Processing the Impossible:

Unlocking the Next Generation of Ceramics

FlackTek™
A GHM Company

Matt Gross 2026

Agenda

Who is FlackTek

What’s Driving the Shift in Thermal Managment Needs?

The Real Bottleneck

The Challenge of Designing v. Making

Rethinking How Materials Are Processed

The Big Picture

Q&A

Information Classification: General

Engineering the Future of Materials Processing

30 years of innovation, integration, & global expansion

Foundation

Founded in 1996 by Dale Flackett, a recognized leader in the silicone industry.

Global Adoption

Established global support across the Americas, Europe, and Asia.
Adopted across 40+ industries worldwide.

Vertical Integration

Founded Colorado-based manufacturing operations in 2019.
Fully integrated engineering, design, support, and production under one roof.

Technology Leadership

1,500+ peer-reviewed publications.
12,000+ patented innovations enabled.
Largest and most advanced system of its kind - The MEGA™.
Continued global presence.

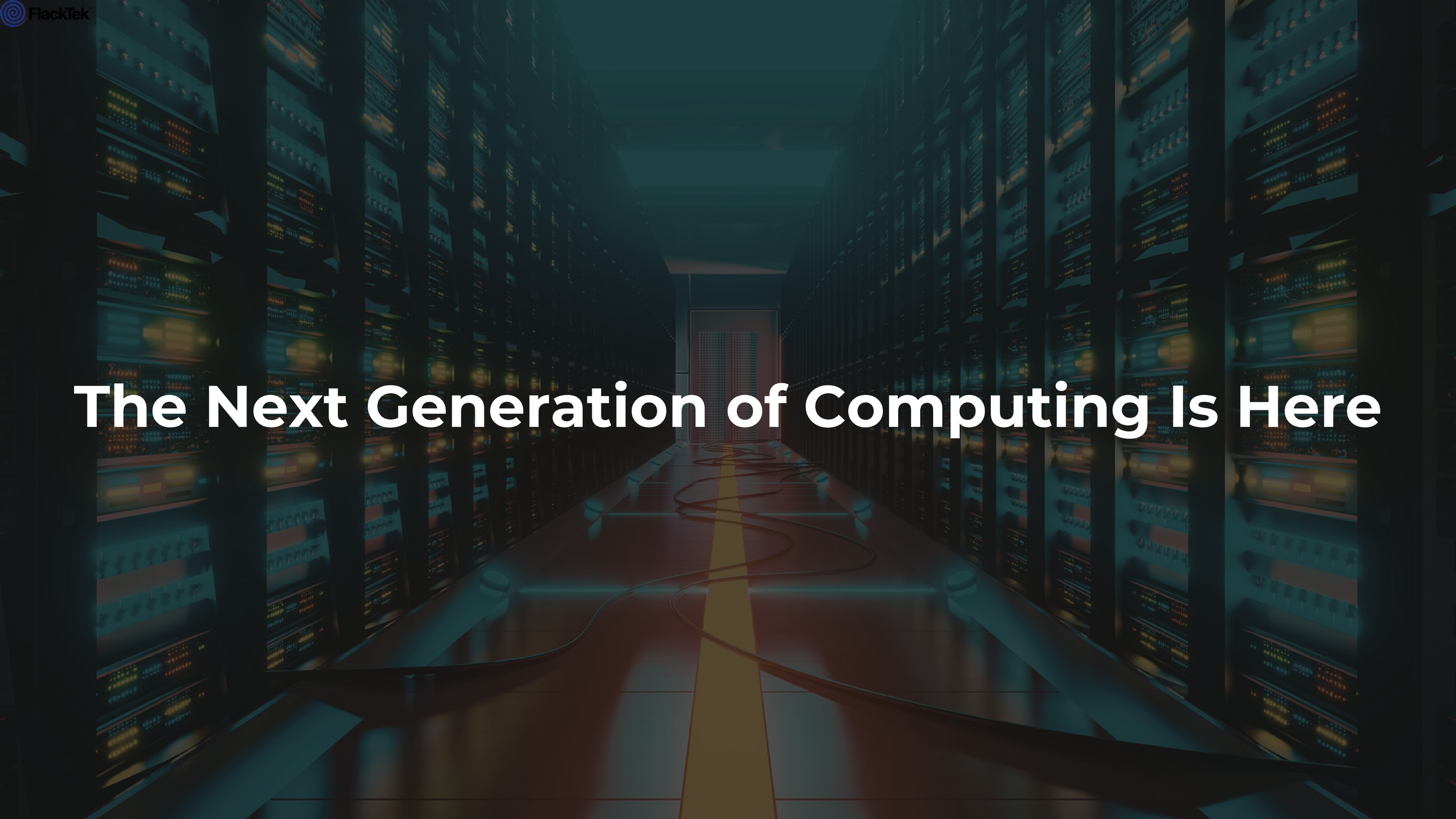
Strategic Acquisition

Acquired by GHM Corp. in 2026, a global leader in engineered thermal management, rotary machinery, and vacuum technologies, accelerating FlackTek's growth and expanding its innovation capabilities.

Information Classification: General

