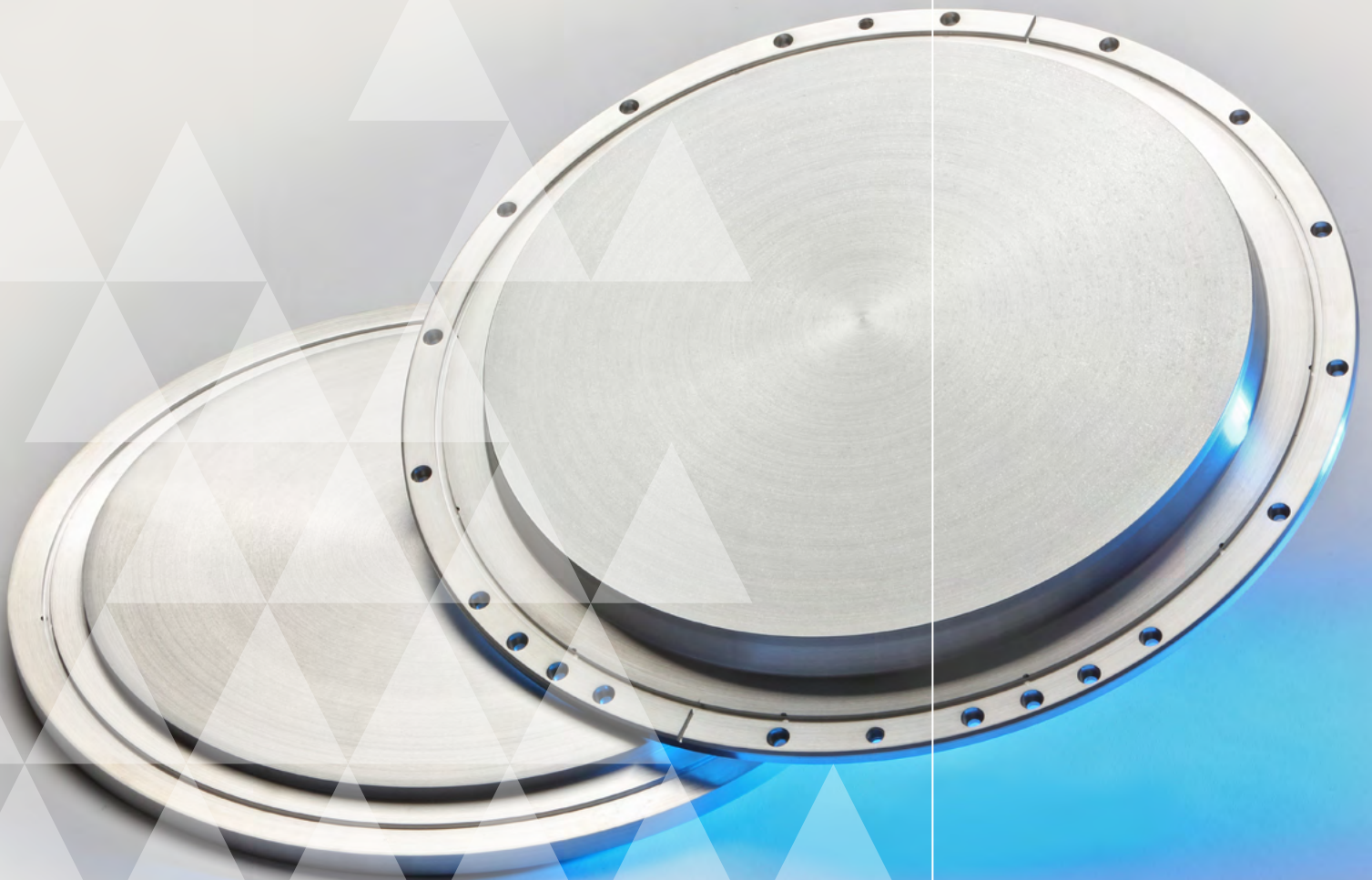




MATERION



**ADVANCED
MATERIALS GROUP**

Aluminum
Scandium
Sputter Targets

Al-Sc Sputter Targets

The Challenge

Thin film-based piezoelectric MEMS (pMEMS) sensors and devices are expected to become popular in electronic devices such as Piezoelectric Micromachined Ultrasonic Transducers (pMUTs) and Energy Harvesting Devices. The performance of many of these devices is greatly enhanced by the use of doped aluminum nitride piezoelectric films. In particular, aluminum nitride films highly doped with scandium have been shown to exhibit excellent Figures of Merit (FoM) for many applications. These nitride films are typically manufactured by reactive sputtering of metallic alloy targets. However, a lack of high quality aluminum scandium sputter targets has hindered the development and fabrication of these pMEMS devices.

The Solution

Materion has developed a melt-based process for producing Aluminum-Scandium sputter targets with high chemical uniformity, low oxygen contents, and 3N purity. These alloys are specifically tailored for the reactive deposition of these nitride piezoelectric materials. Sputter Targets are currently available with Scandium contents of up to 21at% (31wt%). Targets with up to 44at% (57wt%) Sc will be available in the near future.

THE ADVANTAGES OF MATERION AL-SC SPUTTER TARGETS

- Highly consistent stoichiometry across the target and through the target thickness
- Purity >99.9%
- Tightly controlled microstructure for optimal sputter performance
- Manufactured by vacuum casting to produce fully dense targets with low oxygen contents and low contaminant levels.

PIEZOELECTRIC MATERIALS FOR THIN FILM APPLICATIONS

MATERION BENEFITS

World's premier advanced materials products and services company

- Global facilities
- Fully staffed R&D
- Redundant manufacturing capabilities
- Composition and purity analysis
- OEM partnerships
- Multiple bonding techniques
- International quality certifications

MEMS APPLICATIONS

- Energy harvesting
- Piezoelectric micromachined ultrasonic transducer (PMUT) array-based devices including fingerprint sensors, chemical sensors, fat sensors and gesture control devices
- Medical sensors – blood pressure, kidney functions, blood analysis, respiratory monitor and drug delivery



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MATERION CORPORATION

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MATERION ADVANCED MATERIALS GROUP is a global supplier of premier specialty materials and services for the semiconductor, advanced memory, MEMS, optical coatings and large area glass markets. Our offerings include precious and non-precious thin film deposition materials, inorganic chemicals, microelectronic packaging products, precision parts cleaning and precious & valuable metal reclamation. Because of our industry experts and extensive manufacturing capabilities, we are able to meet our customers' specific material requirements today and assist with their innovative Research and Development projects.