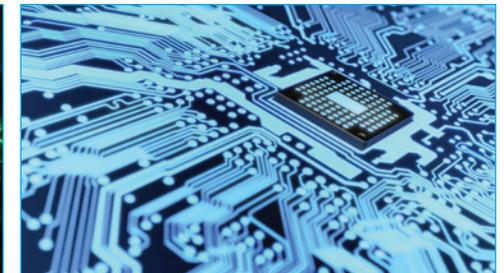
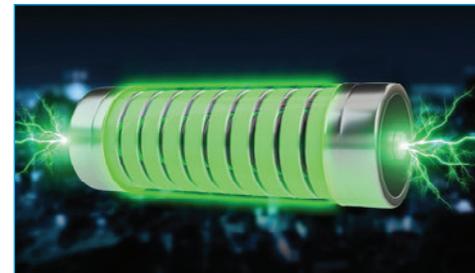
Subject: Flexible production solutions for bus bars, conductors and copper hairpins

Graduated in 1976 and entered the wire industry, working as International Sales Manager for UK manufacturer of spring manufacturing machinery. Transferred to the US in 1980, where I sold British, Italian and Japanese equipment throughout North America.

Returned to the UK in 1987 and was appointed sales manager for a UK manufacturer of wire bending machinery.

From 1992 to date have been the exclusive UK Agent for WAFIOS Group, responsible for sales and service of high tech wire and tube processing machinery, setting up as independent Agent company Wire & Tube Technology Ltd in 2012, with sales and spares administration in Redditch. From 2009 to 2015 was also responsible for assisting Wafios AG in China, establishing their own service and sales operation in Shanghai.

14:35 - 14:55
Wire & Tube
Technology Ltd





Speaker: Loic Chereau

Subject: Novel immersion cooling fluids for electric vehicle battery thermal management

Loic Chereau has over 20 years' experience in the chemistry industry, and began his career in engineering and technology and progressed into global business roles focusing on Engineering Polymers, Elastomers and Specialty Chemicals. Loic played a huge role in developing new solutions and applications through both science and high value chemistry solutions within the Automotive and Aerospace industries.

Loic now holds an extremely senior position within Chemours who are one of the largest chemical manufacturers in the world. He now spends his time focusing on the advancements within Chemours new generation Opteon™ specialty fluid range and explores the wealth of new applications available globally in the market place, however his personal passion lies in the thermal management of electric motor vehicles.

15:00 - 15:20
Fraser Technologies

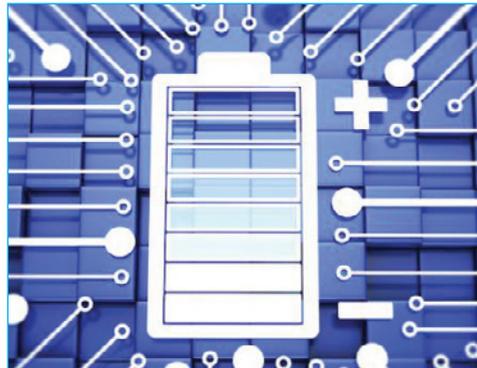


Speaker: Jeff Kapp

Subject: Solutions in Vehicle Light Weight Management

Jeff is a project manager representing the 3M product range relevant to automotive electrification. Over 12 years at 3M he has performed roles within the automotive and aerospace sectors, having previously worked for a number of automotive brands where he was focussed on launching new materials technology. With Masters degrees in Materials Engineering and Engineering Quality, Jeff has applied his knowledge to specialise adhesive bonding, light weighting and is now enjoying the challenges presented by electrification in its many forms.

15:25 - 15:45
3M Ireland Ltd




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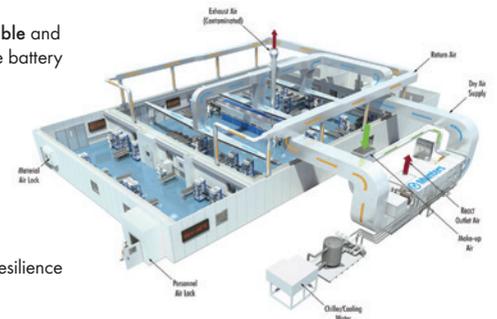
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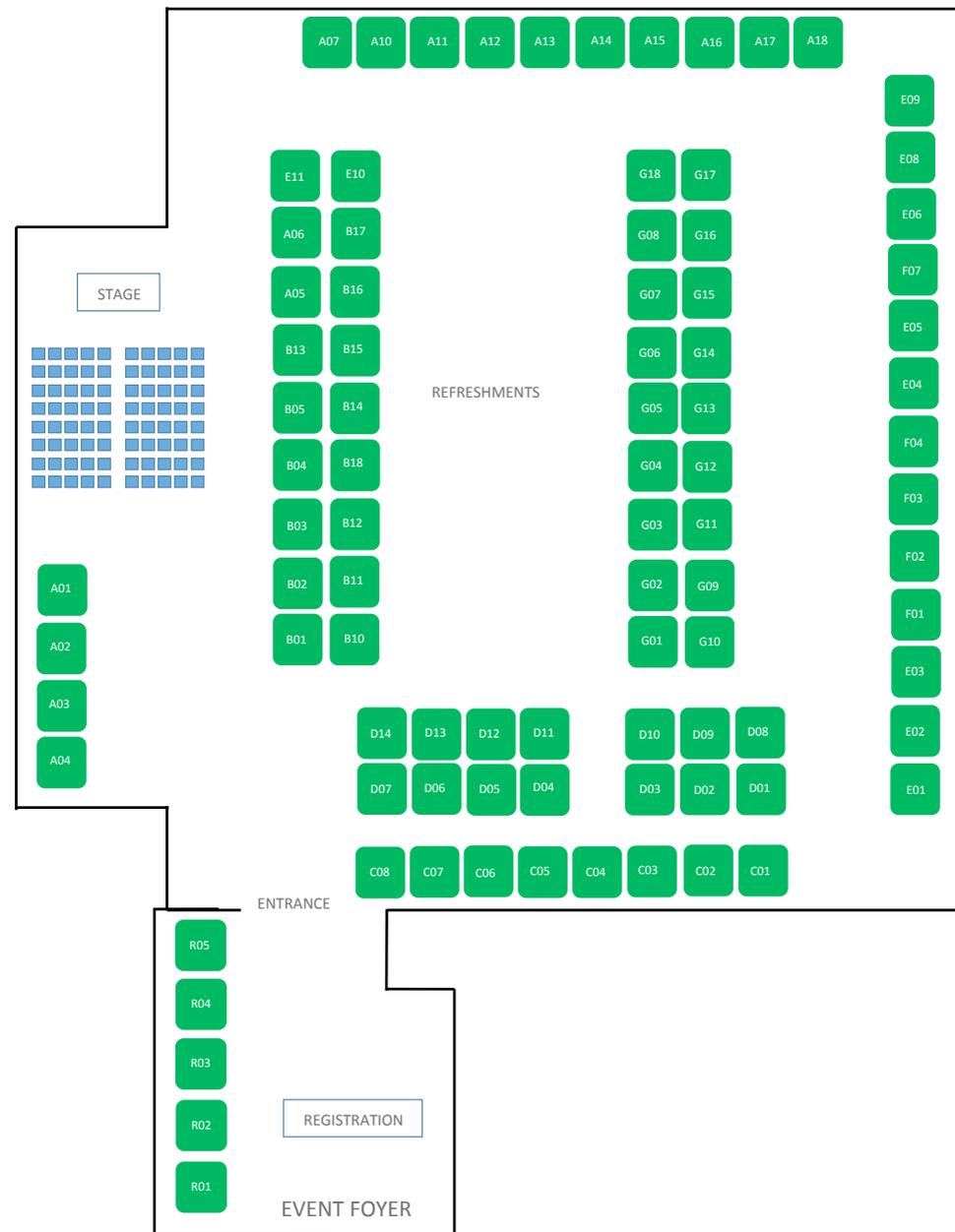
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VISIT US ON STAND D13/14