What’s Driving the Shift in Thermal Managment Needs?

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The Next Generation of Computing Is Here

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Computing Demands Are Increasing Across Applications

AI Workloads



Real-Time Analytics



Simulation & Modeling



Autonomous Systems



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So what’s the the problem?

Information Classification: General

From Data Center to Chip

Thermal manangement happens at every scale.



Data Center

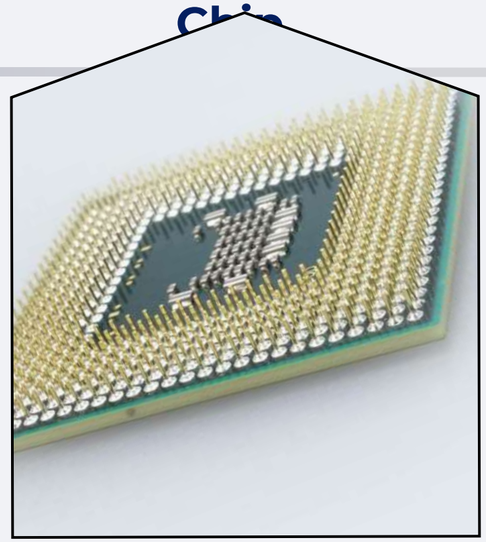


Board

Rack



Chip



Information Classification: General

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Where do we go from there?

Information Classification: General

The Real Bottleneck

Information Classification: General

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Materials and how they are processed are the chokepoint.

Information Classification: General

What We Mean by “Ceramics”

Information Classification: General

The Standards are Changing



Previous

3

W/mK



Current

7

W/mK



Future

12+

W/mK

Information Classification: General

Where Ceramics Show Up



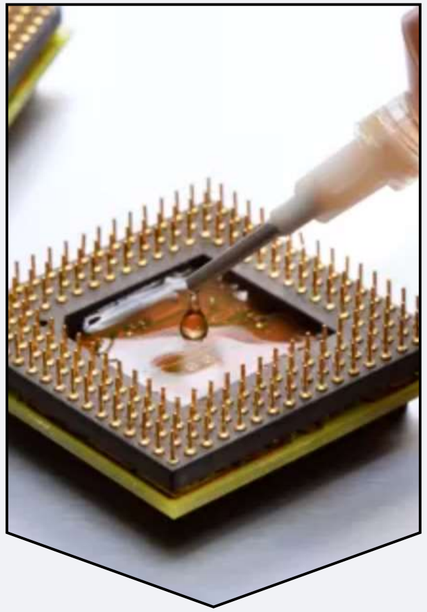
Substrates
(AlN, Al_2O_3)



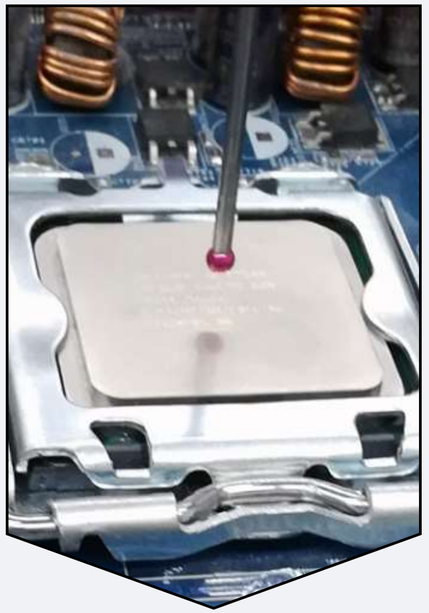
Thermal Interface Materials (TIMs)



