NOTE: The cover page of this standard has been changed for administrative reasons. There are no other changes to this document.

INCH-POUND

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DEPARTMENT OF DEFENSE

STANDARD PRACTICE

IDENTIFICATION CODING AND APPLICATION

OF HOOKUP AND LEAD WIRE

AMSC N/A FSC 6145

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FOREWORD

1. This military standard is approved for use by all Departments and Agencies of the Department of Defense.

2. Beneficial comments (recommendations, additions, deletions) and any pertinent data which may be of use in improving this document should be addressed to: Commander, US Army Communications Electronics Command, ATTN: AMSEL-ED-TO, Fort Monmouth, NJ 07703-5000, by using the self addressed Standardization Document Improvement Proposal (DD Form 1426) appearing at the end of this document or by letter.

PARAGRAPH

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TABLES

1. SCOPE

1.1 Scope. This standard establishes identification coding systems for all insulated hookup and lead wire used in electrical and electronic equipment by the Departments of the Army, Navy, and Air Force. These coding systems shall also be used for identifying lead wires on Hall generators and ac and dc wire coding methods specified (see 4.9 and 4.10).

1.2 Classification. Identification of hookup wiring and lead wire shall be limited to the following systems:

System I - Differentiation color coding for chassis wiring. This system should be employed in complex electronic equipment having numerous wiring points (terminations) and requiring different colored wires for identification. Functional coding (system II) would be inadequate for these complex equipments because of its limited scope of significant colors.

System II - Functional color coding of chassis wiring. This system should be employed in simple electronic equipments where it would be advantageous to identify a circuit function or a component part lead by its significant colored wire.

System III - Differentiation or functional coding of chassis wiring by printed markings. This system should be employed as an alternate for systems I and II and is preferred for maintaining or repairing equipments. White wires are used for replacement, and will be marked with the designated color or symbol to readily identify it in the equipment. Marking may be accomplished through the use of sleeving where the diameter of the wire is so small as to make printing impracticable.

System IV - Coding of interconnecting wiring. This system should be employed to readily identify wiring between complete units of electronic or electrical systems by means of marking on white insulated wires or applying sleeves, tags, or pressure-sensitive tapes on the insulated wires.

System V - Direct wiring and open wiring. This system should be employed for direct, open chassis, and cabinet wiring. The hookup wire (see 3.1) need not be color coded; solid white is the preferred color. Permanently numbered sleeves can be used in conjunction with reference designations wherever practical; i.e., terminal boards, bus bars, capacitors, relays, etc.

* System VI - Differential color coding of hookup wire for chassis and interconnection wiring. This system should be employed for identification of wiring in high density wired chassis units and the interconnection between them. Identification may be accomplished by use of solid color insulated wire, circumferential bands or spiral stripes on white insulated wire, or printed sleeve or tape markers. Short hookup wire, six inches or less between termination points, need not be marked if the path of the short wire can be easily and visually traced.

2. APPLICABLE DOCUMENTS

2.1 Government documents.

2.1.1 Specifications, standards, and handbooks. The following specifications, standards, and handbooks form a part of this document to the extent specified herein. Unless otherwise specified, the issues of these documents are those listed in the issue of the Department of Defense Index of Specifications and Standards (DODISS) and supplement thereto, cited in the solicitation (see 6.1).

SPECIFICATIONS

MILITARY

MIL-W-5088	-	Wiring, Aerospace Vehicle.
MIL-W-8160	-	Wiring, Guided Missile, Installation of, General Specification for.

STANDARDS

MILITARY

MIL-STD-12	-	Abbreviations for Use on Drawings, and in Specifications, Standards, and Technical Documents.
MIL-STD-104	-	Limits for Electrical Insulation Color.

(Unless otherwise indicated, copies of federal and military specifications, standards, and handbooks are available from the Standardization Documents Order Desk, Building 4D, 700 Robbins Avenue, Philadelphia, PA 19111-5094.)

