

# Customized Battery Storage Devices

## Electrochemical Energy Storage Systems for demanding Applications

©Fraunhofer ISIT:  
Example of customized  
Battery Cells

Two decades of accumulate research and development and battery cell design activities have provided us with the knowledge to serve as your company's innovation engine when it comes to design your specific battery solution. Directly connected to your applications, our specialists are experts in delivering the precision match between the requirements of devices and materials, formulations, cell design and functionalities for your applications. Our offering ranges from components coating for the enhancement of battery life and performance over energy or power tailored battery cells to the manufacturing of smart cells for demanding applications.

Our highly trained engineers and scientists are ready to collaborate with you to deliver the right battery storage solutions with the best performance and longest-life. Upon request we also offer our customers consulting services and technical studies as well as in-house workshops and trainings.

### Your advantage working with Fraunhofer ISIT

- Entire process chain expertise from the cell design over the transfer to industry standards
- Highly customizable battery cell parameters and design set-up
- Intrinsically safe technologies utilized in our lithium-ion batteries Series
- Easy integration into existing product (portable electronic device, ..)
- Test and characterization of cells and batteries

### What we can do for you

#### Dry Coating

Solvent free  
Space saving  
Energy saving

#### High-Power Cell

18C discharge/charge rate  
160 Wh/kg  
Graphite technology

#### High Temperature Cell

Up to 150°C operation temperature  
Autoclavable  
High intrinsic safety

#### Smart-Cell

Sensor integration in cells  
Safety monitoring  
Ageing prediction

#### ISIT-Seperator

High flexibility  
Low resistance  
Direct coating on electrodes

#### Ultra-High-Power Cell

60C discharge/charge rate  
190 Wh/kg  
LTO technology

#### High Pressure Cell

600 bar pressure resistant  
Flexible geometry  
Good low temperature performance

#### Cell Test

>400 measurement channels  
Cycle stability, C-Rate capability  
CV, HPLC, Impedance

#### Solid State Batt. (ASSB)

Polymer-Ceramic Hybrid  
Dry coated

#### Si-High-Energy Cell

100% Si Anode  
>300 Wh/kg

#### Flexible Cell

Resistant to alternating bending  
High intrinsic safety

#### Module Test

5 Channels  
Up to 60 V, 150 A







© Fraunhofer ISIT:  
Sensor integrated into  
Battery Cell

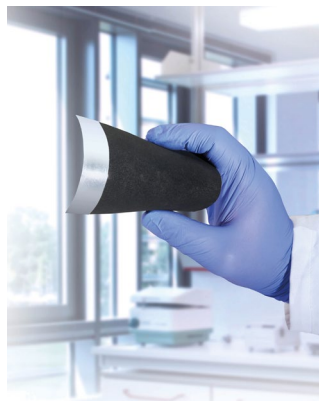


Tell us about your specific needs

### Examples of battery cells realized at Fraunhofer ISIT

Technical Specifications	 High Energy	 High Power	 Flexible	 Robust
Voltage	3,7 V	2,5 V	3,7 / 2,5 V	2,5 V / 3,3 V
Energy Density	> 260 Wh/kg	> 90 - 160 Wh/kg	> 200 Wh/kg	> 75 - 210 Wh/kg
C-rate*	2C	18C / 60C	2C	8C
Cycle stability	> 1000 Cycles	> 2000 Cycles	> 2000 Cycles	> 15000 Cycles
Durability	8-10 years	Up to 20 years	8-10 years	Up to 20 years
Temperature range	0°C - 60°C	-10°C - 60°C	0°C - 60°C	-20°C - 150°C
Capacity	<65 Ah	<20 Ah	~150 mAh	1 Ah
Geometry	35 cm x 10 cm	35 cm x 10 cm	10 cm x 5 cm	6 cm x 5 cm
Use case example	Stationary energy storage	Starter battery	Wearables	Autoclavable medical devices

\*Number of charge / discharge cycles per hour



### Our range of services

#### Material & Component Tests

- Half-cell setup
- Full-cell setup

#### Process development

- Separator technology
- Customized cell manufacturing
- Rapid prototyping

#### Battery Systems & Test

- Cells with integrated sensors
- Cell analytics
- System development

#### Cell development

- Electrode formulations
- Cell adaptation to field applications

### Cooperations



Fraunhofer ISIT is one of Europe's most modern research facilities for microelectronics and microsystems technology. With 20+ scientists the group "Battery Systems for Special Applications" offers an ideal technological and best practice platform for the production of prototypes and small series for specific applications, such as portable electronic devices, traction and stationary energy storage.



Contact us

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