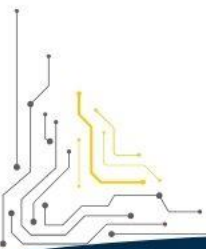
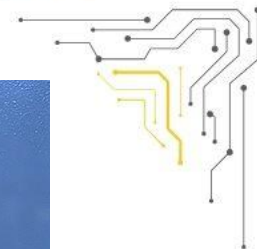
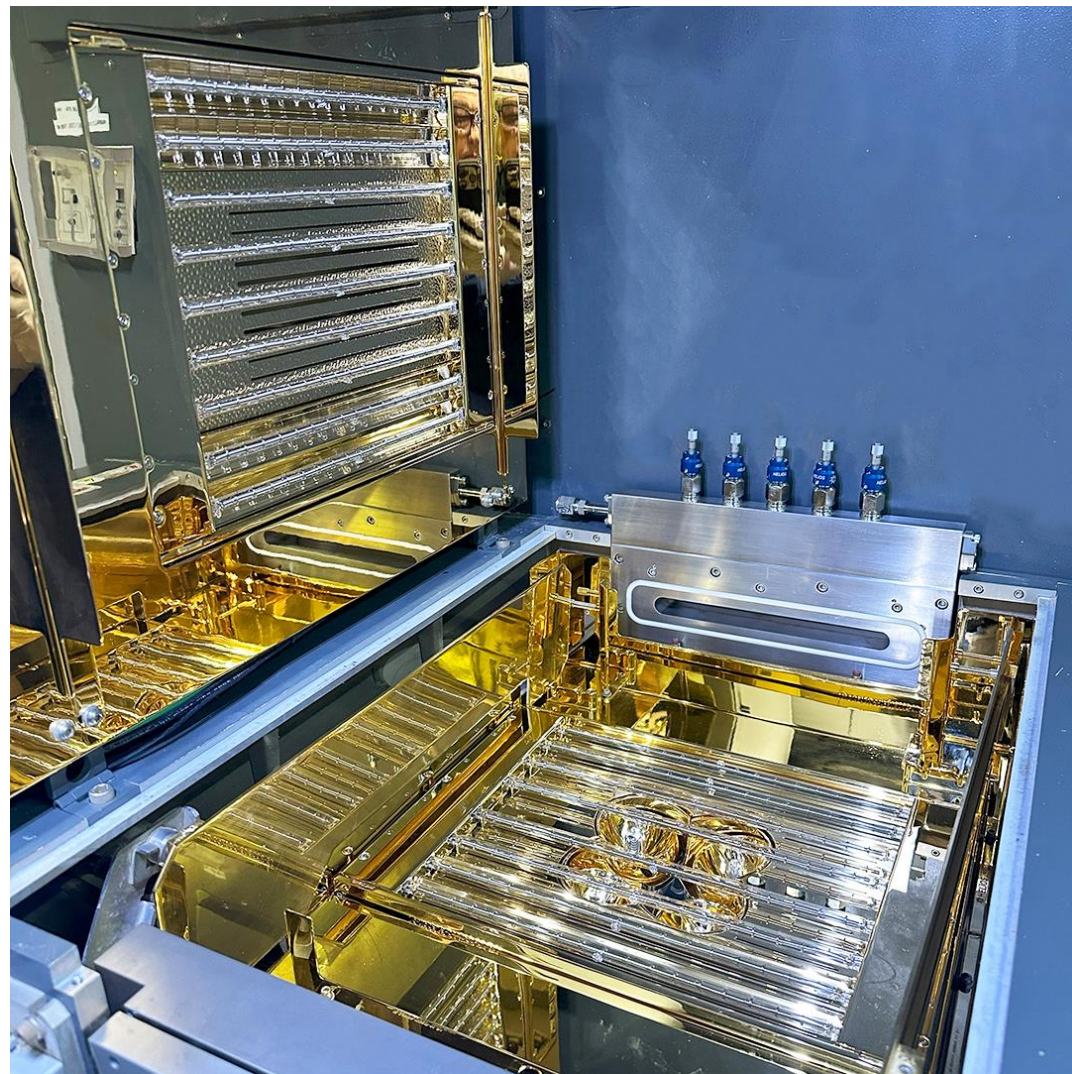




