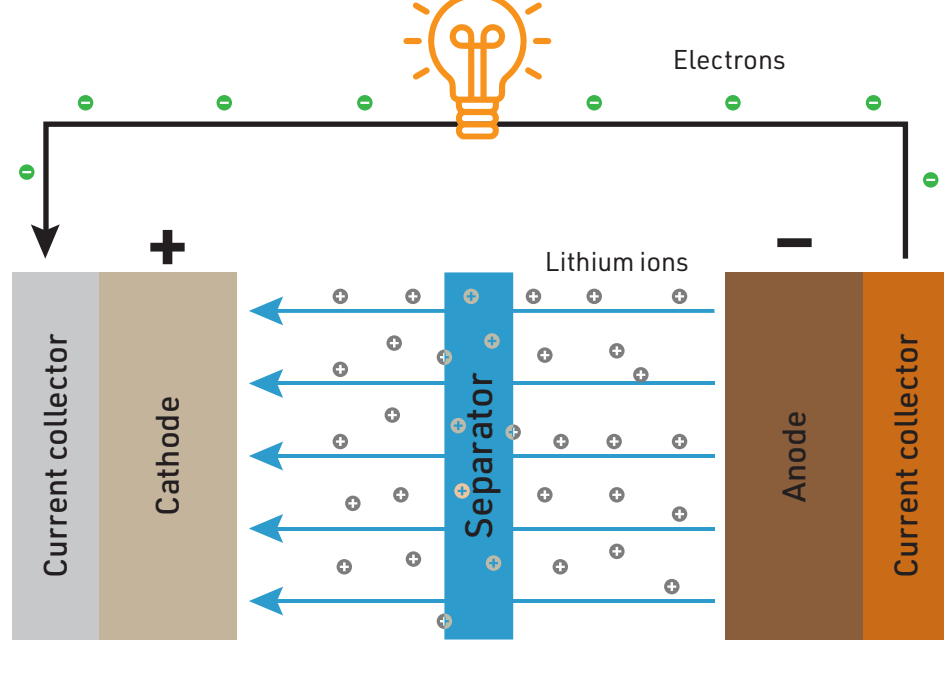


NPORE[®]

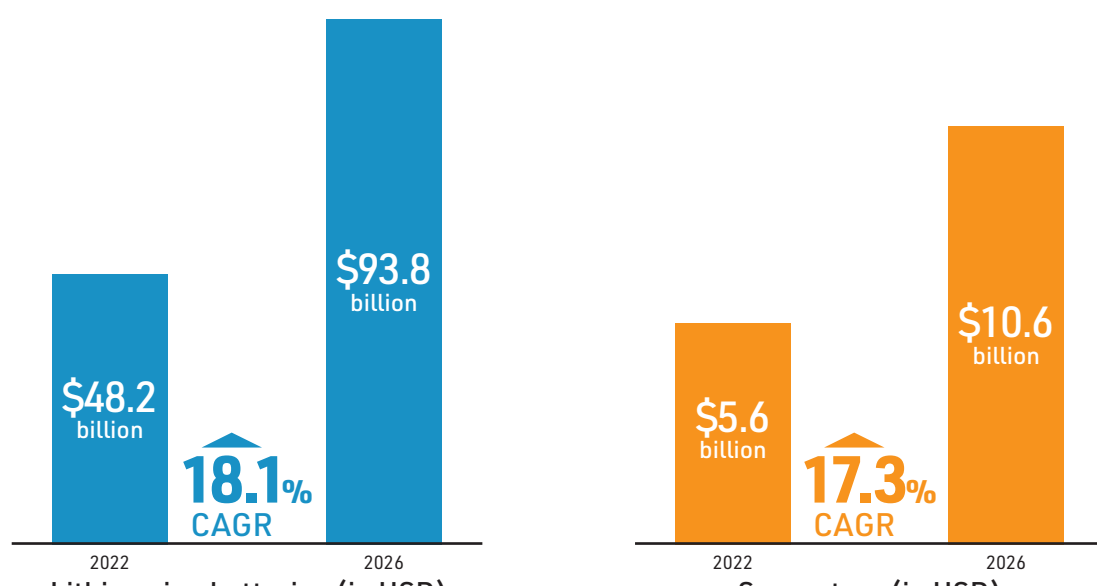
World's first flexible, nanoporous, freestanding ceramic separator

Lithium-Ion Battery Separator



The separator in a lithium-ion battery permits and controls ion transport between the anode and cathode while inhibiting electron transfer during charge and discharge cycles.

