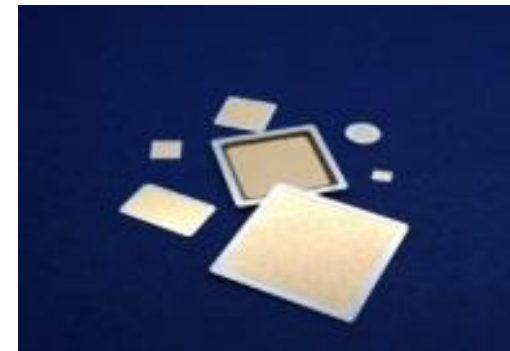
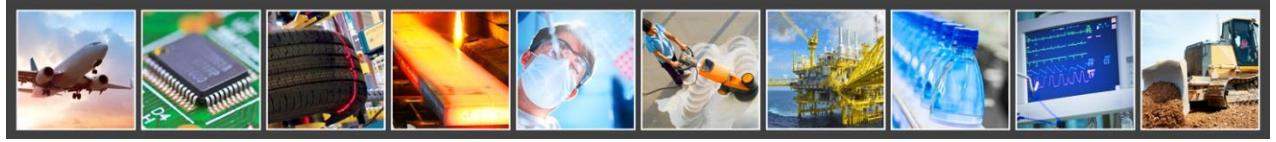




# Coining Metal & Ceramic Cover Assemblies

January 2016





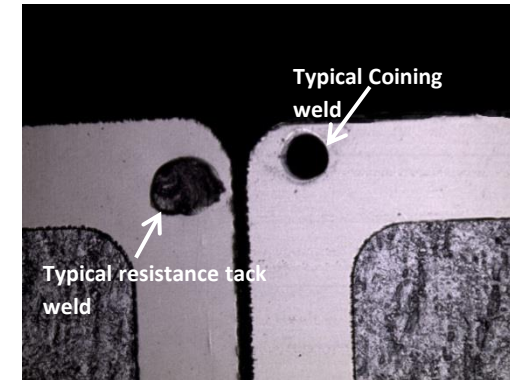
## Cover Assembly Product Offerings

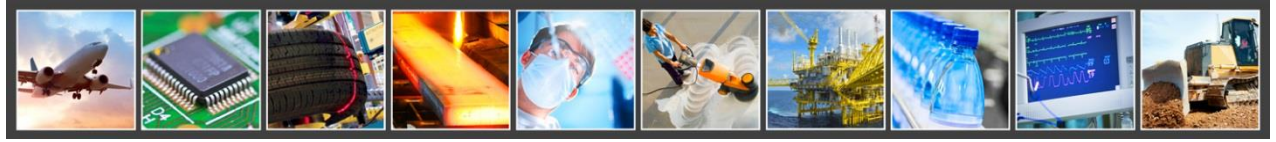
- *Product Line Includes*
  - *Ceramic Cover Assembly (CCCA)*
  - *Metal Cover Assembly (CCA)*
  
- *Coining Offers*
  - *Turnkey Solution*
    - *Cover + attached preform + getter*
  - *Attach Coining preform to customer supplied cover*
  - *Attachment service for customer provided cover, getter and preform*



## New Cover Assembly Manufacturing Process

- *Fully Automated*
  - *Robotic handling with vision system*
- *New Attachment Process Yields Superior Weld Characteristics*
  - *Minimal raised material in area of weld*
    - *helps to eliminate yield losses due to leakers*
  - *Tightly controlled weld penetration*
    - *stops at lid plating material (barrier layer)*





## Key Benefits

- *Consistent, Repeatable High Quality Parts*
- *Rapid Delivery Of Low- And High-Volume CCAs and CCCAs*
- *Continued Use of Qualified Materials*
  - *Use customer's existing material since weld attachment process is independent of base/barrier/plated materials and suppliers*
- *Higher Yield*
  - *Improved weld characteristics reduces leakers*



# Key Cover Assembly Specifications (inches)

		CCA	CCCA
Base	Material	Kovar™, Alloy 42, Cu/Mo, Al Alloys, Ti Alloys, Stainless Steel	Al2O3, AlN, BeO
	Metallization Std. 2 layer or 4 layer	Plated Ni, 50-350 μin	PVD/Evap Ni, 50-350 μin
		Plated Au, ≥ 50 μin	Plated/PVD/Evap Au, ≥ 50 μin
	Size	0.125" Sq - 4.0" Sq ±0.003"	
	Flatness	<0.001" for <0.500"; <0.002" for >0.500"	
	Burrs	<0.001"	
Preform	Alloy	Au/Sn, Au/Ge, Sn-based (SAC 305), Bi-based (BSA 421)	
	Size	0.125" Sq - 4.0" Sq ±0.003"	
	Thickness	0.0021" ±0.0003" (Typical)	
Assembly	# Welds	3 minimum	
	Position Accuracy	±0.003"	
	Weld Splatter	<0.001"	



# Key Cover Assembly Specifications (microns)

		CCA	CCCA
Base	Material	Kovar™, Alloy 42, Cu/Mo, Al Alloys, Ti Alloys, Stainless Steel	Al2O3, AlN, BeO
	Metallization Std. 2 layer or 4 layer	Plated Ni, 1.3 μ - 8.9 μ	PVD/Evap Ni, 1.3μ - 8.9 μ
		Plated Au, ≥ 1.3 μ	Plated/PVD/Evap Au, ≥ 1.3 μ
	Size	3,175 μ Sq - 101,600 μ Sq ±76.2 μ	
	Flatness	<25 μ for <12,700 μ; <51μ for >12,700 μ	
	Burrs	<25 μ	
Preform	Alloy	Au/Sn, Au/Ge, Sn-based (SAC 305), Bi-based (BSA 421)	
	Size	3,175 μ Sq – 101,600 μ Sq ±76μ	
	Thickness	53.3 μ ±7.6μ (Typical)	
Assembly	# Welds	3 minimum	
	Position Accuracy	±76 μ	
	Weld Splatter	<div style="border: 1px solid black; border-radius: 15px; padding: 5px; display: inline-block;">                     &lt;25 μ                 </div>	