# Helios – Reactor GOLD

**The Solutions Company**

# Helios – Reactor GOLD





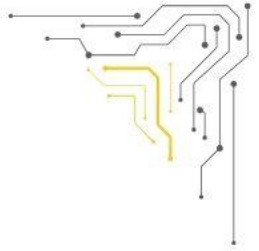
# Helios Reactor Gold

## The two central topics when discussing GOLD:

- 1. Reactor GOLD quality is critical to wafer performance, tunability, and manufacturing consistency**
- 2. GOLD configurations vary leading to inconsistencies in tool to tool performance, recipe optimization and film performance**





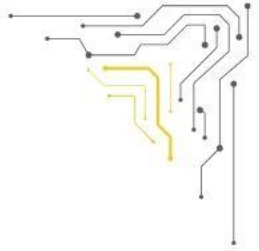


# Helios Reactor Gold

**Reactor GOLD quality is critical to wafer performance, tunability, and manufacturing consistency:**

- **Gold is used in reactors for its emissivity properties, temperature tolerance and corrosion resistance**
  - **Degraded or low quality Gold can cause thermal anomalies**
- **Degraded or poor quality Gold leads to different tuning of each reactor for the same recipe**
  - **Many Fabs must continually augment recipes to compensate for temperature changes / degraded Gold**

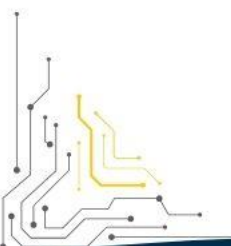


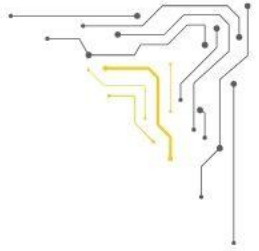


# Helios Reactor Gold

**GOLD configurations vary across tools, leading to inconsistencies in tool to tool performance, recipe optimization, manufacturing and film performance**

- **There are many configurations of gold available**
  - **Number of parabolic, stippling**
- **Most fabs have multiple configurations – not consistent across the fleet**
  - **Leads to performance issues as well as spares challenges and availability**
- **Many customers have changed their product mix for more demanding Epi films**
  - **More demanding films require greater temperature control gained from some gold configurations**