Packaging Dielectrics



Adhesives & Encapsulants



Integrated Heat Spreader (IHS)

Information Classification: General

The Challenge of Designing v. Making

Information Classification: General

Choices v. Challenges

Improved Performance

Thermal & Chemical Stability

Long-Term Reliability

Electrical Insulation

High Thermal Conductivity

VS

Material Challenges

Complex Material Properties

Smaller Particles

Tighter Dispersion

Higher Filled Material

Production Constraints

Inconsistent Results

Inefficient Processing

Difficulty Scaling

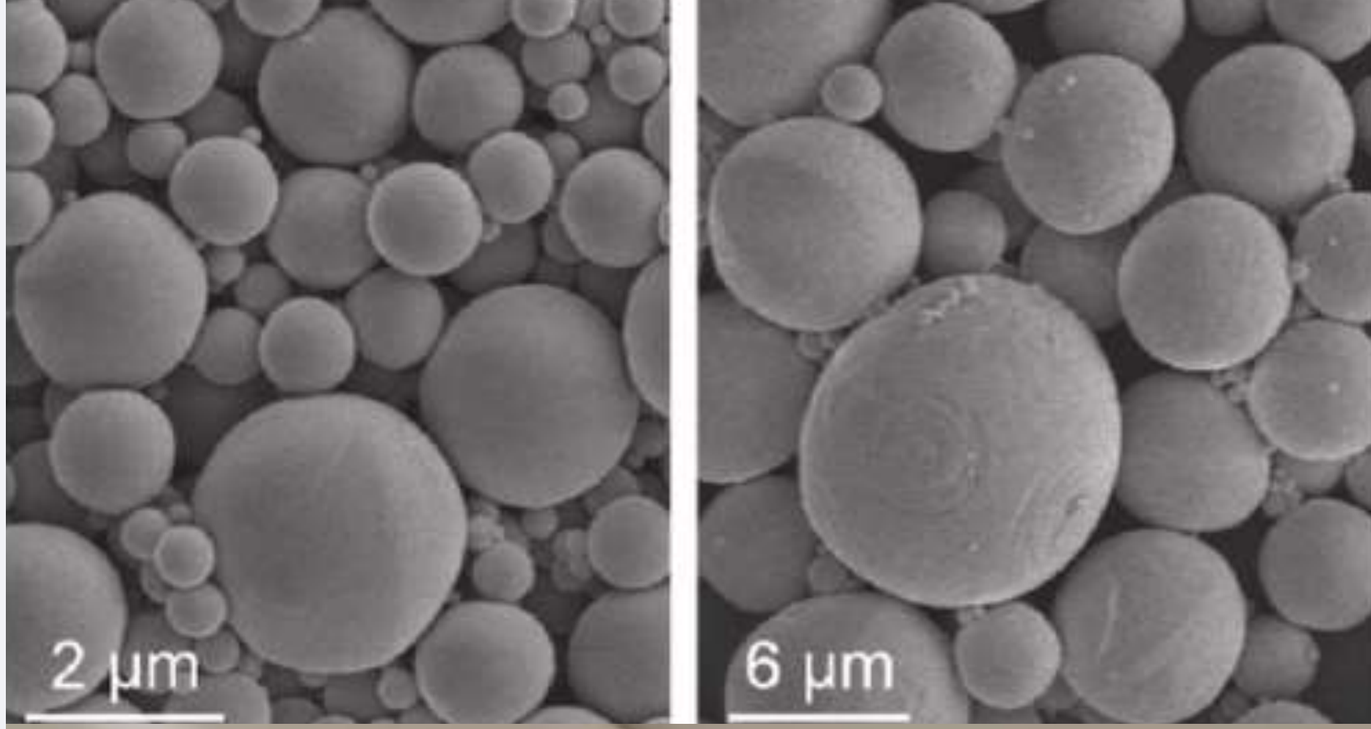
Harder to Manufacture

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Designing materials is one thing.

