

# IF-1<sup>®</sup> Beryllium / Ultrahigh Purity Foil Specifications

IF-1<sup>®</sup> Beryllium — The scope of this specification is to define the characteristics of IF-1 grade beryllium foil that is made from ultrahigh purity input material.

Vacuum cast beryllium ingots of IF-1 specification shall contain a minimum beryllium content of 99.8% and conform to the following maximum chemical limits:

Compound	Maximum %	Compound	Maximum %
BerylliumOxide	0.06	Magnesium	0.006
Aluminum	0.01	Manganese	0.003
Calcium	0.02	Molybdenum	0.001
Carbon	0.03	Nickel	0.02
Chromium	0.0035	Silicon	0.01
Cobalt	0.0005	Silver	0.0005
Copper	0.005	Titanium	0.001
Iron	0.03	Zinc	0.01
Lead	0.0005		

Other metallic impurities as determined by normal spectrographic techniques. Beryllium may be determined by difference (i.e. 100% minus other elements). Please note that detailed analytical procedures used by BW-Electrofusion Products are available upon request.

Foil manufactured to IF-1 specification is available as flat stock in standard thickness range of 0.0001 – 0.010 inches (2.5 – 254 µm). Foil is supplied cut to shapes such as rectangles, discs and other configurations. The material is available in three integrity grades classified as vacuum-tight, optically-dense, and as-rolled in the following thickness ranges:

Vacuum-Tight	0.0003 – 0.010 inches (7.6 – 254 µm)
Optically-Dense	0.0002 – 0.010 inches (5.1 – 254 µm)
As-Rolled	0.0001 – 0.010 inches (2.5 – 254 µm)

**Vacuum-Tight** foil shall have no detectable leakage through the foil when tested with a helium mass spectrometer leak detector calibrated to a sensitivity of 1x10<sup>-9</sup> atm-cc/sec.

**Optically-Dense** foil shall have no detectable light penetration when illuminated with a high-intensity light source applied to a restricted area on one side while viewed from the opposite side in a darkened room environment.

**As-Rolled** foil material is supplied in an as produced condition and is neither inspected nor guaranteed to be vacuum-tight or optically-dense.

Foil 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 40 microinches R<sub>a</sub> or better. All material is appropriately identified, packaged, and labeled to comply with applicable government regulations and Brush Wellman Electrofusion standard procedures. Note that various thicknesses may be available in different surface finishes. Contact Brush Wellman Electrofusion for available foil sizes, tolerances, and finishes.

Feature	Dimension (Inches)		Tolerance (Inches)
	From	To	+ / -
Thickness	0.0001	0.0009	0.0002 / 0
	0.0009	0.0010	0.0002 / 0.0001
	0.002	0.010	10%
Diameter	0.5	4.0	0.003
Length/Width	<	3.0	0.015
	3.0	>	0.030

Tighter tolerances on disc and straight-cut foils are available on request. Please contact Brush Wellman-Electrofusion Products 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 Brush Wellman Electrofusion Products.*

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