2.2 Order of precedence. In the event of a conflict between the text of this document and the references cited herein, the text of this document takes precedence. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

3. DEFINITIONS

3.1 Definitions. For the purpose of this standard, the following definitions apply:

3.1.1 Hookup wire. Hookup wire refers to an insulated conductor free at both ends and used for chassis wiring and interconnecting wiring.

3.1.2 Lead wire. Lead wire refers to an insulated conductor forming an integral part of components such as motors, transformers, Hall generators, etc., and used for chassis wiring.

3.1.3 Chassis wiring. Chassis wiring may consist of hookup wire, lead wire, shielded cable, jacketed multiconductor cable, coaxial cable, or twisted multiconductor groups of wires or cables, or wires and cables, used to connect electrical or electronic elements within the same equipment.

3.1.4 Interconnecting wiring. Interconnecting wiring consists of wires cables, groups or harnesses used to connect complete units of electrical or electronic systems.

3.1.5 Harness. An assembly of wires or cables, or wires and cables arranged so it may be installed or removed as a unit in the same electronic or electrical equipment.

3.1.6 Homogenous cable. Cable composed of identical insulated conductors.

3.1.7 Jacketed cable. A jacketed cable is a bundle of insulated wires encased in a common sheath.

4. GENERAL REQUIREMENTS

4.1 Coding of hookup wire. All hookup wire shall be coded by one or more of the systems listed in 1.2.

4.2 Coding of interconnecting wiring. Coding of interconnecting wiring (system IV) need not apply to jacketed cables.

4.3 Abbreviations. Abbreviations shall be in accordance with MIL-STD-12.

* 4.4 Shielded and unshielded wires. All requirements for all systems shall apply to both shielded and unshielded wires.

4.5 Color limits. Unless otherwise specified, all colors on the finished wire shall conform to class 1 colors of MIL-STD-104.

4.5.1 White, clear, and neutral insulations. The term "white" shall apply only to colors meeting the requirements of "white" in MIL-STD-104. Clear or translucent uncolored (unpigmented) insulation shall be designated "clear". Natural or neutral colored insulations shall be designated "neutral" (see 4.6).

4.6 Clear and neutral colored insulations. Clear and neutral colored insulations shall be used on wires in lieu of white insulation only when specified by the applicable wire specification.

4.7 Lead wires. Lead wires used for motor leads, transformer leads, and similar applications shall be color coded in accordance with table I, where no conflict would be created with another component color-code standard.

4.8 Hall generator leads. Hall generator lead wires shall be color coded in accordance with table II.

* 4.9 DC power wiring for chassis and interconnecting systems. DC power wiring for chassis and interconnecting wiring shall be color coded in accordance with table II or table III.

* 4.10 AC power wiring in assembled units. AC power wiring in assembled units shall be color coded in accordance with table IV.

TABLE I. Preferred color sequence for single wires. 1/ 2/

Base color	First stripe or band	Second stripe or band	Third stripe or band	Identification number
Black				0
Brown				1
Red				2
Orange				3
Yellow				4
Green				5
Blue				6
Violet				7
Gray				8
White				9
White	Black			90
White	Brown			91
White	Red			92
White	Orange			93
White	Yellow			94
White	Green			95
White	Blue			96
White	Violet			97
White	Gray			98
White	Black	Brown		901
White	Black	Red		902
White	Black	Orange		903
White	Black	Yellow		904
White	Black	Green		905
White	Black	Blue		906
White	Black	Violet		907
White	Black	Gray		908
White	Brown	Red		912
White	Brown	Orange		913
White	Brown	Yellow		914
White	Brown	Green		915
White	Brown	Blue		916
White	Brown	Violet		917
White	Brown	Gray		918
White	Red	Orange		923
White	Red	Yellow		924
White	Red	Green		925
White	Red	Blue		926
White	Red	Violet		927
White	Red	Gray		928
White	Orange	Yellow		934
White	Orange	Green		935
White	Orange	Blue		936

See footnotes at end of table.

