



Solid Power High-Content Silicon Cell Data

October 13, 2021



Key Highlights

Cells can surpass commercial cycle life targets

- 82% capacity retention through 1,000+ cycles at C/5 rate

Thin, EV-relevant separator reduces battery mass and cost and increases performance

- 25 micron

High active material concentration increases performance

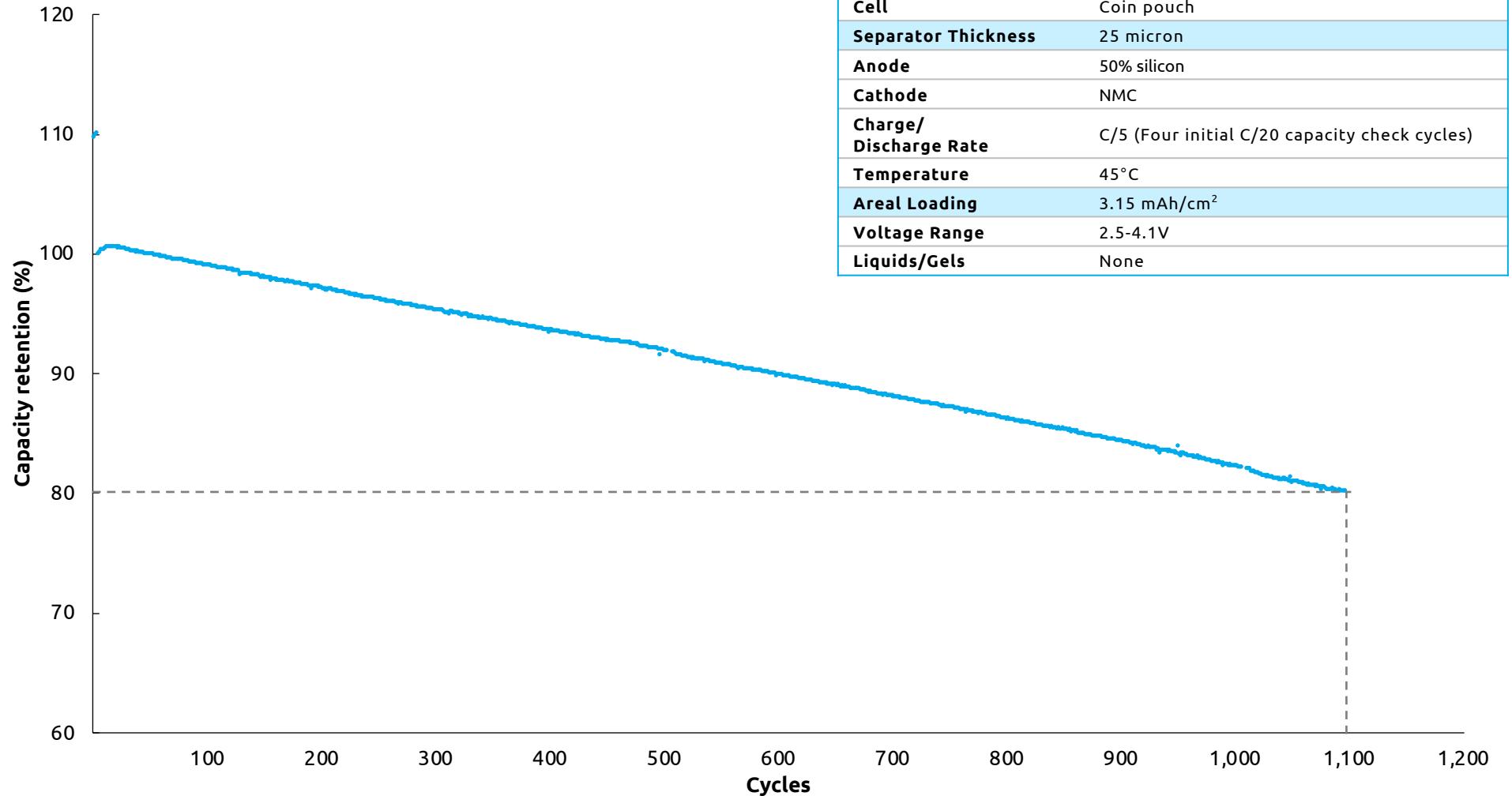
- 3.15 mAh/cm²

No liquids or gels increases safety

- Truly all-solid chemistry

High-Content Silicon EV Cell Data

1,000 cycles at 45°C



Source: Company data.



