

MILITARY SPECIFICATION SHEET

WIRE, ELECTRIC, FLUOROCARBON/POLYIMIDE INSULATED LIGHT WEIGHT  
NICKEL COATED HIGH STRENGTH COPPER ALLOY, 600 VOLTS,  
NOMINAL 4.6 MIL WALL

The complete requirements for wire described herein shall consist of this document and the issue in effect of Specification MIL-W-81381.

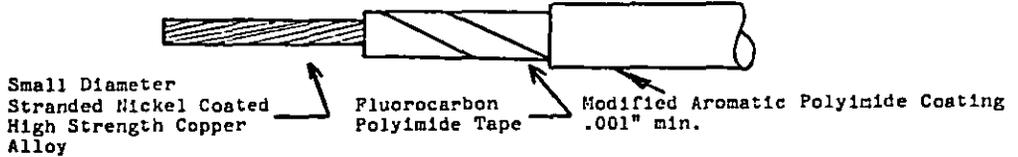


TABLE I CONSTRUCTION DETAILS

PART NUMBER 2/	CONDUCTOR			FINISHED WIRE			INSULATION 1/	
	SIZE	STRANDING	DIAMETER MAXIMUM (INCHES)	MAX. RES. AT 20°C (OHMS/ 1000 FT)	DIAMETER (INCHES) (MIN.-MAX.)	WEIGHT MAX. (LBS/ 1000 FT)	ONE WRAP	
							TAPE CODE	MIN. 2 OVER- LAP
M81381/20-30-*	30	7/38	.013	129.5	.021-.024	0.7	.1-1-.1	67.0
M81381/20-28-*	28	7/36	.016	79.0	.024-.027	0.9		
M81381/20-26-*	26	19/38	.020	49.4	.028-.030	1.3		
M81381/20-24-*	24	15/36	.025	30.1	.032-.035	2.0		
M81381/20-22-*	22	19/34	.031	18.6	.039-.042	2.9		
M81381/20-20-*	20	19/32	.040	11.4	.047-.050	4.5		

1/ TAPE CODE

.1-1-.1: .1 MIL FEP-FLUOROCARBON RESIN; 1 MIL POLYIMIDE FILM; .1 MIL FEP-FLUOROCARBON RESIN.

2/ \*COLOR IDENTIFICATION NUMBER PER MIL-STD-681. OPAQUE DARK YELLOW SHALL BE DESIGNATED BY THE LETTER "N".

TABLE II PERFORMANCE DETAILS

PART NUMBER	DURABILITY TEST LOAD (GMS)	ABRASION RESISTANCE (PROCEDURE II)				BEND TESTING				
		WEIGHT SUPPORT BRACKET	WEIGHT (LBS)	TENSION LOAD (LBS)	MINIMUM INCHES OF TAPE	MANDREL DIA (IN MAX)			TEST LOAD (LBS)	
						LIFE CYCLE TEST	COLD BEND TEST	WRAP TEST	LIFE CYCLE TEST	COLD BEND TEST
M81381/20-30-*	75	A	.125	1	9	1/4	1/4	1/8	1/2	1/2
M81381/20-28-*										
M81381/20-26-*										
M81381/20-24-*	150								3/4	3/4
M81381/20-22-*										
M81381/20-20-*										

Part Number: The asterisk, \*, in the part number shown in the tables shall be replaced with a color identification number in accordance with MIL-STD-681, to indicate the color desired.

Example: M81381/XX-20-9 Size 20 wire, white, without stripes or bands.  
M81381/XX-20-93 Size 20 wire, base color white, with orange stripe or band.

FSC 6145

MIL-W-81381/20 (AS)

RATINGS:

Temperature Rating: 200°C (392°F) max conductor temperature

Voltage Rating: 600 volts (rms) at sea level

ADDITIONAL REQUIREMENTS:

Blocking: Oven temperature,  $200 \pm 2^\circ\text{C}$  ( $392 \pm 3.6^\circ\text{F}$ )

Color: As specified in contract or order in accordance with MIL-W-81381

Flammability: Extinguishing time, 3 seconds (max); travel, 3 inches (max);  
no flaming of tissue paper

Humidity Resistance: 5 megohms-1000 ft, min insulation resistance  
after humidity exposure

Identification of Product: Required for sizes 22 and larger

Identification, Striping, or Banding Durability: 125 cycles (250 strokes) (min);  
see Table II for test load.

