



Structural Performance Additives for Lithium-ion Battery Separators

Breaking the 10 μm Thickness Barrier with Exceptional Thermal Safety Properties

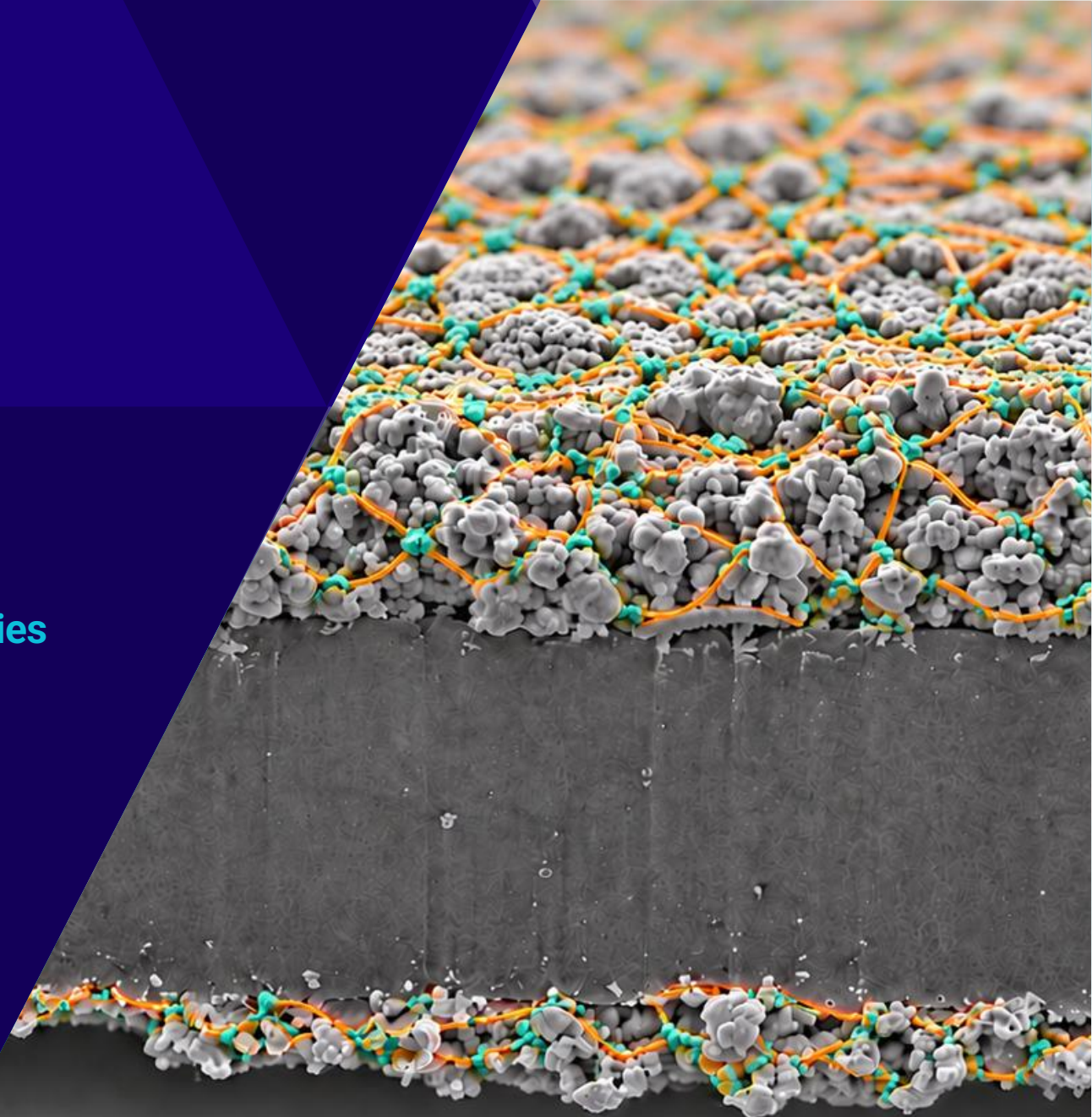
Manuel Wieser – EGM, Advanced Battery Technologies

manuel.wieser@anteotech.com

THE **BAT**TERY SHOW

by informa...

14 October 2026, Detroit





Disclaimer

IMPORTANT INFORMATION

The purpose of the presentation is to provide an update of the business of AnteoTech Ltd (ASX: ADO) (AnteoTech). These slides have been prepared as a presentation aid only and the information they contain may require further explanation and/or clarification. Accordingly, these slides and the information they contain should be read in conjunction with past and future announcements made by AnteoTech and should not be relied upon as an independent source of information. Please contact AnteoTech and/or refer to the Company's website for further information. The views expressed in this presentation contain information derived from publicly available sources that have not been independently verified. No representation or warranty is made as to the accuracy, completeness or reliability of the information. Past performance is not indicative of future performance.