# Helios Reactor Gold

## Is it time to upgrade your Gold?

**Helios manufactures quality gold and in all configurations**

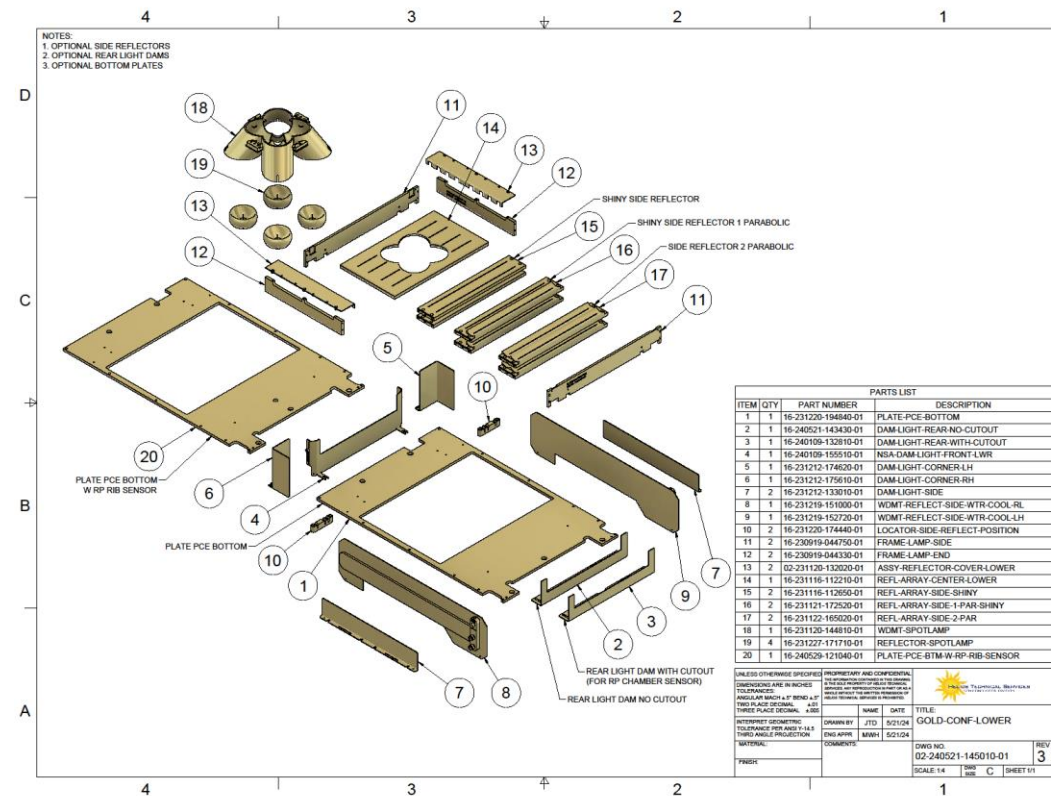
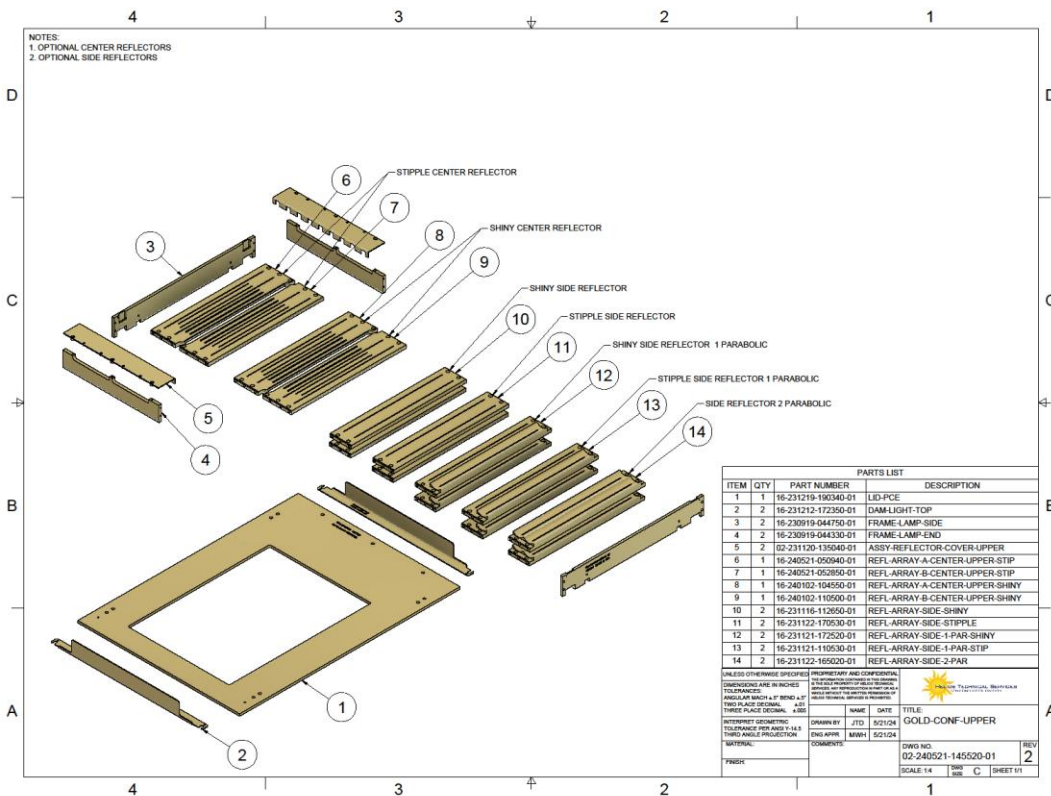
- **Let Helios supply you with the best gold configuration for your Processes**
  - **Create a Gold configuration best suited for your needs**
- **With your optimized Helios Gold configuration, you can stock useful spares and upgrade your other reactors in a timely manner**
- **Replace your old, worn out, or damaged gold**
- **Consistency and availability in spare gold**



