Downloaded from http://www.everyspec.com

INCH-POUND
J-W-1177/13B
June 10, 1988
SUPERSEDING
J-W-1177/13A
September 27, 1976

FEDERAL SPECIFICATION SHEET

WIRE, MAGNET, ELECTRICAL, CLASS 200, TYPE K, POLYESTER, POLYESTER-IMIDE OR POLYESTER-AMIDE-IMIDE OVERCOATED WITH POLYAMIDE-IMIDE, RECTANGULAR

This specification is approved by the Commissioner, Federal Supply Service, General Services Administration, for the use of all Federal agencies.

The requirements for acquiring the wire described herein shall consist of this specification and the latest issue of J-W-1177.

Classification:	Class 200; type K2 (heavy), type K4 (quadruple); rectangular.
Insulating materials:	The conductor shall be coated with a dual film. The underlying coating shall be based on a polyester, polyester-imide or a polyester-amide-imide resin. The superimposed coating shall be based on a polyamide-imide resin.
NEMA/ANSI equivalent:	All test requirements except thermal endurance are equivalent to MW-36 or NEMA MW 1000.
General requirements:	See J-W-1177 for general requirements, quality assurance provisions, and packaging.

Requirements:

Characteristics	Test procedure, see J-W-1177	Wire sizes, AWG	Requirements
Dimensions	4.7.1.2	All	Rectangular wire: (a) Conductor dimensions and radii - see table I. (b) Conductor tolerances - see table II. (c) Increase in thickness and width - see table III. Square wire: (a) Conductor dimensions, radii and tolerances - see table IV. (b) Increase in thickness and width - see table IV.

AMSC N/A FSC 6145

DISTRIBUTION STATEMENT A Approved for public release; distribution unlimited

Downloaded from http://www.everyspec.com

Requirements: (Continued)

Characteristics	Test procedure, see J-W-1177	Wire sizes, AWG	Requirements
Adherence and flexibility	4.7.2.1	All	No cracks visible in the film coating.
Elongation	4.7.5	All	Not less than 32 percent.
Heat shock	4.7.4	All	No cracks visible in the film coating after 15 percent elongation followed by conditioning at 220°C.
Dielectric strength	4.7.9		Values shall be not less than those shown in table V.1/
Bend	4.7.3		Values shall be not less than those shown in table V after bending.2/
Thermoplastic flow	4.7.8	18 AWG	Median not less than 300°C with heavy film coated wire.
Solubility	4.7.12	All	Specimens shall not soften sufficiently to expose bare conductor when immersed in xylene or 50/50 parts by volume xylene/ethyl Cellosolve.
Dielectric strength at temperature	4.7.14	18 AWG	Heavy film coated wire shall average not less than 4275 volts.
Thermal endurance	4.7.15.1	18 AWG	200°C minimum with heavy film coated wire.
	4.7.15.3	All	220°C minimum.

1/ Applicable to heavy coated sizes with a thickness less than 0.049 inch or a width greater than 0.492 inch or a width to thickness ratio greater than 5:1, and all quadruple.
2/ Applicable to all other heavy coated sizes not covered by "1/".

Downloaded from http://www.everyspec.com

TABLE I. Dimensions and radii for rectangular wire.

Nominal thickness	Nominal width																																											
Inch	.063	1/.067	.071	1/.075	.079	1/.083	.088	1/.093	.098	1/.104	.110	1/.118	.124	1/.132	.140	1/.148	.157	1/.167	.177	1/.187	.197	1/.209	.220	1/.236	.248	1/.264	.280	1/.295	.315	1/.335	.354	1/.374	.394	1/.417	.441	1/.465	.492	1/.520	.551	1/.591	.630	1/.669	.709	1/.748
0.025																																												
.028																																												
.031																																												
.035																																												
.039																ROUNDED EDGES																												
.044																																												
.049																																												
.055																																												
.063																																												
.071																																												
.079													0.020																															
.088																																												
.098																																												
.110																0.025															0.031													
.124																																												
.140																																												
.157																																												
.177																																												
.197																																												
.220																													0.039															
.248																																												
.280																																												

1/ R-40 series numbers radii tolerance is plus or minus 25 percent.

Example

Preferred sizes	55 x 110 (R20 x R20)
Intermediate sizes	55 x 118 (R20 x R40)

Downloaded from http://www.everyspec.com

TABLE II. Tolerances.