Key Highlights

Cells can pack more energy than commercial lithium-ion

- ~350 Wh/kg stack level¹ specific energy

High-energy cell designs nearing commercial cycle life targets

- 80% capacity retention at 750 cycles at C/5 rate

Thin, EV-relevant separator reduces battery mass and cost and increases performance

- 25 micron

Increasing active material concentration further increases performance

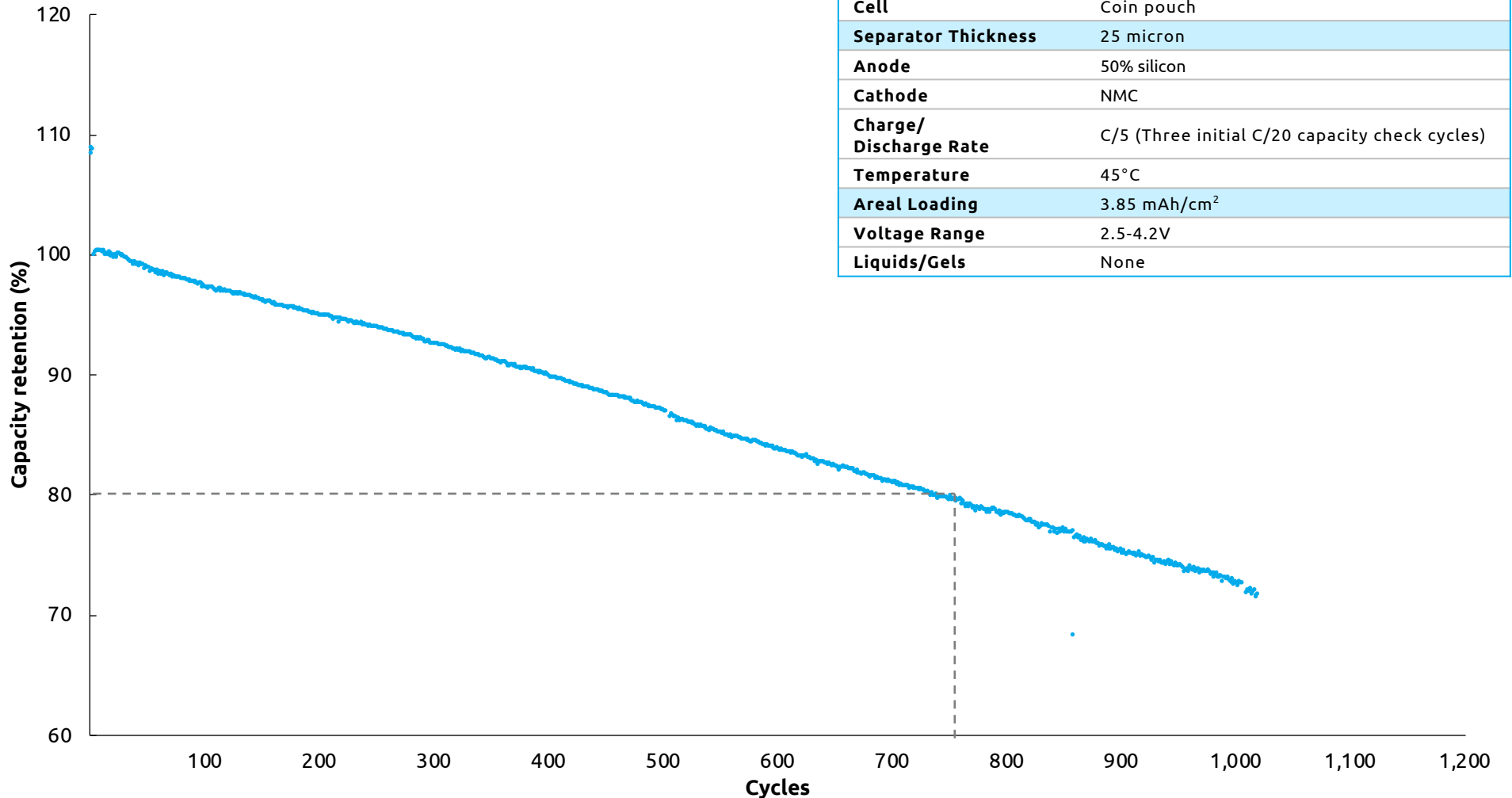
- 3.85 mAh/cm²

No liquids or gels increases safety

- Truly all-solid chemistry

High-Content Silicon EV Cell Data (cont'd)

High Specific Energy with 750 cycles



Source: Company data. 1. Does not include pouch / tabs.