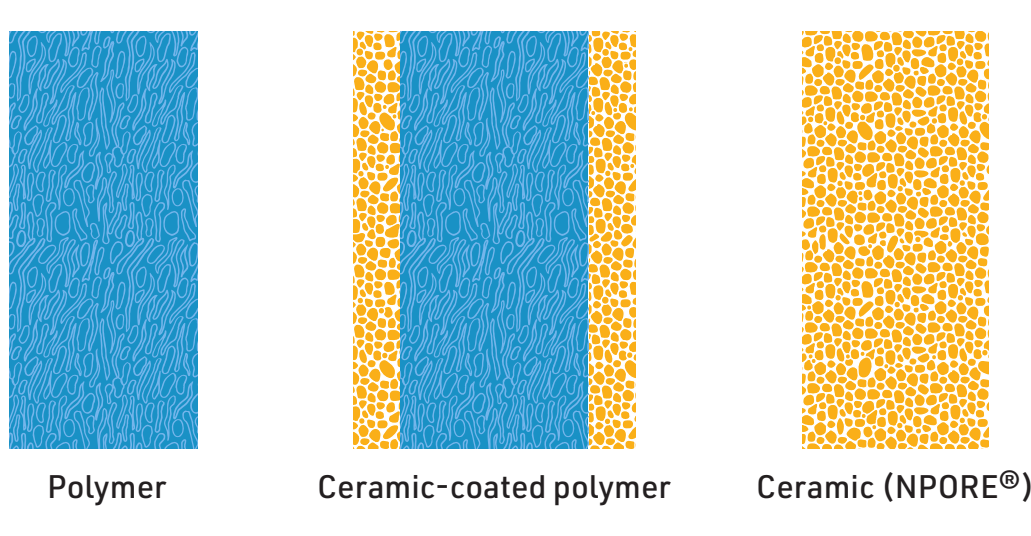
Market Trends



Sources: Bloomberg and Grandview research on lithium-ion batteries. CAGR: Compound Annual Growth Rate.

Sources: Yano Research; SNE Research.

Types of Separators



Polymer

Ceramic-coated polymer

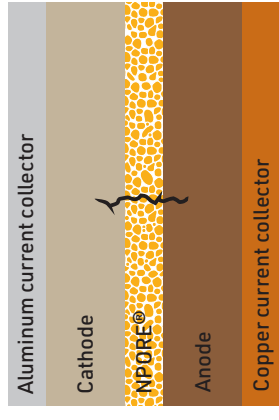
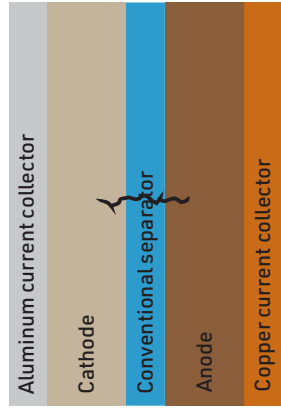
Ceramic (NPORE[®])

NPORE[®] vs Conventional Separators

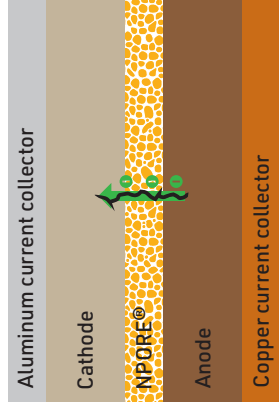
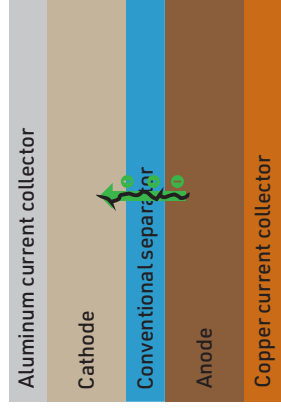
Conventional separator

NPORE[®]

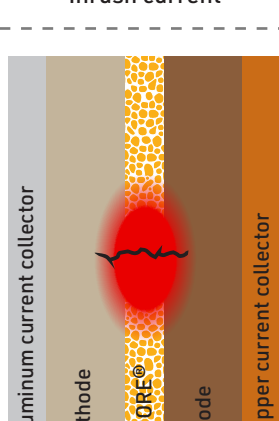
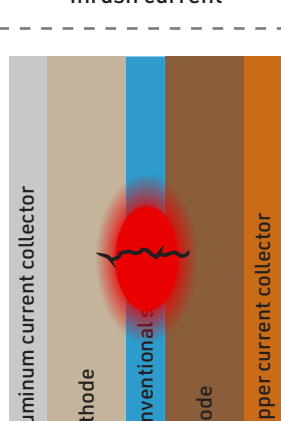
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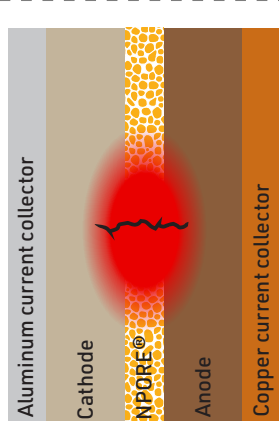
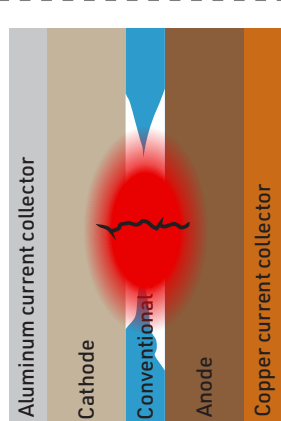
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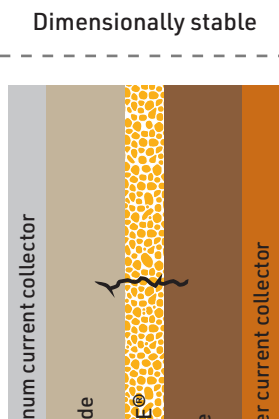
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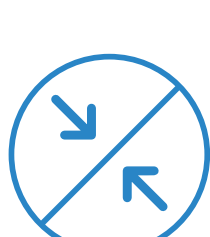
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5



Advantages of NPORE[®]



< 1% shrinkage at 220°C



5X higher thermal conductivity

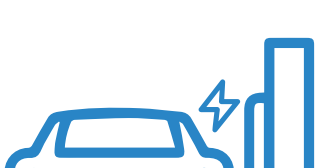


Improved safety

Applications



Lithium-ion batteries



Electric vehicles



Aerospace battery safety