Company	Plot	Company	Plot
Teledyne LeCroy	A01	Nordson DAGE	D09 + D10
MBraun	A02	Alvatek	D11
Wire & Tube Technology Ltd	A03	Lincad Ltd	D12
STMicroelectronics	A04	Munters Ltd	D13 + D14
Binder GmbH	A05	Advanced Chemical Etching Ltd	E01
PI-KEM Ltd	A06	Centrica Business Solutions	E02
Frost Electroplating Ltd	A07	Hyperdrive Innovation	E03
Tektronix	A10	Würth Electronics UK	E04 + E05
Stantronic Instruments	A11	Huber UK and Ireland Ltd	E06
AMS Technologies Ltd	A12	Samuel Taylor Limited	E08
Weiss Technik UK Ltd	A13 + A14	Technotrans	E09
Thermal Vision Research	A15	TDK-Lambda UK Ltd	E10
CentraTEQ Ltd	A16 + A17	JULABO UK Ltd	E11
Air Sea Containers Ltd	A18	Fraser Technologies	F01 + F02
ANSYS UK Ltd	B01 + B02	Tappex	F03
QINETIQ	B03	Renesas	F04
AMETEK	B04	Littelfuse	F07
Telonic Instruments Limited	B05	Caltest Instruments Ltd & Arbin Instruments	G01
Intertek	B10 + B11	Power Products International Ltd	G02
MDL Technologies Limited	B12	HORIBA MIRA	G03
Lauda Technology Ltd	B13	ETPS Ltd – Electronic Test & Power Systems	G04
ZwickRoell	B14	Retsch UK Ltd	G05
Thermo Fisher Scientific	B15 + B16	m+p international	G06
Advanced Propulsion Centre UK	B17	Hidden Analytical Ltd	G07
TR Fastenings	B18	Steatite Ltd	G08
Thermal Issues Ltd	C01	StrainSense Limited	G09
KRATZER AUTOMATION	C02	Yokogawa UK Ltd	G10
Potter Clarkson	C03	Analog Devices	G11
MEP Technologies Ltd	C04	IMI Precision Engineering	G12
3M UK PLC	C05 + C06	Nikon Metrology	G13
Zarges (UK) Ltd	C07	TESVOLT	G14
TBAT Innovation Ltd	C08	Unitemp Environmental	G15 + G16
Enix Power Solutions	D01	Test Equipment	G17
Aceleron Ltd	D02	Scientific and Medical Products Ltd	G18
Accutronics Ltd	D03	COMSOL	R01
ICAR	D04	The Mustard Services	R02
TWS Technology Ltd	D05	The IET	R03
Panasonic Industry Europe GmbH	D06	Tesla	R04
Thermal Hazard Technology	D07	Benchmark Minerals Intelligence	R05
Universal Science UK Ltd	D08	Altair	R05

Exhibition Floor Plan





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Wire & Tube technology Ltd are the UK Agents for the WAFIOS Group who manufacture a wide range of wire and tube processing equipment. This includes CNC machinery for processing flat strip, from coil, into battery busbars in a single operation complete with laser stripping, and to manufacture Hairpins for E-motor stators.

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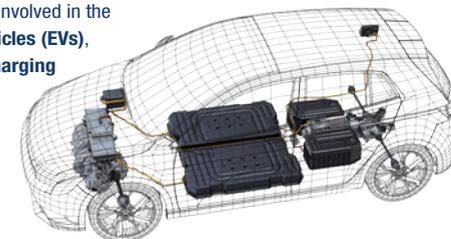


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A13

A14



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A15



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A16

A17



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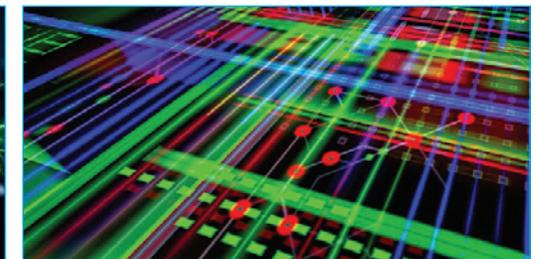
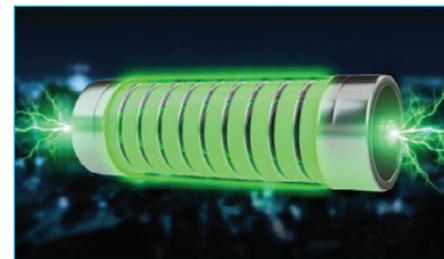
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VISIT US ON STAND

B01

B02

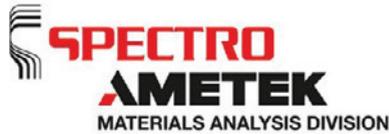


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VISIT US ON STAND **B03** 

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www.telonic.co.uk

VISIT US ON STAND **B05** 

Telonic a specialist in test instruments and power supplies will have on show Delta Elektronika's new range of programmable dc power supplies which run from 30w to 300kW including a new range of grid tied regenerative sink source units.