FORWARD-LOOKING STATEMENTS

The presentation may contain certain "forward-looking statements". Forward-looking statements can generally be identified by the use of forward-looking words such as "may", "will", "would", "could", "expect", "intend", "plan", "aim", "estimate", "target", "anticipate", "believe", "continue", "objectives", "outlook", "guidance" or other similar words, and include statements regarding AnteoTech's intent, belief or current expectations with respect to AnteoTech's business and operations, market conditions, results of operations and financial condition, capital adequacy and risk management. These forward-looking statements should not be relied upon as a representation or warranty, express or implied, as to future matters. Prospective financial information has been based on current expectations about future events and is, however, subject to risks, uncertainties, contingencies and assumptions that could cause actual results to differ materially from the expectations described in such prospective information. AnteoTech disclaims any obligation to update any forward-looking statement to reflect events or circumstances after the date of the presentation, subject to the disclosure requirements applicable to the Group.

NOT AN OFFER OF SECURITIES

This presentation should not be relied on as a recommendation or forecast by AnteoTech. Nothing in this presentation should be construed as either an offer to sell or a solicitation of an offer to buy or sell shares in any jurisdiction. The information in this presentation is not intended to be relied upon as advice to investors or potential investors and does not take into account your financial objectives, situation or needs. Investors should consult with their own legal, tax, business and/or financial advisors in connection with any investment decision.

AnteoBind™ NXT, Anteo X®, ANTEO S®, Anteo C™ and Ultranode® are trademarks of AnteoTech. The use of registered and pending trademark symbols throughout the presentation is implied. All \$ quoted are AUD unless otherwise stated.



AnteoTech's Products and Technology

Established and growing business



- **Australian publicly listed company (ASX:ADO)**
- Advanced chemical and materials solutions business
- Advanced Battery Technologies and Life Sciences markets
- Headquartered in Brisbane, Australia

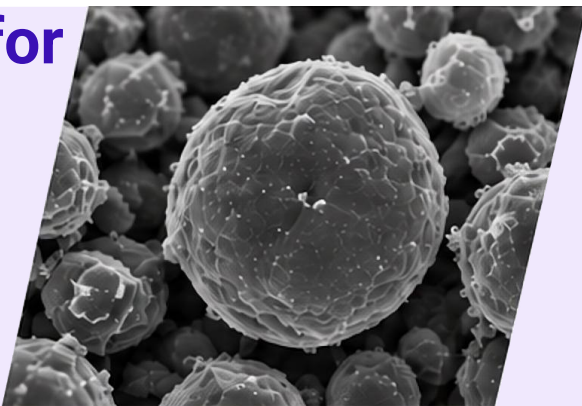
Proprietary patented technology



Portfolio of lithium-ion battery (LIB) products

- **Anteo C** – Cross-linker for water-based primer coatings
- **Anteo X** – Cross-linker for high silicon anodes
- **Anteo S** – Cross-linker for ceramic coated separators
- **SiMRAX** – Anteo X + SWCNT combined product for silicon anodes
- **Ultranode** – Ultra-high silicon content anode technology (70% – 95% silicon)

Innovating for the next generation of batteries



Deep expertise in battery chemistry and electrode development

- >20 wt% silicon active material anode focus
- Performance optimization of silicon anode designs
- Collaborations with novel cathode active material suppliers
- **Anteo X** and Anteo S production facility with commercial-scale supply capacity
- **SiMRAX** supply capability at GWh scale through US technology partner (BDS)



Cross-linking Performance Additives for Lithium-ion Batteries

Advanced materials. Better batteries. A cleaner tomorrow.

Images source: Company Generated



Cross-linker for primer coatings on current collector foils



Stabilises water-based binders to prevent primer dissolution during electrode coating



Improved Performance

- Improved adhesion between coating layers
- Reduction in electrical contact resistance.

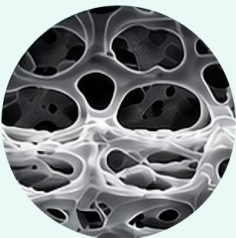


Improved Cost Efficiency

- Lower cost, eco-friendly binders.
- Allows for single component binder system.



Cross-linker for ceramic coated separators (CCS)



Reinforcing ceramic coatings on LiB separators



Safer and Thinner Separators

- Improved thermal stability, tensile and puncture strength.
- Reduces risk of thermal runaway and fires.



Ease of Use

- Fits into conventional manufacturing processes as a simple additive.



Cross-linker for silicon anodes



Stronger electrode structure for high-silicon anodes



Improved Performance

- Improved cycle life / capacity retention.
- Reduced anode expansion.
- Improved mechanical integrity.



Improved Cost Efficiency

- Reduction in CNT and binder content.
- Compatible with a wide range of binders.



Anteo X® + SWCNT combination product



All-in-one binder strengthening system for high silicon anodes



High-Performance Solution

- Improves performance and reduces costs.
- Simplified slurry processing enabling easier scale-up.



