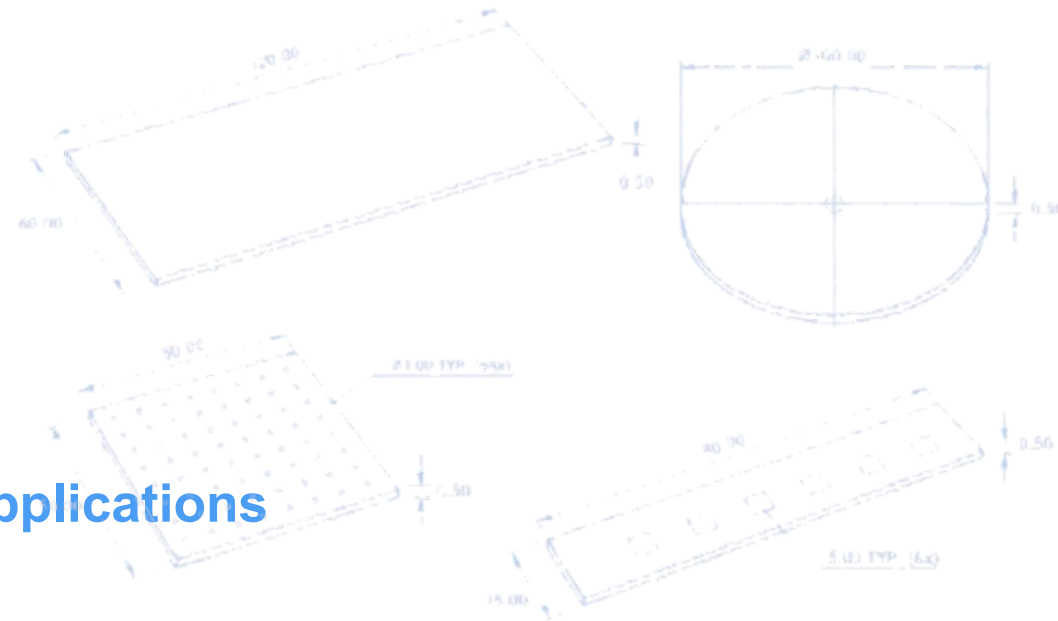


# Precision Aluminum Nitride Substrates & Thermal Plates

for Electronic, Electrical & Thermal Applications



High Thermal Conductivity · Electrical Insulation  
Standard & Custom Sizes



Custom Dimensions & Features



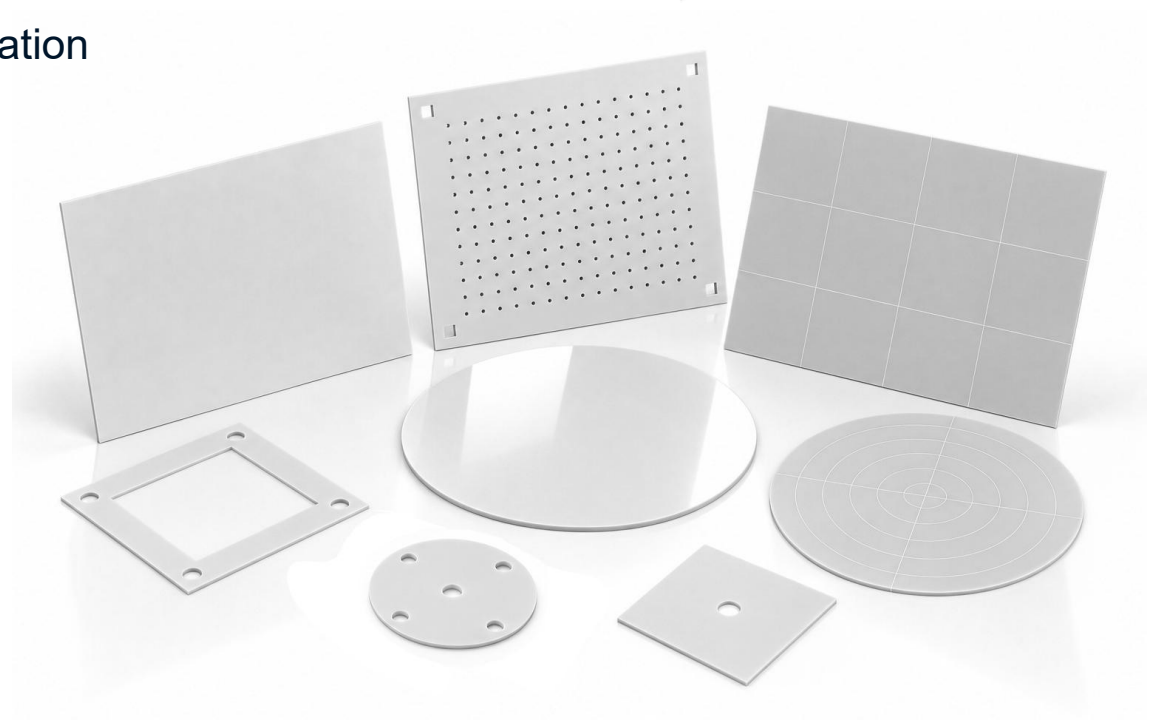
Precision Thickness & Flatness Control



Laser Cutting & Machining



Consistent Quality Assurance



ISO 9001  
Certified



Advanced  
Manufacturing



Custom  
Solutions



Trusted OEM  
Partner

# About Us & Applications

## About Jinghui

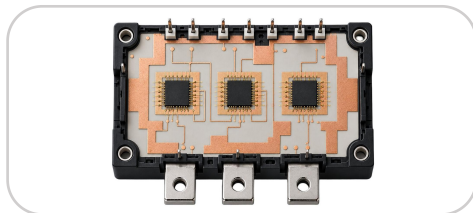
Jinghui is a custom manufacturer of advanced ceramic components, specializing in aluminum nitride (AlN) and alumina ceramics. We provide AlN substrates and thermal plates in standard and custom sizes, supported by integrated manufacturing capabilities.

### Our Focus

AlN Substrates & Thermal Plates · Precision Manufacturing & Finishing

