



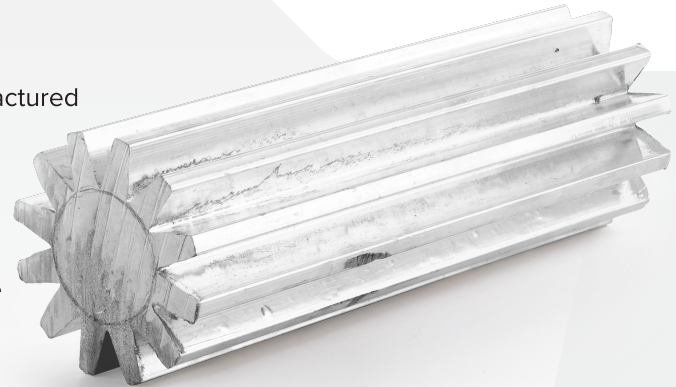
**Metallic Resources**

## Tin & Tin/Lead Anodes Product Bulletin

### Quality Manufacturing

Metallic Resources' cast and extruded plating anodes are manufactured using the purest tin and tin/lead solder alloy.

Cast anodes are available in a rectangular shape 1"x4" by a specified length up to 54" long. Extruded anodes are available in a variety of shapes in specified lengths up to 84" long. All anodes are drilled and tapped to accept a 3/8" diameter, 16 threads/inch hook. Plating hemisphere anodes are also available for basket plating applications.



### For Re-Flow & Protection

Metallic Resources' tin and tin/lead anodes are ideally suited for re-flow processing of printed circuit boards. They are also used extensively as an etch resistant material.

### Sludging Dramatically Reduced

Metallic Resources' tin and tin/lead anodes are manufactured from metals exhibiting the highest purity attainable, resulting in a dramatic reduction in sludging. Sludging is reduced because all metallic impurities, non-metallic oxides, and sulfides are removed by a proprietary manufacturing process prior to casting or extruding. Less sludge results in less energy consumption, greater plating process efficiency, less maintenance required for equipment, and lower waste treatment/disposal costs.

The manufacturing process also creates a product with smaller metal crystals packed into a much tighter crystal-line structure. This results in more uniform corrosion of the anode in the bath, and a even distribution of metallic ions in the plating bath.

The special shape of anodic plating nuggets is designed to eliminate "hang ups" in basket plating applications. The semi-circle shape allows for more surface contact to bring about greater current efficiency and a more uniform electrical current distribution throughout the basket. The result is a more uniform deposition of tin and/or tin/lead on the printed circuit board.

Metallic Resources special waffle anodes provide 1.67 times the surface area of a rectangular anode of the same dimensions for an increased anode to cathode ratio.

### Superior Quality

Metallic Resources unique solders outshine all others to provide greater cost effectiveness, higher finished goods quality, and superior production line performance.



**Metallic Resources, Inc.**



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Shape	Size (nominal dimensions)	Approximate Weight/Inch (lbs)	
		Sn	Sn/Pb
Rectangle	1" x 4"	1.05	1.28
Elliptical	1.5" x 3"	0.95	1.12
Oval	1.5" x 3"	1.05	1.28
Star	3" (12pt.)	1.36	1.64
	2.75" (16pt.)	1.05	1.28
Semisphere	1"	0.26	0.31
Waffle	1.3125" x 4.25	1.10	1.30

Pure Tin Anodes	
MRI Specification	
Sn	99.90% (min)
As	.0035 (max)
Sb	.0250 (max)
Au	.0020 (max)
Fe	.0080 (max)
Ni	.0080 (max)
Bi	.0100 (max)
Al	.0010 (max)
Cu	.0080 (max)
Ag	.0080 (max)
Zn	.0010 (max)
Cd	.0010 (max)
In	.0200 (max)
Pb	.0500 (max)

Tin/Lead Anodes	
MRI Specification	
Sn	62.50-63.50%
As	.0080 (max)
Sb	.0500 (max)
Au	.0020 (max)
Fe	.0100 (max)
Ni	.0080 (max)
Bi	.0120 (max)
Al	.0005 (max)
Cu	.0080 (max)
Ag	.0080 (max)
Zn	.0008 (max)
Cd	.0010 (max)
In	.0030 (max)
Pb	Balance

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