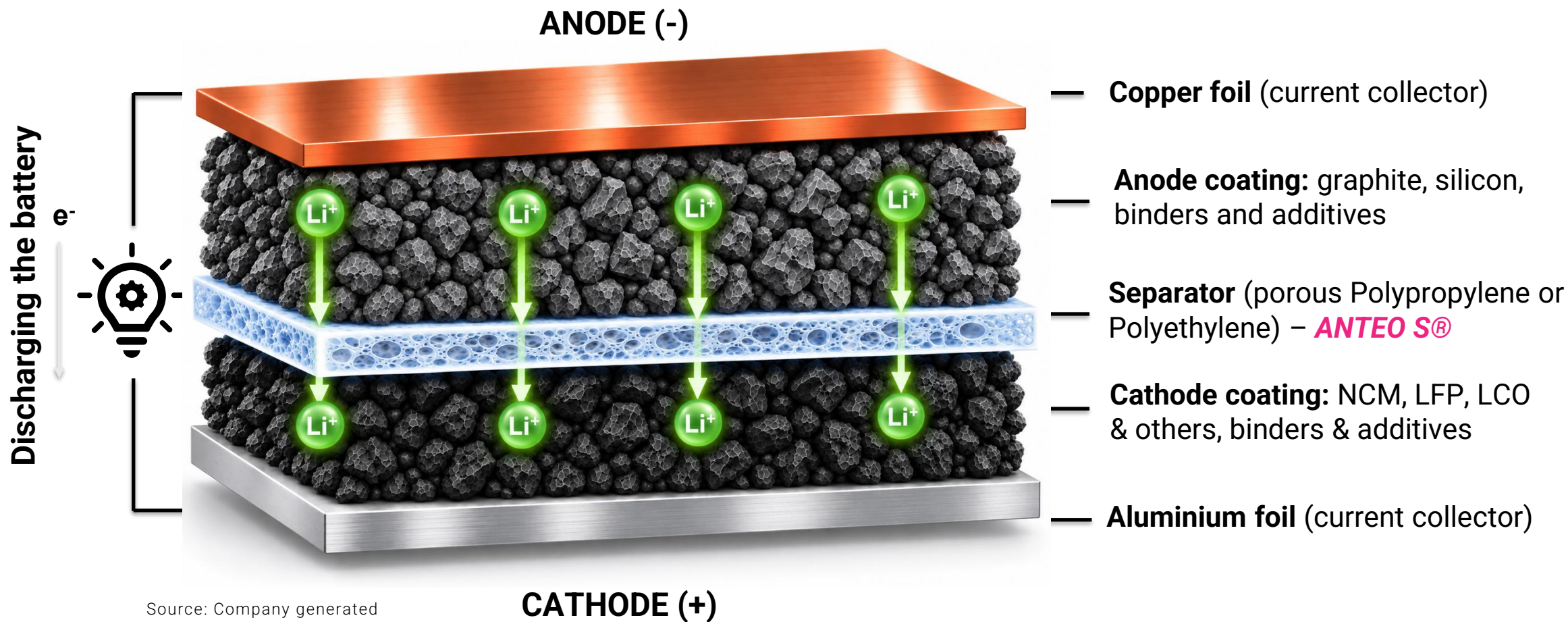
Advanced Technology

- Synergistic combination of additive products.
- Manufactured by **Black Diamond Structures** in the US.



Anatomy of a lithium-ion battery

Separators. The neglected component.





What is the function of a separator in a battery?

The separator is a critical safety component in a lithium-ion battery

- Conventional separators are micro-porous Polyethylene (PE) or Polypropylene (PP) films
- The porosity is critical to facilitate ion transport across the separator

Separator type	PE (°C)	PP in (°C)
Glass transition point (T_g) in °C	-130 to -120	-10 to 0
Melting point (m_p) in °C	130 to 145	160 to 170

- **Its key purpose in a battery?**
- Separating the anode from the cathode, preventing short-circuiting and thermal runaway
- Or else...

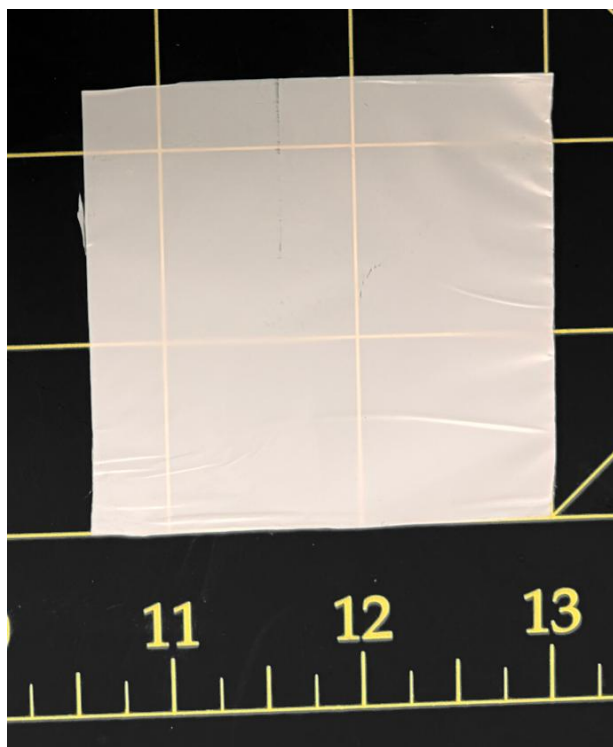


PE separators and heat

An unfavourable combination...