Also on show will be Kikusui's range of DC electronic loads for battery testing and kikusui's DC bench power supplies with built in variable impedance setting.

intertek

Total Quality. Assured.

Intertek
8 Tanners Drive, Blakelands,
Milton Keynes, MK14 5BN
+44 (0)1908 513000
intertek.com/automotive/miltonkeynes

VISIT US ON STAND **B10** **B11** 

Intertek is a leading Total Quality Assurance provider to industries worldwide. Our network of more than 1,000 laboratories and offices and over 44,000 people in more than 100 countries, delivers innovative and bespoke Assurance, Testing, Inspection and Certification solutions for our customers' operations and supply chains.

Intertek's global network of performance, safety and quality evaluation teams are able to assess batteries and energy storage systems for every type of use, from consumer goods to electric vehicle and grid energy storage applications.

Intertek Total Quality Assurance expertise, delivered consistently with precision, pace and passion, enabling our customers to power ahead safely.

MDL TECHNOLOGIES

MDL Technologies Limited
Unit 11, Devonshire Business
Centre, Works Road, Letchworth,
Herts SG6 1GJ
01462 431981
www.mdltechnologies.co.uk

VISIT US ON STAND **B12** 

MDL Technologies provides specialist electronic test equipment and consultancy to the UK and Ireland, working in partnership with market leading global manufacturers such as Chroma ATE Inc., Hioki, Typhoon HIL, etc.

We will be showcasing EVSE (Electric Vehicle Supply Equipment) and EV (Electric Vehicle) ATS (Automatic Test Solutions) for AC Charger Stations Level 1 & 2 and DC Charger Stations from Chroma ATE Inc. as well as Battery Management Systems (BMS), Battery Cell, Module and Pack Test Solutions from Hioki.

Applications include:

Regenerative Battery Test Solutions –
Cell, Module and Pack

Battery Impedance, Resistance, Insulation and Data
Logging

EV Motor Test Solutions

Electric Vehicle Test Solutions

Hardware in the Loop Simulation

LAUDA Technology Limited,
1200 Century Way,
Thorpe Park Business Park,
Colton, Leeds, LS15 8ZA,
United Kingdom
+44 788 138 0270
www.lauda-technology.co.uk

LAUDA is a solution provider for process cooling, thermal management and viscosity measurement to the automotive and aerospace industry. Our products are supported by the knowledge gained through many successful projects from the cooling of dynamometer engine test beds to the precise viscosity measurement of lubricants, oils and fuels.

Over the years we have successfully fulfilled the needs of many research establishments, providing both cooling and heating solutions, covering a range of -100 °C to 320 °C for a wide range of test apparatus.

VISIT US ON STAND **B13** 

Zwick / Roell

ZwickRoell, Southern Avenue,
Leominster, HR6 0QH
01568615201
www.zwickroell.com

Zwick Roell manufactures and supports a wide range of materials testing machines, systems and accessories for use in research, quality control, production environments and academia.

Our extensive portfolio of products can be used to determine the mechanical properties of both materials and components and can accommodate tension, compression, flexure, friction, peel, torsion, impact, melt flow, hardness and fatigue testing procedures, making them ideal for the most rigorous testing requirements.

Our product range also includes many accessories such as specimen grips, electronics, software and essential hydraulic components – everything to cover individual requirements.

VISIT US ON STAND **B14** 



Thermo Fisher Scientific
Stafford House, Boundary Way,
Hemel Hempstead, HP2 7GE
01442 233555
www.thermofisher.com/energy

Thermo Fisher Scientific is the world leader in serving science. Through our Thermo Scientific brand we help customers in the battery industry accelerate innovation and enhance productivity, with instruments that aid research in advanced battery and energy storage technologies. We provide a range of solutions for:

- Improved Battery and Energy Storage
- Battery failure and analysis
- In-situ analysis of battery components
- Rapid material characterization and analysis

Watch our presentation on using new analytical technologies to study Li-ion battery degradation products and then join us on Booth B15/16 to talk to our experts and find out how we can help you accelerate your research, support your production processes.

VISIT US ON STAND **B15** **B16** 

ADVANCED PROPULSION CENTRE UK

Advanced Propulsion Centre UK
University Road Coventry CV47AL
024 7652 8700
www.apcuk.co.uk

The Advanced Propulsion Centre was born out of the collaboration between UK Government and the automotive industry to support the R&D of low carbon propulsion technologies in the UK through a matched investment of £1 billion – aiming to save 50 million tonnes of CO2 and safeguard or create 30,000 UK-jobs.

VISIT US ON STAND **B17** 

Fastenings

www.trfastenings.com

TR Fastenings
Trifast House, Bellbrook Park,
Uckfield, East Sussex, TN22 1QW
08454 811 800
www.trfastenings.com

TR Fastenings Ltd is an international specialist in the design, engineering, manufacture and distribution of high quality industrial and Cat C fastenings principally to major global assembly industries.

TR is actively working with a number of organisations involved in the design, manufacture and development of Electric Vehicles (EVs), Battery Pack Modules (EVB) and Electric Vehicle Charging Units for both commercial and residential use. As this sector continues to emerge and develop, TR is able to supply an extensive product range and has the necessary technical knowledge, expertise and experience to support this industry.

VISIT US ON STAND **B18** 



Thermal Issues Flexibility in Response

Thermal Issues Ltd
Unit H, Welland Court,
Riverside Industrial Estate,
Market Harborough, Leics
LE16 7PT
01858 431133
www.tiltld.eu

VISIT US ON STAND **C01**

As power densities increase and battery management systems become increasingly more complex, the need for combined thermal management and electrical isolation increases.

Our production process makes use of digital data created directly from CAD drawings.

This eliminates the need for costly tooling, and shortens leadtime from weeks to days

Changes to a drawing can be made instantaneously giving a seamless transition from prototype to production

Samples can be supplied next day for fit/form/functional testing

All parts are batch traceable and date controlled.

The company also operates a managed inventory system, allowing for fluctuations in a scheduled demand.

