



**Contains Proprietary and Confidential Information**  
**Not for distribution without authorization**



# Nitride Global: Executive Summary



HQ: Wichita, Kansas

- Advanced materials (for semiconductors) development & manufacturing company with
- The ONLY remaining North American owned company, and one of only four companies globally with this expertise. 8 patents with 2 pending.
- The material of focus (Aluminum Nitride) is now the top choice for next generation semiconductors in use cases such as AI chips, EV, aerospace, and weapons.
- Existing revenue (\$1M) and profitability in one line of business, with 3X growth expected in next 18 months.
- Second line of business is bringing revolutionary thermal management solution to semiconductor market that can double semiconductor life span and improve reliability by as much as 4X



## Who We Are

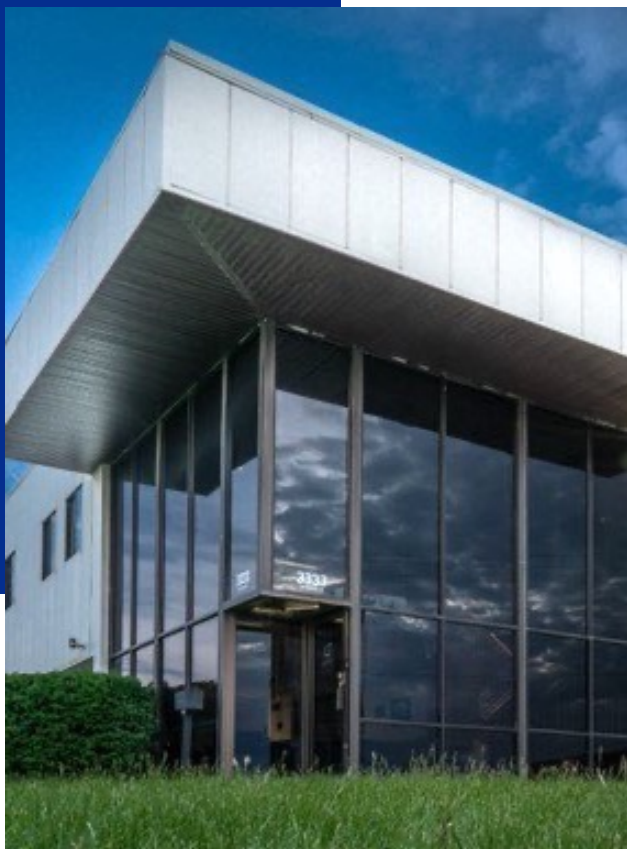
# Nitride Global

Leading global supplier of high purity Aluminum Nitride (AlN) and Aluminum Oxynitride (AlON) materials for advanced electronics, semiconductors, and optical devices.

- We manufacture the **highest purity and highest value polycrystalline AlN** on the market.
- Our new **AlON thermal management product is transformative** for the microelectronics industry, with **global patents on materials**, global exclusivity to manufacturing technology.
- We are expanding our expertise and IP in single crystal AlN for use in non-optical semiconductor devices

**We have a significant IP portfolio.**

We are a team with extensive breadth and depth of relevant global expertise.



HQ: Wichita, Kansas



# Aluminum Nitrides

## Advantages

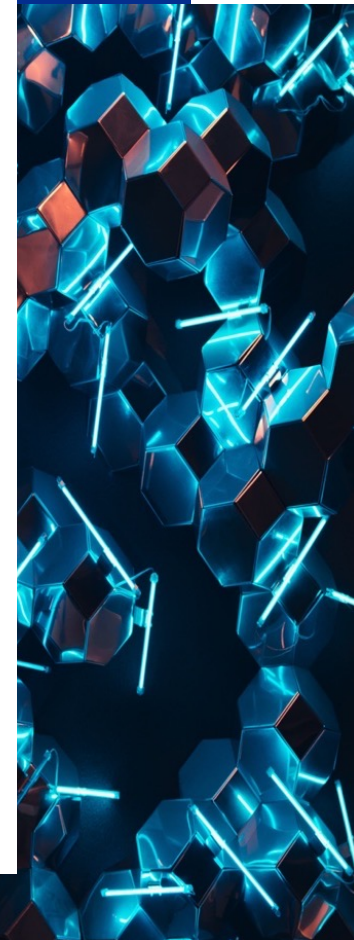
- 10,000x less transmission loss than silicon. [LEARN MORE](#)
- 2x the performance of current material (Gallium Nitride) for electronics and RF. [LEARN MORE](#)
- In Europe, est. 3 terra watt hours of power is lost in conversion for electronic devices. [LEARN MORE](#)
- Power loss expected to be only 5% of Silicon, 35% of Silicon Carbide, and 50% of GaN. [LEARN MORE](#)



