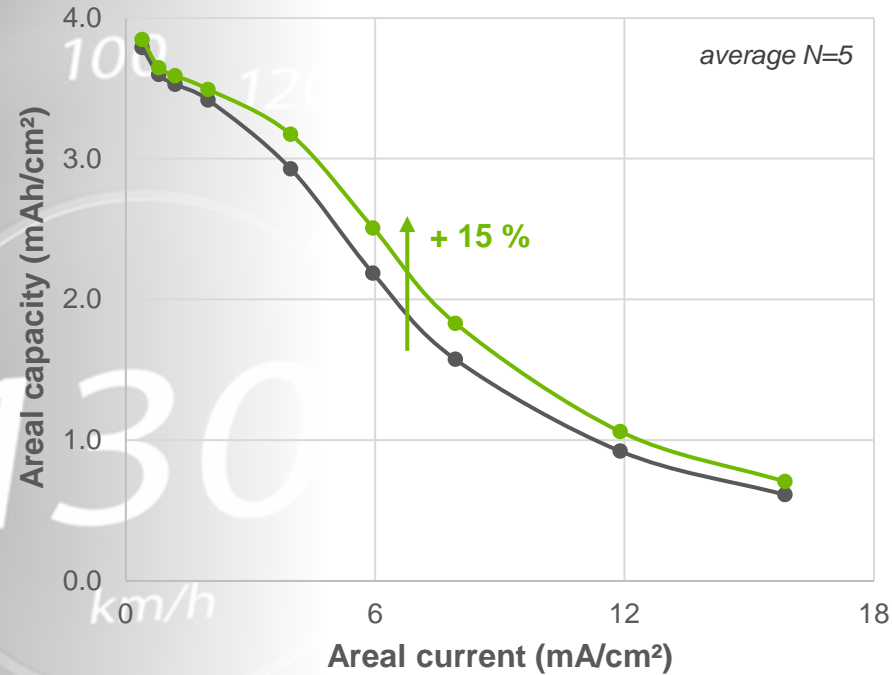


ENHANCED C-RATE PERFORMANCE



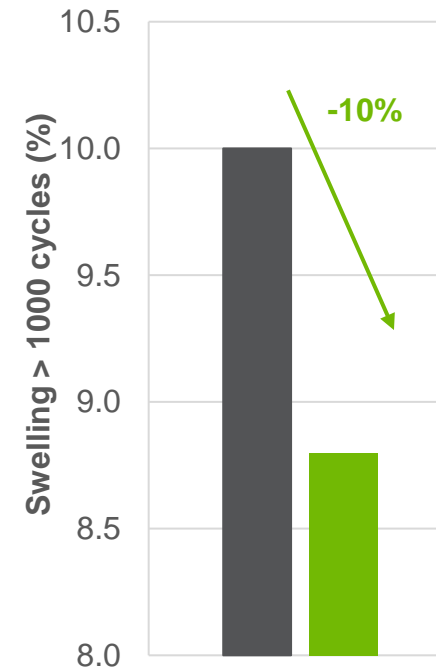
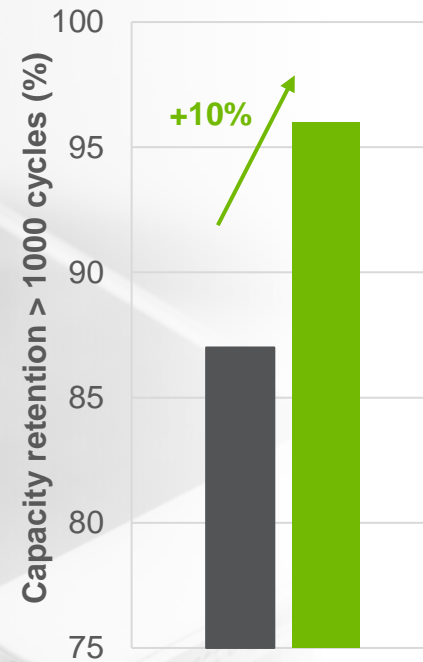
★	Heraeus Case study	
🔋	Design:	Energy cell
🔋	Form factor:	Coin cell
⬡	Electrode:	Cathode
🔬	Active Mat.:	NMC622
🌍	Region:	Europe
🚩	KPI:	C-rate discharge
⬡	Carbon:	Ref. / Porocarb