Flexibility in Response



KRATZER AUTOMATION
Gutenbergstr. 5, 85716
Unterschleissheim, Germany
Tel: +49-(89)-32152-100
www.kratzer-automation.com

VISIT US ON STAND **C02**

KRATZER AUTOMATION offers tailored solutions for testing automotive batteries – from individual battery test stands up to complete test fields, from cell to pack level. From concept layout up to turnkey test stands, all solutions focus on efficiency. With the VES4c battery cycler, KRATZER AUTOMATION offers a NEW generation of compact High Voltage DC Source/Sink system for Battery test & simulation. It is a bi-directional, high-dynamic DC-system for testing all eMobility components in EV's. Thanks to state of the art SIC-technology, the design of the 250kW/1000V/1000A system is very compact and efficient. Two measuring ranges for voltage and current with an excellent precision of 0,03% make the VES4c ideal for integrated battery testing.



Potter Clarkson LLP
The Belgrave Centre, Talbot Street,
Nottingham NG1 5GG
0115 955 2211
www.potterclarkson.com

VISIT US ON STAND **C03**

Potter Clarkson LLP is an award-winning, top tier firm of European patent and trade mark attorneys and IP solicitors. Established in 1889 in Nottingham, the firm is one the largest full-service IP practices in Europe.

Dedicated to offering clients around the globe unrivalled expertise on intellectual property rights and strategy across a variety of industry sectors and technologies, Potter Clarkson also offers the full range of IP legal services (including both contentious and non-contentious), making it the European firm of choice for several global giants, household names, universities, SME's, start-ups and individuals.



MEP Technologies Ltd
Balgray Works, Balgray Place,
Dundee DD3 8SH
01382 690900
www.meptec.co.uk

VISIT US ON STAND **C04**

A UK company providing leading edge design and manufacture of battery packs and systems for automotive and non-automotive applications.

With extensive expertise in the design and development of lithium-based battery packs and full systems, MEP Technologies can offer a complete development solution to support a variety of applications, from small high power battery packs to energy storage systems and automotive traction batteries.



3M UK PLC
3M Centre, Cain Road, Bracknell,
RG12 8HT
0870 536 0036
https://www.3m.co.uk/3M/en_GB/company-uk/

VISIT US ON STAND **C05** **C06**

At 3M's Electronics & Energy business group, we are using the entire breadth of 3M technologies to improve automotive electrification and vehicle energy ecosystems. We leverage more than 100 years of automotive industry experience and combine this with extensive consumer electronics technologies, advanced materials technologies and energy industry expertise. All brought together to create custom solutions to help you envision the future of automotive electronics and build the most advanced and capable vehicles and roadways. From head-up displays to optimising Electric Vehicle (EV) battery range and performance, we're working directly with you to reduce the development cycle and create fully integrated and immersive solutions.



Lithium-ion batteries are considered dangerous goods and are only allowed to be transported in secure containers because the battery may be damaged by improper handling, and in the worst case, a damaged battery may cause a fire.

ZARGES, in conjunction with a world market leader for e-bike batteries, has developed a safety container – the Battery Safe - that has an interior that is coated with intumescent material. In case of fire, the case's interior swells up and prevents the flames from spreading further. The special absorbent material ensures that solid components are filtered out of the battery gases and that liquid constituents condense on the fibres' surface.

Zarges (UK) Ltd.
Unit 8 Holdom Avenue,
Saxon Park Industry Estate,
Bletchley, Milton Keynes MK1 1QU
01908 641118
www.zarges.com/uk

VISIT US ON STAND **C07**



Innovation

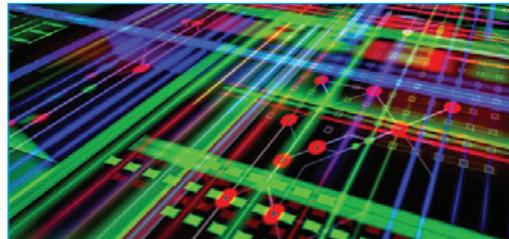
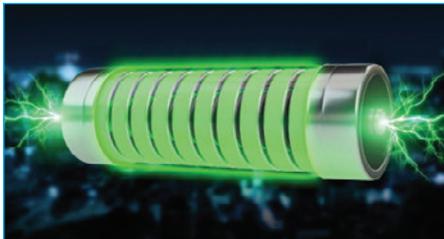
TBAT Innovation is a first-choice provider of innovation support for technology R&D organisations throughout the UK. With over 17 years' experience, we are experts in helping businesses to progress their projects from beginning to end.

Our support ranges from accessing UK and EU grant funding via Innovate UK and Horizon 2020, assistance and guidance for the Grant Claim Management process during a successfully funded project, preparing business plans for Private Investment and writing the financial and technical reports for R&D Tax Credits claims.

Our aim is to offer a holistic, 360 approach to funding, scoping innovation opportunities through a professional, honest and vibrant service which delivers consistent success.

TBAT Innovation Ltd
Unit 3 Bradley Court, Maple Road,
Castle Donington, DE74 2UT
01332 819740
www.tbat.co.uk

VISIT US ON STAND **C08**



With over 30 years of experience in the manufacturing and distribution of batteries, Enix Power Solutions has diversified into new areas of technology. Our global aim is to become a complete battery solution provider.

Our in house design technicians are on hand to find the best solution to meet clients specific product requirements across all chemistries and design constraints. Whether client's needs are simple or complex we can design a custom battery pack that is fit for purpose and commercially beneficial. We identify the correct battery technology and configurations to ensure the battery is physically and electrically suitable, with appropriate safety and electronic circuits.

Enix Power Solutions
Unit 2 Focus Park, Ashbourne Way,
Solihull, West Midlands, B904QU
01215068621
www.enix-power-solutions.co.uk