- What happens if a PE film is exposed to heat?
- PE films experience severe dimensional change at temperatures well below PE's melting point
- **The result:** The anode and cathode contact resulting in a short-circuit and thermal runaway

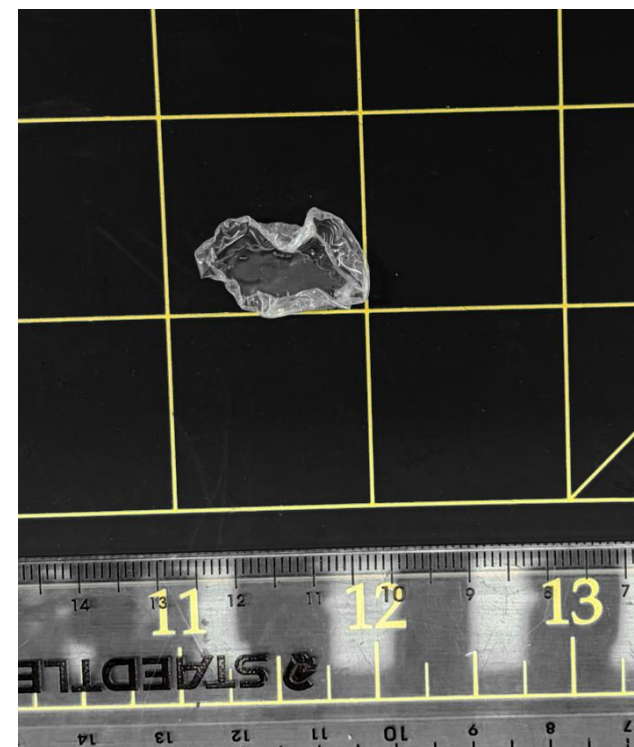
PE at room temperature



150 °C
in oven



PE after experiencing 150 °C





Ceramic Coated Separators (CCS) – Part of the solution?

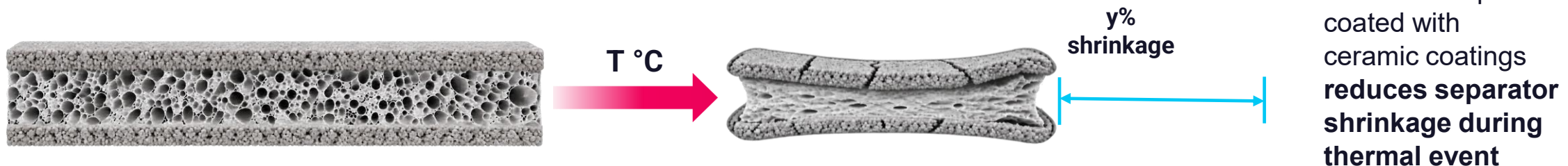
Ceramic coatings help but they are not perfect

Conventional PE/PP separator base film



Source: Company Generated

Ceramic coated PE/PP separator base film



Source: Company generated

- Ceramic coatings on PE/PP base films help to mitigate some of the shrinkage
- Thicker coatings achieve reduced shrinkage, but thicker coatings add inactive weight and volume
- Battery and device OEMs are demanding thinner coatings to improve cost and energy density
- **Thermal separator stability while minimising ceramic coating thickness has reached its limit**



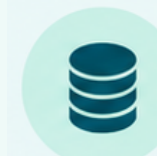
The Solution - Anteo S cross-linker technology for CCS

The missing piece of the puzzle



Performance

- Improved thermal stability and mechanical strength leading to reduced thermal shrinkage.
- Reduces risk of thermal runaway and fires



Cost reductions

- Minimizes binder and conductive material content
- Allows lower coating thicknesses
- Enables more sustainable, cost-efficient manufacturing



Product specifications

- Water-based, PFAS free solution
- Water-like rheology allows simple mixing
- Customisable across cross-linking strength and pot-life



Ease of use

- Fits into conventional manufacturing processes
- Broad binder compatibility
- Heat activated at conventional drying temperatures



