

INCH-POUND

J-W-1177/31

June 10, 1988

FEDERAL SPECIFICATION SHEET

**WIRE, MAGNET, ELECTRICAL, CLASS 180, TYPE G0,
GLASS-FIBER-COVERED, ORGANIC VARNISH TREATED, ROUND**

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 180;
type G0 and type G20 (bare with single or double glass fiber, varnished),
type LG0 and type LG20 (single film, single or double glass fiber, varnished),
type L2G0 and type L2G20 (heavy film, single or double glass fiber, varnished); round.

Insulating materials: The fiber covering and application of the covering shall be as specified in J-W-1177. If an underlying film coating is used, it shall have a class 155 rating. The varnish used in treating fibrous covered wire shall conform to the requirements of class 180 of MIL-I-24092, or an alternate selected on the basis of equivalent test data. The varnish shall be a high temperature non-silicone insulating varnish. The varnish used shall be identified in the qualification test report.

NEMA/ANSI equivalent: All test requirements are equivalent to MW-50 of NEMA MW 1000.

General requirements: See J-W-1177 for general requirements, quality assurance provisions, and packaging.

AMSC N/A

DISTRIBUTION STATEMENT A

Approved for public release; distribution unlimited

FSC 6145

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Requirements:

Characteristics	Test procedure, see J-W-1177	Wire sizes, AWG	Requirements
Dimensions	4.7.1.2	4/0-30	See table I.
Adherence and flexibility	4.7.2.2.1	4/0-30	Covering shall not open sufficiently to expose the bare or underlying film-coated wire after bending 0 AWG and heavier wire on a 15X mandrel and 1-30 AWG wire on a 10X mandrel.
Elongation	4.7.5	4/0-30	Not less than the values shown in table II.
Dielectric strength	4.7.9	4/0-30	Not less than the values shown in table III.
Thermal endurance	---	4/0-30	Class 180. Insulating materials shall meet the thermal class ratings as described above.

TABLE I. Dimensions.

AWG size	Bare wire diameter, inch			Minimum increase glass fiber covering, inch	Single covering			Minimum increase glass fiber covering, inch	Double covering		
	Minimum	Nominal	Maximum		Maximum overall diameter, inch		Maximum overall diameter, inch				
					Bare	Single film			Heavy film		
4/0	0.4554	0.4600	0.4646	0.0045	0.4716	---	---	0.0070	0.4756	---	---
3/0	.4055	.4096	.4137	.0045	.4207	---	---	.0070	.4247	---	---
2/0	.3612	.3648	.3684	.0045	.3754	---	---	.0070	.3794	---	---
1/0	.3217	.3249	.3281	.0045	.3351	---	---	.0070	.3391	---	---
1	.2864	.2893	.2922	.0045	.2992	---	---	.0070	.3032	---	---
2	.2550	.2576	.2602	.0045	.2672	---	---	.0070	.2712	---	---
3	.2271	.2294	.2317	.0045	.2367	---	---	.0070	.2427	---	---
4	.2023	.2043	.2053	.0045	.2133	---	0.2168	.0070	.2173	---	0.2210
5	.1801	.1819	.1828	.0045	.1907	---	.1942	.0070	.1947	---	.1982
6	.1604	.1620	.1628	.0045	.1706	---	.1741	.0070	.1746	---	.1781
7	.1429	.1443	.1450	.0045	.1527	---	.1561	.0070	.1567	---	.1601
8	.1272	.1285	.1292	.0045	.1368	---	.1402	.0070	.1408	---	.1442
9	.1133	.1144	.1150	.0045	.1225	---	.1259	.0070	.1265	---	.1299
10	.1009	.1019	.1024	.0040	.1089	---	.1121	.0060	.1119	---	.1151
11	.0898	.0907	.0912	.0040	.0976	---	.1008	.0060	.1006	---	.1038
12	.0800	.0808	.0812	.0040	.0876	---	.0907	.0060	.0906	---	.0937
13	.0713	.0720	.0724	.0040	.0787	---	.0817	.0060	.0817	---	.0847
14	.0635	.0641	.0644	.0040	.0707	0.0726	.0742	.0060	.0737	0.0726	.0772
15	.0565	.0571	.0574	.0040	.0637	.0654	.0669	.0060	.0667	.0654	.0699
16	.0503	.0608	.0511	.0040	.0573	.0591	.0605	.0060	.0603	.0621	.0635

See footnote at end of table.