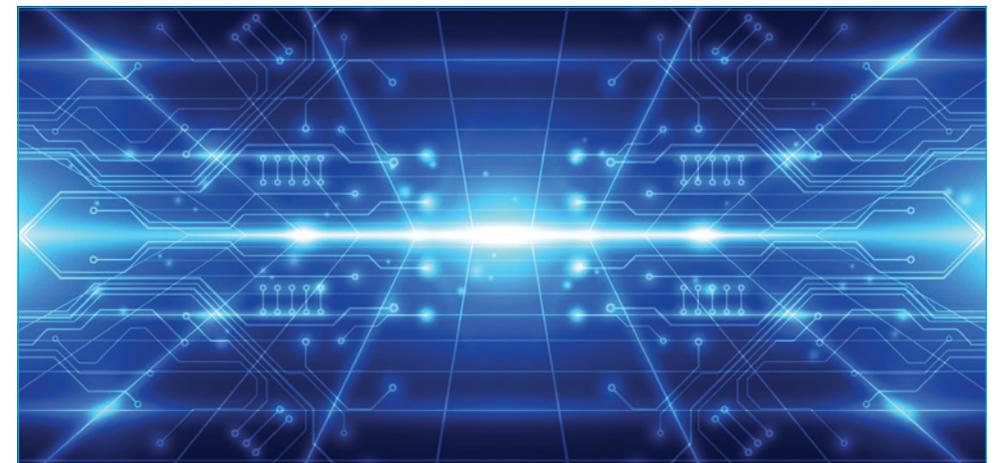
VISIT US ON STAND **D01**



ACELERON'S patented and disruptive battery building technology changes the way we all store and use our energy. For the first time, Lithium-Ion battery packs are both low-cost and fully serviceable. ACELERON designs and builds battery packs using innovative technology that offers lower cost more serviceable long-term energy storage. Introducing the ESSENTIALS pack, arguably the best fundamental energy storage product on the market today, offering the best combination of performance and price.

Aceleron Ltd.
Central Research Laboratory,
Shipping Building, 252 Blyth Road,
Hayes, UB3 1HA
+447411 706466
www.acceleronenergy.com

VISIT US ON STAND **D02**



Accutronics Ltd
Unit 20 Loomer Road Ind Est,
Loomer Road, Chesterton,
Newcastle-under-Lyme,
Staffordshire ST5 7LB
01782 566622
www.accutronics.co.uk

Accutronics is an industry leader in design, development & manufacture of portable power solutions for Medical, Defense & Security, Test & Instrumentation, Robotics and IoT applications where failure is not an option. Together with our parent company, Ultralife Corporation, we create high quality, high performance power solutions that meet demanding application requirements. OEMs worldwide depend on us to be a valued partner delivering both custom and pre-engineered batteries and chargers which are differentiated by innovation, time to market, performance, reliability & safety – from design to manufacture & everything in-between.

VISIT US ON STAND **D03** 

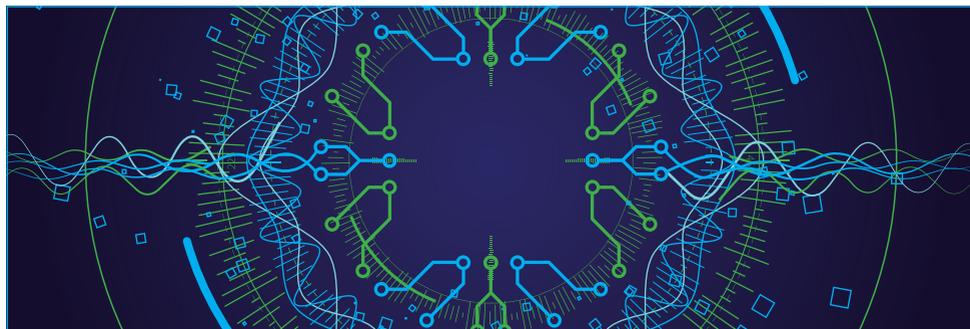


Icar Spa
Via Isonzo 10
+3903983951
www.icar.com

ICAR is one of the leading manufacturers of power electrical capacitors and systems in low and medium voltage. Established in 1946, it bases its reputation on over 70 years of experience in research, design, development and production of high-performance capacitors.

In its 6 plants, located in Europe, ICAR controls all production phases in order to obtain high quality and reliability.

VISIT US ON STAND **D04** 



Dynamic Leadership in Innovative Energy Storage Solutions

TWS is a dynamic, global industry leader focused on energy storage and rechargeable battery solutions. TWS is committed to serving customers across a wide range of industries by providing innovative Lithium-ion products and reliable power solutions, addressing an expanding range of energy storage applications.

Through innovation, design and manufacturing expertise, TWS offers a broad portfolio of battery solutions, predominantly small- and large-scale battery packs, rechargeable Lithium-ion batteries, and Battery Management Systems (BMS).

After more than a decade of growth, the company now employs more than 2,500 staff in four continents. TWS has a well-established pre-sales and post-sales customer service network and several research and development centers worldwide. TWS has established a track record of being a highly responsive and dependable supplier of safe and reliable Lithium-ion products. TWS offers comprehensive solutions and cutting-edge technologies to meet both current and future energy storage needs. Today TWS is at the forefront of rechargeable energy technology, helping to create better lives through clean energy solutions.

TWS Technology Ltd
Unit 6, Wyvols Court Farm,
Basingstoke Road, Swallowfield,
Reading, Berkshire, RG7 1WY
0118 334 2068
www.tws.com

VISIT US ON STAND **D05** 

Panasonic

Panasonic Corporation is a worldwide leader in the development of diverse electronics technologies and solutions for customers in the consumer electronics, housing, automotive, and B2B businesses.

Panasonic started manufacturing batteries back in 1931. Today, with numerous production sites around the globe, the corporation offers the widest product range of any battery manufacturer worldwide. The product spectrum includes batteries in diverse technologies, including non-rechargeable batteries (Lithium, Zinc-Carbon and Alkaline) and rechargeable batteries (Lithium-Ion, Nickel-Metal-Hydride, Nickel-Cadmium and Valve-Regulated-Lead-Acid (VRLA) batteries).

Panasonic Industry Europe GmbH
Maxis 2, Western Road, Bracknell -
RG12 1RT · Great Britain
+494085496373
<http://industry.panasonic.eu/>

VISIT US ON STAND **D06** 



THERMAL HAZARD TECHNOLOGY

Thermal Hazard Technology
1 North House, Bond Avenue,
Bletchley, MK1 1SW
01908646800
www.thtuk.com

VISIT US ON STAND

D07



Thermal Hazard Technology (THT) is one of the leading suppliers of lithium battery safety testing equipment. Their Accelerating Rate Calorimeter (ARC) provides an adiabatic testing environment typically leading to full thermal runaway. Options exist for nail penetration, short circuit, spark generation, heat capacity and multipoint measurements. Isothermal Battery Calorimeters (IBC) for high precision heat measurement and heat capacity are also available.