Key results

- Successful improvement of NMC622 cathode with highly structured CB and **Porocarb®**
- Improving capacity retention by up to 15 % for C-rates above 0.5C for continuous current discharge
- Results were reproduced by European premium automotive OEM in their energy design

EXTENDED CYCLE LIFE AND SAFETY



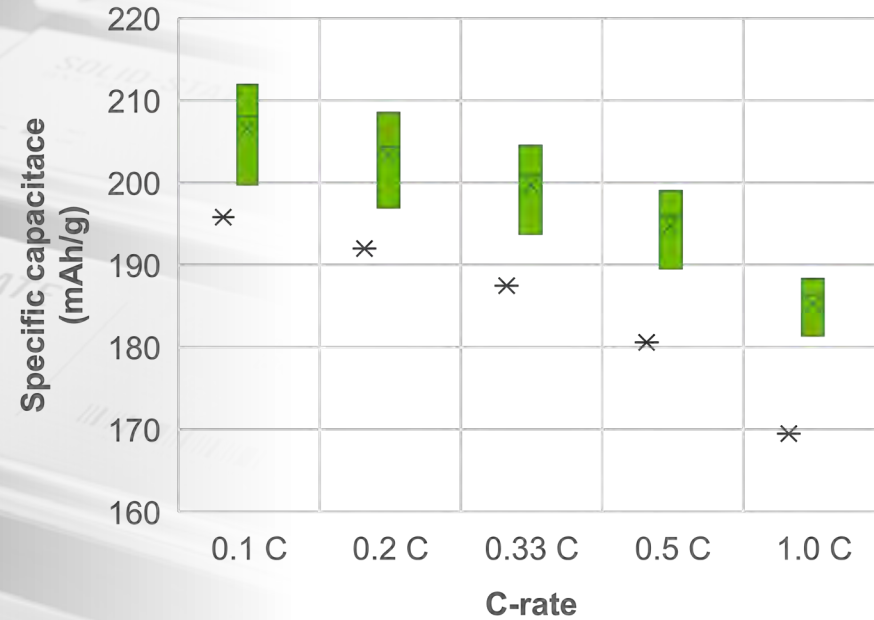
	Customer feedback	
	Design:	Energy cell
	Form factor:	Pouch cell
	Electrode:	Cathode
	Active Mat.:	NMC
	Region:	Asia
	KPI:	Cycle life
	Carbon:	Ref. / Porocarb



Key results

- **Porocarb®** enhances the cycle life by +10% capacity retention after > 1000 cycles
- In addition the cell swelling is reduced by -10% after > 1000 cycles, increasing the cell safety
- By adding **Porocarb®** to your battery both, cycle life time and safety are improved

BOOSTED ASSB CATHODE PERFORMANCE



Customer feedback



Design: ASSB



Form factor: Jig-cell



Electrode: Cathode



Active Mat.: NMC



Region: Asia



KPI: C-rate discharge



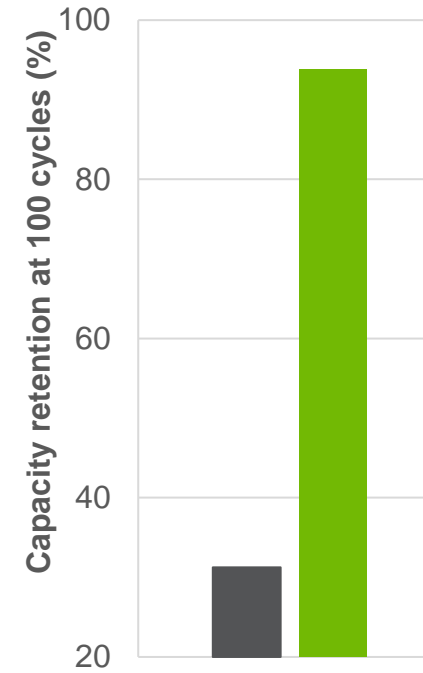
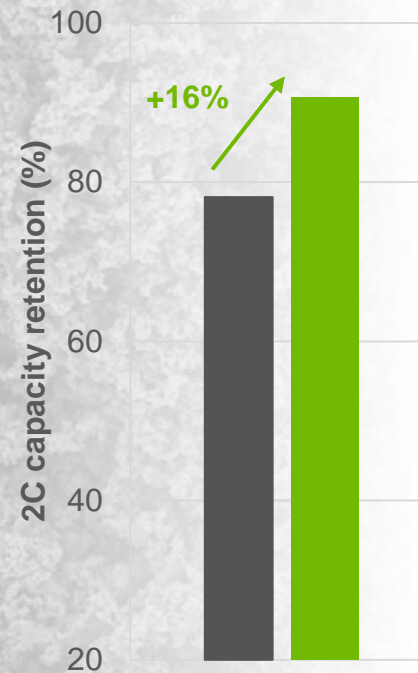
Carbon: Ref. / **Porocarb**