TABLE I. Preferred color sequence for single wires - Continued. 1/ 2/

Base color	First stripe or band	Second stripe or band	Third stripe or band	Identification number
White	Orange	Violet		937
White	Orange	Gray		938
White	Yellow	Green		945
White	Yellow	Blue		946
White	Yellow	Violet		947
White	Yellow	Gray		948
White	Green	Blue		956
White	Green	Violet		957
White	Green	Gray		958
White	Blue	Violet		967
White	Blue	Gray		968
* White	Violet	Gray		978
White	Black	Brown	Red	9012
White	Black	Brown	Orange	9013
White	Black	Brown	Yellow	9014
White	Black	Brown	Green	9015
White	Black	Brown	Blue	9016
White	Black	Brown	Violet	9017
White	Black	Brown	Gray	9018
White	Black	Red	Orange	9023
White	Black	Red	Yellow	9024
White	Black	Red	Green	9025
White	Black	Red	Blue	9026
White	Black	Red	Violet	9027
White	Black	Red	Gray	9028
White	Black	Orange	Yellow	9034
White	Black	Orange	Green	9035
White	Black	Orange	Blue	9036
White	Black	Orange	Violet	9037
White	Black	Orange	Gray	9038
White	Black	Yellow	Green	9045
White	Black	Yellow	Blue	9046
White	Black	Yellow	Violet	9047
White	Black	Yellow	Gray	9048
White	Black	Green	Blue	9056
White	Black	Green	Violet	9057
White	Black	Green	Gray	9058
White	Black	Blue	Violet	9067
White	Black	Blue	Gray	9068
White	Black	Violet	Gray	9078
White	Brown	Red	Orange	9123
White	Brown	Red	Yellow	9124
White	Brown	Red	Green	9125
White	Brown	Red	Blue	9126
White	Brown	Red	Violet	9127

See footnotes at end of table.

TABLE I. Preferred color sequence for single wires - Continued. 1/ 2/

Base color	First stripe or band	Second stripe or band	Third stripe or band	Identification number
White	Brown	Red	Gray	9128
White	Brown	Orange	Yellow	9134
White	Brown	Orange	Green	9135
White	Brown	Orange	Blue	9136
White	Brown	Orange	Violet	9137
White	Brown	Orange	Gray	9138
White	Brown	Yellow	Green	9145
White	Brown	Yellow	Blue	9146
White	Brown	Yellow	Violet	9147
White	Brown	Yellow	Gray	9148
White	Brown	Green	Blue	9156
White	Brown	Green	Violet	9157
White	Brown	Green	Gray	9158
White	Brown	Blue	Violet	9167
White	Brown	Blue	Gray	9168
White	Brown	Violet	Gray	9178
White	Red	Orange	Yellow	9234
White	Red	Orange	Green	9235
White	Red	Orange	Blue	9236
White	Red	Orange	Violet	9237
White	Red	Orange	Gray	9238
White	Red	Yellow	Green	9245
White	Red	Yellow	Blue	9246
White	Red	Yellow	Violet	9247
White	Red	Yellow	Gray	9248
White	Red	Green	Blue	9256
White	Red	Green	Violet	9257
White	Red	Green	Gray	9258
White	Red	Blue	Violet	9267
White	Red	Blue	Gray	9268
White	Red	Violet	Gray	9278
White	Orange	Yellow	Green	9345
White	Orange	Yellow	Blue	9346
White	Orange	Yellow	Violet	9347
White	Orange	Yellow	Gray	9348
White	Orange	Green	Blue	9356
White	Orange	Green	Violet	9357
White	Orange	Green	Gray	9358
White	Orange	Blue	Violet	9367
White	Orange	Blue	Gray	9368
White	Orange	Violet	Gray	9378
White	Yellow	Green	Blue	9456
White	Yellow	Green	Violet	9457
White	Yellow	Green	Gray	9458

See footnotes at end of table.

