

STARCryo is a leading manufacturer of advanced magnetic sensors based on low temperature superconductor (LTS) and high temperature superconductor (HTS) thin films. STARCryo's robust Nb/Al-AlO<sub>x</sub>/Nb trilayer Josephson junction process is optimized specifically for the fabrication of Superconducting QUantum Interference Device (SQUID) sensors and is the only commercial LTS SQUID foundry for 150-mm wafers currently available.



STARCryo offers foundry services for the fabrication of low-T<sub>c</sub> Josephson junction and dc SQUIDs, as well as custom thin-film microfabrication services. The Josephson junction process is based on a standard critical current density of 100 A/cm<sup>2</sup>. Shunt resistors are made using Pd thin films, ensuring proper operation at all temperatures. The standard sheet resistance is 1 Ω/□. Other critical current densities and sheet resistances are available upon request.



Design data may be submitted to STARCryo in GDSII, CIF, XIC, and KIC formats. Please contact STAR Cryoelectronics for process specifications and pricing.

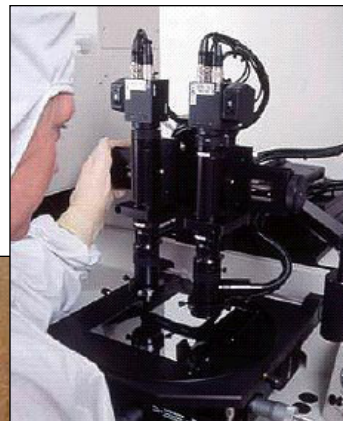
## FEATURES:

Robust Nb/Al-AlO<sub>x</sub>/Nb Josephson junction trilayer process for up to 150 mm wafers.

Pd or AuPd resistors.

SiO<sub>2</sub> and Si<sub>3</sub>N<sub>4</sub> dielectrics.

Standard 100 A/cm<sup>2</sup>, 1 Ω/□ process.



## FACILITIES

### Photolithography

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- **Brewer Science Model 100 Spin Coater**  
Auto-dispense primer and up to three resists
- **Tek-Vac PRC-2000 Photoresist Cure Station**
- **Fusion Semiconductor M150-PC**  
Photo resist UV cure station
- **AB-M Mask Aligner**  
Expose and pattern wafers up to 150 mm diameter  
Backside IR illumination and alignment  
Sub-micron resolution, <0.5  $\mu\text{m}$  alignment accuracy (front side)
- **Polyimide Cure Station**

### Thin-Film Deposition

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- **Extensive Materials Capabilities**  
Nb, Al, Mo, Ti, Ta, Hf, Zr, W, Au, Ag, Pd, AuPd, Cu, Si, SiO<sub>2</sub>, NbTiN, Bi, YBCO, CeO<sub>2</sub>
- **UniFilm Technology Multi-Target Sputter System**  
Three rf/dc magnetrons; Ar, O<sub>2</sub>, N<sub>2</sub> process gases  
Ion mill for pre-sputter etch and patterning  
Backside heater (>700 °C) for up to 150-mm wafers  
Tooling for 100 mm, 150 mm and 200 mm wafers  
Up to 99% film thickness uniformity over entire wafer, regardless of size
- **Kurt Lesker Multi-Target Sputter System**  
Four rf/dc magnetrons  
Load-lock process chamber
- **Ion and Plasma Systems PECVD**  
Low temperature, low stress a-Si, SiO<sub>2</sub>, Si<sub>3</sub>N<sub>4</sub>
- **Varian Thermal Evaporator**

### Thin Film Patterning

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- **Plasma-Therm 790 RIE**  
Etch up to 200 mm wafers  
Configured with CF<sub>4</sub>, SF<sub>6</sub>, O<sub>2</sub>, Ar, H<sub>2</sub>
- **Technics PE-IIA**  
Oxygen ash and descum
- **Ion Technology Ion Mill**  
Installed in UniFilm Sputter System  
Configured for Ar ion milling
- **XeF<sub>2</sub> Polysilicon Etcher**

### Metrology

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- **Dektak III Step Profilometer**
- **FSM 8800 Thin-Film Stress Gauge**
- **Four-Point Probe**
- **Tencor Surfscan 6200**
- **Hitachi S-4800 Type II SEM with EDS**

### Back-End Assembly

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- **DISCO DAD-321 Dicing Saw**
- **K&S Models 4523AD and 4129 Deep Access Wedge Bonders (Au ribbon and Al wire)**
- **Unitek UniBond Parallel Gap Microwelder**