



MO-EM MOLYBDENUM WIRE

GENERAL ELECTRIC COMPANY

Components/Quartz Marketing
and Sales Operation

PRODUCT DATA SHEET 7220-A

April, 1993

(Replaces 7220-A, 4/85)



This array of parts was produced by electrical discharge machining using molybdenum wire as the cutting tool.



In operation, the molybdenum wire maintains sufficient strength at high temperatures under adverse conditions to provide precise cuts in carbide, steel, copper and other materials.

Mo-EM is a molybdenum wire that is specifically processed by General Electric for use as a moving cutting edge in electrical discharge machining operations.

GE Mo-EM exhibits higher tensile strengths, superior resistance to high temperature softening, and the ability to withstand spark erosion better than many products currently used for these demanding applications. The properties in Mo-EM are achieved through special chemistry and processing controls designed to provide maximum productivity for EDM equipment. Mo-EM's electro-chemically polished surface also contributes to EDM productivity by signifi-

cantly minimizing wire guide and electrical contact wear.

Molybdenum wire is commonly used for cutting carbide, steel, or copper when high accuracy and fine finish are required, and for applications requiring exceptionally small corner radii. Because of molybdenum's high tensile strengths, it withstands greater wire tensions than other more commonly used materials. It also provides greater accuracy and more consistent results in machining tall workpieces. Molybdenum wire also eliminates workpiece plating that sometimes occurs with other electro-discharge machining wires.

Specific advantages of Mo-EM molybdenum wire include:

- Ability to maintain its stiffness at high tension under a variety of operating conditions for improved corner cutting.
- Uniform diameter from one end of spool to the other, allowing users to make intricate cuts with constant kerf width.
- Availability in long continuous lengths.

- Carefully controlled chemistry and homogeneous processing provides a uniform quality product from one lot of material to another.
- Uniform surface finish and tensile strength permit users to maintain reproducible working parameters such as tension, current density, and linear travel speed.
- Ability to reduce wire speeds, minimizing wire consumption.

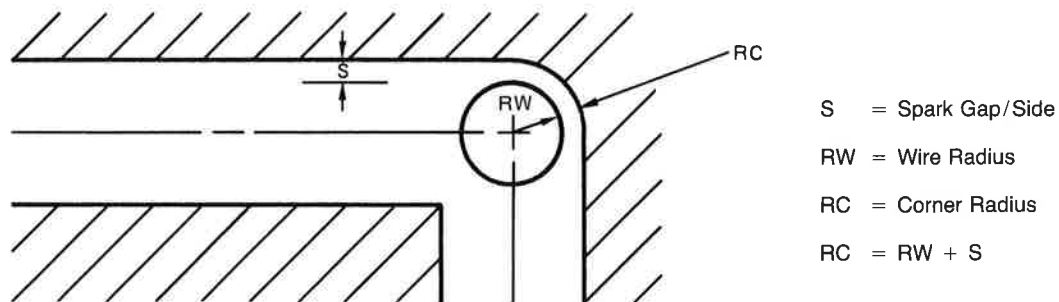
RELATIVE VALUES OF FIVE EDM CUTTING MATERIALS

	Young's Modulus of Elasticity*	Electrical Conductivity (DACS)	Density, Grams/CC	Ultimate Tensile Strength, PSI
Brass	15×10^6 PSI	33%	8.5	74,000
Copper	17×10^6 PSI	100%	8.9	55,000
Steel	30×10^6 PSI	18%	7.8	120,000
Molybdenum	46×10^6 PSI	30%	10.2	230,000
Tungsten	59×10^6 PSI	27%	19.3	435,000

*Young's Modulus is a measure of the stiffness of wire.

Note that molybdenum offers more than a 310% improvement in tensile strength over brass with similar electrical conductivity.

CORNER CUTTING



Molybdenum wire is used to the best advantage when cutting very small corner radii. These cuts require a small diameter wire, 0.006" (0.152mm) diameter or less, with high tensile properties. Lower tensile materials, such as brass or copper, often experience excessive breakage in these applications.

As illustrated above, the smallest internal corner that can be cut is equal to the wire radius plus the spark gap. When machining tall workpieces, the tension levels required are often beyond the strength limits of brass and copper wire, yet well within the capabilities of molybdenum wire.


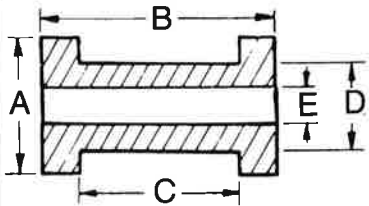

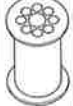
AVAILABILITY

General Electric Mo-EM molybdenum wire is available in diameters from 1 mil through 6 mil in one mil increments. Standard tolerances are $\pm 2\%$ by diameter. Other diameters and tolerances are available on special orders. A variety of standard containers are available, including the non-conductive 4K reel, Lexan® mandrel spool, and the 1S plastic spool.

Specified quantities per container other than those shown on the table at the right are available upon request. Mo-EM can also be custom wound on special containers supplied by the customer. Individually sealed packages protect the wire from impact damage, oxidation, and corrosion.

Maximum GE Container Loadings

Wire Dia.	Meters			Grams		
	Mandrel Spool	4K Reel	1S Spool	Mandrel Spool	4K Reel	1S Spool
1 mil (0.025mm)	50,000	N/A	60,000	400	N/A	500
2 mil (0.051mm)	20,000	N/A	25,000	500	N/A	600
3 mil (0.076mm)	10,000	90,000	12,000	500	4500	600
4 mil (0.102mm)	6,000	50,000	7,200	500	4500	600
5 mil (0.127mm)	3,700	34,000	4,500	500	4500	600
6 mil (0.152mm)	3,000	23,000	3,200	500	4500	600

	Name	Material	GE Drawing No.	Approx. Weight In Grams	CONTAINER DIMENSIONS						Designation of Container Dimensions
					Units	Flange Diameter (A)	Width (B)	Traverse (C)	Barrel (D)	Hole (E)	
	Mandrel Spool	Lexan®	601-C-415	188	mm	82.55	57.15	41.25	49.48	25.48	
					in.	3.250	2.250	1.624	1.948	1.003	
	4K Reel	Lexan®	601-C-358	774	mm	152.40	96.82	76.20	110.62	15.90	
					in.	6.00	3.812	3.00	4.355	0.626	
	1S Spool	Plastic	601-B-1224	75	mm	63.50	85.73	76.20	44.45	15.88	
					in.	2.50	3.375	3.00	1.75	0.625	

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TECHNICAL ASSISTANCE

Let GE work with you. We have the products, the facilities, and the depth of experience to provide reliable, repeatable quality and competent service. Send your specifications and requirements to the Dover Wire Plant listed below, attention of Manager-Engineering.

ORDERING INFORMATION

To order Mo-EM Wire for EDM applications, contact your Lamp Components sales representative or:

Domestic

General Electric Company
Dover Wire Operation
200 West Broadway
Dover, Ohio 44622
Phone: (216) 364-0224

Europe
GENERAL ELECTRIC
Components Marketing & Sales Oper
21a High Street East, Uppingham
Leicestershire LE15 9PY, England
Telef: 0572-823748/9
Telex: 34362 (GELCOS)
Telefax: 0572-823836

International

GE Components Marketing
& Sales Operation
21800 Tungsten Road
Cleveland, OH 44117
U.S.A.
Telex: 985569
(GECOLC EUCD)
Phone: (216) 266-3295
Fax: (216) 266-3372



GE Lighting