## Typical Applications

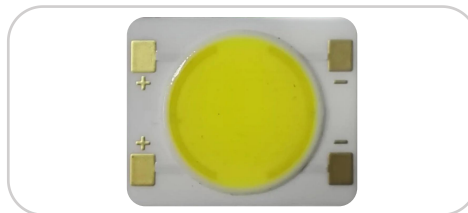
AlN substrates and thermal plates deliver high thermal conductivity and electrical insulation for electronic and thermal applications.



### Power Electronics

#### Power Modules + High-Power Devices

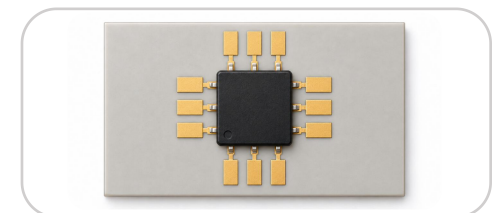
AlN substrates for high-power modules and semiconductor devices requiring efficient heat dissipation and electrical insulation.



### LED & Laser Devices

#### High-Power LEDs + Laser Diodes

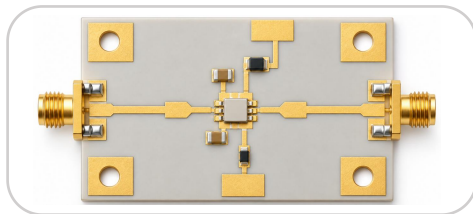
AlN substrates for high-power optoelectronic devices requiring efficient thermal management and electrical insulation.



### Electronic Packaging

#### IC Packages + Component Mounting

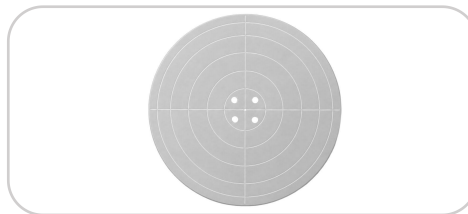
AlN substrates for electronic packages requiring electrical insulation, dimensional stability, and effective heat dissipation.