Key results

- The single particles of **Porocarb®** allow for a defect free cathode processing and densification
- **Porocarb®** enables an increased initial specific discharge capacitance
- At high C-rates of 1.0 C **Porocarb®** enables an increased capacity of up to 10%

CARBON PROTECTIVE LAYER FOR ASSB ANODE

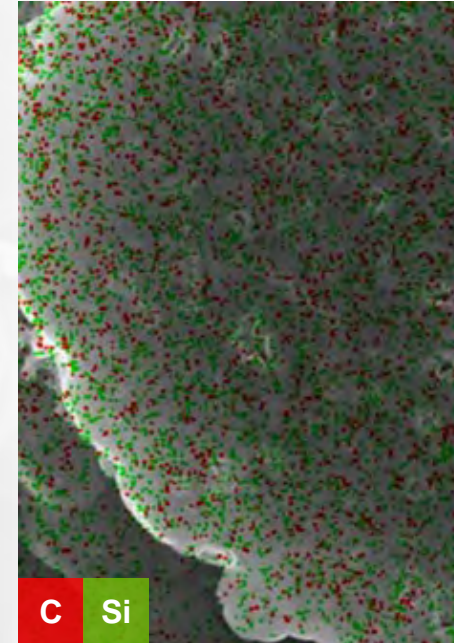
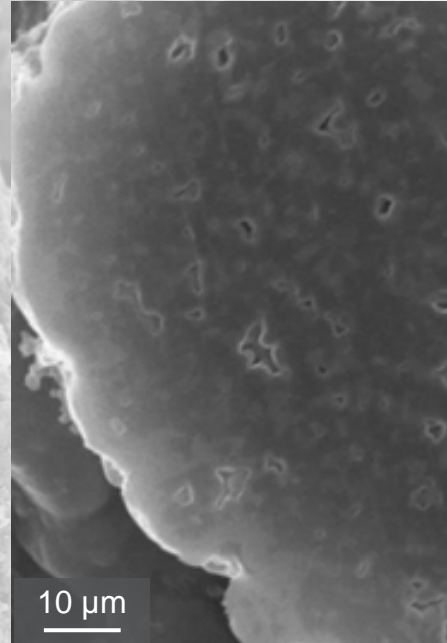
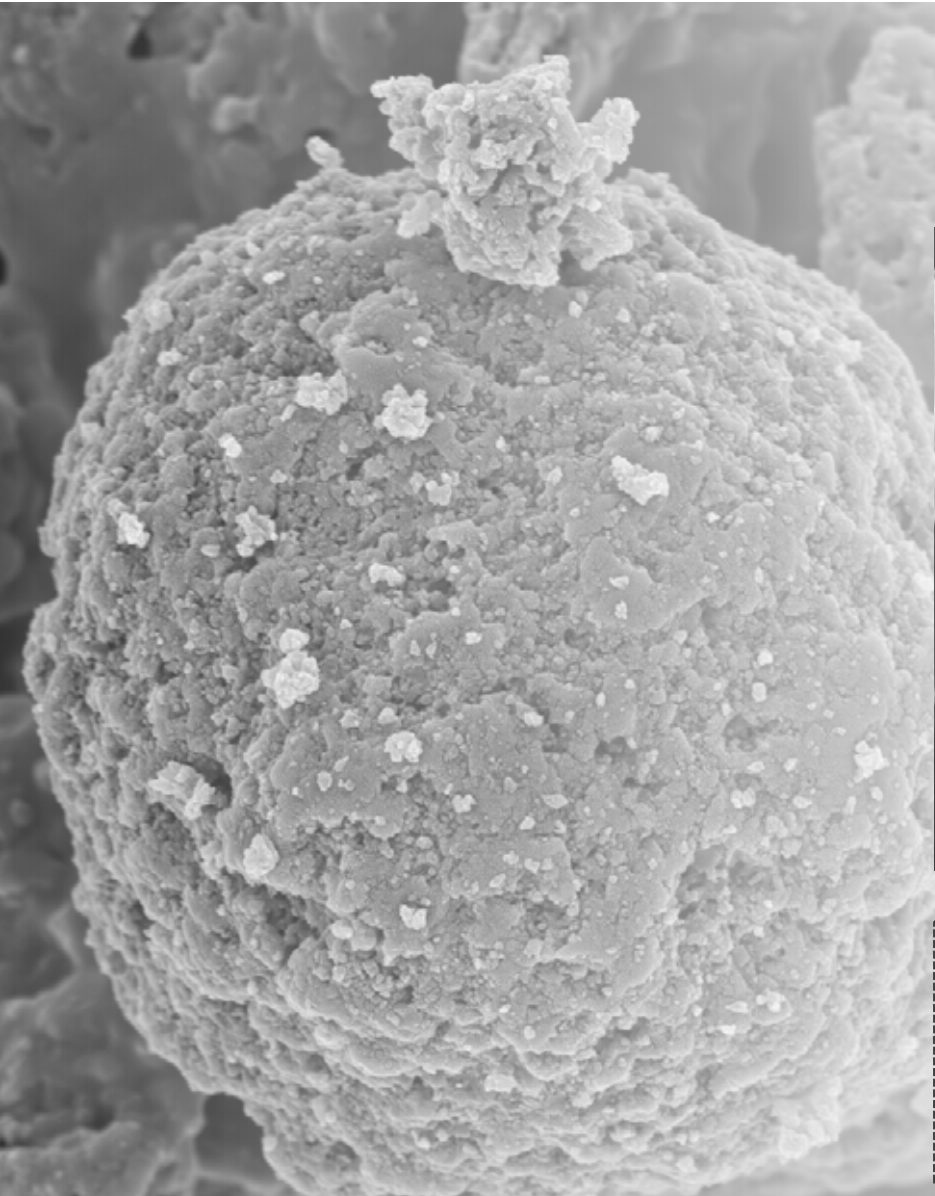