# Prospectives for AlN electronics and optoelectronics



Material	$E_G$ (eV)	$V_{sat}$ ( $10^7$ cm/s)	$E_{crit}$ at $10^{16}$ $cm^{-3}$ (MV)	Thermal conductivity (W/m K)	Baliga FOM ( $10^6$ $V^2/\Omega cm^2$ )	Johnson FOM ( $10^{12}$ V/S)	$V_{Break}$ at 10 mW $cm^2$ (V)	Substrate size (mm)	N- type/P- type?	Light emission?
Si	1.12	1.0	0.3	145	8.8	0.48	100	400	Yes/Yes	No
SiC	3.26	<b>1.9</b>	3.1	<b>490</b>	6270	9.4	3000	~150	Yes/Yes	No
GaN	3.45	1.4	4.9	253	27 900	11.0	5000	~100	Yes/Yes	<b>Yes</b>
$\beta$ -Ga <sub>2</sub> O <sub>3</sub>	4.8	1.1	10.3	27	36 300	18.0	6000	~100	Yes/No	No
AlN (Parameter rank)	<b>6.1</b> <b>(#1)</b>	1.3 <b>(#3)</b>	<b>15.4</b> <b>(#1)</b>	319 (#2)	<b>336</b> <b>000</b> <b>(#1)</b>	<b>31.9</b> <b>(#1)</b>	<b>20</b> <b>000</b> <b>(#2)</b>	~100	<b>Yes/Yes</b> <b>Lately</b>	<b>Yes</b>