TABLE I. Preferred color sequence for single wires - Continued. 1/ 2/

Base color	First stripe or band	Second stripe or band	Third stripe or band	Identification number
White	Yellow	Blue	Violet	9467
White	Yellow	Blue	Gray	9468
White	Yellow	Violet	Gray	9478
White	Green	Blue	Violet	9567
White	Green	Blue	Gray	9568
White	Green	Violet	Gray	9578
White	Blue	Violet	Gray	9678

1/ For bundles composed of more than 139 wires, the above color designations shall be repeated in sequence with appropriate subgroupings to the extent necessary to provide identification of all conductors (see 5.1.3).
2/ The code designation "N" shall be applied to unpigmented clear or neutral insulations (see 4.6) to indicate nonstandard color coding. These insulations may be used only if the color of these insulations do not fall within the requirements for the gray or the chromatic colors of MIL-STD-104.

* TABLE II. Colors for chassis and interconnecting wiring system by function.

Function	Base color	Identification number	Alternate color code (see 5.2.1)	Alternate identification number
Grounds, grounded elements 1/ 2/	Green 2/	5	White/green 2/	95
Heaters or filaments	Brown	1	White/brown	91
Power supply, B+ 3/	Red	2	White/red	92
Screen grids clock	Orange	3	White/orange	93
Cathodes and transistor emitters, high logic 4/ 5/ 6/	Yellow	4	White/yellow	94
Control grids and transistor bases, low logic 5/	Black 7/	0	White/black 7/	90
Anodes (plates) and transistor collectors, control 4/ 5/ 8/	Blue	6	White/blue	96
Power supply, minus	Violet (purple)	7	White/violet	97

See footnotes next page.

1/ Negative side of Hall generator control current.
* 2/ Inactive for new design. For new design, use green for base color (white/green for alternate), and identification number 5 (95 for alternate).
3/ Positive side of Hall generator control current.
4/ Applies to diodes, semiconductor elements, photoelectric cells, mercury-arc rectifiers, and other elements with operation similar to vacuum tubes and transistors.
5/ Applies to all types of gas tubes with operation similar to vacuum tubes.
6/ Negative side of Hall generator output voltage.
* 7/ Inactive for new design. For new design, use black for base color (white/black for alternate), and identification number 0 (90 for alternate).
8/ Positive side of Hall generator output voltage.

* TABLE III. DC power color coding for chassis and interconnection wiring (optional method).

Voltage (volts)	Color	Identification number
+151 to +500	Red	2
+61 to +150	White/red	92
+26 to +60	White/brown/red	912
+7 to +25	White/red/orange	923
+2 to +6	White/red/yellow	924
-26 to -60	Violet	7
-11 to -25	White/violet	97
-2 to -10	White/violet/yellow	47
Ground	Green	5

* TABLE IV. Color coding for ac power wiring (100 V and greater) for single and three phase systems.

Service (nominal)	Wire insulation color				
	Phase A	Phase B	Phase C	Neutral 1/	Ground
115 V 60 Hz 1 Φ	Black	---	---	White	Green
208 V 60 Hz 3 Φ "Y" 2/	Black	Red	Orange or blue	White	Green
230 V 60 Hz 3 Φ delta 2/	Black	Red	Orange or blue	---	Green
115 V 400 Hz 3 Φ delta 2/	Black	Red	Orange or blue	---	Green
208 V 400 Hz 3 Φ "Y" 2/	Black	Red	Orange or blue	White	Green

1/ For all ac voltages below 100 V, gray wire is to be used, unless the optional color code is specified (see 2/).
2/ Optional wire color insulations for phases A, B, C, and neutral shall be as follows:
Phase A - Gray
Phase B - White/gray
Phase C - White/brown/gray
Neutral - White

5. DETAIL REQUIREMENTS

5.1 System I - Differentiation color coding for chassis wiring (see 1.2).

5.1.1 Standard color code for single wires. Single conductor chassis wires to be coded for differentiation only shall be identified by colors in accordance with table I, preferably in the order given. All the combinations listed in table I are made up of the first 10 colors.