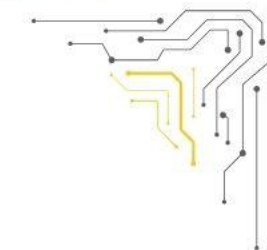


# Helios Reactor Gold

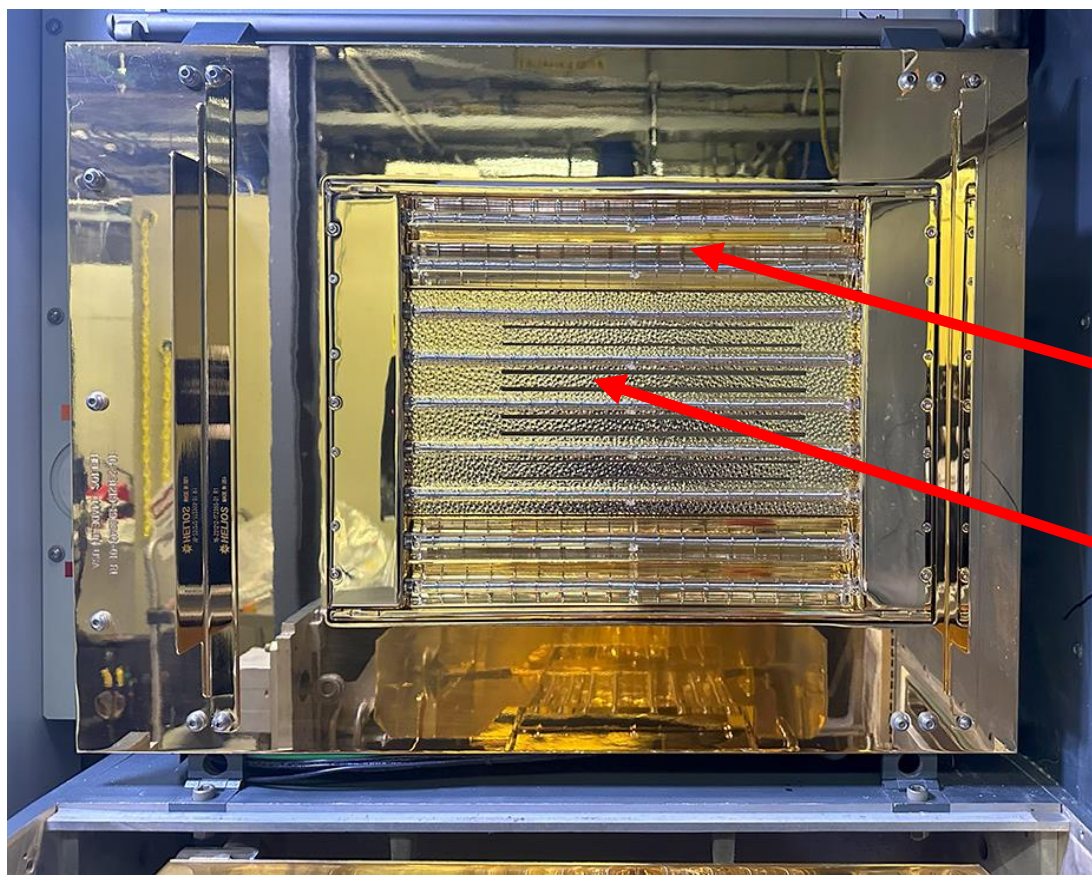
## All configurations (choices) for both Upper and Lower