# Polycrystalline Aluminum Nitride



# Current NGI Value Chain



**Aluminum Nitride Powder**  
China/ Taiwan



**Aluminum Nitride Crystal Boule**  
Nitride Global (KS)



**Aluminum Nitride Single Crystal**



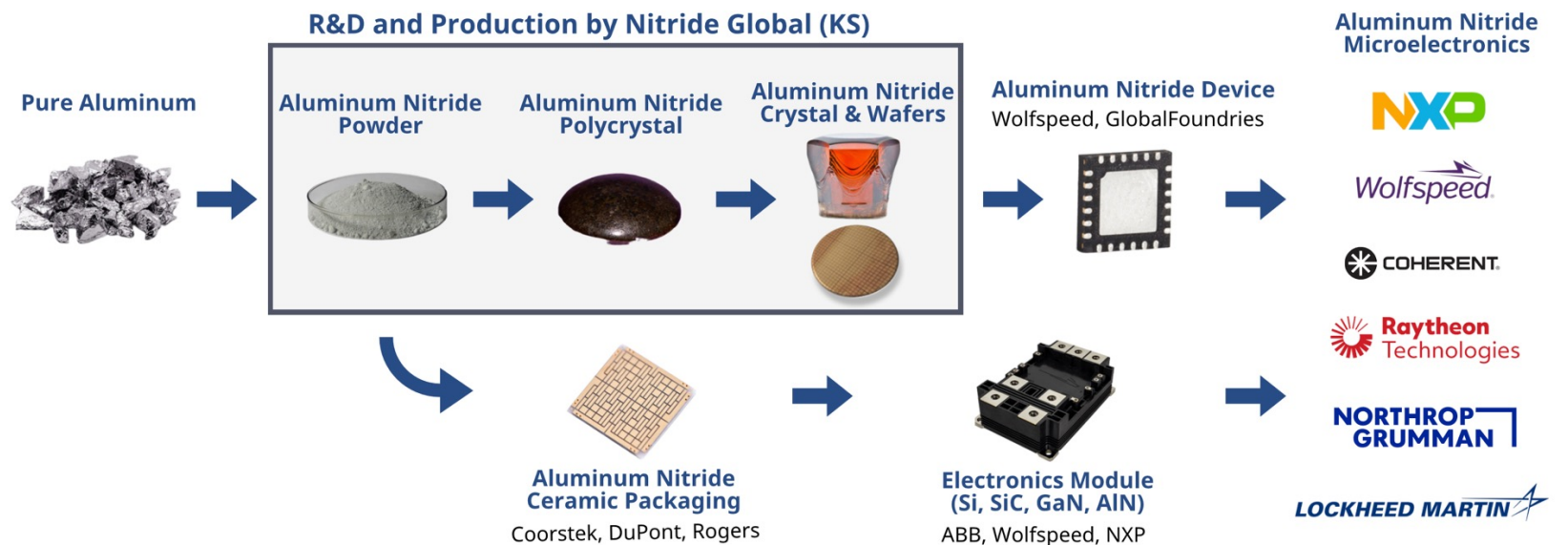
**UV-C LED**



# Opportunity to create the ONLY Fully Domestic Semiconductor Value Chain

- All current semiconductor materials have dependencies on foreign nations.
- Current materials have reached limits in high performance applications.
- AlN (ultrawide bandgap) can more than double the performance of certain microelectronics such as EV platforms, radar/ avionics, and weapons.