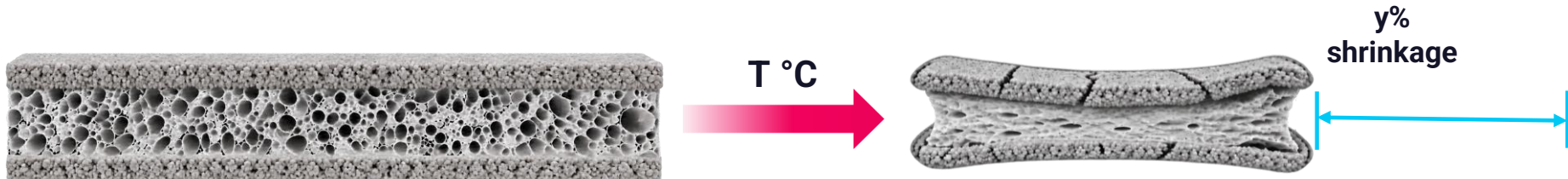
Source: Company Generated



The Solution - CCS with Anteo S

Thinner and more thermally stable coatings

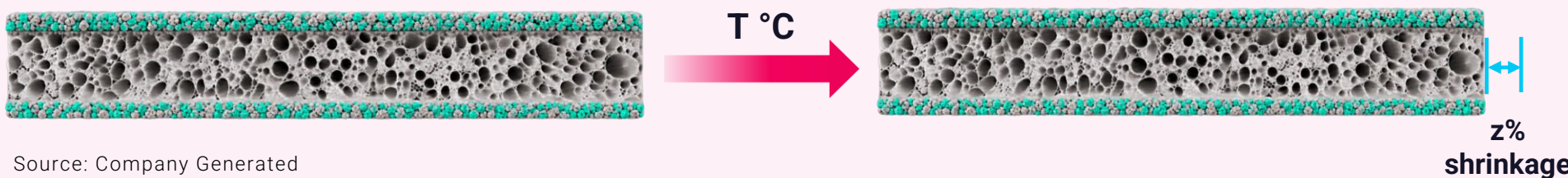
Ceramic coated PE/PP separator base film



Source: Company Generated

PE based separator coated with ceramic coatings **reduce separator shrinkage during thermal event**

Ceramic Coated Separator + Anteo S



Source: Company Generated

Anteo S reinforces ceramic coatings achieving

The outcome:

- Substantially increased thermal stability of separator at elevated temperatures
- Reduced coating thickness with excellent performance outcomes demonstrated with 1µm coatings
- Improved mechanical properties (tensile and puncture strength)



Why does CCS separator thickness matter?

Thinner separators = Higher energy density

STARTING ASSUMPTIONS

- Generic 5 Ah and 750 Wh/L pouch cell
- Cell stack repeat unit: Cathode + Anode + Separator on both sides of one electrode
- Separator thickness: 10 μm separator

Chemical Cell Stack – Layers	Thickness @ 10 μm	Thickness @ 9 μm	Thickness @ 7 μm
Cathode (Al + Active layer)	132 μm	132 μm	132 μm
Anode (Cu + Active layer)	138 μm	138 μm	138 μm
2 x Separator layers per stack	20 μm	18 μm	14 μm
Total repeat unit	290 μm	288 μm	284 μm
Volume saved per stack	-	2 μm	6 μm
Volume saved at total stack height	-	54 μm	162 μm
Energy density gained	-	+ ~5 Wh/L	+ ~13 Wh/L

The outcome:

- **0.5% to 2.0%** in energy density gain without changing the chemistry of the electrodes!
- **>2.0%** energy density gains possible for higher energy density cells

PE base film and improvements in thermal stability

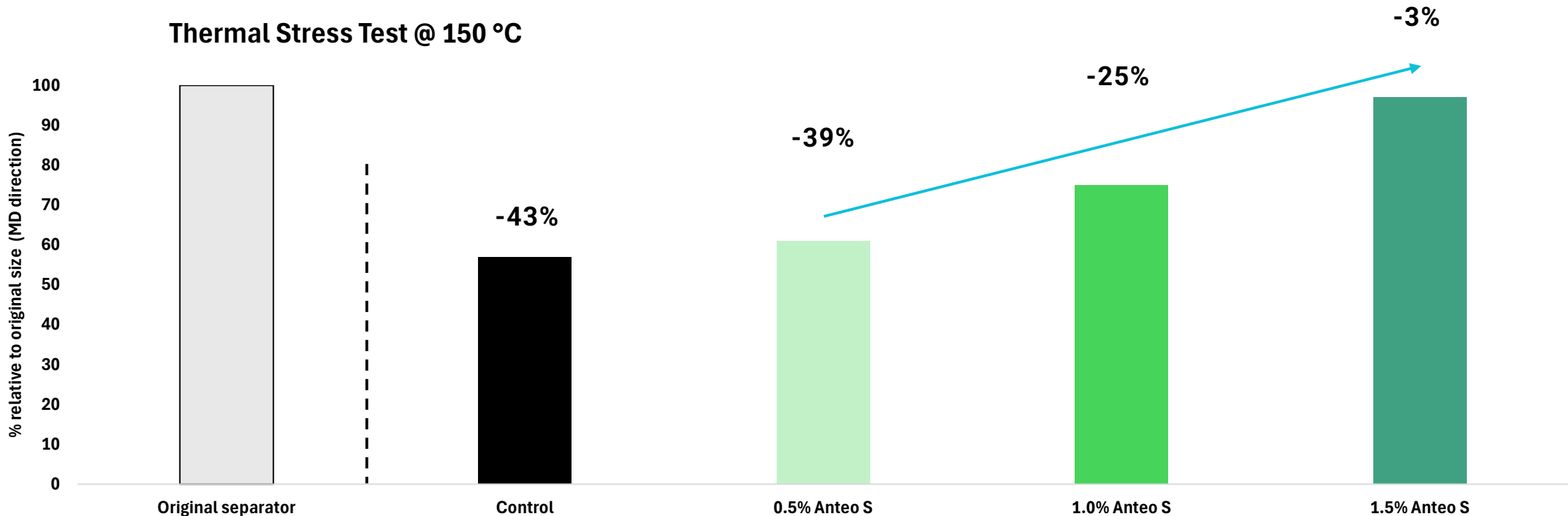
Case study 1 – External testing

Background information

Outcomes with Anteo S

- **Separator type:** Polyethylene (PE)
- **Total separator thickness:** 10 µm

- ✓ Substantial reduction in separator shrinkage
- ✓ Pilot-scale manufacturing trials in progress