### RF & Microwave Electronics

#### RF Modules + High-Frequency Devices

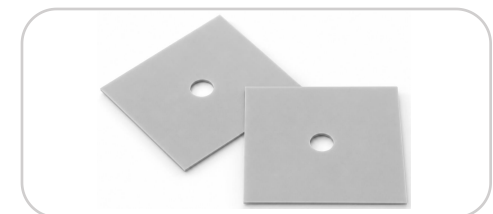
AlN substrates for RF and microwave devices requiring thermal management, electrical insulation, and stable performance.



### Semiconductor Equipment

#### Vacuum Chucks + Wafer Processing Components

AlN substrates for semiconductor equipment requiring thermal stability, electrical insulation, and precision dimensional control.

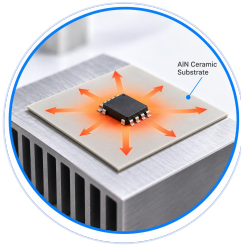


### Thermal Management

#### Heat Spreading + Thermal Control

AlN thermal plates for efficient heat spreading and thermal control in electronic and high-power applications.

# Designed Around Your AlN Ceramic Challenges



## Thermal Performance

### Challenge

High-power electronic devices generate significant heat, while electrical insulation is still required.

### Our Approach

We provide AlN substrates and thermal plates combining high thermal conductivity with electrical insulation.

### Advantage

Efficient heat dissipation while maintaining electrical insulation.



## Precision & Quality

### Challenge

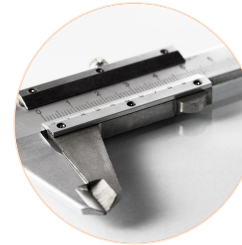
Dimensional variation, warpage, and inconsistent quality can affect component performance and assembly.

### Our Approach

Controlled production and precision inspection from ceramic forming to final inspection.

### Advantage

Consistent thickness, flatness, surface quality, and dimensions.



## Size & Thickness

### Challenge

Different applications require substrates and thermal plates in various sizes and thicknesses.

### Our Approach

We produce AlN substrates and thermal plates in a range of sizes and thicknesses.

### Advantage

Flexible size and thickness options for different applications.



## Integrated Manufacturing

### Challenge

Multiple processing suppliers can increase coordination, lead times, and quality risks.

### Our Approach

Integrated ceramic manufacturing and inspection under one manufacturing partner.

### Advantage

One Supplier. Multiple Processes.

# Why Aluminum Nitride?

High Thermal Conductivity for Demanding Thermal Management Applications

| Item                                                  | Unit                     | Value              |
|-------------------------------------------------------|--------------------------|--------------------|
| Mechanical Properties                                 |                          |                    |
| Color                                                 | —                        | Gray               |
| Density                                               | g/cm <sup>3</sup>        | ≥ 3.3              |
| Flexural Strength (25°C)                              | MPa                      | ≥ 380              |
| As-fired Camber / Warpage                             | Length%                  | ≤ 0.3%             |
| Thermal Properties                                    |                          |                    |
| Maximum Service Temperature (Without Mechanical Load) | °C                       | > 1000             |
| CTE (Coefficient of Thermal Expansion) (25–800°C)     | 1 × 10 <sup>-6</sup> /°C | 4.0–6.0            |
| Thermal Conductivity (25°C)                           | W/m·K                    | 170–220            |
| Electrical Properties                                 |                          |                    |
| Dielectric Constant                                   | —                        | 8.0–10.0           |
| Dielectric Loss Tangent (tan δ)                       | × 10 <sup>-4</sup>       | ≤ 3                |
| Volume Resistivity (25°C)                             | Ω·cm                     | > 10 <sup>14</sup> |
| Dielectric Strength                                   | KV/mm                    | > 15               |

