



INNOVATION
NEWS NETWORK

eBook
helpsheets

Suggested elements

Text elements

Standard text elements we set all booklets with, unless requested otherwise:

- 1 Headlines
- 2 Subheaders
- 3 Page numbers
- 4 Headers/footers
- 5 Contact details (Usually added to back cover)

Other text elements we can include and suggest the client to consider:

- 6 Pull quotes
- 7 Standfirst
- 8 Image captions
- 9 References/Further reading

Design elements

Suggested design elements to include:

- 1 Logo
- 2 Images
- 3 Colour - Background, borders, text etc. Often client company colours unless requested otherwise.
- 4 Graphic elements - Shapes, details, particular layout styles etc. For example, these can be included to mirror the logo or website.
- 5 Font - Client can request fonts to be used in the eBook. We may request client to send font files if we don't already own them.

Brand guidelines - We are happy to follow any brand guidelines sent to us by the client.

KIT
Karlsruhe Institute of Technology

Calorimeters to advance battery safety

Ensure your lithium-ion and post-Li cells are safe and perform well

With six accelerating rate calorimeters of different sizes – from coin to large pouch, or prismatic automotive cell format – the IAM-AWP at KIT offers the evaluation of thermal and safety data for lithium-ion and post-lithium cells on material, cell and pack level. These data can be used on all levels of the innovation chain – from the design of intrinsically safe materials up to innovative thermal management and safety systems. Our fields of research and range of tests encompass both normal conditions and abuse conditions:

Normal condition tests include:

- Isothermal cycling measurements which provide constant environmental temperatures; and
- Adiabatic cycling measurements which ensure that there is no heat exchange between the cell and its surroundings.

Each of these allows:

- Measurement of temperature curve and distribution for full cycles, or application-specific load profiles;
- Determination of generated heat;
- Separation of heat in reversible and irreversible parts; and
- Ageing studies.

Abuse condition tests include:

- Thermal abuse – the heat-wait-seek, ramp heating and thermal propagation test;
- Electrical abuse – external short circuit, overcharge and overdischarge testing; as well as
- Mechanical abuse – nail penetration test.

Each of these allows:

- Temperature measurement;
- External or internal pressure measurement;
- Gas collection and analysis;
- Post-mortem analysis; and
- Ageing studies – identifying the change of risk potential with an increasing degree of ageing.

INSTITUTE FOR APPLIED MATERIALS – APPLIED MATERIALS PHYSICS (IAM-AWP)

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IAM
Institute for Applied Materials

KIT – The Research University in the Helmholtz Association
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Ecohydrology Research Group

For peat's sake

One type of soil that is of particular interest to ERG researchers are the organic soils found in peatlands. While they store approximately 30% of land-based organic carbon, Canada has a large fraction of the world's peatlands. Northern peatlands are attracting much attention because high latitude regions are warming faster than the global average, hence, creating the possibility of rising carbon emissions from peat soils, further accelerating global climate change.

Peat soils form by the accumulation of plant debris in wetlands. Compared to most mineral soils, peat is a highly structured and complex porous medium, with unique physical, geochemical, thermal, and hydraulic properties. In particular, the structure of peatlands influences the flow of water and solutes through the peat.

The immobile regions within peat are the primary sites where microbially mediated biogeochemical processes take place. Diffusional mass transfer limitations between the mobile and immobile porosity may therefore largely regulate belowground carbon and nutrient turnover and, hence, the biogeochemical cycling and groundwater quality in peatlands. Researchers at ERG are combining geochemical, isotopic, and genetic methods with X-ray tomography and tracer experiments, to unravel how the pore structure of peat soils controls their solute transport and biogeochemical activity.

Several of ERG's recent studies focus on coastal peat deposits and explore assessing the effects of freshwater resources that mining and exposure to rising sulphate concentrations. This collaborative work with colleagues from the University of Rostock is motivated by the need to better understand and forecast the consequences of sea-level rise and land subsidence from wetland drainage that are increasingly exposing nearshore peatlands to seawater intrusion. In other projects, the understanding of the hydrology and biogeochemistry of peatlands is used to assess the potential of peat to attenuate the dispersion of agricultural and municipal pollutants.