Key Highlights

Cells can surpass commercial cycle life targets at room temperature

- 82% capacity retention through 1,000+ cycles at C/5 rate
- Capacity fluctuations are temperature-driven

Thin, EV-relevant separator reduces battery mass and cost and increases performance

- 30 micron

High active material concentration increases performance

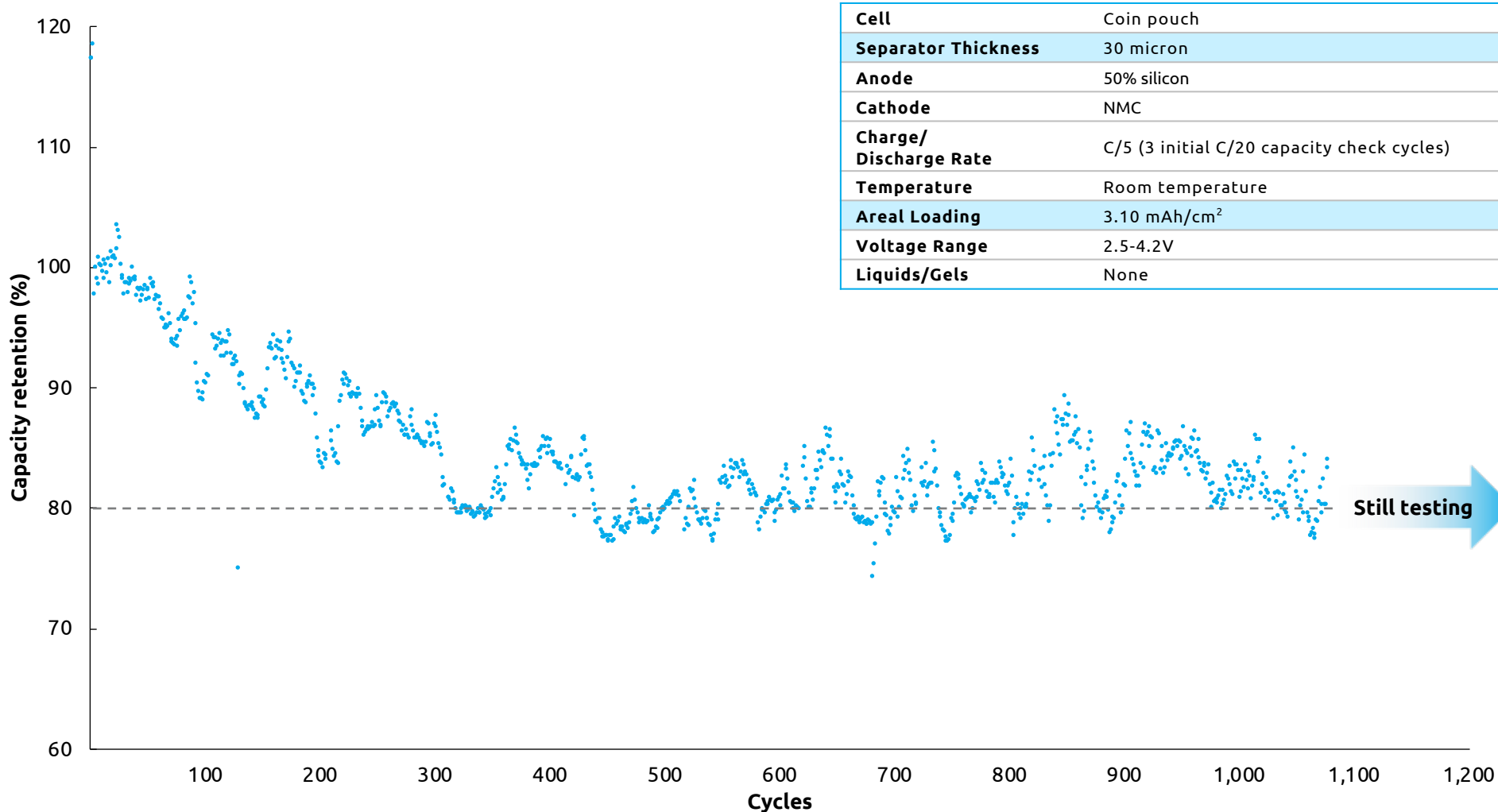
- 3.10 mAh/cm²

No liquids or gels increases safety

- Truly all-solid chemistry

High-Content Silicon EV Cell Data (cont'd)

1,000 cycles at Room temperature



Source: Company data.