Universal Science UK Ltd
16 Walker Avenue Wolverton Mill
Industrial Estate Milton Keynes
MK12 5TW
01908 22 22 11
www.universal-science.com

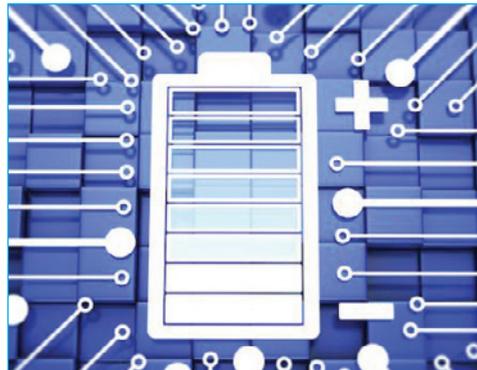
VISIT US ON STAND

D08



Manufacturers and suppliers of battery protection components and materials including comprehensive Thermal Management, EMI, Fire Protection, structural Cell support, vibration damping and environmental Gaskets.

Universal Science also announces a new distributor agreement with 3M who also offer a wide range of some of the best materials in the market.



Nordson DAGE
25 Faraday Road, Aylesbury,
Buckinghamshire, HP19 8RY
01296 317800
www.nordsondage.com

VISIT US ON STAND

D09

D10



Nordson DAGE, MATRIX and SONOSCAN market leaders in the Electronics industry have a wide variety of Bondtest, X-ray and C-SAM® solutions for testing and failure analysis of battery components.

Nordson DAGE's 4600 Battery Bondtester can be automatically configured to quantify the strength of connections using most standard test methods. Heavy gauge wire bonds or battery tab welds typically involve forces of 20-100kg. We offer custom solutions specific to these applications, with shear and pull testing modes of 100kg pull and 200kg shear. We offer the head-extension mainframe which delivers the ideal, large working area, universal battery testing platform.



Alvatek Ltd, Unit 48, Basepoint
Business Centre,
Abbey Park Industrial Estate,
Premier Way, Romsey, Hampshire,
SO51 9AQ
0800 566 8228
www.alvatek.co.uk

VISIT US ON STAND

D11



Alvatek distributes and supports a range of electrochemistry research equipment including test, research and manufacturing equipment for battery and energy storage applications.

By providing our customers with expert advice and timely high-quality support, our aim is to ensure that our customers are happy to recommend Alvatek to their peers.

At Power Electronics Expo Alvatek will be taking the opportunity to launch a new line of AC power sources from N4L. These sources are perfect for applications including testing and research of renewable energy products.

Leading brands represented include Ivium Technologies, BaSyTec, Scribner Associates, N4L, Novonix, Hohsen, PalmSens, BASi, EL-Cell, and more.



Lincad is a leading expert in the design and manufacture of lithium-ion batteries, chargers and associated products for a range of applications across a number of different sectors. With a heritage spanning more than three decades in the defence and security sectors, Lincad has particular expertise in the development of reliable, ruggedised product with high environmental, thermal and electromagnetic performance.

With a dedicated team of engineers, all product is designed and manufactured in-house at our facility in Ash Vale, Surrey. Lincad is ISO 9001 and TickITplus accredited and works closely with its customers to meet their power management needs.

Lincad Ltd
331 Lysons Avenue, Ash vale,
Gu12 5QF
01252894600
www.lincad.co.uk

VISIT US ON STAND **D12**

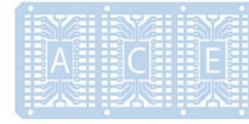
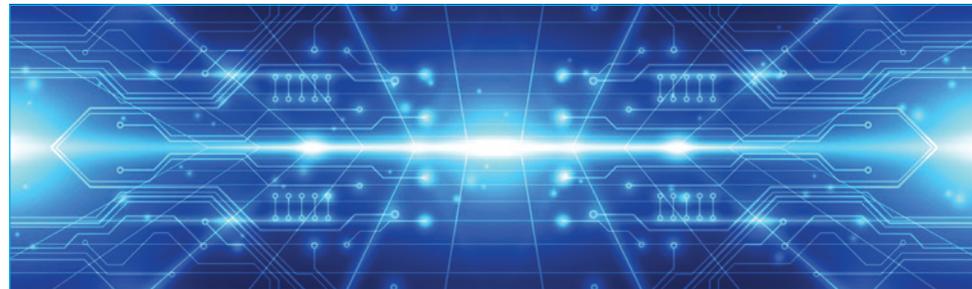


Munters is a global leader in energy efficient indoor climate control and dehumidification. Using innovative technologies, Munters creates the perfect climate for customers in a wide range of industries.

Munters is an expert in the design, manufacture, supply and installation of dry room systems to achieve ultra-low dew points of less than 1% humidity ($\leq -40^{\circ}\text{C}$ Dew-point). Specifically designed to meet the needs of advanced battery manufacturers' requirement for precise and low dew point control, whilst consuming less energy. Munters has over 40 years' experience with proven global installations for manufacturing and research and development for battery technology, automotive and advanced manufacturing.

Munters Ltd
Knowledge Centre, Wyboston Lakes,
Great North Road, Wyboston,
Bedfordshire, MK44 3BY
01480 432243
www.munters.co.ukbatterydryrooms

VISIT US ON STAND **D13** **D14**



www.ace-uk.net

Advanced Chemical Etching Ltd
Units 31-34, Hortonwood 33,
Telford, Shropshire, TF1 7EX
Telephone No: 01952 416666
Website: www.ace-uk.net

VISIT US ON STAND **E01**

Advanced Chemical Etching Ltd (ACE) is the largest independent etching company in the UK, based in a 35,000 sq ft state-of-the-art manufacturing facility in Telford Shropshire.

Manufacturers of bespoke 2D & 3D precision etched metal components from prototype to high volumes. Manufacturing products ranging from safety critical components for cars and aircraft to battery meshes, busbars, connectors, heat exchangers etc. for multiple industry sectors.

Located on Stand E1 they will be showcasing their new unique and innovative solutions for the etching of exotic materials for bespoke EV applications. Technical Engineers from ACE will be on hand to discuss your individual etching requirements.



Centrica Business Solutions - Powering our customers' ambitions

We understand the power of power. In a changing energy landscape, Centrica Business Solutions are helping our customers unlock the power of power to realise their ambitions.

Centrica Business Solutions
Centrica, Millstream, Maidenhead
Road, Windsor SL4 5GD
01753 494000
www.centricabusinesssolutions.com

VISIT US ON STAND **E02**

- Powering Performance: Improving operational efficiency
- Powering Resilience: Enabling businesses to stay on 24/7
- Powering the Future: Unlocking new sources of value and advantage for business

Through British Gas we can offer you a range of commercial services to suit your needs and also supply your business energy.