PE base film and improvements in mechanical properties

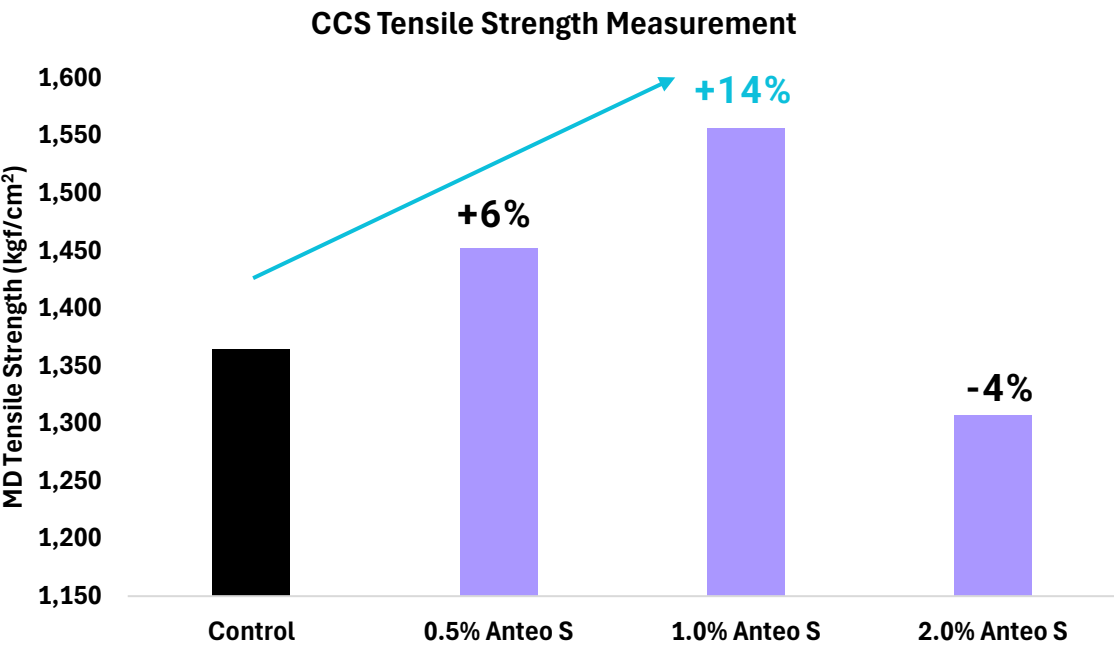
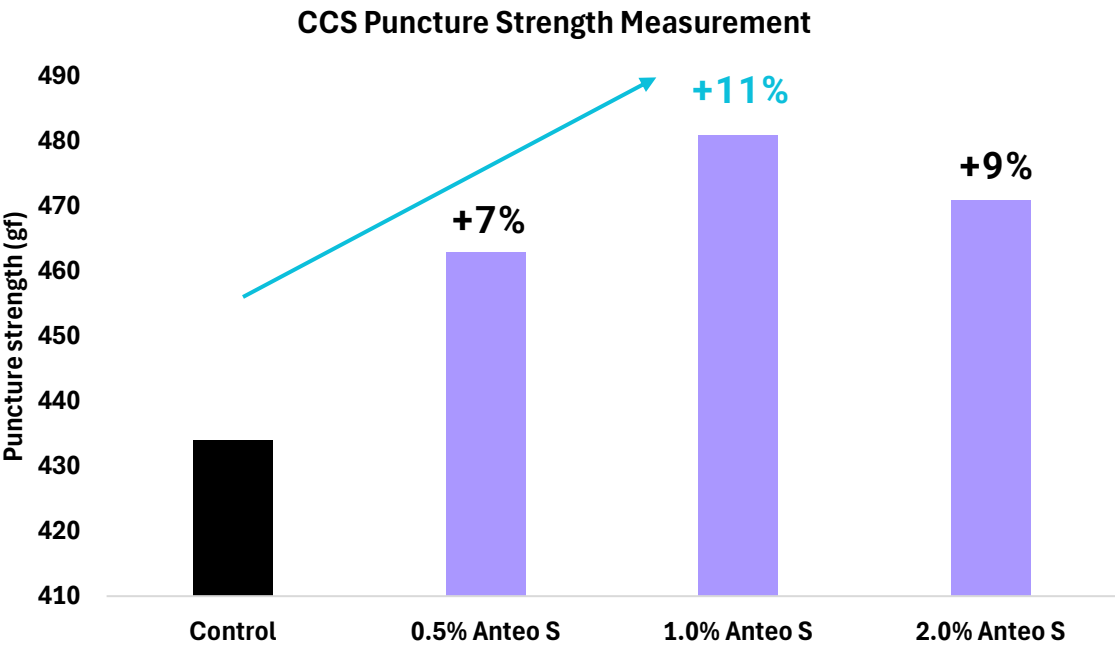
Case study 2 – External testing