Key Highlights

New anode composition shows improved cycle life at near room temperature

- 95% capacity retention through 450 cycles at C/5 rate

Thin, EV-relevant separator reduces battery mass and cost and increases performance

- 25 micron

High active material concentration increases performance

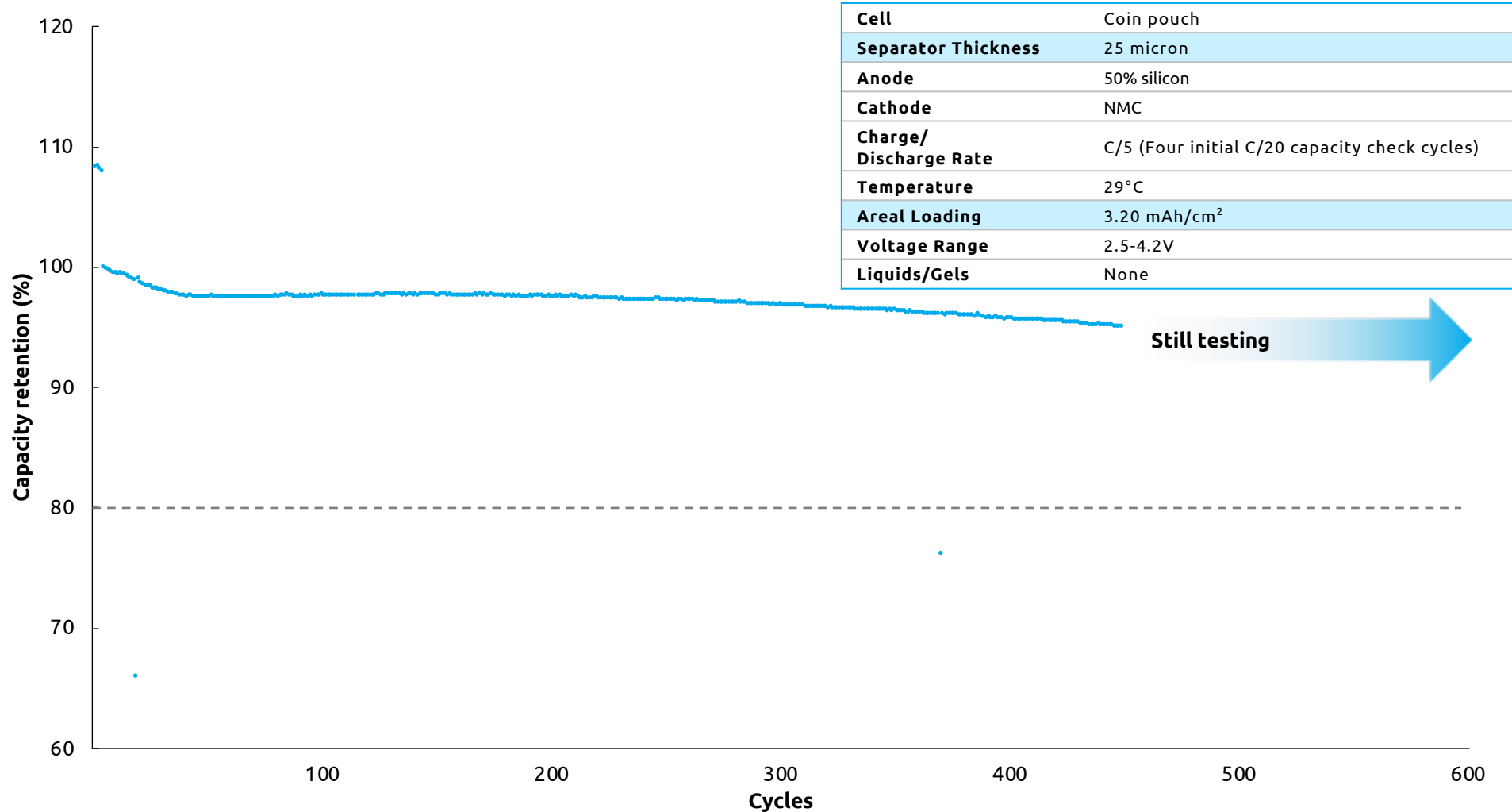
- 3.20 mAh/cm²

No liquids or gels increases safety

- Truly all-solid chemistry

High-Content Silicon EV Cell Data (cont'd)

Cycle life performance improvement at 29°C



Source: Company data.



