

## MOLYBDENUM POWDER METALLURGY PRODUCTS

# PURE MOLYBDENUM

## Foil F-21-5

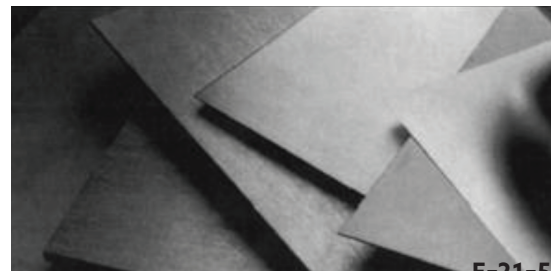
Rolled molybdenum foil from 0.001 inches through 0.0049 inches thick produced from pressed and sintered powder metallurgy sheet bar.

### CHEMICAL CHARACTERISTICS<sup>1</sup>

(Mass fraction in % [cg/g]; ppm [ $\mu$ g/g])

The chemical composition of the molybdenum powder used for producing sheet bar shall conform to the following limits:

Molybdenum (By Difference)	min.	99.95 %
Mg	max.	0.001 %
Mn	max.	0.001 %
Ni	max.	0.002 %
Al	max.	0.002 %
Cu	max.	0.002 %
Pb	max.	0.002 %
Ti	max.	0.002 %
Ca	max.	0.003 %
Si	max.	0.003 %
Sn	max.	0.003 %
Cr	max.	0.005 %
C	max.	0.005 %
Fe	max.	0.005 %



F-21-5

### STRUCTURE

Sheet will be supplied in a stress-relieved condition unless otherwise requested.

<sup>1</sup> Information on testing methods on request.

## MECHANICAL PROPERTIES

Tensile tests will be conducted at room temperature (65°F - 85°F) using a strain rate of 0.002 to 0.010 in/in/min through 0.6 % offset and 0.02 to 0.05 in/in/min to fracture. Tensile properties will be determined on specimens taken transverse to the final rolling direction of the sheet. Test specimens will be prepared and tested according to ASTM Specification No. E-345. The gage length will be 5 inches for Type B tensiles and 2 inches for Type A tensiles.

Tensile properties shall meet the following minimum values:

Thickness (inches)	Tensile Strength (psi Minimum)	Yield Strength (.2% Offset) (psi Minimum)	Elongation (% Minimum)
0.001	115,000	95,000	----
Over 0.001 to 0.002	115,000	95,000	1
Over 0.002 to 0.003	115,000	95,000	2
Over 0.003 to 0.0049	115,000	95,000	3

## DIMENSIONAL TOLERANCES

### THICKNESS TOLERANCE:

Thickness (inches)	Tolerance (inches)
0.001	± 0.0001
Over 0.001 to 0.002	± 0.0002
Over 0.002 to 0.003	± 0.0004
Over 0.003 to 0.0049	± 0.0005

### WIDTH TOLERANCE:

Thickness (inches)	Up to 6 inches wide (inches)	Over 6 inches wide (inches)
0.001 to 0.0049	± 0.005	± 0.010

### LENGTH TOLERANCE

For specified lengths, the tolerance for all sizes is + 0.0625 - 0 inches per foot of length.

### APPLICABLE WIDTHS AND LENGTHS

Minimum width is 0.250 inches. Maximum width is 12 inches. If random lengths are specified, the minimum length supplied will be 10 inches. Maximum length depends on thickness specified. Molybdenum foil shipped as a coil will be on a core with a minimum inside diameter of 3 inches and a minimum coil length of 10 feet.

### SURFACE CONDITION

Standard foil will have a uniform finish and be free of surface defects (slivers, cracks, pits and scratches) that cannot be removed with minor conditioning. The surface will be bright (approximately Ra 10 micro inch) and free from contamination. Photo etch quality, available on request, will not require any conditioning and will be suitable for photo etching applications in maximum lengths of 3 feet. Photo etch quality is also available in mirror finish on request.

## IDENTIFICATION

The material will be identified with appropriate specification number, ingot or lot number, and nominal size. Packaging will be marked with the name of the customer and the purchase order number.

**Hazards identification in Advertising (Directive 67/548/EEC Article 26, Directive 1999/45/EC Article 13 and REGULATION (EC) No 1272/2008 Article 48) none.**

## REJECTION

Elmet Technologies must receive written notification of rejected material with the reason for rejection. Elmet Technologies reserves the right to inspect rejected material at the customer's plant for claim validation. The material may be returned only after proper authorization.



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