Background information

Outcomes with Anteo S

- **Separator type:** Polyethylene (PE)
- **Ceramic coating thickness average:** 2.0 µm (1.0 + 1.0)
- **Base film thickness:** 7 µm

- ✓ Good improvement in tensile strength
- ✓ Good improvement in puncture strength



Teaming up with XERABRID for below 10 µm and safer separators

NEXT GENERATION SEPARATORS

Enabling safer Lithium-Ion Batteries



Maximises
thermal stability



Minimises
separator thickness



Enhances
safety

Xerabrid®

Leader in ceramic coated separator (CCS)
formulations and manufacturing



AnteoTech

ANTEO S® - Structural performance
additive for CCS



Teaming up to deliver the next generation of separators

Separators with exceptional thermal stability and mechanical properties

Xerabrid®

Leader in ceramic coated separator (CCS) formulations and manufacturing



Based in **Seoul, South Korea**



Extensive CCS formulation and coating **IP/Know-How**



Pilot-scale CCS **manufacturing facility**



Contact for sampling in **South Korea and Japan**



AnteoTech

Leading structural performance additives for **CCS**



Based in **Brisbane, Australia**



Structural performance **additive portfolio**



ANTEO S® product pushes the boundaries of current ceramic coating limitations



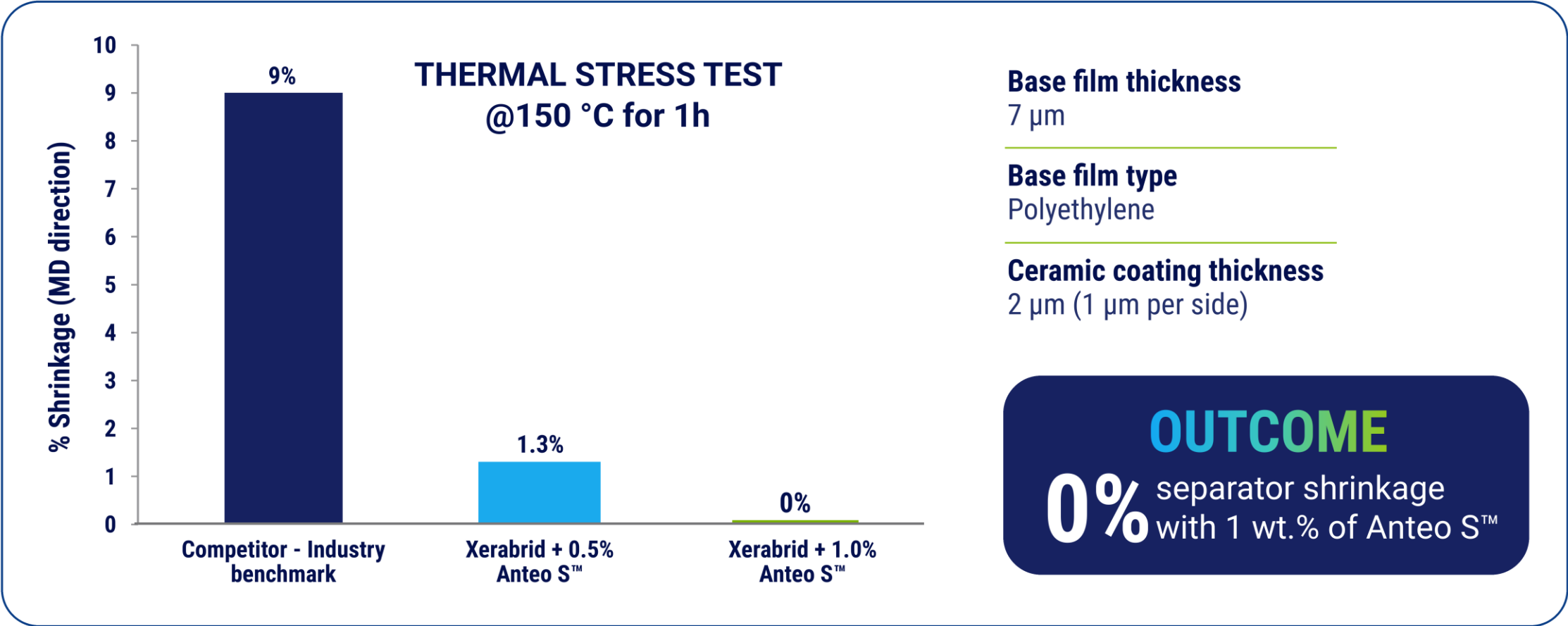
Contact for sampling in **EU, US and India**



Xerabrid test results for prototype product

Minimal coating thickness, high thermal stability

- Ceramic coated separator prototypes with 1 μm coating thickness per side currently in progress
- Initial testing on 7 μm PE base film confirms excellent thermal stability and mechanical strength





Products currently available for sampling and order

High thermal stability at minimal coating thickness

- High-performance ceramic coated PE and PP products available with exceptional thermal stability
- New developments target **7 µm total separator** thickness