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TABLE I. Dimensions. - Continued

AWG size	Bare wire diameter, inch			Minimum increase glass fiber covering, inch	Single covering			Minimum increase glass fiber covering, inch	Double covering		
					Maximum overall diameter, inch				Maximum overall diameter, inch		
	Minimum	Nominal	Maximum		Bare	Single film	Heavy film				
17	0.0448	0.0453	1/0.0455	0.0040	0.0518	0.0535	0.0548	0.0060	0.0548	0.0565	0.0578
18	.0399	.0408	1/.0405	.0040	.0467	.0484	.0497	.0060	.0497	.0514	.0527
19	.0355	.0359	1/.0361	.0040	.0423	.0439	.0451	.0060	.0453	.0469	.0481
20	.0317	.0320	1/.0322	.0040	.0383	.0399	.0411	.0060	.0413	.0429	.0441
21	.0282	.0285	1/.0286	.0040	.0348	.0363	.0374	.0060	.0378	.0393	.0404
22	.0250	.0253	1/.0254	.0040	.0316	.0330	.0341	.0060	.0346	.0360	.0371
23	.0224	.0226	1/.0227	.0040	.0288	.0303	.0313	.0060	.0318	.0333	.0343
24	.0199	.0201	1/.0202	.0025	.0243	.0257	.0267	.0045	.0263	.0277	.0287
25	.0177	.0179	1/.0180	.0025	.0221	.0234	.0243	.0045	.0241	.0254	.0263
26	.0157	.0150	1/.0160	.0025	.0201	.0213	.0222	.0045	.0221	.0233	.0242
27	.0141	.0142	.0143	.0025	.0183	.0196	.0204	.0045	.0203	.0216	.0224
28	.0125	.0126	.0127	.0025	.0167	.0180	.0187	.0045	.0187	.0200	.0207
29	.0112	.0113	.0114	.0025	.0154	.0166	.0173	.0045	.0174	.0186	.0193
30	.0099	.0100	.0101	.0025	.0141	.0152	.0159	.0045	.0161	.0172	.0179

1/ The maximum bare wire dimensions may be exceeded up to the NEMA/ANSI maximum bare wire limit, provided the minimum increase is maintained and the maximum overall diameter specified is not exceeded.

TABLE II. Elongation.

AWG size	Minimum elongation, percent	
	With glass fiber covering	Glass fiber covering removed
4/0-0	35.0	35.0
1-8	30.0	30.0
9-15	20.0	30.0
16-21	15.0	25.0
22-28	—	20.0
29 and 30	—	15.0

TABLE III. Minimum breakdown voltages.

AWG size	Diameter of mandrel, inches	Minimum breakdown, volts ^{1/}	
		Single covering	Double covering
4/0-9	—	170	315
10-23	1.00	360	540
24-30	0.25	225	400

^{1/} For glass fiber covered wire having an underlying film coating, add the minimum breakdown voltage for the film coated wire.

Part number: Magnet wire covered by this specification shall be defined by the following part numbering system. Example:
M1177/31-06C021.

M1177/31- Federal specification identifier	06 Two digit type code	C Single letter conductor code	021 Three character size code
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The following codes shall apply:

Type	Type code	Conductor	Conductor code
GO	01	Copper	C
G20	02	Aluminum	A
LG0	03	Nickel-coated copper	N
LG20	04	Silver-coated copper	S
L2GO	05		
L2G20	06		

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The size code shall be the bare wire dimension. AWG wire size shall be used.

Intended use: Type GO magnet wire is intended for use in 180°C applications similar to GK where a silicone varnish cannot be used.

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 6145-1111-27)