* 5.1.1.1 Method of color coding. Color coding shall be accomplished by use of solid colored insulations, and by helical striping or circumferential banding on all-white insulation, in accordance with 5.7 except that system VI shall be used for circumferential banding (see 5.6). Longitudinal (nonhelical) color striping may be used if colored insulation material is used for striping. Materials or paints used for helical striping or circumferential banding shall not be electrically conductive.

5.1.1.2 Identification numbers. Identification numbers appearing in table I are a ready reference to color combinations. The first digit indicates the background color (color of insulation or braid), and the succeeding digit or digits, if any, indicate the colors of the helical stripes or circumferential bands. Therefore, the second and third digit indicates the color of the first and second stripe or band, respectively.

5.1.1.3 Color sequence of helical stripes or circumferential bands. Where stripes or bands are used, the first stripe or band shall be of the color with the lowest identification number, the second with the next higher number, and the third with the highest number.

5.1.2 Harness wiring. Unless the wiring is routed to the same terminal, two or more wires shall not be identically color coded if they break out of a harness and are routed to terminations in close proximity where they could be misconnected.

5.1.3 Grouping of wires. Where it is not practical to use wires each of which is differently color coded, the wires may be divided into groups. (Typical instances are where many wires enter a connector, or connect to grouped terminal blocks, or multiple terminations in close proximity.) Within each group, each wire shall be differently color coded, and the groups shall be distinguished by colored metal bands, pressure-sensitive tapes, or other approved devices that hold each group of wires together. The wire color coding sequence may be repeated in different groups. This method shall be used only where a large number of wires is involved.

5.1.4 Termination points. Wires terminating where it would be difficult to distinguish one wire from another shall not be identically color coded unless the wiring is routed to the same termination point. For example, if three wires from one harness, three wires from another harness, and two point-to-point wires are all connected to a tube socket, different color coding shall be used on each wire to eliminate confusion.

5.2 System II - Functional color coding of chassis wiring. Simple electronic connections where it is advantageous to identify circuit function (see 1.2).

5.2.1 Standard colors. Colors used to identify chassis wires by function shall be as specified in table II and 5.2.2 unless otherwise specified by the contracting activity. Color identification shall be accomplished by use of solid color insulation, or as an alternate method, by use of a single colored helical stripe or circumferential band over white insulation. For example, a white insulated wire having a blue helical stripe or a blue circumferential band would be considered an alternate equivalent to a solid blue wire. When more than one value of the same function must be identified, the alternative method may use a second stripe or band over white insulation as shown in table I.

* 5.2.2 Miscellaneous circuits. White insulation shall be used for all circuits not designated in tables II, III, and IV or 5.2.3.

5.2.3 Direct-coupled circuits. In direct-coupled circuits, connecting wires shall be white with appropriately colored helical stripes or circumferential bands at the ends of the insulated wire to identify the elements to differentiate from the method of marking described in 5.2.2. For example, if a plate is connected directly to a control grid, the wire shall be white with helical green and blue stripes, or have green and blue circumferential bands at both ends of the wire (green designates grid, and blue, the plate). This is in contrast to the coding of wires connecting plate and grid through a coupling capacitor; in such case the wire from the plate to the capacitor would be solid blue, or have a blue stripe or band on a white wire (for the plate), and the wire from the other end of the capacitor to the grid would be black, or have a black stripe or band on a white wire (for the grid). This method of identification will normally be applied by the equipment fabricator to white insulated wire, when required.

5.3 System III - Differentiation or functional coding of chassis wiring by printed markings. Chassis wiring shall be identified by printed characters (see table V) over white insulation or white insulation-braid. The printed characters shall represent differentiation or functional code marking (see 1.2).

5.3.1 Differentiation marking. Wires shall be differentiated by printing the name(s), abbreviation(s) in accordance with MIL-STD-12, or identification number(s) of the colors and combinations listed in table I. Random printed numbers for alpha numerical characters designating specific coded information may be used provided this specific coding is not intermixed with stripe or band identification. The marking shall appear either along the entire length of the wire at 2-inch intervals, at each end of the wire (for wire harnesses only), on sleeves, or in the manner prescribed in applicable specifications.