Key Highlights

High-content silicon EV cells charge quickly

- 2C charge every 5th cycle

Cells in fast charge conditions nearing commercial cycle life targets

- 81% capacity retention at 650 cycles at C/5 rate

Thin, EV-relevant separator reduces battery mass and cost and increases performance

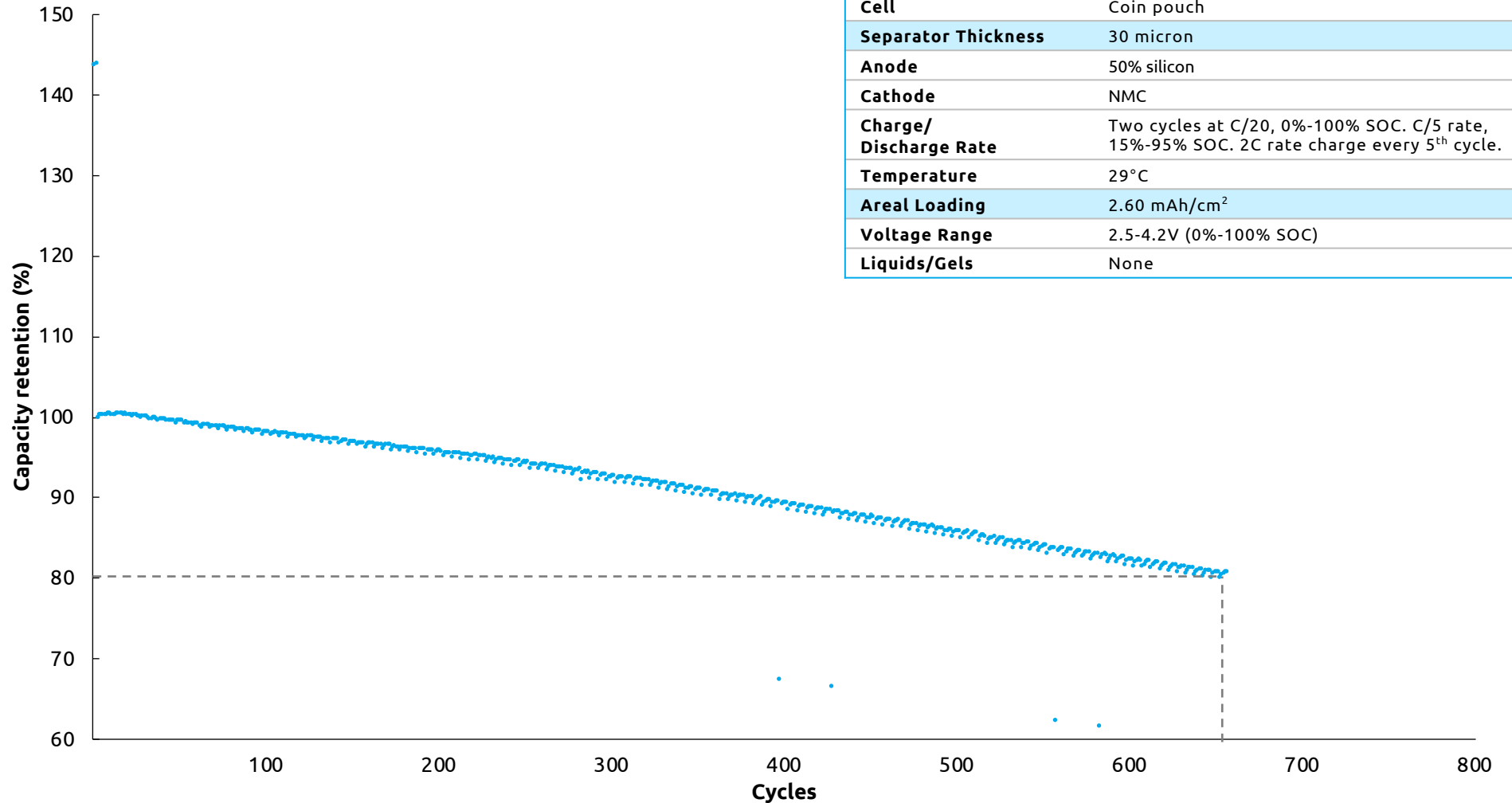
- 30 micron

No liquids or gels increases safety

- Truly all-solid chemistry

High-Content Silicon EV Cell Data (cont'd)

29°C fast charge



Source: Company data.