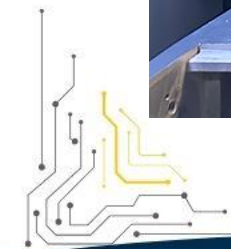
# Helios Reactor Gold - example



**Option for best performance and tunability**

**Dual Parabolic**

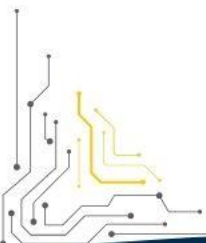
**Stippled, shinny**





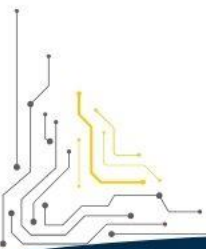
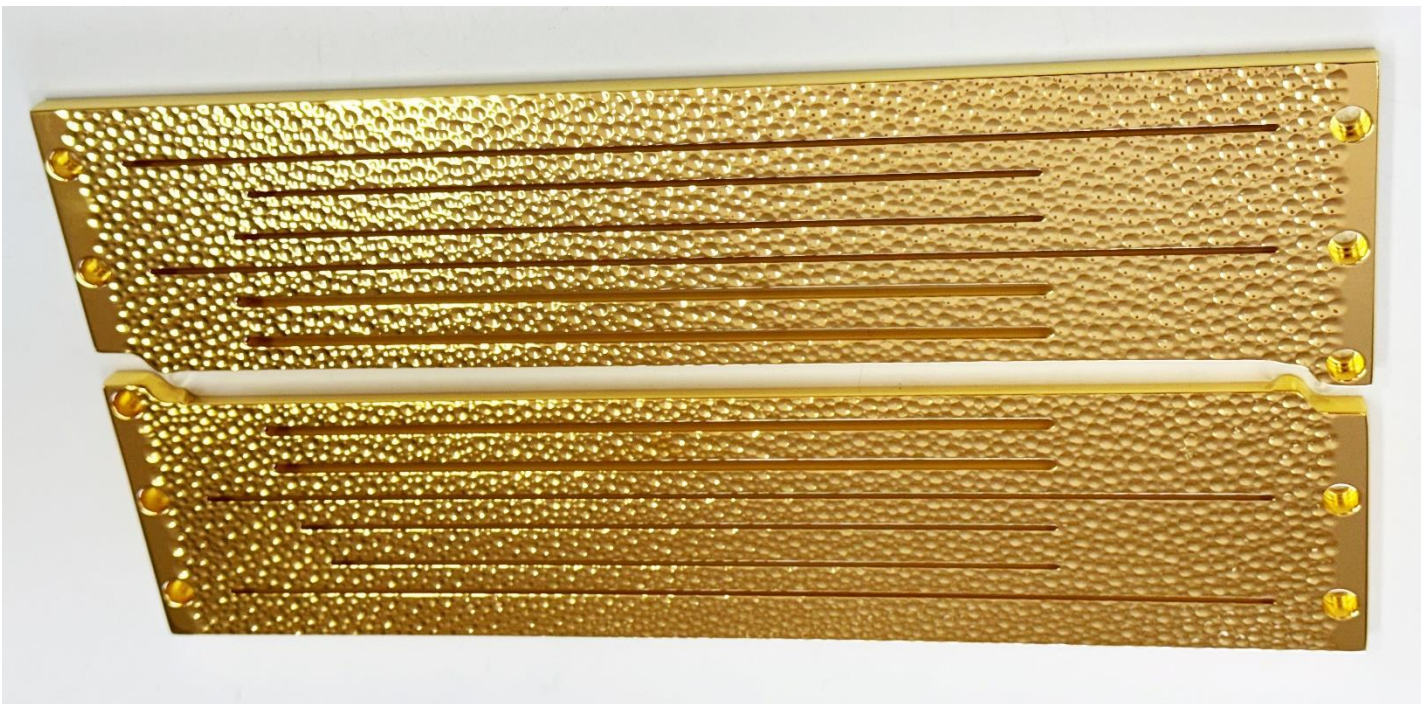