5.3.2 Functional markings. Functional information shall be as specified in table II or in the applicable equipment specification. Such information shall be printed either at the ends of the wire, on the sleeve, or in some other manner as prescribed in the applicable equipment specification.

5.4 System IV - Coding of interconnecting wiring.

5.4.1 Wire insulation color. White insulation shall be used for all interconnecting wires unless a particular color is prescribed in the equipment or system specification to identify a definite arrangement of elements, a specific function, or a hazardous condition.

5.4.2 Differentiation markings. Circuit identification, if required, shall be printed in black on the wire insulation, on the white sleeve, or on some other type of marker. Printed markings shall be legible and applied so that the wire type is readily identified.

5.4.3 Interconnecting wiring on aircraft and guided missiles. The coding of interconnecting wiring on aircraft shall be in accordance with MIL-W-5088, and on guided missiles shall be in accordance with MIL-W-8160. In the event of conflict between the requirements of this standard and those of the referenced specifications, the requirements of the referenced specifications shall govern.

5.4.4 Flat, multiconductor, homogenous cable. When color coding is required, the base colors of table I shall be used, and shall be repeated in sequence for the required number of conductors by using solid colored insulation or striping on all-white insulation.

5.5 System V - Direct wiring and open wiring.

5.5.1 Wire insulation color. White insulation shall be used for all interconnecting wires, unless a particular color is prescribed in the equipment or system specification to identify a definite arrangement of elements, a specific function, or a hazardous condition.

5.5.2 Differentiation markings. Identification, if required, shall be printed in black on the wire insulation, on the white sleeve, or on some other type of marker. Printed markings shall be legible and applied so that the marking function is readily identified.

* 5.6 System VI - Differential color coding for high density chassis and interconnecting wiring (see 1.2).

5.6.1 Method of color coding. Color coding shall be accomplished by use of solid color insulations, circumferential banding on all-white insulation or numerically marked sleeve or tape markers. Materials or paints used for circumferential banding or numeric marking shall not be electrically conductive.

5.6.2 Circumferential banding.

5.6.2.1 Identification numbers. Identification numbers shall consist of not more than four digits, which may be either in sequential or ascending sequential order, deleting the digit 9 for white.

5.6.2.2 Color sequence of circumferential bands. The circumferential bands shall be parallel to each other, be clearly defined and, within and between repeated color groupings, consistent in width and spacing for the length of the wire, and essentially continuous except that discontinuities may be permitted provided the coded identity can be read by rotating the wire.

a. Band width. The width of the bands shall be measured perpendicular to the centerline of the band. The width of all bands shall be not less than 0.031 inch when the diameter over the marked surface exceeds 0.047 inch; or not less than two-thirds the nominal diameter of the surface when the diameter over the marked surface is 0.047 inch or less.

b. Band spacing. The spacing between bands in a group shall be not less than the individual band width, except that the spacing between the first band in a group of three or four shall be twice the spacing between the bands in the remainder of the group.

c. Spacing between groups of bands. The spacing separating a group of bands from the next grouping shall be greater than the widest spacing between bands within a group, but not exceed 3 inches, and be repeated along the length of the wire.

d. Sequence of reading. The wire number represented by the color banding is read by starting with the band further displaced from the remaining two or three bands.

5.6.3 Wire markers. Numerically marked sleeves, tapes or pressure sensitive tapes may be applied at the ends of the insulated wire or braided covering where wire diameter, cable concentricity or insulation type preclude the application of circumferential bands.