## Three Key Advantages of AlN

High Thermal Conductivity  
170–220 W/m·K



Efficient heat dissipation

Electrical Insulation  
>15 kV/mm



Reliable electrical isolation  
for thermal management

CTE Compatibility  
4.0–6.0 × 10<sup>-6</sup>/°C



Helps minimize thermal  
stress in electronic packages

# AlN Substrates — Standard Dimensions

Standard substrate sizes vary depending on thickness and finishing conditions. Selected standard dimensions are shown below.

| Thickness (mm) | Length × Width (mm)  |                      |
|----------------|----------------------|----------------------|
| 0.1–0.2        | 50.8 × 50.8 (2")     |                      |
| ≥ 0.2          | 114.3 × 114.3 (4.5") |                      |
| 0.38           | 120 × 120            | 140 × 190            |
| 0.5            | 120 × 120            | 140 × 190            |
| 0.635          | 140 × 190            | 200 × 200            |
| 1.0            | 140 × 190            | 200 × 200 300 × 300* |
| 1.5            | 200 × 200            | 300 × 300*           |
| 2.0            | 200 × 200            | 300 × 300*           |

Note: Red-highlighted sizes indicate selected large-format capabilities available upon request.

## Dimensional Tolerances

| Item             | Standard Tolerance (mm) | Tightest Tolerance (mm) |
|------------------|-------------------------|-------------------------|
| Length and Width | ± 2 (as-fired)          | ± 0.15 (lazer cutting)  |
| Thickness        | ± 0.03                  | ± 0.01                  |

## Standard Thickness Range

0.1–2.0 mm  
Thin configurations for electronic packaging and thermal management applications.

## Available Substrate Shapes

Square | Rectangular | Circular  
Custom geometries available



## Dimensional Control

Tighter dimensional tolerances are available through precision finishing and laser processing, depending on substrate size, thickness and geometry.

## Need a Different Size or Tighter Tolerance?

Custom dimensions and precision finishing are available upon request.

# AlN Thermal Plates — Representative Sizes

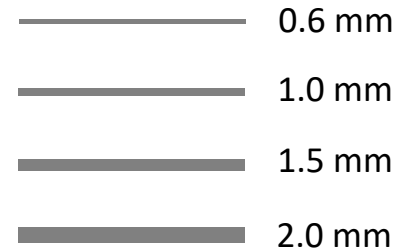
Selected from our production experience, representing a range of commonly produced sizes and thicknesses.

| Thickness (mm) | Length × Width (mm) |             |
|----------------|---------------------|-------------|
| 0.6            | 48.3 × 43           |             |
| 1.0            | 22 × 17             | 25 × 20     |
|                | 30 × 20             | 37 × 26     |
|                | 40 × 25             | 48 × 37     |
|                | 50 × 40             | 54 × 40     |
| 1.5            | 23.3 × 18.9         | 58.2 × 35.1 |
| 2.0            | 26 × 20             |             |

## Manufacturing Processes

Dry Pressing | Tape Casting

## Produced Thicknesses



## Typical Shapes



Rectangular, with 4 right angles.



Rectangular, with rounded corners (R2.5 / R3 / R5).

## Available Configurations



### Through holes

Quantity and layout as required.