Thickness, inch	Permissible variations in thickness
0.315 to 0.098	± 1 percent
Under 0.098 to 0.055	± 0.001 inch
Width, inch	
Over 0.492	± 1 percent
0.492 to 0.315	± 0.003 inch
Under 0.315 to 0.098	± 1 percent
Under 0.098 to 0.093	± 0.001 inch

TABLE III. Increase in thickness and width.

Type	Increase in width, inch			Increase in thickness, inch		
	Minimum	Thermoplastic outer coating, inch (maximum)	Maximum 1/	Minimum	Thermoplastic outer coating, inch (maximum)	Maximum 1/
Type K2B	0.0025	0.0007	0.0045	0.0030	0.0007	0.0050
Type K4B	.0040	.0009	.0060	.0050	.0009	.0070

1/ The maximum increase may be exceeded provided the maximum overall dimension of the coated wire does not exceed the sum of the maximum dimension of the bare wire plus the maximum increase due to the coating.

TABLE IV. Dimensions, sizes 1 - 14 AWG square.

AWG size	Bare wire dimensions, inch			Radii inch1/	Type K2B			Type K4B		
	Minimum	Nominal	Maximum		Minimum increase in dimensions, inch	Thermoplastic outer coating, inch	Max overall dimensions, inch	Minimum increase in dimensions, inch	Thermoplastic outer coating, inch	Max overall dimensions, inch
1	0.2864	0.2893	0.2922	0.040	0.0030	0.0009	0.2972	0.0050	0.0009	0.2992
2	.2550	.2576	.2602	.040	.0030	.0009	.2652	.0050	.0009	.2672
3	.2271	.2294	.2317	.040	.0030	.0009	.2367	.0050	.0009	.2387
4	.2023	.2043	.2063	.040	.0030	.0009	.2113	.0050	.0009	.2133
5	.1801	.1819	.1837	.040	.0030	.0009	.1887	.0050	.0009	.1907
6	.1604	.1620	.1636	.032	.0030	.0009	.1686	.0050	.0009	.1706
7	.1429	.1443	.1457	.032	.0030	.0008	.1507	.0050	.0008	.1527
8	.1272	.1285	.1298	.032	.0030	.0008	.1348	.0050	.0008	.1368
9	.1133	.1144	.1155	.026	.0030	.0008	.1205	.0050	.0008	.1225
10	.1009	.1019	.1029	.026	.0030	.0008	.1079	.0050	.0008	.1099
11	.0897	.0907	.0917	.020	.0030	.0008	.0967	.0050	.0008	.1987
12	.0798	.0808	.0818	.020	.0030	.0008	.0868	.0050	.0008	.0888
13	.0710	.0720	.0730	.016	.0030	.0008	.0780	.0050	.0008	.0800
14	.0631	.0641	.0651	.016	.0030	.0008	.0701	.0050	.0008	.0721

1/ Radii tolerance is plus or minus 25 percent.

Downloaded from http://www.everyspec.com

Downloaded from http://www.everyspec.com

TABLE V. Minimum breakdown voltages.

Type	Volts	
	Any three out of four electrodes	Fourth electrode
Type K2B	1500	500
Type K4B	2500	900

Part number: Magnet wire covered by this specification shall be defined by the following part numbering system. Example: M1177/13-02CXXX.

M1177/13-	02	C	XXX
Federal specification identifier	Two digit type code	Single letter conductor code	Rectangular wire code

The following codes shall apply:

Type	Type code	Conductor	Conductor code
K2	01	Copper	C
K4	02	Aluminum	A
		Nickel-coated copper	N
		Silver-coated copper	S

Intended use: Type K rectangular magnet wire is intended for use in 200°C applications similar to those for which type K round magnet wire is used.

Revision letters are not used to denote changes due to the extensiveness of the changes.

MILITARY INTERESTS:

Custodians:
Army - CR
Navy - SH
Air Force - 85

Review activities:
Army - AR, ER, MI
DLA - IS

User activities:
Army - ME
Navy - AS, CG, MC, OS

CIVIL AGENCY COORDINATING ACTIVITIES:

GSA - FSS, PBO, PCD
INTERIOR - BLM
HHS - FDA
DCGOVT - DCG
NASA - JFK
COMMERCE - NBS
TRANSPORTATION - APM, FAA

Preparing activity:
Navy - SH
(Project 6145-1111-10)

☆U.S. GOVERNMENT PRINTING OFFICE: 1988 - 505-033/92144