TABLE V. Printing type size of identification marking. 1/

Insulation diameter 2/	Printing type: Height of type face 3/ 4/ (±.001)	Printing type: Radius of curvature of type face (±.001) 5/	Printing type: Reading direction
For insulating materials that are not flattened during the printing the operation, following curved and flat face type shall be used:			
.030 to .038	.015	.020	Vertical
.039 to .048	.020	.025	Vertical
.049 to .060	.025	.031	Vertical
.061 to .090	.025/.031	.046	Horiz or vert
.091 to .122	.031/.046	.062	Horiz or vert
.123 to .154	.046	.078	Horizontal
.155 to .184	.062	.093	Horizontal
.185 to .248	.078	.125	Horizontal
.249 to .310	.093	.156	Horizontal
.311 to .374	.093/.125	.187	Horizontal
.375 to .436	.125	.218	Horizontal
.437 to .498	.125	.250	Horizontal
.499 to .560	.125	.281	Horizontal
.561 to 1.000	.125	Flat	Horizontal
Over 1.000	.187	Flat	Horizontal
* For insulating tubings that are flattened during the printing operation, the following minimum flat face type shall be used:			
.035 to .060	.065	Flat face	Vertical
.052 to .068	.050	Flat face	Horizontal
.069 to .096	.062	Flat face	Horizontal
.097 to .166	.078	Flat face	Horizontal
.167 to .624	.109	Flat face	Horizontal
.625 to 1.000	.125	Flat face	Horizontal
Over 1.000	.187	Flat face	Horizontal

1/ Dimensions are in inches.
2/ For heat shrinkable tubing, the height of the type face shall be governed by the "as supplied" insulation diameter.
3/ Other type face heights may be used only when approved by the contracting activity.
4/ For horizontal lettering, this quantity is the actual height. For vertical lettering, this quantity is the width of the letter. The letter height would be approximately 3 times this quantity.
5/ All industry standard sizes.

* 5.7 Striping or banding.

* 5.7.1 Colored helical stripes or circumferential bands. Colored helical stripes or circumferential bands shall be used only on all-white insulation wherever color combinations other than solid colored wires are necessary. Not more than three stripes or bands shall be used. Stripes and bands shall be applied in the same direction and shall conform to the color code designated in table I. Longitudinal (nonhelical) color striping may be used if colored insulation is used for striping.

5.7.2 Sequence. In the sequence of applying helical stripes or circumferential bands on a wire, the first stripe or band shall be distinguishably wider than the second and third stripe or band within the group. Helical stripes shall run parallel to each other and shall be continuous, clearly defined, and constant in width and spacing throughout the length of the wire. Circumferential bands shall be parallel to each other around the circumference of the wire, shall be clearly defined, shall be constant in width and spacing, and shall be continuous in repeated color groupings for the length of the wire unless specified (see 5.2.3).

5.7.2.1 Stripe or band width. The width of the stripe or band shall be measured perpendicular to the centerline of the stripe or band. The width of the wide (first) stripe or band shall be not less than 0.031 inch when the diameter over the marked surface exceeds 0.047 inch; when the diameter over the surface on which the stripe or band is applied is less than 0.047 inch, then the width of the first stripe or band shall be not less than two-thirds the nominal diameter of the surface. The narrow (second and third) stripe or band shall be not less than one-half nor more than three-quarters the width of the wide (first) stripe or band. The third stripe or band shall be of the same width as the second stripe or band.

5.7.2.2 Stripe or band spacing. On single stripe or band coloring, the spacing between each stripe or band shall be not less than twice the width of the individual stripe or band. On multiple stripe or band coloring, the spacing between stripes or bands within a grouping shall be not less than the width of the narrow stripe or band.

5.7.2.3 Length of lay (spacing between groups). The length of lay of each stripe shall not exceed 2 inches.

NOTE: Length of lay is defined as the longitudinal distance along a wire from the starting point of one grouping of stripes to the starting point of the next repetition of the grouping. Also, length of lay required does not apply if stripes of colored insulation material are used.

5.7.2.4 Spacing between groups of bands. The spacing between groups of bands shall be at regular intervals along the wire. The spacing separating a group of bands from the next grouping shall be greater than the spacing between the bands within a group, but shall not exceed 3 inches.