## Proposed AlN Domestic Value Chain



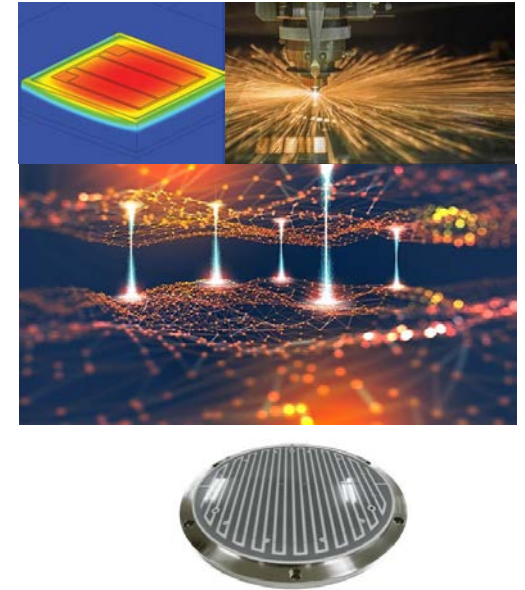




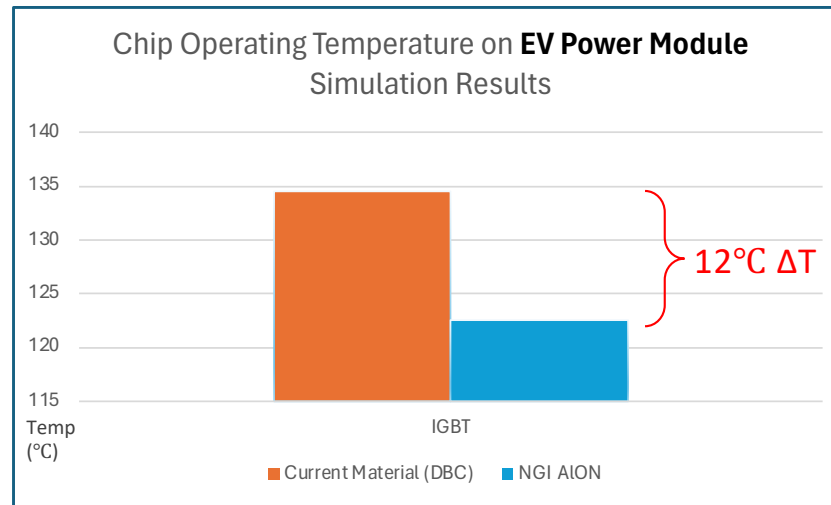
# **Aluminum Oxynitride Coating**

## WHAT IF YOU COULD

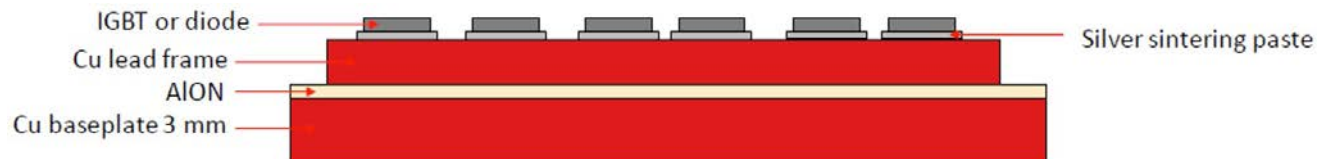
- **Improve thermal efficiency of microelectronics by 30%?**  
By replacing the unnecessary packaging layers
- **Improve the efficiency of an EV-inverter by 25%?**  
By minimizing the heat-soaked induced electrical losses
- **Extend the life of a laser diode by 10,000 hours?**  
By lower junction temperature and slowing thermal degradation
- **Improve efficiency of a thermoelectric cooler by 50%?**  
By reducing the thickness of the ceramic electrical isolation layer
- **Extend the service duration of a semiconductor e-chuck by 100%?**  
By increasing chemical etching resistance of the protective layer



**We are Significantly Increasing Reliability and Efficiency of Microelectronics & Semiconductors**



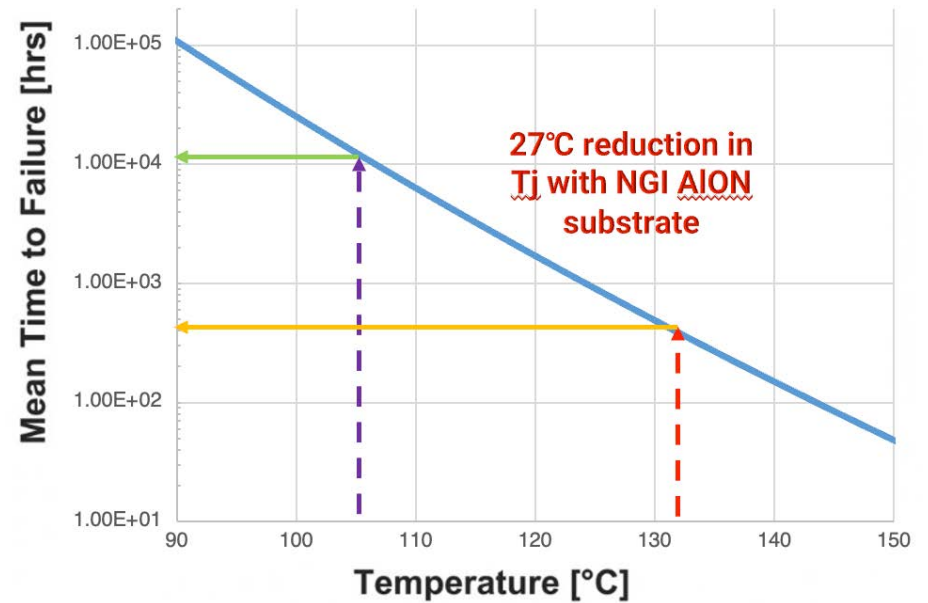
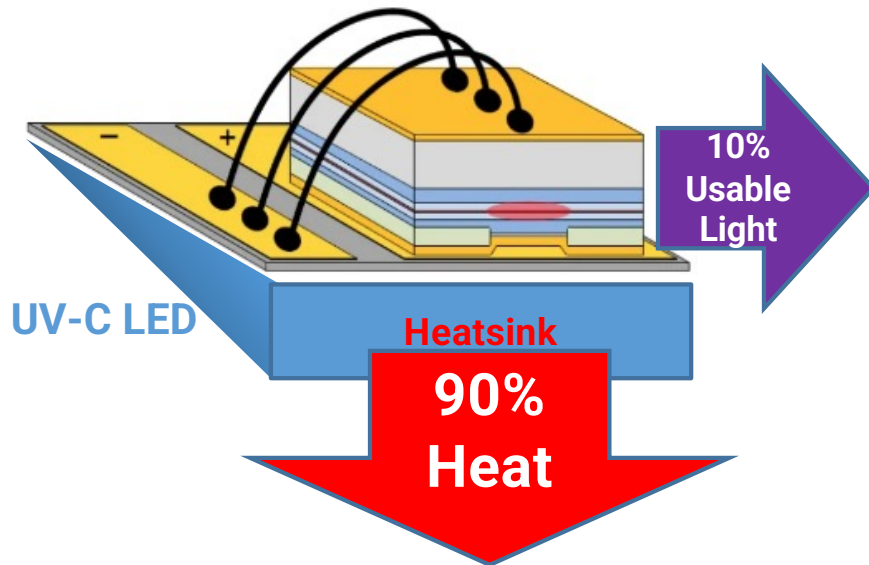
**Every 10°C reduction  
DOUBLES lifespan**



