

EcoCu Clean for PVD Cu

Advanced Copper Removal for Semiconductor Manufacturing

Extend Component Life • Eliminate NOx Emissions • Lower Total Cost of Ownership

OPTIMIZED PVD COPPER CLEANING FOR HIGH-PERFORMANCE SEMICONDUCTOR TOOLS

In advanced semiconductor fabrication, PVD copper (Cu) deposition builds up on critical chamber components and process kits, requiring precise and repeatable cleaning to maintain yield and performance.

Traditional copper strip methods introduce hazardous emissions, substrate damage, and shortened component lifespan, creating both operational and environmental challenges.

EcoCu Clean is a next-generation, environmentally safe copper removal solution engineered specifically for PVD Cu applications.

THE CHALLENGE: LIMITATIONS OF CONVENTIONAL Cu CLEANING PROCESSES

Drawbacks of Traditional Cu Removal Methods

Conventional cleaning processes for copper deposition removal introduce several risks:

- Release of hazardous NOx (nitrogen oxide) fumes
- Post-strip clean attack on aluminum substrates and precision surfaces
- Accelerated **material degradation across cleaning cycles**
- Increasing handling and exposure risks

Operational Impact

- Reduced **PVD kit and component lifetime**
- Increased **replacement frequency and downtime**
- Higher **cost of ownership (COO)**
- Compromised **process stability and tool uptime**

UCT SOLUTION: EcoCu CLEAN - SUSTAINABLE COPPER REMOVAL TECHNOLOGY

1. Precision Cu Removal for PVD Applications

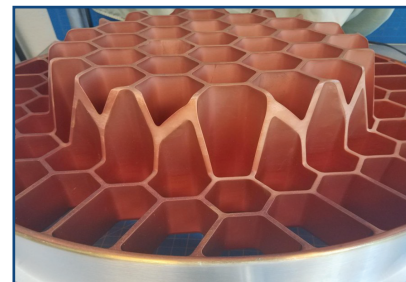
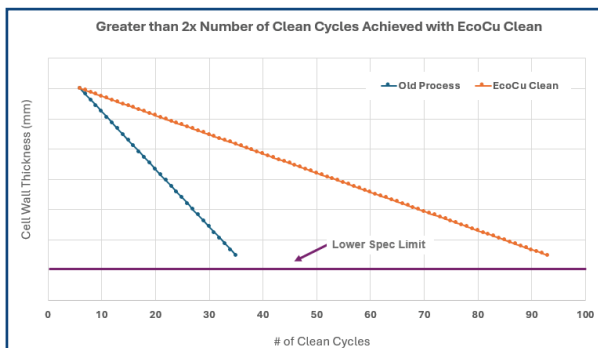
EcoCu Clean is engineered for **high-efficiency, environmentally friendly removal of copper deposition** across complex semiconductor hardware:

- Uniform Cu removal from **PVD chambers, kits, and flux optimizers**
- Preserves **critical dimensions and wall thickness**
- Maintains integrity of **aluminum and specialty materials**
- Enables **repeatable multi-cycle cleaning performance**

2. Environmentally Responsible Semiconductor Cleaning

- **Zero NOx emissions** released into environment
- Supports **ESG initiatives and sustainability goals**
- Improves **workplace safety and regulatory compliance**
- **Reduces environmental impact** of semiconductor operations

PROVEN PERFORMANCE: EXTENDED LIFECYCLE VS. CONVENTIONAL CLEANING



Cu Deposition on a PVD flux optimizer

Performance data demonstrates clear advantages of EcoCu Clean over traditional cleaning methods:

- >2x increase in component life
- >50 successful clean cycles achieved before reaching spec limits
- Reduced material loss per cycle

 **Key Insight:** EcoCu Clean transforms cleaning from a substrate-reducing process into a recipe for part life extension.

PERFORMANCE BENEFITS FOR SEMICONDUCTOR MANUFACTURING

Extended Component Lifetime

- Double the usable life of high-value PVD components
- Reduced wear on critical process surfaces

Improved Process Stability

- Consistent cleaning results across multiple cycles
- Reduced variability in chamber performance

Lower Total Cost of Ownership (TCO)

- Fewer replacements and reduced spare inventory
- Longer maintenance intervals

Sustainability & ESG Alignment

- Eliminates hazardous emissions
- Supports corporate sustainability reporting and goals

APPLICATION SCOPE

Semiconductor Process Coverage

- PVD (Physical Vapor Deposition) – BEOL applications
- Copper deposition removal from:
 - PVD Cu kits
 - Flux optimizers
 - Chamber hardware components

WHY LEADING FABs CHOOSE EcoCu CLEAN

Semiconductor Process Coverage

- Advanced **copper cleaning technology** tailored for semiconductor manufacturing
- Proven results in **PVD Cu process environments**
- Strong alignment with **ESG, sustainability, and safety standards**
- Backed by UCT's expertise in **precision cleaning and materials performance**

PARTNER WITH UCT FOR SUSTAINABLE PVD CLEANING SOLUTIONS

EcoCu Clean is redefining copper removal by combining **performance, sustainability, and cost efficiency** into a single integrated solution.

EcoCu Clean = Longer Part Life + Safer Process + Lower Operational Cost