Processing them *consistently* is another





Information Classification: General

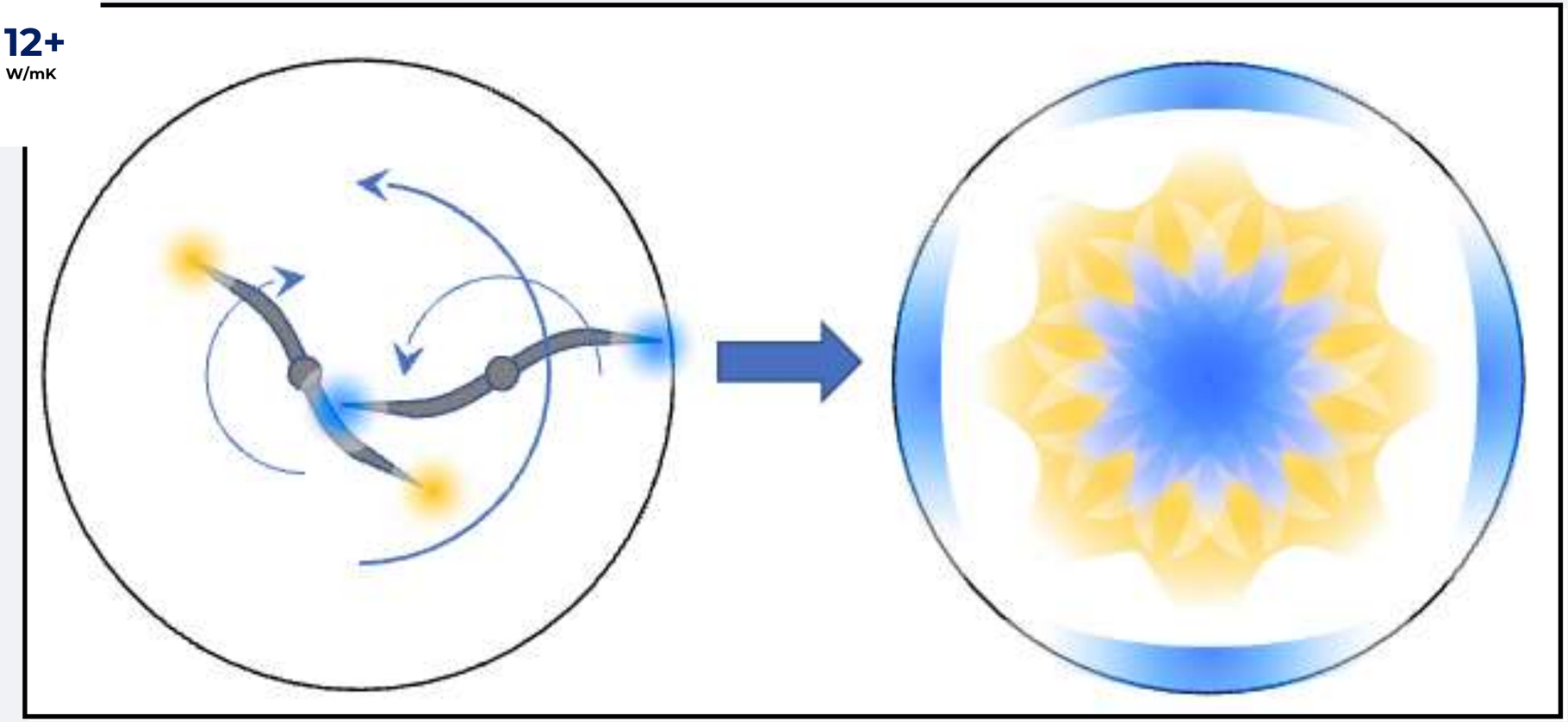
Rethinking How Materials Are Processed

Information Classification: General

Traditional Methods

Recall:

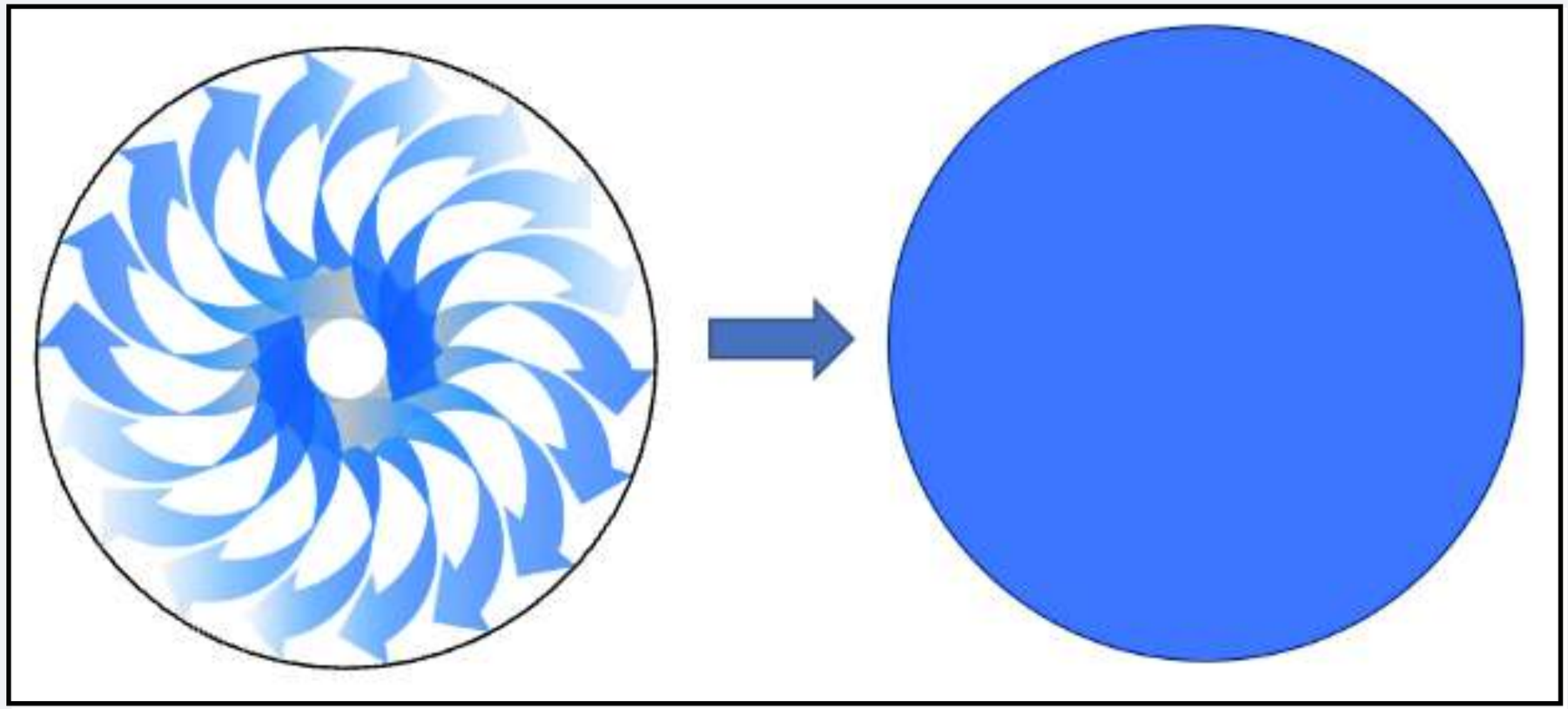
Previous	Current	Future
3 W/mK	**7** W/mK	**12+** W/mK