**We are Significantly Increasing Reliability and Efficiency of Microelectronics & Semiconductors**



Heat generated as a result of thermal barriers reduces efficiency



And for every 10 °C the temperature is reduced the lifetime doubles.

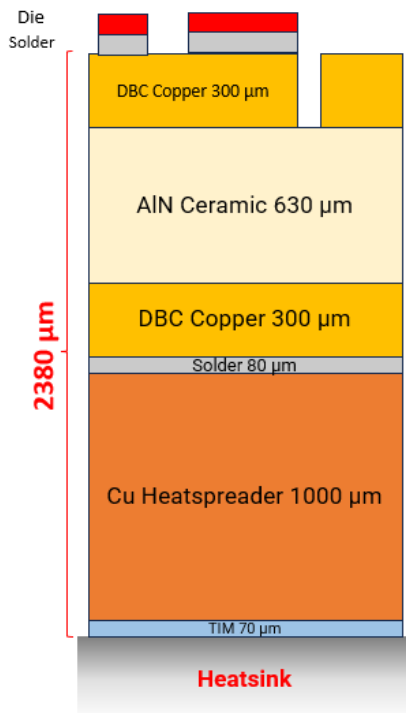
**Advanced packaging can increase device power and lifetime**

# Aluminum Oxynitride in Devices

## Revolutionary Thin Film Packaging for Power and RF Devices



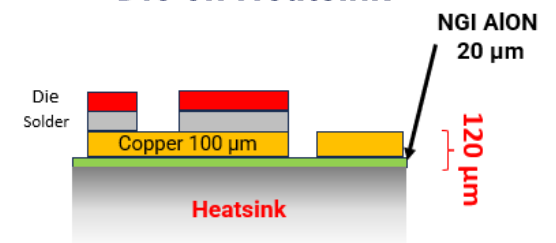
### Current Industry Standard "Die on DBC"



NGI AION Copper Package Characteristics	
Low temperature deposition	< 300 °C
Excellent $V_{BD}$	up to 540 V/ $\mu\text{m}$
High chemical etching resistance	7x > SiO <sub>2</sub> from NF <sub>3</sub>
Thermal Conductivity	2 W/m-K – 30 W/m-K
Flexible but mechanically robust	210 Gpa
Very high reliability	> 1000 cycles @ -50°C to 150°C
Suitable for high temp. applications	< 300 °C

