THIN-FILM MATERIALS
32 N Gould St., Sheridan, WY 82801, USA
Tel.: +1 (786) 825 8645
WhatsApp: Keyue Advanced Materials
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# Certificate of Analysis (CoA)

Dec. 25, 2025

**Product Name**: Aluminum-doped Zinc Oxide (AZO) Sputtering Target
**Chemical Formula**: $ZnO:Al_2O_3$
**Composition**: 97 wt% ZnO / 3 wt% $Al_2O_3$
**Purity**: 99.99% (4N, oxide basis)
**Dimensions**: Ø76.2 mm × 1.59 mm
**Bonding**: Indium-bonded to Copper (Cu) Backing Plate, 1.59 mm thick
**Lot Number**: CSFM-251225085TB
**Quantity**: 1 piece
**Manufactured by**: Thin-Film Materials

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## Physical Description

- Form: Oxide ceramic sputtering target, bonded
- Appearance: Off-white to light gray, dense ceramic
- Crystal Structure: Hexagonal wurtzite (ZnO structure with Al doping)
- Theoretical Density: ~5.6 g/cm³
- Resistivity: < $1.0 \times 10^{-3}$ Ω·cm (for sintered target)
- Fabrication: Powder synthesis, pressing, sintering, precision grinding, and bonding

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## Total Impurities (by ICP-OES / GDMS)

| Element | Symbol | Max. Content (ppm) |
|---|---|---|
| **$ZnO$, $Al_2O_3$** | **Zn, Al** | **Balance (>99.99%)** |
| Iron | Fe | < 5 |
| Silicon | Si | < 5 |
| Copper | Cu | < 5 |
| Lead | Pb | < 5 |
| Nickel | Ni | < 5 |

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| Element | Symbol | Max. Content (ppm) |
|---|---|---|
| Sodium | Na | < 5 |
| **Other Metallic (each)** | - | < 2 |

## Handling & Storage

- This is a brittle ceramic material. Handle with care to avoid chipping or cracking.
- Store in a dry, clean environment to prevent moisture absorption and contamination.
- Avoid thermal shock.

## Declaration

We certify that this AZO target meets the specified doping concentration and 4N purity, providing a reliable source for depositing transparent conductive oxide (TCO) thin films in cost-effective photovoltaic, display, and low-emissivity coating applications.

## Authorized Signature:

**Inspection Certificate by**: **Nancy Liu**

**Approver by**: **Chen Qiang**