	Customer feedback
	Design: ASSB
	Form factor: Lab cell
	Electrode: Anode
	Active Mat.: "anode free design"
	Region: Asia
	KPI: Performance
	Carbon: Ref. / Porocarb

Key results

- Thin coating of **Porocarb®** results in a porous carbon protective layer in an anode free design
- **Porocarb®** improves the C-rate discharge performance compared to the **reference carbon**
- The **Porocarb®** layer improves the cycling stability with 94% capacity retention at 100 cycles

CARBON CORE FOR ACTIVE MATERIAL SPECIES



Customer feedback



Design: Energy



Form factor:



Electrode: Anode



Active Mat.: Porocarb® / Si



Region: Asia



KPI: Capacity



Carbon: L1108s / L1808s



Key results

- Porocarb® provides a stable macro porous carbon matrix for active material deposition
- EDX mapping reveals 33 wt.% of Si deposited within and around the Porocarb® particles
- First electrochemical testing indicates a initial reversable capacity of 1350 mAh/g

VISIT US AT
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Heraeus

Porocarb® Particles

Heraeus

For A Better Battery.
We improve your value chain.

Raw Materials → Electrode Formulation → Electrode Manufacturing → Battery Cell Assembly → Cell Drying → Cell Connection → Battery Pack

Heraeus

Heraeus

Battery Cell

Let's discuss how **Porocarb®**
can help you!

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