Key Highlights

Cells can perform in broad temperature range, including below freezing

- Stable charge and discharge demonstrated down to -10°C
- 70% of 30°C capacity retained with charge and discharge at 0°C

Thin, EV-relevant separator reduces battery mass and cost and increases performance

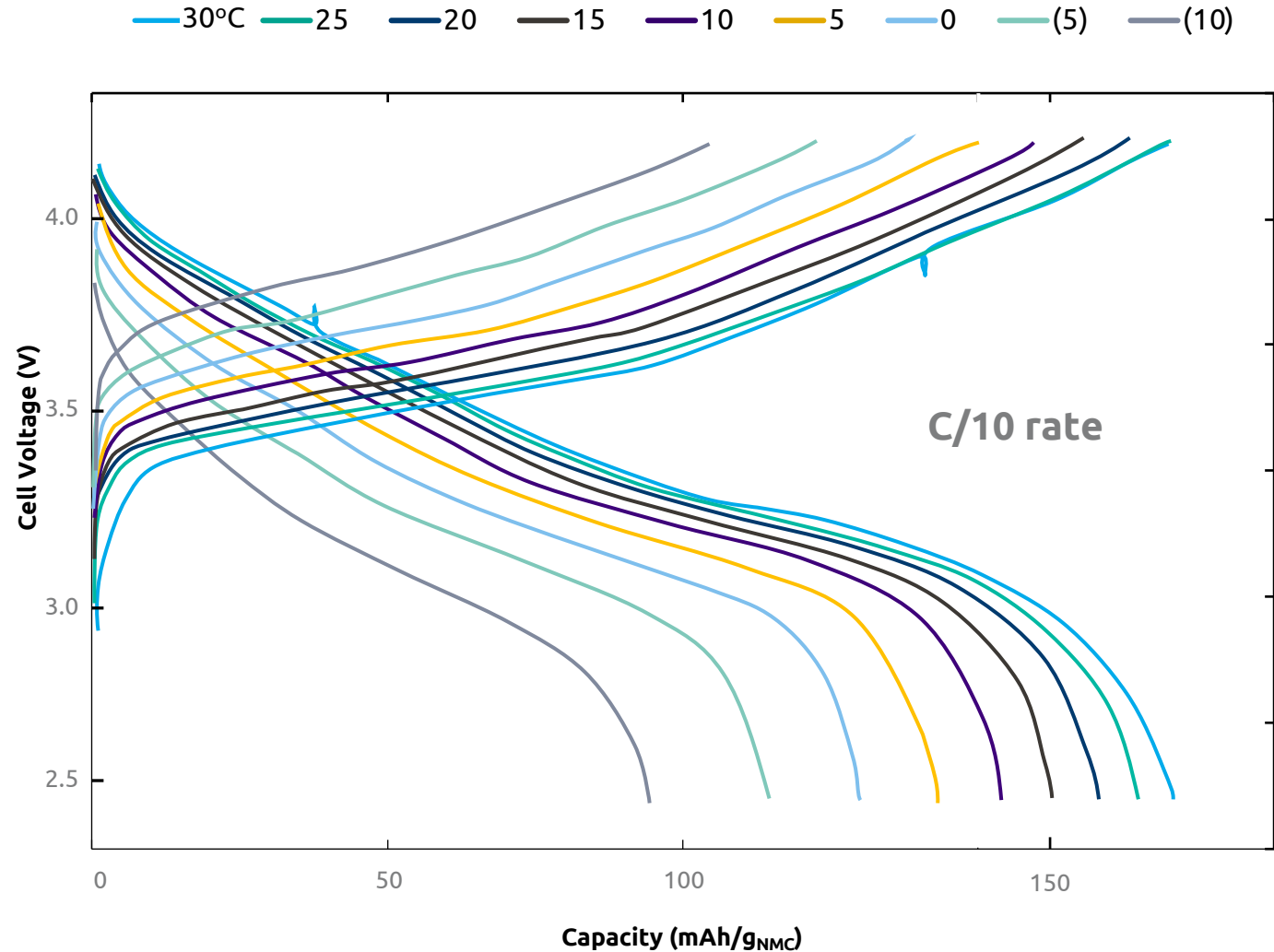
- 30 micron

No liquids or gels increases safety

- Truly all-solid chemistry

High-Content Silicon EV Cell Data (cont'd)

Low Temperature Operations of Silicon Anode Cells



Source: Company data.

Cell	Coin pouch
Separator Thickness	30 micron
Anode	50% silicon
Cathode	NMC
Charge/Discharge Rate	C/10, 100% depth of discharge
Temperature	As marked
Areal Loading	2.55 mAh/cm ² (30°C)
Voltage Range	2.5-4.2V
Liquids/Gels	None



