

IF-5 High-Purity Beryllium Foil

Materion IF-5™ high-purity, ingot-derived beryllium foil is used for analytical and medical X-ray applications where greater image clarity is desired and/or where lower energy X-rays are used. IF-5 foil is provided with a surface that is uniform in quality and condition on a piece-by-piece basis for pieces cut to size. It is clean, sound and free from visible foreign materials or imperfections that are detrimental to fabrication or performance. Slight variations in coloration within individual pieces may be present.

Chemical Composition (Weight Percent)

IF-5 foil contains a minimum beryllium content of 99.5% and conforms to the following maximum chemical limits:

Compound	Maximum %	Compound	Maximum %
Beryllium Oxide	0.20	Lead	0.002
Aluminum	0.05	Magnesium	0.049
Calcium	0.01	Manganese	0.01
Carbon	0.06	Molybdenum	0.005
Chromium	0.01	Nickel	0.02
Cobalt	0.001	Silicon	0.04
Copper	0.01	Silver	0.001
Iron	0.08	Titanium	0.03

*Rev C specification. 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 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.

Forms Available

Foil and sheet manufactured to IF-5 specification is available as flat stock in specific gauges as noted below. IF-5 foil is supplied in shapes such as rectangles, discs and other configurations. The material is available only in vacuum-tight integrity grade.

Vacuum-tight foil will have no detectable leakage through the foil when tested with a helium mass spectrometer leak detector calibrated to a sensitivity of 1×10^{-9} atm-cc/sec. Leak integrity up to 1×10^{-10} atm-cc/sec is available as an option for foil at 0.008" (0.2 mm) and 0.010" (0.25 mm) gauge.

Foil supplied in sizes of 4 sq. in. (25.8 sq. cm) or larger come in an as-is condition which may have cosmetic imperfections and significant variation of color within each sheet. The formation of oxides is a naturally occurring process when beryllium is exposed to atmosphere.

Pieces of foil will be cut from sheets which have been determined to meet the specified thickness based on the sheet mean thickness measurement plus two standard deviations.

Data Sheet continued

Surface roughness is not specified. Surface roughness of 64 micro-inches Ra (1.6 μm Ra) is available as an option for foil that is 0.005" (0.13 mm) thick or thicker. Surface roughness of 32 micro-inches Ra (0.8 μm Ra) is available as an option for foil that is 0.008" to 0.012" (0.2 to 0.3 mm) thick.

Parts shall be visibly flat to the unaided eye.

We may be able to accommodate requests if specific cosmetic requirements or other characteristics are required. For additional technical information and details on foil sizes, tolerances, finishes and other specifications, contact us at +1.800.375.4205 (+1.216.383.6800). Any custom material requirements must be agreed upon by both parties before being produced.

Available Gauges and Dimensional Tolerance

Feature	Dimension (inches)	Tolerance (inches)	Dimension (mm)	Tolerance (mm)
Thickness	0.008	± 0.0008	0.2	+0.024 / -0.017
	0.010	± 0.002	0.25	± 0.05
	0.012	± 0.002	0.3	+0.06 / -0.05
	0.020	± 0.002	0.5	+0.06 / -0.04
	0.032	± 0.002	0.8	+0.06 / -0.04
Diameter*	≤ 6	± 0.003	≤ 152	± 0.08
	> 6	± 0.005	> 152	± 0.13
Length/Width*	< 18	± 0.01	< 457	± 0.25
	≥ 18	Contact us	≥ 457	Contact us

*Tighter tolerances may be available upon request.

Related Information

All material is appropriately identified, packaged and labeled to comply with applicable government regulations and Materion's standard procedures.

Health and Safety

Processing beryllium-containing alloys poses a health risk if safe practices are not followed. Inhalation of airborne beryllium can cause serious lung diseases in some individuals. Occupational safety and health regulatory agencies worldwide have set mandatory limits on occupational respiratory exposures. Read and follow the guidance in the Safety Data Sheet (SDS) before working with this material. The SDS and additional important beryllium health and safety information and guidance can be found at berylliumssafety.com, berylliumssafety.eu and Materion.com. For questions on safe practices for beryllium-containing alloys, contact the Materion Product Stewardship Group at +1.800.862.4118 or contact us by email at Materion-PS@Materion.com.

Disclaimer:

Only the buyer can determine the appropriateness of any processing practice, end-product or application. Materion does not make any warranty regarding its recommendations, the suitability of Materion's product, or its processing suggestions for buyer's end product, application or equipment.

The properties presented on this data sheet are for reference purposes only, intended only to initiate the material selection process. They do not constitute, nor are they intended to constitute, a material specification. Material will be produced to one of the applicable industry standards, if any, listed in the Industry Standards and Specification section.

Actual properties may vary by thickness and/or part number. Please contact your local sales engineer for detailed properties to be used in simulation.

Any properties marked as preliminary are subject to change at any time as the manufacturing process is further refined.