Hyperdrive Innovation designs, develops and manufactures lithium-ion battery systems for powering off-highway and material handling vehicles as well as stationary and portable energy storage systems. Based in Sunderland, UK, where we employ more than 40 people, Hyperdrive is the first company in the world to secure the supply of Nissan's LEAF lithium-ion battery technology for our own commercial products and holds key intellectual property which puts us at the forefront of technological advances.

As the UK's leading independent battery manufacturing facility, we have the capacity to manufacture over 20,000 battery packs per year, with recent customers including JCB and the world's largest online grocery retailer.

Hyperdrive Innovation
Future Technology Centre,
Barmston Court, Nissan Way,
Sunderland, SR5 3NY
0191 640 3512
www.hyperdriveinnovation.com

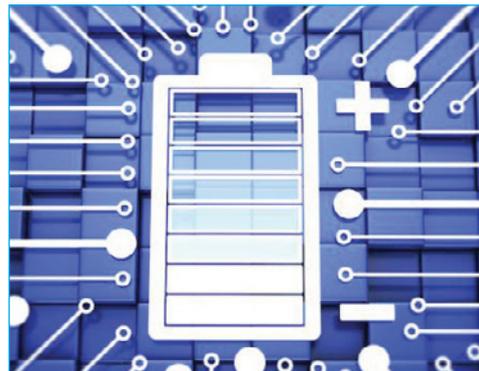
VISIT US ON STAND **E03**



Würth Electronics UK is a leading manufacturer and service provider in the electronic components market. Our product portfolio includes: EMC Components, Capacitors, Inductors, Resistors, Transformers, Switches, Connectors, Wireless Connectivity and Sensors. We have 16 production facilities across the globe and are active in 43 countries. We provide complete design-in support, samples free of charge and the delivery of our components anywhere in the world.

Würth Electronics UK
8 Exchange Quay, Salford,
Manchester, M5 3EJ
01618720431
www.we-online.com

VISIT US ON STAND **E04** **E05**



Peter Huber Kältemaschinenbau was established in 1968 by Peter Huber as one of the first enterprises specialised in the development and construction of temperature control systems. Today our company employs around 250 people at the headquarter in Offenburg, the 'Tango Factory'. In addition, international subsidiaries and trading partners provide a solid foundation for comprehensive support and services all over the world.

We are technology leader for high precision thermoregulation solutions in research and industry. Our products ensure precise temperature control in laboratories, pilot plants and production processes throughout the whole world – from -125 °C to +425 °C.

Huber UK Temperature Control Ltd
Unit 7 Heritage Business Centre,
Derby rd, Belper DE56 1SW
www.Huber-online.com

VISIT US ON STAND **E06**



Samuel Taylor Ltd (STL) manufactures precision stamped components and assemblies as well as sophisticated bonding of precious bi-metals, typically used in electro-mechanical switches.

With over 120 years of manufacturing history, and an in-depth understanding of precious and semi-precious metal stamping, STL are keen to collaborate and provide successful implementation of scalable manufacturing techniques for the future of battery busbar technology. STL are fully equipped with in-house design and toolmaking capability to support with new and existing projects. STL are able to offer prototype samples as well as full-scale production support for presswork components and assemblies.

Samuel Taylor Limited
Arthur Street Central, Lakeside,
Redditch, B98 8JY, UK
+44(0) 1527 504 910
www.samuelstaylor.co.uk

VISIT US ON STAND **E08**



Technotrans understands that the temperature of modern lithium-ion batteries is an essential factor for the correct operation and service life of high-performance batteries. Optimum operating temperature of vehicle batteries and stationary energy storage devices can be ensured by a range of our powerful cooling systems.

Technotrans offers a wide range of cooling concepts for fast-charging stations. These include compact designs of active as well as passively cooled charging cable cooling modules, suitable for easy integration into the charging stations.

Technotrans
Axis One, Brunel Way,
Colchester, CO4 9QX
01206 224 200
www.technotrans.com/en.html

VISIT US ON STAND **E09**

TDK-Lambda

TDK-Lambda UK Ltd
Kingsley Avenue, Ilfracombe,
Devon, EX34 8E5
+44 (0)1271 856666
www.uk.tdk-lambda.com

VISIT US ON STAND **E10** 

Part of the TDK Corporation, a leading global electronics company.

TDK-Lambda UK Limited, Britain's largest manufacturer of standard and configurable power supplies offer a range of 1.5W to 100kW AC-DC power supplies, DC-DC converters, Programmable (Lab) DC power supplies and EMC/EMI noise filters to suit many applications. With design and manufacturing facilities in EMEA, Asia and America, TDK-Lambda is a major supplier of power conversion products and recognized leader in the industrial market segment.

Visit stand E10 to see our latest range of programmable power supplies.

Julabo

THE TEMPERATURE CONTROL COMPANY

JULABO UK Ltd
Unit 7,
Casterton Road Business Park,
Old Great North Road,
Little Casterton,
Stamford PE9 4EJ
+44 201733 20265892
www.julabo.com

VISIT US ON STAND **E11** 

TEMPERATURE CONTROL EXPERT IN THE AUTOMOTIVE AND SPACE INDUSTRIES

JULABO provide fast and accurate temperature control that is crucial in the research and development for the automotive industry and aerospace. JULABO offers reliable instruments for the various tests under realistic conditions as well as test simulations. To ensure reproducible temperatures, manufacturers and suppliers require premium instruments supporting more than standard applications. The high-performance instruments made by JULABO offer the high-precision control and fast temperature changes required today. JULABO instruments reliably comply with the highest requirements and solve even the most difficult temperature control applications without problems.

CUSTOM SOLUTIONS AND OPTIMUM SUPPORT

JULABO Custom Solutions Department focuses on custom applications. The comprehensive accessory program offers suitable complete solutions and supplements for every customer-specific requirement.

FRASER

TECHNOLOGIES

Fraser Technologies
24 Grange Road,
Houstoun Industrial Estate,
Livingston EH54 5DE
01506 443058
www.frasertech.co.uk

VISIT US ON STAND **F01** **F02** 

Fraser Technologies are proud to have supported the cleaning and speciality fluid industry for last 50 years. We continue to offer technological advances, adapt to legislative changes and embrace environmental challenges and are now considered one of the leaders within the Precision Cleaning industry. We offer a wide range of new generation chemistries, including replacements solutions for the likes of Trike and nPB and a large variety of solvent and aqueous cleaning systems.