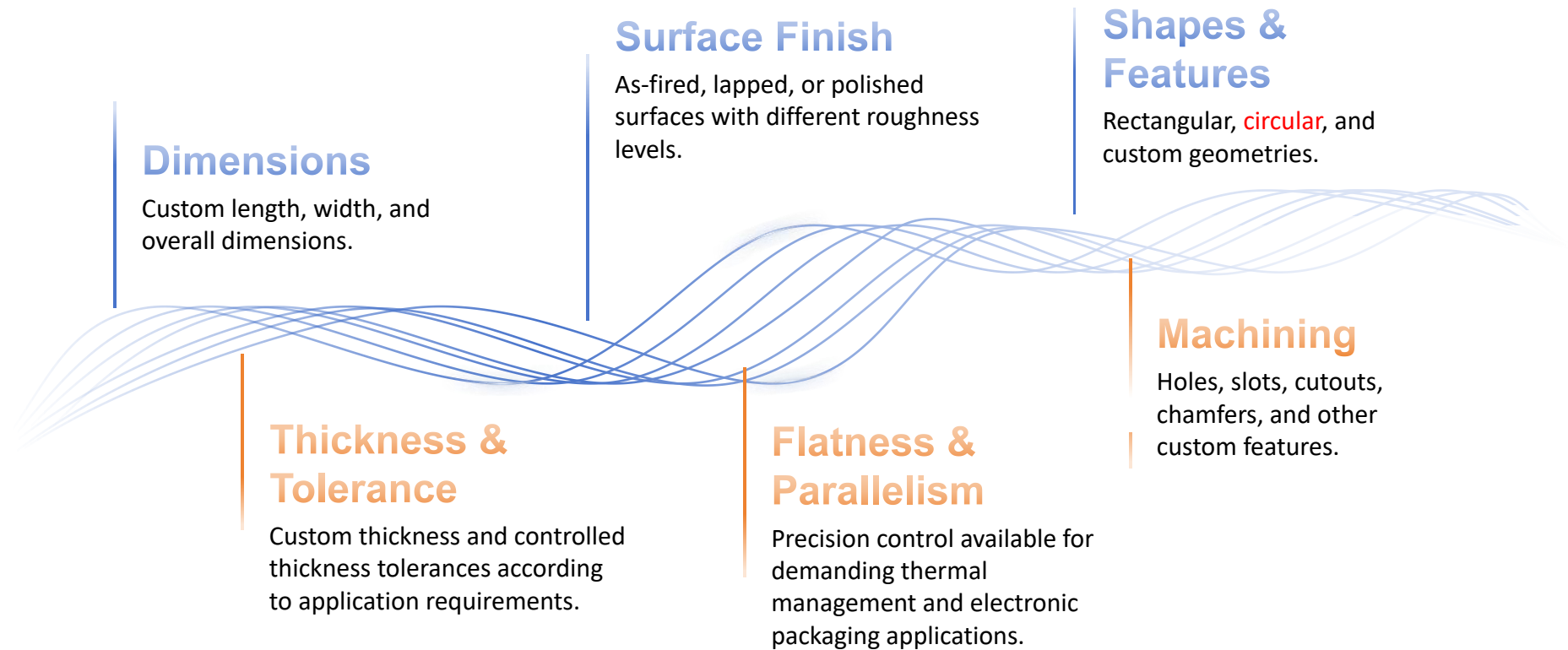
### Cutouts

Shape and location as required.

# Custom Options & Manufacturing Flexibility

Custom dimensions, tolerances, surface finishes, and precision features are available based on application requirements.

## Custom Options



## Drawing-Based Customization

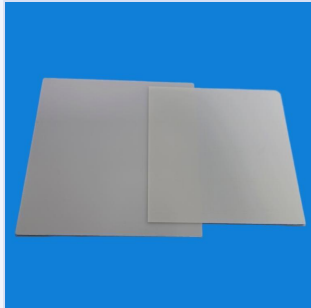
Manufacturing according to customer drawings and specifications.

## Thickness & Large-Format Capability

Thickness from 0.1–2.0 mm, with larger dimensions available depending on thickness, geometry, and finishing requirements.