Moving Beyond Ceramic Substrates

### NGI AION Concept "Die on Heatsink"



# NGI AION Coatings for Defense & Commercial Applications



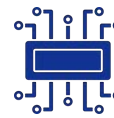
**Power Electronics**



**Laser Diodes**



**Electronics Cooling**



**Semiconductor  
Manufacturing**



**Aerospace &  
Defense**

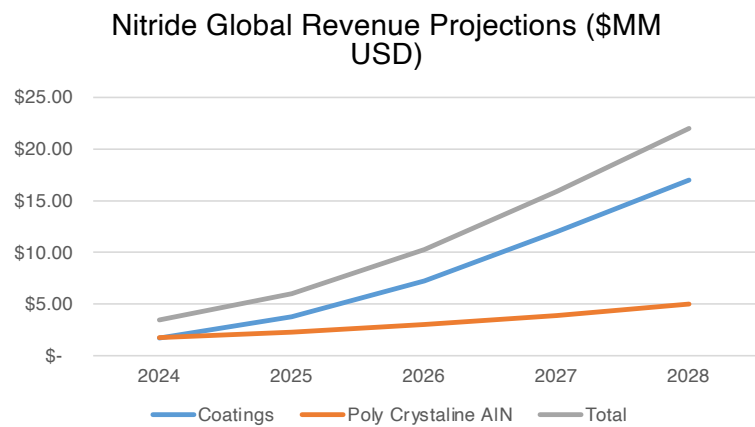
<b>Our Solutions</b>	<b>AION coatings for MOSFET &amp; IGBT packages</b>	<b>AION coatings for diode packaging</b>	<b>AION coatings for Thermoelectric devices</b>	<b>AION protective coatings for electrostatic, vacuum wafer chunks.</b>	<b>AION Thermal, Insulating, and Protective Coating for high power, high temp, high frequency devices</b>
<b>Customer Applications</b>	<b>EV inverters and power electronics</b>	<b>Cutting, additive manufacturing, 3D sensing (LiDAR)</b>	<b>Telecom, low GHG refrigeration</b>	<b>Deposition, etch tools</b>	<b>Hypersonic Vehicles, Directed Energy, High Frequency/ Resolution Radar, Low Power Satellites</b>
<b>Value Proposition</b>	<b>Longer range, faster charging, lower heat</b>	<b>Faster cutting, better resolution &amp; response time, longer life</b>	<b>80x faster cooling, lower power usage, cost</b>	<b>2X longer tool uptime</b>	<b>A new generation of devices and performance/ reliability metrics</b>
<b>Addressable Market, CAGR</b>	<b>&gt; \$0.2b, 15%</b>	<b>&gt; \$0.4b, 13%</b>	<b>&gt; \$0.6b, 8%</b>	<b>&gt; \$0.5b, 7%</b>	<b>&gt; \$1b, 8%</b>





# About Nitride Global

# Revenue & Fundraising Summary



## Polycrystalline AIN:

- **Highly profitable manufacturing operations**
- **\$1M in revenue with 20%+ net profit for 2023**
- **Estimated \$3M by 2025 w/ 30% net profit**

## AION Coatings:

- **Customer funded development projects**
- **Capability for small scale manufacturing – 2024+**
- **Licensing revenue**

**Seeking \$7MM - \$10MM USD in equity or convertible debenture**

Capital Expenditure	\$4MM
Technical, Sales, and Marketing Resources	\$2.5MM
Infrastructure & Testing	\$1.5MM
Debt Repayment	\$0.5M
Total	\$8.5M

- Seeking strategic CVC or VC partners
- \$2.5MM USD raised thus far in convertible debenture





# Our Leadership Team



**Mahyar Khosravi, P.Eng.**

Chief Executive Officer

- 20+ years in global technology roles with organizations such as Cisco, Nortel, etc.
- Experienced VC/PE Investor
- Startup to growth scale experience



**Matthew D. Healy, Ph.D.**

Chief Strategy Officer

- 20+ years experience in Electronic Materials, Product Management, Applications Engineering, and M&A
- Air Products, ATMI, Ferro Corporation, Kurt J. Lesker Company



**Jason Schmitt, MS, MBA**

VP, Research & Development

- 20+ years of experience in nitride crystal growth, reactor design
- Deep expertise in substrates and thin film coatings



**Jeremy Jones, MS, MBA**

VP, Business Development

- Vast experience in building global advanced materials businesses
- Motorola, Cabot Microelectronics, Koch Genesis





# Advisors & Consultants



**Duncan W. Brown Ph.D.**

Consultant/ Advisor

- 20+ years of experience consulting with Japanese and American technology companies
- Founder of Pacific Tech Link American and Japanese tech companies
- One of the Founders of ATMI



**Mark Kennard Ph.D.**

Consultant

- 25+ years in the semiconductor industry with C-level and VP experience
- Author or co-author of 12 patents and more than 30 journal articles
- Lam Research, Soitec, AMAT, Svagos Technik



**Haris Basit, MS**

Advisor

- 30+ years in the semiconductor and electronics industries. Founder of multiple successful companies.
- Significant expertise in EDA, semiconductors, High-Frequency Trading software, crypto, and licensing IP.



**Christian Winkler Ph.D.**

Consultant

- Managing Director—Global BA
- Long experience in electronic device and electronic materials market for companies such as Rogers, KCC Corp., Nippon Steel, NGK Electronic Devices.





NITRIDE  
GLOBAL