# Helios Reactor Gold - example





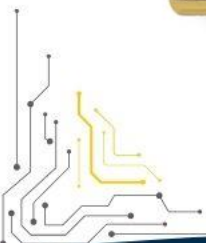
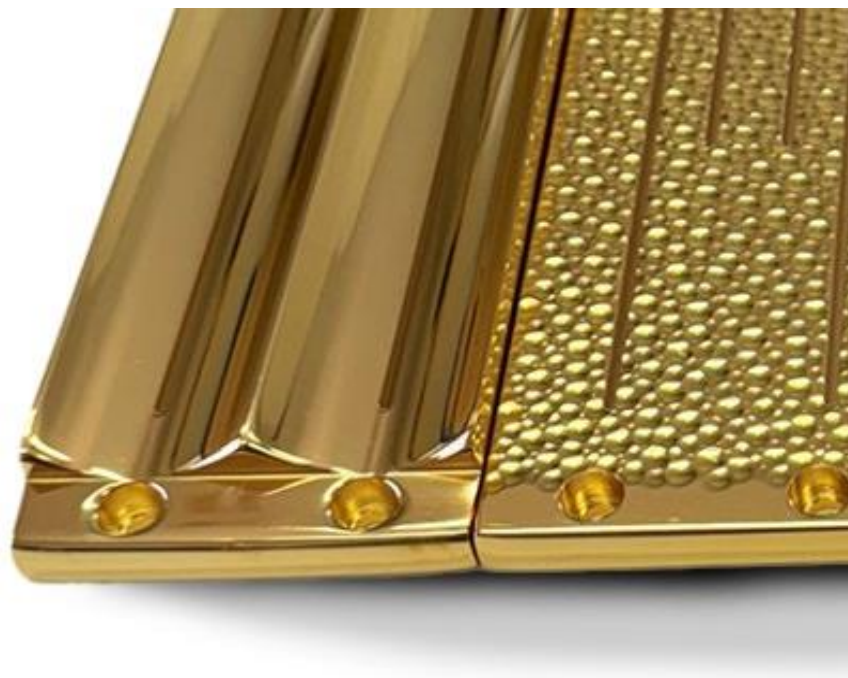
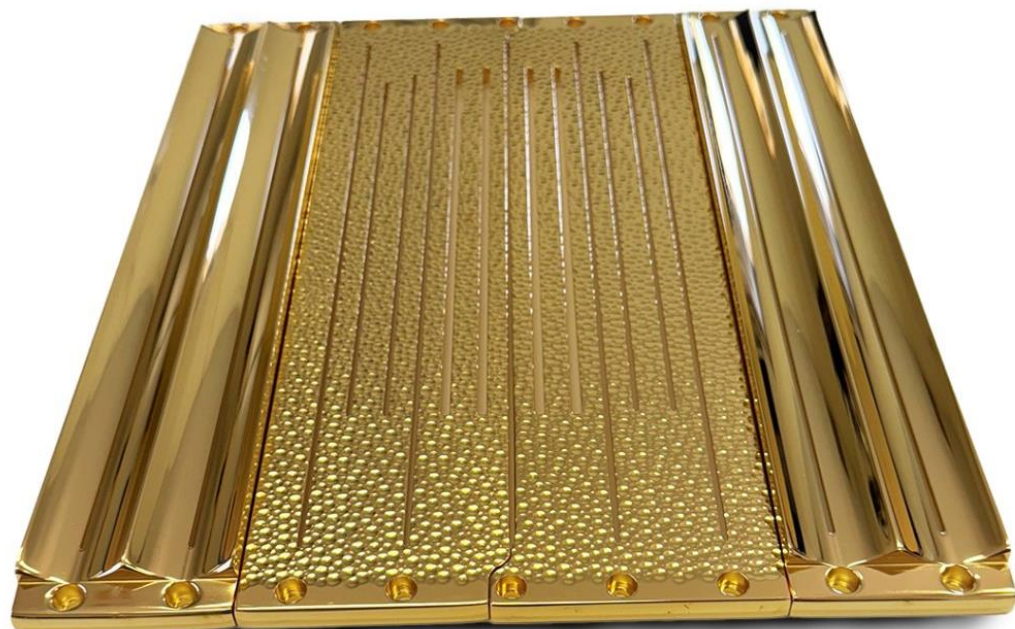
# Helios Reactor Gold - example