# Surface Finish & Precision Processing

Surface finish options and typical roughness (Ra) values

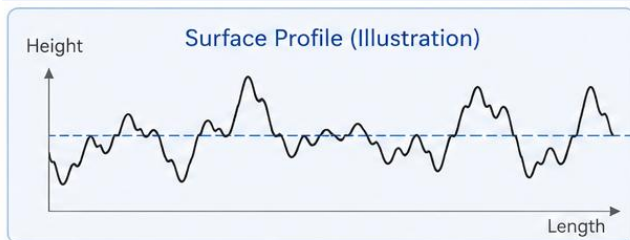


## As-fired

Surface after sintering

### Typical Ra

AlN:  $\leq 0.6 \mu\text{m}$

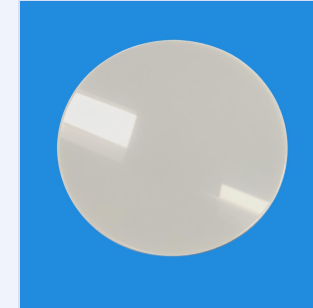
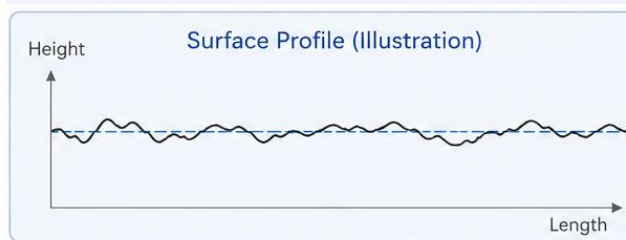


## Lapped

Surface after lapping

### Typical Ra

AlN:  $0.3\text{--}0.6 \mu\text{m}$

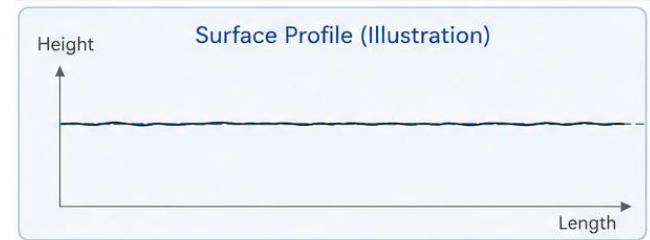


## Polished

Surface after polishing

### Typical Ra

AlN:  $\leq 0.05 \mu\text{m}$



Note: Illustration only. Surface profiles are shown for visual comparison and are not to scale.

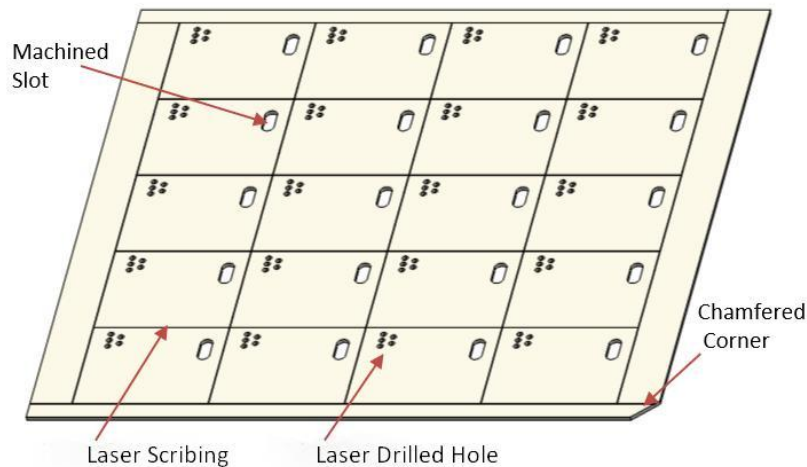
## Lower Ra = Smoother Surface

Smoother surfaces can improve contact, bonding consistency, and overall performance.

# Laser Processing

Precision laser processing for holes, scribing, and custom features on thin AlN substrates.

## Custom Laser Features



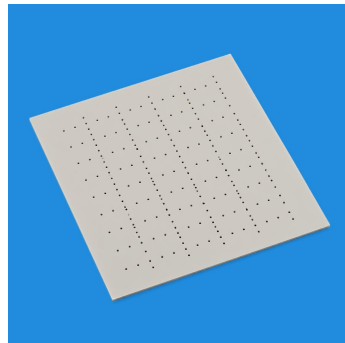
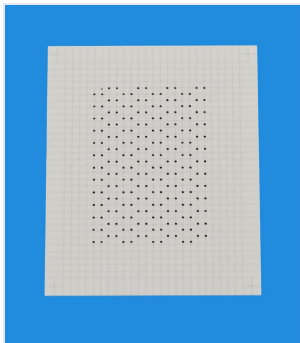
| Hole Diameter (mm) | Typical Dimensional Tolerance (mm) |
|--------------------|------------------------------------|
| $\leq 1^*$         | $\pm 0.1$                          |
| $> 1$              | $\pm 0.2$                          |

Note: Small-diameter holes are available for thin AlN substrates.

