

NATIONAL AEROSPACE STANDARD

AEROSPACE INDUSTRIES ASSOCIATION OF AMERICA, INC., 1725 DE SALES STREET, N.W., WASHINGTON, D. C. 20036

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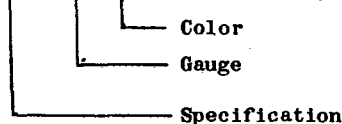
FED. SUP CLASS
6145**SPECIFICATION****WIRE, ELECTRICAL, INSULATED, COPPER SOLID CONDUCTOR,
HOOK-UP AND GENERAL PURPOSE (For 105°C Service)****1. SCOPE**

- 1.1** This specification covers insulated copper solid conductor hook-up and general purpose wire suitable for use in temperatures ranging from -55°C to 105°C. (Maximum temperature for continuous operation)
- 1.2** Types and Classification - Wire shall be furnished in one type suitable for 600 volt service.
- 1.2.1** Colors - This wire shall be available in all colors shown in Table I. Wire with white primary insulation is also available with colored tracers as specified in 3.2.2.3.

TABLE I

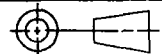
COLOR	NO.	COLOR	NO.
Black	0	Green	5
Brown	1	Blue	6
Red	2	Violet	7
Orange	3	Gray	8
Yellow	4	White	9

- 1.3** Method of Designation on Orders - The method of designation shall be as follows:

NAS1391-22-903 = AWG 22 Wire, White Plus 1 Black and 1 Orange Tracer

① Inactive for New Design After October 18 1983 No Superseding Standard.

CUSTODIAN NATIONAL AEROSPACE STANDARDS COMMITTEE

THIRD
ANGLE
PROJECTIONPROCUREMENT
SPECIFICATION

NONE

TITLE

WIRE, ELECTRICAL, INSULATED COPPER
SOLID CONDUCTOR HOOK-UP AND GENERAL
PURPOSE (FOR 105°C SERVICE)

CLASSIFICATION
SPECIFICATION

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2. APPLICABLE SPECIFICATIONS

- 2.1 The following publications of the issue in effect on the date of invitation for bids, shall form a part of this specification to the extent specified herein:

FEDERAL

FED STD 151 Metals, Test Methods
 QQ-W-343 Wire, Electrical and non Electrical, Copper

MILITARY

MIL-C-915 Cable, Cord and Wire, Electrical (Shipboard Use)
 MIL-T-5438 Tester, Abrasion, Electrical Cable
 MIL-G-5572 Gasoline, Aviation
 MIL-H-5606 Hydraulic Fluid, Petroleum Base, Aircraft and Ordnance
 MIL-F-5624 Fuel Aircraft Turbine and Jet Engine Grades JP-4 and JP-5
 MIL-O-6081 Oil, Lubricating, Jet Engine
 MIL-A-6091 Alcohol, Ethyl, Specially Denatured Aircraft
 MIL-H-7083 Hydraulic Fluid, Nonflammable, Aircraft, Hydrolube
 MIL-P-20693 Plastic Compounds, Molding and Extrusion Polyamide
 MIL-STD-104 Limits for Electrical Insulation Color
 MIL-STD-681 Identification Coding and Application of Hook-up Wire

COMMERCIAL STANDARDS

"Skydrol" Fluid, Hydraulic mfg. by Monsanto Chemical Company
 ASTM D-470 Insulated Wire and Cable (Tentative)

3. REQUIREMENTS

- 3.1 Selection of Materials - Where materials, methods of test or other qualifications are not specifically designated, it is understood that recognized best commercial practice shall apply.
- 3.2 Construction - This wire shall consist of (1) tinned, solid conductor, (2) polyvinyl chloride type resin primary insulation and (3) nylon jacket.
- 3.2.1 Conductor - The conductor shall be in accordance with Table II and with QQ-W-343 Type S Coated.

TABLE II - DETAILS OF CONDUCTOR

CONDUCTOR SIZE AWG	MAX DIA CONDUCTOR IN INCHES	NOM. AREA (CIR. MILS)	MAX CONDUCTOR RESISTANCE D.C. OHMS PER 1000 FT AT 25°C
30	.0103	100	112.1
28	.0130	159	72.9
26	.0164	253	46.0
24	.0207	404	28.3
22	.0261	640	17.6
20	.0330	1,020	11.1

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- 3.2.2 Primary Insulation - The primary insulation shall consist of a Polyvinyl Chloride type material applied to the conductor by extrusion. The insulation shall strip freely without adherence to the conductor.
- 3.2.2.1 Physical Properties - Physical properties of the primary insulation shall be as required below and shall be determined as required in 4.3.2.2.
- Tensile Strength (min) 1800 PSI
Elongation (min) 1 1/2 inch (2 inch Specimen stretched to 3 1/2 inches)
- 3.2.2.2 Accelerated Aging - After subjection to the accelerated aging test described in 4.3.2.3. the tensile strength and elongation shall be at least 70 percent of that of the unaged specimen of insulation.
- 3.2.2.3 Color - The color of the primary insulation and tracers shall be as designated in Table I and shall conform with MIL-STD-104. The colors used shall be fast to direct sunlight, and shall be discernible after all tests on the finished wire required herein, have been completed. The tracers shall be non-conductive. If one color is specified, the primary insulation shall be a solid color. When tracers are required, the tracers shall be indicated by numbers shown in Table I and shall be listed in increasing numerical order following the digit 9 in conformance to MIL-STD-681. Two tracers are available in AWG size 24 and larger. Only one tracer is available in AWG size 26 and smaller.
- 3.2.2.4 Thickness - At any cross-section along the length of the wire, the minimum thickness of the insulation shall be not less than 41% of the difference between the measured diameter over the insulation and the measured diameter of the conductor. The method of checking thickness shall be in accordance with 4.3.2.1.
- 3.2.2.5 Soldering - The shrinkage characteristics of the insulating material shall be such that, when tested in accordance with 4.3.4, the insulation shall not flare away from the conductor nor shrink back along the conductor more than 1/16 inch.
- 3.2.3 Covering - An extruded clear nylon (MIL-P-20693 Type III Grade E) jacket .003 - .005 inch thick, shall be applied directly over the primary insulation.
- 3.3 Characteristics of the Finished Wire -
- 3.3.1 Life Cycle - The completed wire shall be subjected to the Life Cycle Test given in 4.3.3.1. Upon completion of this test the wire shall not crack as a result of the Bend Test and shall meet the Dielectric Test without breakdown.
- 3.3.2 Cold Bend - The finished wire shall withstand a temperature of -55°C without cracking when bent over a mandrel as specified in 4.3.7. After bending, the wire shall withstand the Dielectric Test without breakdown.
- 3.3.3 Water and Solvent Resistance - After being subjected to the Immersion Test given in 4.3.8, the wire shall show no evidence of cracking and shall withstand the Dielectric Test without breakdown. The increase in diameter of the finished wire shall not exceed 5 percent.
- 3.3.4 Flammability - The finished wire shall evidence a rate of burning not in excess of 1 inch per minute, shall not release burning particles and shall be self extinguishing when subjected to the test specified in 4.3.10.

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