Information Classification: General

Non-Invasive Method

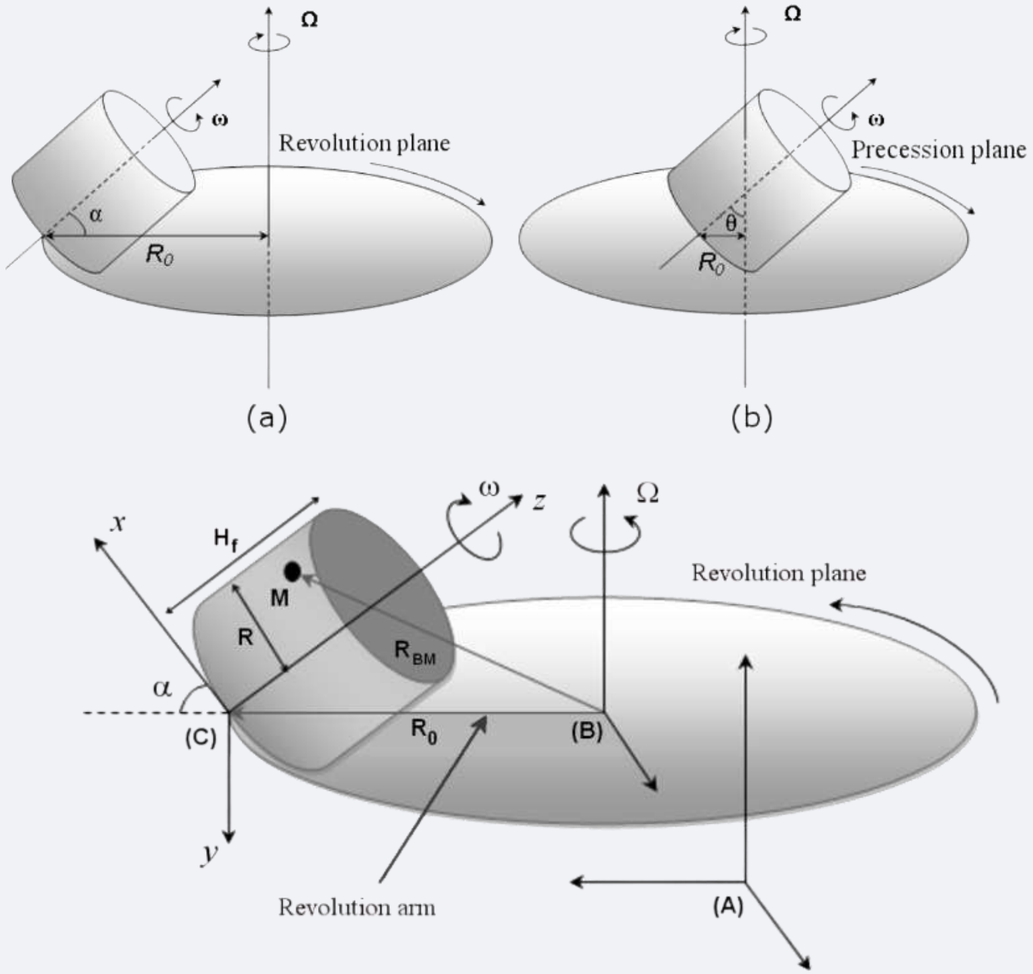
Bladeless Centrifugal / Dual Axis Centrifuge



“Turn Every Molecule Into a Blade”