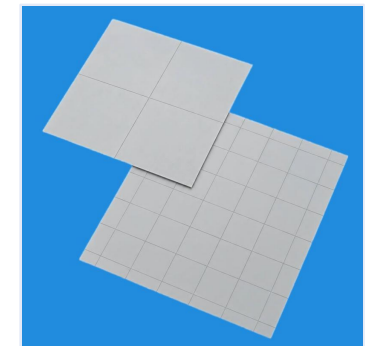
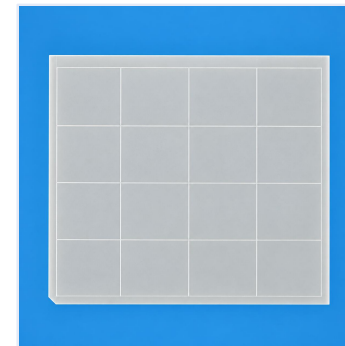
## A. Laser Cutting

Laser cutting of AlN sheets into custom-sized substrates.

## B. Laser Drilled Holes



## C. Laser Scribing



| Substrate Thickness (mm) | Laser Scribe Depth (% of Substrate Thickness) |
|--------------------------|-----------------------------------------------|
| $\leq 2$                 | 45%–55%*                                      |

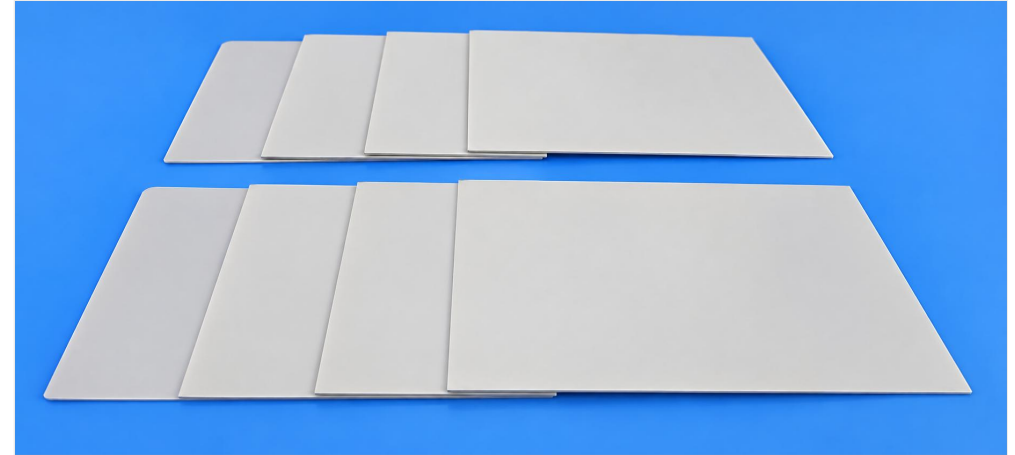
Note: Scribe depth is controlled according to substrate thickness and processing requirements.

# Appearance & Surface Quality Control

Careful inspection to ensure clean surfaces, intact edges, and consistent appearance of AlN substrates and thermal plates.

## Appearance Quality

- Clean and uniform surface
- No visible cracks
- Controlled edge condition
- Consistent appearance
- Customer-specific inspection criteria available



## Inspection Focus

01

### Surface Cleanliness

Clean and uniform ceramic surfaces with consistent surface quality.

02

### Edge Integrity

Inspection of edge integrity and overall edge condition.

03

### Dimensional Features

Verification of holes, slots, scribe lines, and other custom features.

04

### Appearance Consistency

Batch-to-batch consistency based on agreed customer requirements.

## Typical Visual Inspection Criteria

Cracks · Edge Chipping · Foreign Matter · Surface Scratches

- Aluminum Nitride Substrates & Thermal Plates Supplier

We support OEM projects from prototype development to mass production, supplying precision aluminum nitride substrates and thermal plates for electronic and thermal applications worldwide.

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