* 5.8 Braided wire covering. When the wire covering includes a braided covering (of synthetic yarn or continuous filament glass yarn) over the insulation, with systems I and II color coding, the braided covering shall be the same base color; with systems III, IV, and VI color coding, the insulation and braided coverings shall be natural white. If color coded striping or banding is required on braided covering of systems I, II, or IV color coded wires, the method described in 5.5 shall be adopted. If color coded banding is required on braided covering of system VI color coded wires, the method described in 5.6 shall be adopted. When helical stripes are used, colored carriers of suitable widths shall be used to form the coding stripes. The narrow (second and third) stripe, when applicable, shall be formed by using colored yarn in one carrier. The spacing between stripes in any group shall be formed by one base color carrier. The colored helical stripe, striping sequence, and length of lay shall be in accordance with 5.7.1, 5.7.2, 5.7.2.1, 5.7.2.2, and 5.7.2.3.

6. NOTES

(This section contains information of a general or explanatory nature which may be helpful, but is not mandatory.)

6.1 Issue of DODISS. When this standard is used in acquisition, the issue of the DODISS to be applicable to this solicitation must be cited in this solicitation (see 2.1.1).

6.2 Subject term (keyword) listing.

AC power wiring
Chassis wiring
Circumferential banding
DC power wiring
Hall generator
Interconnecting wiring
Striping

6.3 International standardization agreements. Certain provisions of this document are the subject of international standardization agreement STANAG 4093. When change notice, revision, or cancellation of this document is proposed which will affect or violate the international agreement concerned, the preparing activity shall take appropriate reconcilation action through international standardization channels, including departmental standardization offices, if required.

6.4 Changes from previous issue. The margins of this standard are marked with asterisks to indicate where changes (additions, modifications, corrections, deletions) from the previous issue were made. This was done as a convenience only and the Government assumes no liability whatsoever for any inaccuracies in these notations. Bidders and contractors are cautioned to evaluate the requirements of this document based on the entire content irrespective of the marginal notations and relationship to the last previous issue.

CONCLUDING MATERIAL

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

Review activities:
Army - AR, AV, ME, MI
Navy - AS, OS, SH
Air Force - 11, 17, 99
DLA - IS, ES
NSA

User activities:
Army - AT
Navy - MC, OS, SH

International Interest:
(See section 6)

Preparing activity:
Army - CR

Agent:
DLA - ES

(Project 6145-1158)

STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

INSTRUCTIONS

1. The preparing activity must complete blocks 1, 2, 3, and 8. In block 1, both the document number and revision letter should be given.
2. The submitter of this form must complete blocks 4, 5, 6, and 7.
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I RECOMMEND A CHANGE:	1. DOCUMENT NUMBER MIL-STD-681D	2. DOCUMENT DATE (YYMMDD) 13 August 1990

3. DOCUMENT TITLE Military Standard
Identification Coding and Application of Hookup and Lead Wire

4. NATURE OF CHANGE *(Identify paragraph number and include proposed rewrite, if possible. Attach extra sheets as needed.)*

5. REASON FOR RECOMMENDATION

6. SUBMITTER

a. NAME *(Last, First, Middle Initial)*	b. ORGANIZATION	
c. ADDRESS *(Include Zip Code)*	d. TELEPHONE *(Include Area Code)* (1) Commercial (2) AUTOVON *(If applicable)*	7. DATE SUBMITTED (YYMMDD)

8. PREPARING ACTIVITY

a. NAME	b. TELEPHONE *(Include Area Code)*
Commander, U.S. Army Communications and Electronics Command	(1) Commercial (908)532-5851 (2) AUTOVON 992-5851
c. ADDRESS *(Include Zip Code)* ATTN: AMSEL-ED-TO (Stdzn Ofc) Fort Monmouth, NJ 07703-5000	IF YOU DO NOT RECEIVE A REPLY WITHIN 45 DAYS, CONTACT: Defense Quality and Standardization Office 5203 Leesburg Pike, Suite 1403, Falls Church, VA 22041-3466 Telephone (703) 756-2340. AUTOVON 289-2340