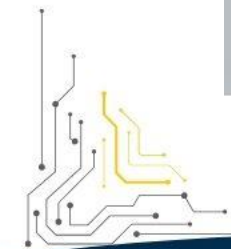
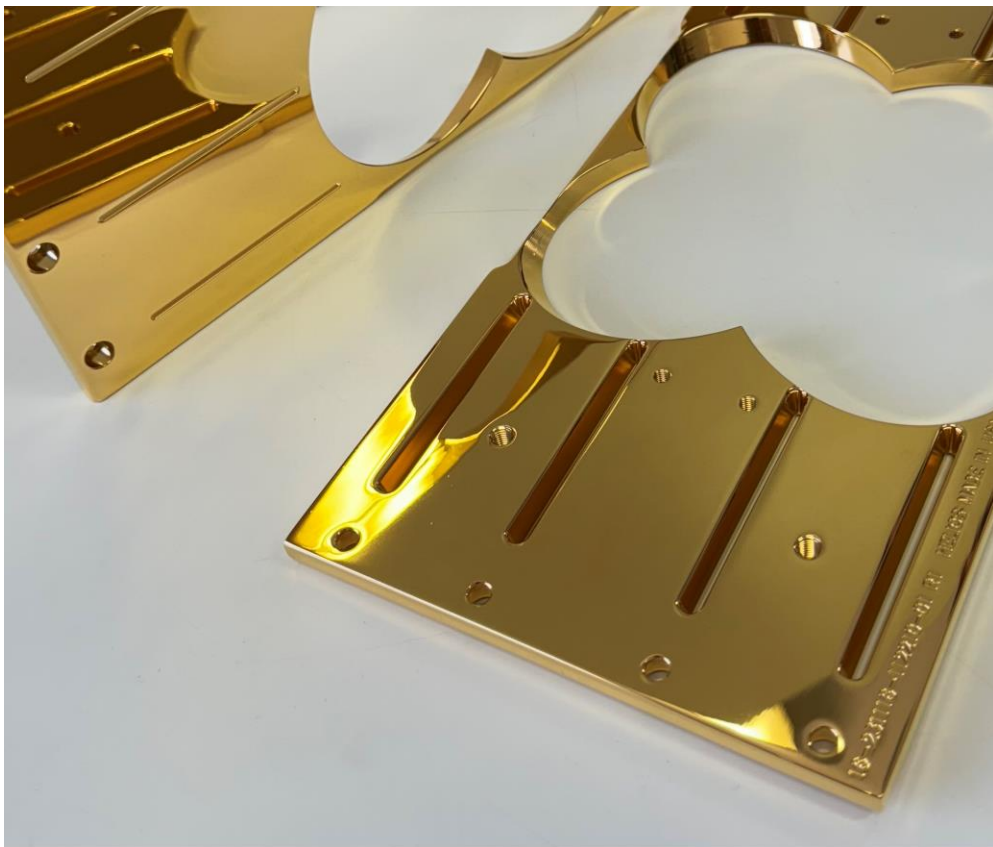
# Helios Reactor Gold - example





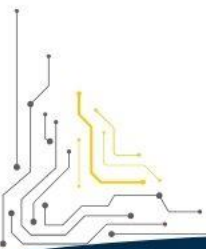
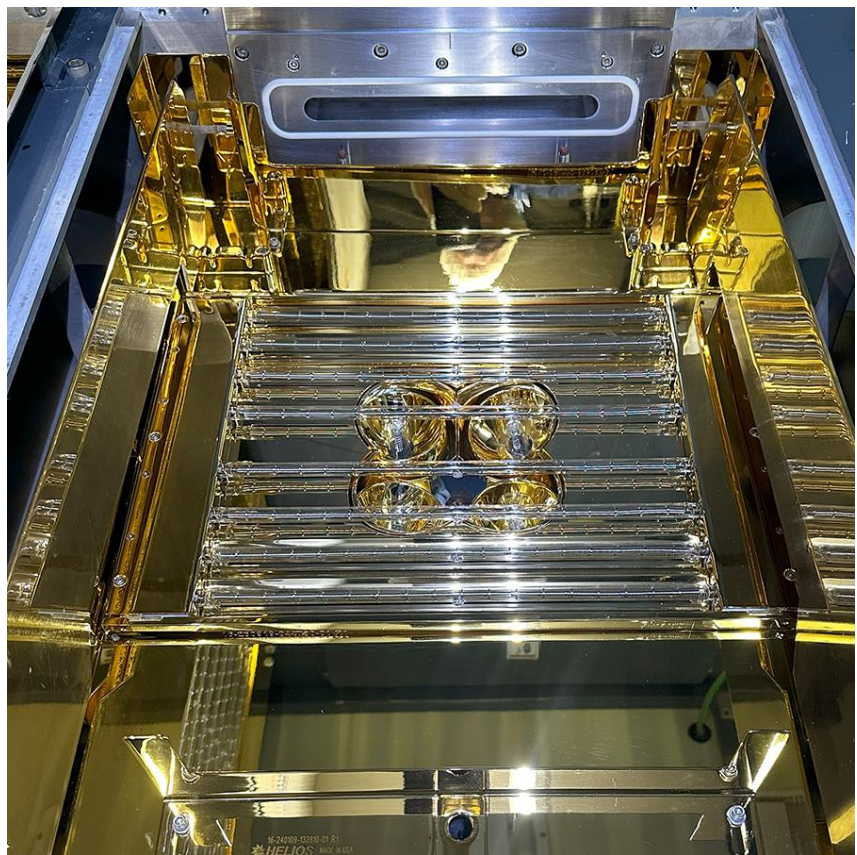