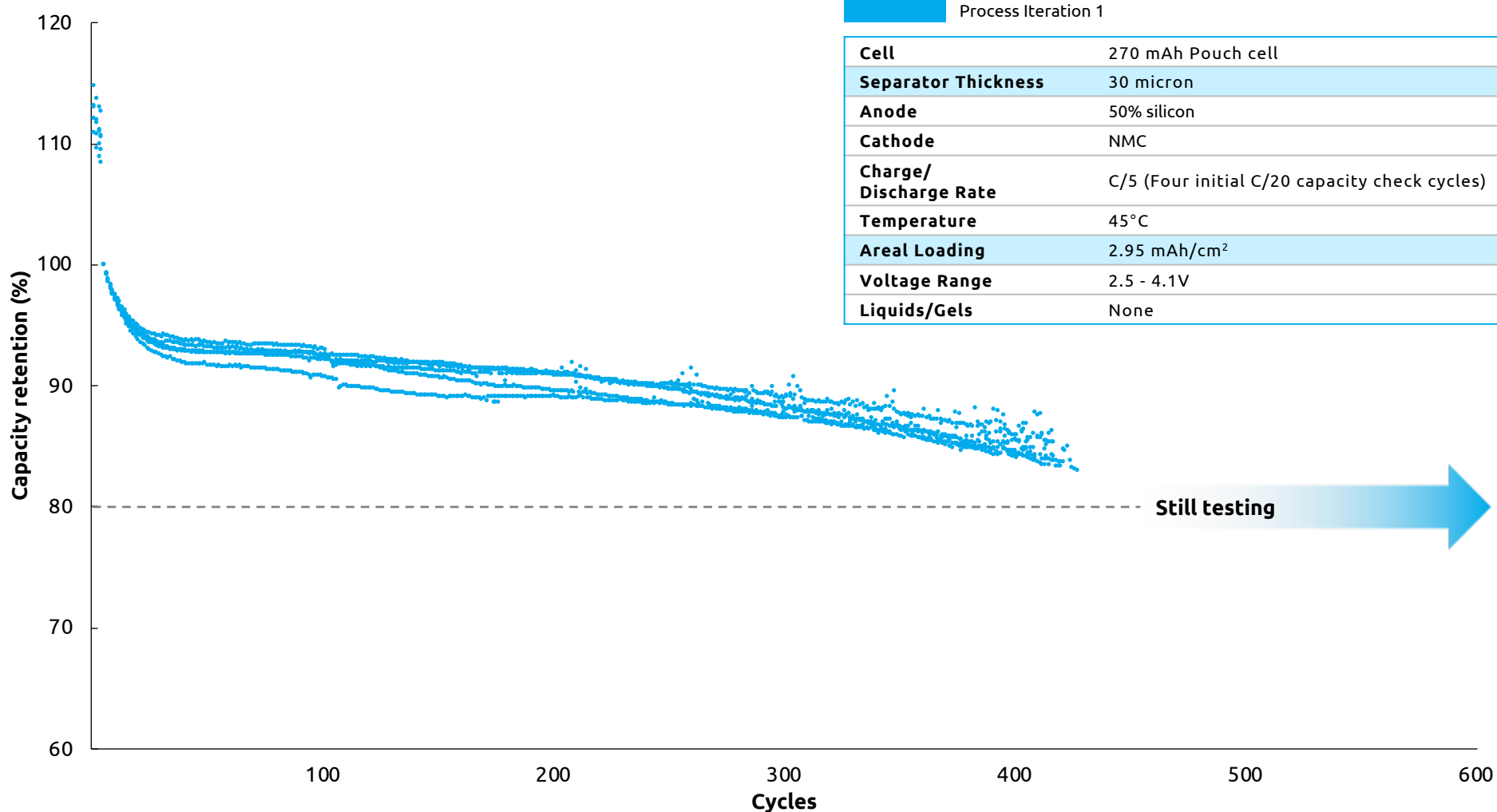
Key Highlights

Cells produced entirely on Solid Power's roll-to-roll pilot production line show promising early performance

- Pouch cells (5 repetitions) with two anodes and one double-sided cathode
- ~85% capacity retention through first 400 cycles at C/5 rate

0.2+ Ah Pouch cell data

Production line built cells – Process iteration 1



Source: Company data.



