



IS-50M Beryllium Mammography Grade Foil

IS-50M® Beryllium —The scope of this specification is to define the characteristics of IS-50M material, designed specifically for mammography applications that are required to be radiographically artifact free at X-Ray energy levels down to 15 KeV. IS-50M material is made from high purity cast ingot and can be joined to a variety of customer-specified frame materials.

Beryllium of IS-50M specification shall contain a minimum beryllium content of 99.0% and conform to the following maximum chemical limits:

Compound	Maximum %	Compound	Maximum %
Beryllium Oxide	0.50	Lead	0.002
Aluminum	0.09	Magnesium	0.08
Calcium	0.02	Manganese	0.02
Carbon	0.10	Molybdenum	0.002
Chromium	0.04	Nickel	0.05
Cobalt	0.001	Silicon	0.06
Copper	0.01	Silver	0.0005
Iron	0.15	Zinc	0.02

Other metallic impurities (0.04% maximum each) as determined by normal spectrographic techniques. Beryllium may be determined by difference (i.e. 100% minus other elements). Please note that various test methodologies (Leco, DC Plasma, etc.) are used by our laboratory to determine trace element concentrations. Copies of the laboratory's NADCAP and A2LA certifications are available at www.materion.com

Foil manufactured to IS-50M specification is available as flat stock in standard thickness ranges from 0.020 – 0.125 inches (0.5 – 3.2mm). Foil is supplied cut to shapes such as rectangles, discs and other configurations. The material is available only in vacuum-tight integrity.

Vacuum-Tight foil shall have no detectable leakage through the aperture when tested with a helium mass spectrometer leak detector calibrated to a sensitivity of 1×10^{-9} atm-cc/sec.

Depending on assembly geometry, beryllium sheets can be joined to customer-designed frames using proprietary Materion Electrofusion high-temperature brazing techniques, where braze alloy migration of no more than 0.060 inches (1.5mm) into the window's clear aperture is guaranteed. Brazed window assemblies are bakeable to 1,200°F (650°C).

Assemblies joined using Materion Electrofusion's proprietary diffusion bonding process are bakeable to 840°F (450°C) and maintain a clear

aperture that matches the frame's physical aperture. All vacuum joints are guaranteed vacuum-tight. Beryllium surface shall be uniform in quality and condition, clean, sound, and free from foreign materials, or internal and external imperfections that are detrimental to fabrication or performance. Standard surface finish shall be 63 microinches R_a or better. All material is appropriately identified, packaged, and labeled to comply with applicable government regulations and Materion Electrofusion standard procedures. Note that various thicknesses may be available in different surface finishes. Contact Materion Electrofusion for available assembly sizes, tolerances and finishes.

Feature	Dimension (Inches)		Tolerance (Inches)
	From	To	
Thickness	0.020	0.025	0.002
	0.026	0.055	0.003
	0.056	0.075	0.004
	0.076	0.125	0.006

Tighter tolerances on disc and straight-cut foils are available on request. Please contact Materion Electrofusion for price and availability.

Health & Safety Note:

Handling solid beryllium material poses no significant health risks. However, as with many other industrial materials—materials containing beryllium may pose a health risk, if and when recommended safe handling practices are not followed and adhered to. Inhalation of airborne beryllium may cause a serious lung disorder in susceptible individuals. The Occupational Safety and Health Administration (OSHA) have set mandatory limits on occupational respiratory exposures. Read and follow the guidance set forth in the Material Safety Data Sheet (MSDS) before working with beryllium. For additional information on safe handling practices or technical data on beryllium, contact Materion Electrofusion.

ELECTROFUSION
 44036 South Grimmer Boulevard
 Fremont, CA 94538-6346
 +1 510.623.1500
electrofusion@materion.com

MATERION CORPORATION
www.materion.com/electrofusion

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