Information Classification: General

Understanding The Motion



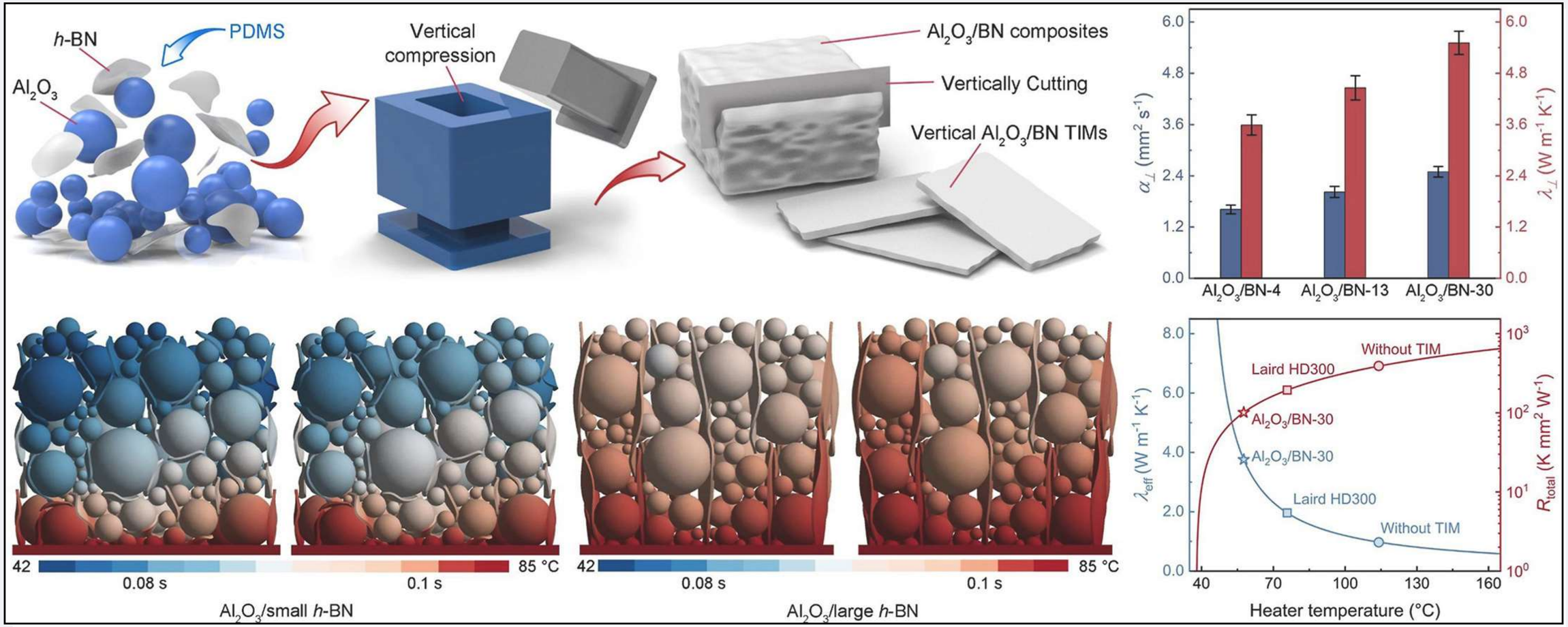


Patented Technology US20230234007A1

Information Classification: General

Innovating Ceramic Formulations

Hybrid particle systems can improve thermal conductivity by ~2x



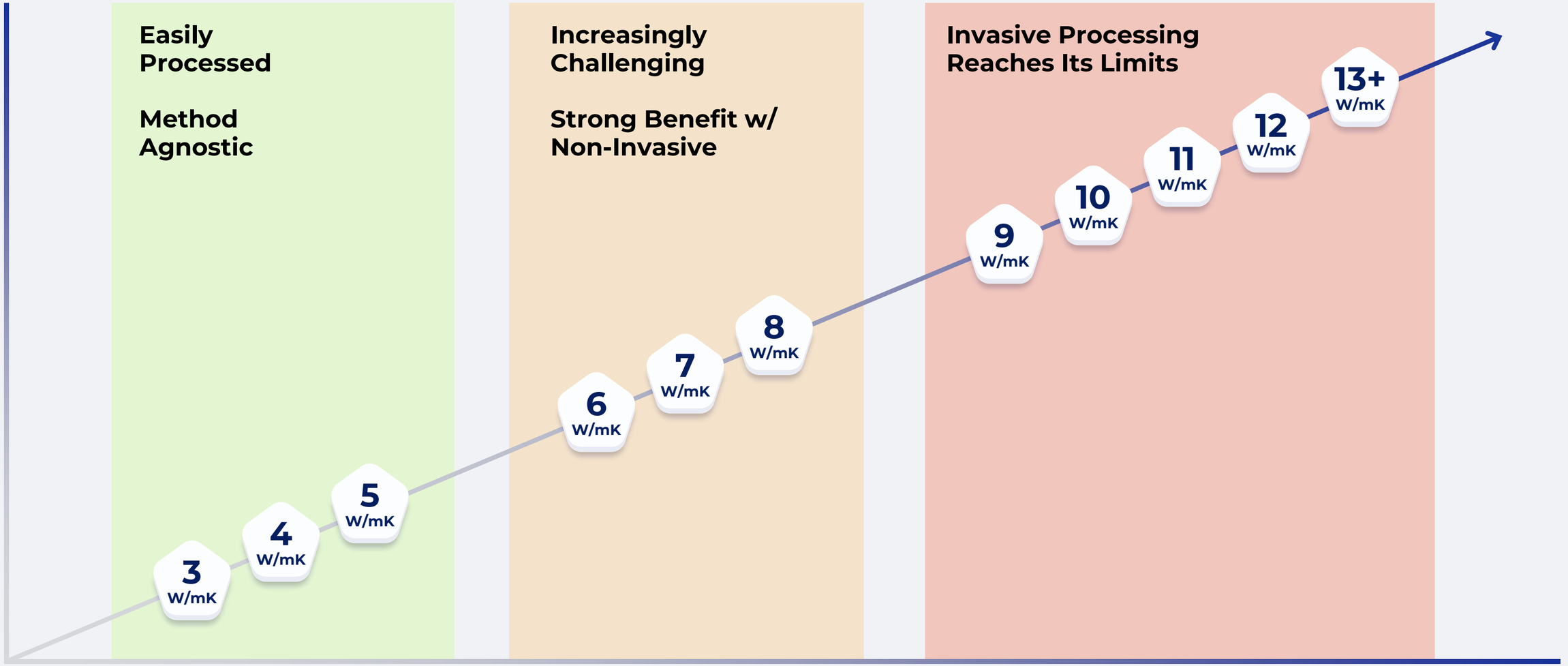
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Qingwei Yan, Yongan Huang, Haotong Zhang, Mengying Wu, Jiali Zhu, Bohan Huang, Hongbing Ma, Tao Cai, Yuezhong Wang, Jinhong Yu, Kazuhito Nishimura, Nan Jiang, Jingyao Gao, Wen Dai, Cheng-Te Lin, Synergistic enhancement of thermal conductivity in self-adhesive alumina-based thermal interface materials via hexagonal boron nitride size engineering, Composites Science and Technology, Volume 281, 2026, 111664, ISSN 0266-3538