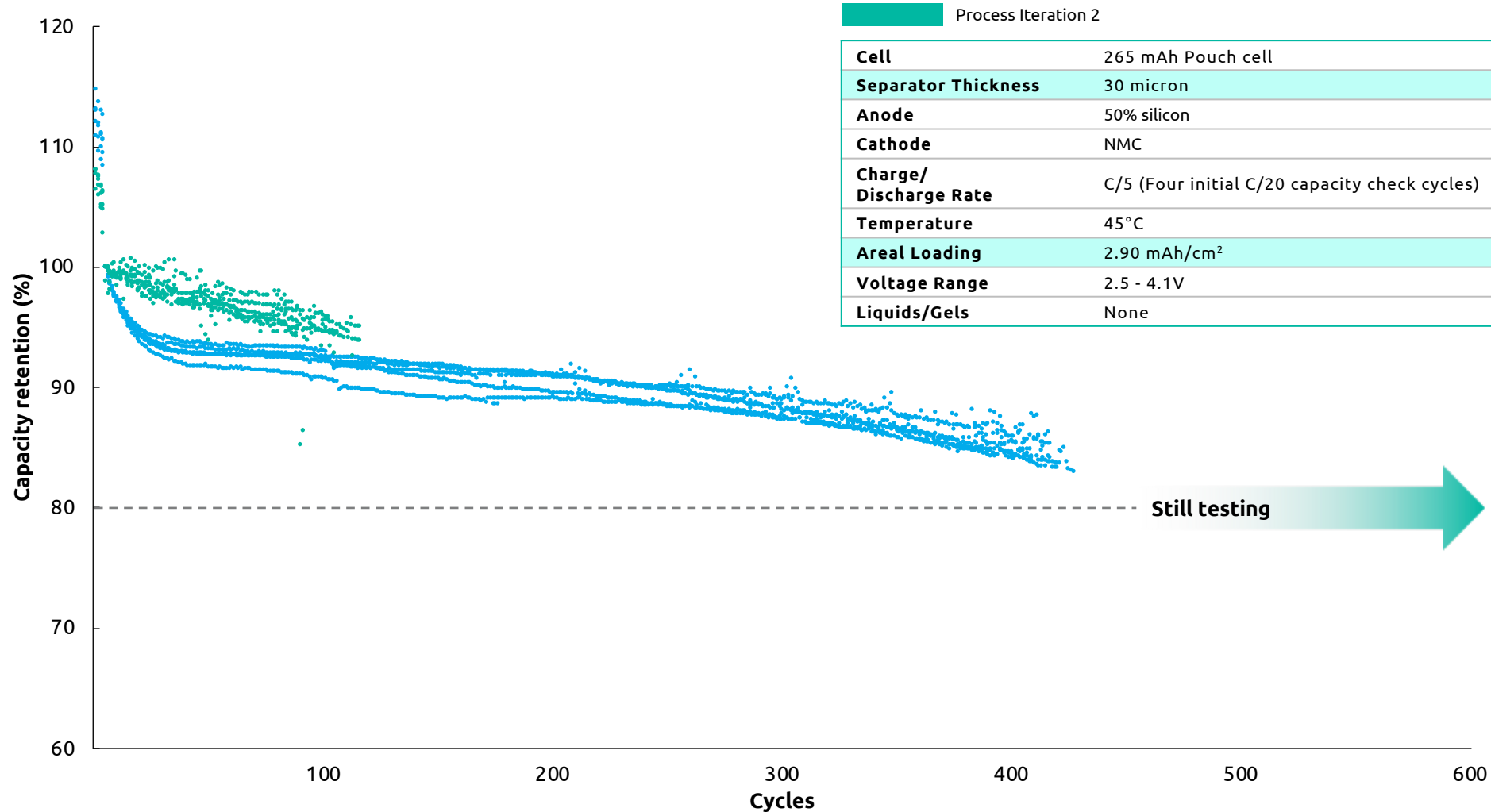
Key Highlights

Early roll-to-roll pilot production process iterations improving cell performance

- Pouch cells (5 repetitions) with two anodes and one double-sided cathode
- ~95% capacity retention through first 110 cycles

0.2+ Ah Pouch cell data (cont'd)

Production line built cells – Process iteration 2



Source: Company data.

High-Content Silicon EV Cell Data Recap

Performance data demonstrates ability to meet key automotive requirements

1

Cells can pack more energy than commercial lithium-ion

- ~350 Wh/kg stack level specific energy
- Made possible by a thin, 25 micron separator

2

Cells can surpass commercial cycle life targets at room temperature

- 82% capacity retention through 1,000+ cycles at C/5 rate

3

High-content silicon EV cells charge quickly

- 2C charge every 5th cycle

4

Cells can perform in broad temperature range, including below freezing

- Stable charge and discharge demonstrated down to -10°C
- 70% of 30°C capacity retained with charge and discharge at 0°C

5

Cells produced entirely on roll-to-roll pilot production line show promising early performance

- ~85% capacity retention through first 400 cycles at C/5 rate

Improving performance while working to match characteristics in multi-Ah, roll-to-roll pilot production line-produced cells

Source: Company data. 1. Does not include pouch / tabs.