Read more:

- Bosch, L., Toppstedt, H., Kreuzburg, M., Jansson, M., Rezzonatto, F., and Lemmertz, B. (2018) Sulfate mobility in fen peat and its impact on the release of solutes. *Frontiers in Environmental Science* 7, 188. doi: 10.3389/fenv.2018.00188
- Kreuzburg, M., Rezzonatto, F., Hilgendorf, T., Voss, M., Bosch, L., Leibner, S., Van Cappellen, P., and Rehder, S. (2020) Carbon release and transformation from coastal peat deposits controlled by submarine groundwater discharge: A column experiment study. *Limnology and Oceanography* 65, 1196–1205. doi: 10.1002/lno.14248
- Liu, H., Price, J., Rezzonatto, F., and Lemmertz, B. (2020) Centennial-scale shifts in hydrophysical properties of peat induced by drainage. *Water Resources Research* 56, e2019077038. doi: 10.1029/2019WR026703
- McCarter, C.P.B., Rezzonatto, F., Gharaedaghi, B., Price, J., and Van Cappellen, P. (2019) Transport of chloride and desiccated water in peat: The role of anion exclusion, diffusion and anion adsorption in a dual porosity organic media. *Journal of Contaminant Hydrology* 229, 103487. doi: 10.1016/j.jconhyd.2018.103487
- McCarter, C.P.B., Rezzonatto, F., Quinton, W.L., Gharaedaghi, B., Lemmertz, B., Price, J., Connon, R., Van Cappellen, P. (2020) Pore-scale controls on hydrological and geochemical processes in peat: Implications on interacting processes. *Earth-Space Science* 2017, 103227. doi: 10.1002/essoar.2020.103227

“While peatlands are estimated to cover only 3% of the continents, they store approximately 30% of land-based organic carbon.”

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Lithium Power International is a pure-play lithium development company on the verge of developing a new, low-cost mine in Chile

Lithium Power International (LPI) has a diversified asset base from a geological and resource type point of view, including its flagship Maricunga lithium brine project located in northern Chile at the Maricunga Salina, and its hard rock lithium production projects in Western Australia.

LPI's Maricunga project, developed through its JV company, Minera Salar Blanco (MSB), is a sustainable, de-risked, major lithium production development supporting the energy transition. The project, located in South America's "Lithium Triangle", is home to the world's largest and richest lithium reserves.

Lithium's long-term position as an element critical in the global battery revolution has been assured during the last year. The rapid expansion in the metal's use in batteries that power vehicles, store electricity and even propel some ferries and light aircraft is expected to continue for years as people strive to replace fossil fuels. Lithium sales increased by a very healthy six across the globe in 2021. This focus is expected to accelerate in the foreseeable future as the soft, silvery metal provides vital solutions for new, low carbon economies. There is simply no cheaper and more effective way to slash pollution than with lithium batteries. Even if carbon pollution was not a problem, lithium batteries are now among the cheapest power sources available.

Understandably, this is causing lithium prices to soar. S&P Global Platts, which tracks energy charges, commented in mid-February that battery-grade lithium carbonate prices in China had reached an all-time high of Yuan 450,000/metric tonne (\$498,300/metric ton) on a delivered and duty paid basis. It quoted an unnamed producer as saying that lithium usage was increasing very aggressively, at a rate close to Yuan 10,000/metric tonne daily. This is being cited as a reason for higher EV prices, and some speculate it was behind a recent 20% price rise by Tesla, said to be the highest single hike yet for its cars.

Fitch, a ratings analyst, expects lithium demand to accelerate in coming years and apply more pressure on prices, despite a faster expected rise in lithium mine output. Its country-by-country forecast expects global output of lithium carbonate equivalent to rise by about 600,000 tonnes between 2021-25. While this is considerably more than the 240,000-tonne output hike between 2019-20, supply will continue to be confronted by bottlenecks. However, Fitch does leave some hope by saying that advancements in extraction technology could cause supply to rise more quickly, particularly from new sources such as geothermal brine and sedimentary clay deposits.

Strategic research provider BloombergNEF commented that: "For more than 10 years the clean energy sector has been unremitting in driving costs down, such that equipment for renewables plants is now as much as 10 times cheaper. Many people working in renewables have known nothing but falling costs. So, the commodity price boom of the past months has been new ground for many. For batteries, the target is to get pack prices down to \$150/kWh – the figure at which EVs are expected to start competing with conventional vehicles on an upfront, purchase-cost basis, without subsidies. If we factor in continuing high input prices, the date gets pushed back just two years to 2026." The publication warns, however, that higher prices will increasingly be fed through to consumers, leading to "soul-searching on whether green policies are the cause".

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Images

We request all images to be supplied as the original, high quality image file. eBooks are set to a minimum 300dpi. If the image quality falls below this we can replace with images from www.istockphoto.com. The client is free to choose any images from iStock they wish.

We request images to be sent in vector or rasterized format - jpg / png / pdf / eps etc. They can also be supplied as Illustrator or Photoshop files.

Please do not supply images on Word documents or Powerpoint.

eBook examples

Front and back cover: Includes title, logo and contact details.



Text heavy: Around 2000 words per spread. Smaller headlines and font. Few, if any images.



Standard word count: Around 1000 words per spread. Even mixture of image and text.



Image heavy: Less than 500 words per spread. Larger headlines, images and added elements, such as pull quotes.





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