The Big Picture

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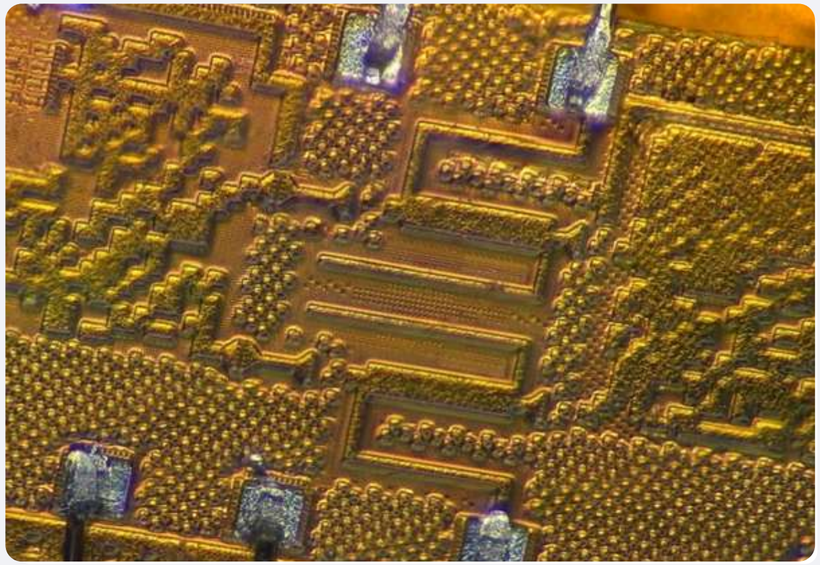
The Challenge Will Continue to Grow

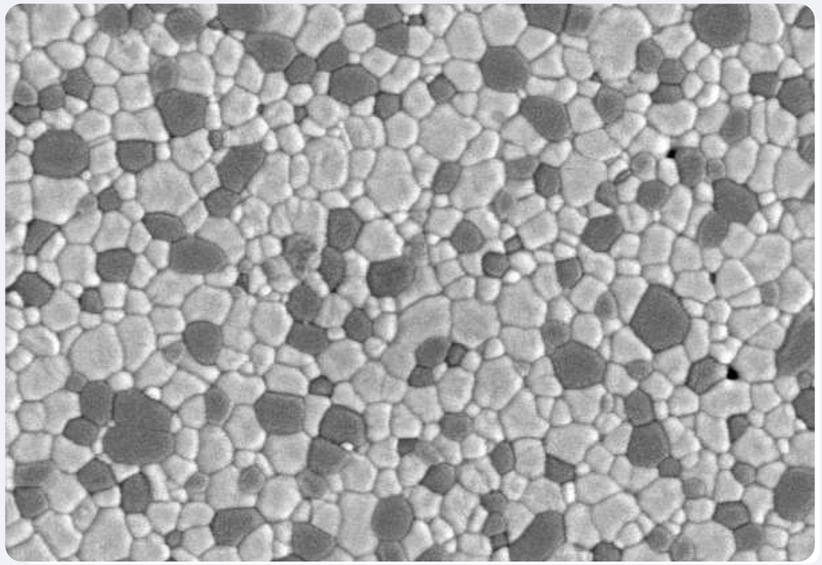


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Processing *Has* to Evolve

Advanced chips require higher-performance TIMs → **High-performance TIMs demand higher ceramic loading** → **Non-Invasive Processing provides the solution for higher ceramic loading**







The Trustees of Princeton University. (n.d.). AI slashes cost and time for chip design, but that is not all - Princeton Engineering. Princeton University. https://engineering.princeton.edu/news/2025/01/06/ai-slashes-cost-and-time-chip-design-not-all

Example of fully robotic system for materials processing - FlackTek™

Information Classification: General



Thanks for listening.

Questions?

PHONE
864-895-7441

EMAIL ADDRESS
Info@FlackTek.com

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