Property		Unit	Xeracoat (PE)	Xeracoat (PE)	Xeracoat (PP)
Thickness		µm	9 (5+2+2)	11 (7+2+2)	11 (7+2+2)
Air Permeability (Gurley)		sec/100cc	< 180	< 200	< 60
Tensile Strength	MD	kg _f /cm ²	> 2,300	> 1,800	> 1,000
	TD	kg _f /cm ²	> 1,700	> 1,800	> 250
Elongation	MD	%	> 60	> 80	> 60
	TD	%	> 40	> 80	> 60
Puncture Strength		g _f	> 350	> 450	> 150
Thermal Shrinkage @ 150°C, 1hr	MD	%	< 1.5	< 1.0	< 0.5
	TD	%	< 1.5	< 1.0	< 0.5
Thermal Shrinkage @ 180°C, 1hr	MD	%	-	-	< 1.0
	TD	%	-	-	< 1.0
Basis Weight		g/m ²	10.0	13.0	10.0

MD = Machine direction
TD = Transverse direction



VISIT US

Want to learn more about thinner and safer separators?

Visit us at our booths



BOOTH No. 4505
(TCMS Co., Ltd.)



BOOTH No. 2204
(Team Australia)



Source: Company generated

NEXT GENERATION SEPARATORS

Enabling safer Lithium-Ion Batteries (LIBs)

- Maximises thermal stability
- Minimises separator thickness
- Enhances safety

Xerabrid
Leader in ceramic coated separator (CCS) formulations and manufacturing

AnteoTech
Anteo S™ - Structural performance additive for CCS

A LEADING VALUE PROPOSITION IN THE SEPARATOR INDUSTRY

Property	Value
Exceptional thermal stability	0% shrinkage at 150 °C
Superior mechanical properties	High puncture and mechanical strength
Thinner separators	<10 µm including ceramic coating layer

Xerabrid's CCS formulations enable extremely thin CCS films that deliver superior thermal and mechanical properties

The two technologies combined offer a next generation separator product

Anteo S™ is a structural performance additive that reinforces ceramic coatings on LIB separators, improving structural integrity and heat tolerance

THERMAL STRESS TEST @150 °C for 1h

Sample	Shrinkage (%)
Control	9%
Anteo S™	0%

OUTCOME
0% separator shrinkage with 1 wt.% of Anteo S™

HOW OUR NEXT GENERATION SEPARATOR TECHNOLOGY ENABLES SAFER LIBs

Enabling ceramic coating formulation IP and expertise with structural performance additives (Anteo S™)

MECHANICAL TESTING (puncture and tensile strength)

Measurement	Control	Anteo S™
CCS Puncture Strength (MPa)	~10	~40
CCS Tensile Strength (MPa)	~10	~40

1 wt.% of Anteo S™ in CCS demonstrated >10% improvement in puncture and tensile strength

ANTEO S™ Cross-linker Additive for Separators

Reinforcing Ceramic Coated Separators (CCS) in Lithium-Ion Batteries (LIBs)

Anteo S™ is a performance additive that reinforces ceramic coatings on LIB separators. Anteo S™ improves the structural integrity and heat tolerance.

KEY BENEFITS

- Improved thermal stability
- Improved puncture strength
- Improved tensile strength
- Thinner separators

Performance Improvements

- Improved thermal stability and mechanical strength leading to reduced thermal shrinkage
- Reduced risk of thermal runaway and fire

Product Specifications

- Water-based, PVD free solution
- Excellent adhesion to separator
- Customizable across coating thickness and porosity

Cost Reductions

- Supports reduction in coating material and thinner separators

Ease of Use

- Proven commercial manufacturing processes as a simple additive
- Excellent water compatibility
- Automated ready-to-use commercial drying process

AnteoTech

Contact us if you are looking for:

- Enhanced thermal safety in CCS
- Reduction in ceramic coating thickness and material cost
- Water-based, PVD-free cross-linking solutions
- Drop-in additive with no additional CMPLX required
- Implementation and formulation support available

sales@antech.com
+61 7 3219 1800
Unit 4, 26 Brand St,
Ripley Park, Perth
6113 Australia

Source: AnteoTech



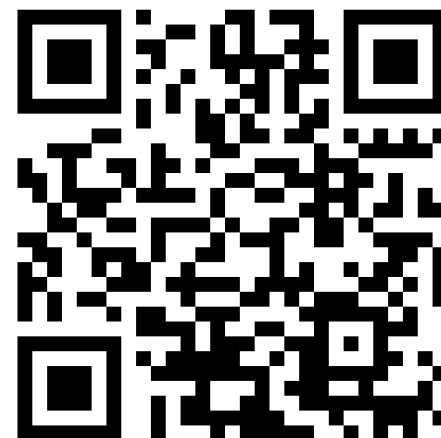
THANK YOU !



Xerabrid

Mr. Chris Song
c.song@xerabrid.com
xerabrid.com

*CONTACT US FOR
SAMPLES
AND PRODUCT SALES*



 **AnteoTech**

Mr. Manuel Wieser
contact@anteotech.com
anteotech.com