Companies from the aerospace, electronics and automotive industries have chosen to work with us because of our expert knowledge, superior trial facilities and our first class after sales service.

We are very excited to launch our new speciality products into the Battery Industry. The Opteon™ range of speciality products are well known for their thermal management and dielectric capabilities and have been constantly adapted to meet industry demand, including ultra-low environmental impact, extremely safe, non-flammable, no health risks and proven replacements solutions for HFC's, PFC's and HFE's. Please come and visit us on stand F1&F2 to find out more about our revolutionary products.

Tappex



Tappex Group of Companies
Masons Road,
Stratford-Upon-Avon,
Warwickshire, CV37 9NT
07736625834
www.tappex.co.uk

VISIT US ON STAND **F03** 

Tappex Group of companies includes Tappex Thread inserts, UK manufacturers of high quality threaded inserts for plastics, composites and light alloys since 1956. Our qualified and experienced sales engineers will be available to discuss your thread insert projects & challenges and we'll also be offering demonstrations of our new installation equipment and promoting our new products, including our range of Titanium thread inserts. We will also be promoting our sister company Pressavon - Est 1953. Pressavon who specialise in progression tooled bracketry, pressings and stampings and sub-assemblies, primarily for fluid handling applications in the automotive industry.



Renesas
Arcadiastrasse 10,
40472 Dusseldorf, Germany
+49-211-6503-0
www.renesas.com

Renesas Electronics Corporation delivers trusted embedded design innovation with complete semiconductor solutions that enable billions of connected, intelligent devices to enhance the way people work and live. A global leader in microcontrollers, analog, power, and SoC products, Renesas provides comprehensive solutions for a broad range of automotive, industrial, home electronics, office automation, and information communication technology applications that help shape a limitless future.

VISIT US ON STAND **F04** 



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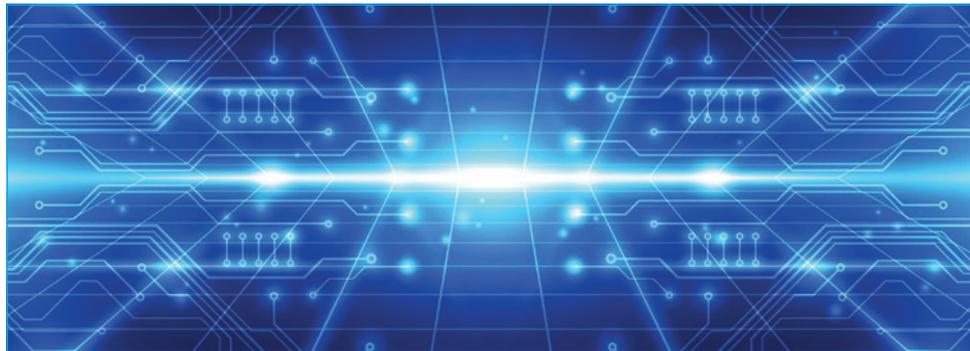
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m+p international is a worldwide provider of high-quality multi-channel test and measurement system solutions, developing and manufacturing systems for closed-loop vibration testing, shock testing, portable noise & vibration signal analysis, data acquisition and continuous process monitoring.

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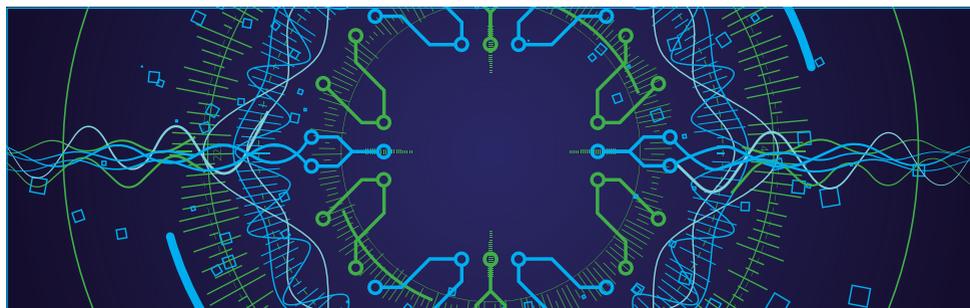
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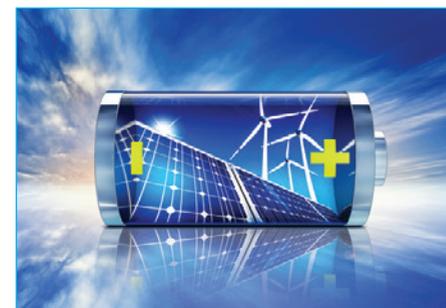


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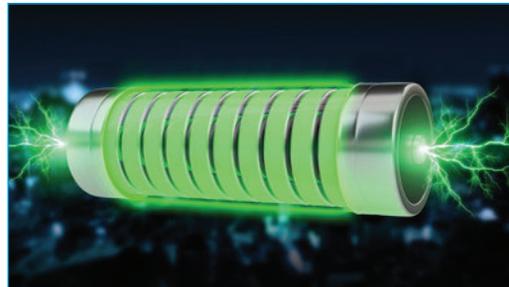


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In 2018, Tesvolt was awarded the German Entrepreneur Award. In the same year, Tesvolt received the "The smarter E award" in the "Outstanding projects" category for the off-grid power supply of an avocado farm in southwestern Australia.

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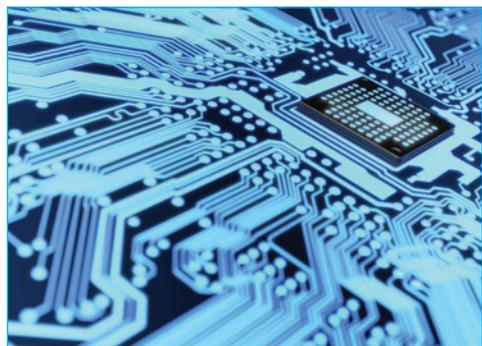
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Altair is a global technology company that provides software and cloud solutions for product development, high performance computing (HPC) and data intelligence. Altair's software solutions include HyperWorks, the most comprehensive, open-architecture CAE solution in the industry and a key technology being used to develop batteries and battery packs worldwide. Our clients use HyperWorks to assess and solve thermal management issues, design and optimise battery packaging, and develop system level electrical models to enable multi-disciplinary simulation of battery systems. Find out more at www.altair.com

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