# Helios Reactor Gold - example





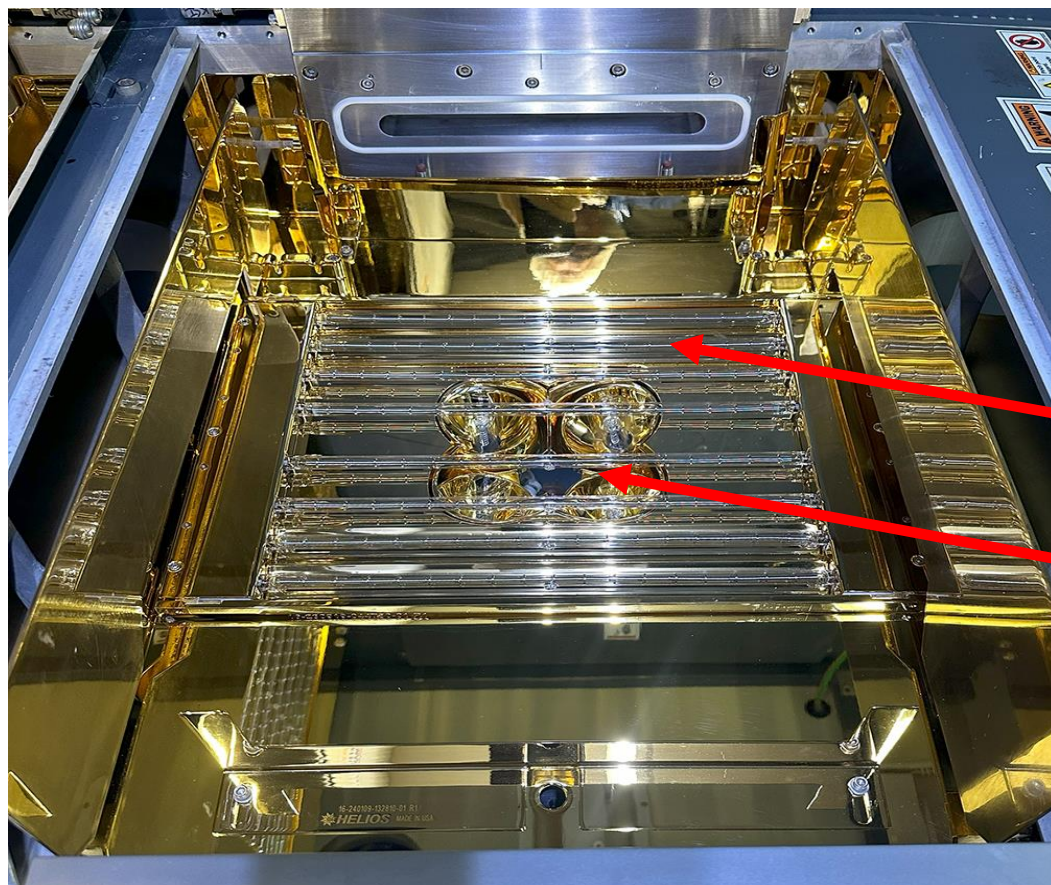
# Helios Reactor Gold - example







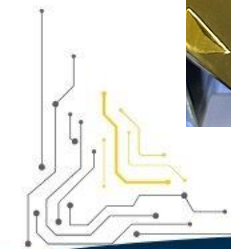
## Helios Reactor Gold - example



Option for best performance and tunability

Dual Parabolic

Adjustable Spotlamps







# Helios – Reactor Gold – Reconditioning

**Helios can typically recondition your current gold components for approximately 70% of new cost**



**Damaged and reconditioned shown**