Impulse Dielectric Test: 100% test; impulse voltage as specified in MIL-W-81381

Insulation Resistance: 2500 megohms-1000 ft (min)

Lamination Sealing: Oven temperature,  $230 \pm 2^\circ\text{C}$  ( $446 \pm 3.6^\circ\text{F}$ ) for 48 hours

Life Cycle: Oven temperature,  $230 \pm 2^\circ\text{C}$  ( $446 \pm 3.6^\circ\text{F}$ ) for 500 hours

Minimum Wall Thickness: 4.3 mils

Polyimide Cure Test: Required

Propellant Resistance: Test not required

Resin Coating Durability: 250 cycles (500 strokes) (min ave), 200 cycles (400 strokes)  
(min single reading) of 6 readings; see Table II for test load.

Shrinkage: 0.031 inch (max) at  $230 \pm 2^\circ\text{C}$  ( $446 \pm 3.6^\circ\text{F}$ )

Surface Resistance: 5 megohms - inches (min), initial and final readings

Thermal Shock: Oven temperature,  $200 \pm 2^\circ\text{C}$  ( $392 \pm 3.6^\circ\text{F}$ )  
Change in measurement, 0.031 inch (max)

Wet Dielectric Test: 2500 volts (rms)

NOTES:

- (1) This wire is intended for use in electronic chassis hookup applications. It is also intended for use in bundles under a protective jacket for airframe interconnecting applications.
- (2) This wire should not be subjected to hypergolic propellants.

**INSTRUCTIONS:** In a continuing effort to make our standardization documents better, the DoD provides this form for use in submitting comments and suggestions for improvements. All users of military standardization documents are invited to provide suggestions. This form may be detached, folded along the lines indicated, taped along the loose edge (*DO NOT STAPLE*), and mailed. In block 5, be as specific as possible about particular problem areas such as wording which required interpretation, was too rigid, restrictive, loose, ambiguous, or was incompatible, and give proposed wording changes which would alleviate the problems. Enter in block 6 any remarks not related to a specific paragraph of the document. If block 7 is filled out, an acknowledgement will be mailed to you within 30 days to let you know that your comments were received and are being considered.

**NOTE:** This form may not be used to request copies of documents, nor to request waivers, deviations, or clarification of specification requirements on current contracts. Comments submitted on this form do not constitute or imply authorization to waive any portion of the referenced document(s) or to amend contractual requirements.

---

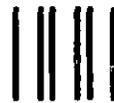
(Fold along this line)

---

(Fold along this line)

DEPARTMENT OF THE NAVY  
Commanding Officer  
Naval Air Engineering Center  
Systems Engineering Standardization Department  
(SESD), Code 93  
Lakehurst, NJ 08733

**OFFICIAL BUSINESS**  
PENALTY FOR PRIVATE USE \$300



NO POSTAGE  
NECESSARY  
IF MAILED  
IN THE  
UNITED STATES

**BUSINESS REPLY MAIL**  
FIRST CLASS PERMIT NO. 12503 WASHINGTON D. C.

POSTAGE WILL BE PAID BY THE DEPARTMENT OF THE NAVY

Commanding Officer  
Naval Air Engineering Center  
Systems Engineering Standardization Department  
(SESD). Code 93  
Lakehurst, NJ 08733

ATTN: TJM (9322)



# STANDARDIZATION DOCUMENT IMPROVEMENT PROPOSAL

(See Instructions - Reverse Side)

1. DOCUMENT NUMBER

2. DOCUMENT TITLE

3a. NAME OF SUBMITTING ORGANIZATION

4. TYPE OF ORGANIZATION (Mark one)

VENDOR

USER

MANUFACTURER

OTHER (Specify): \_\_\_\_\_

b. ADDRESS (Street, City, State, ZIP Code)

## 5. PROBLEM AREAS

a. Paragraph Number and Wording:

b. Recommended Wording:

c. Reason/Rationale for Recommendation:

## 6. REMARKS

7a. NAME OF SUBMITTER (Last, First, MI) - Optional

b. WORK TELEPHONE NUMBER (Include Area Code) - Optional

c. MAILING ADDRESS (Street, City, State, ZIP Code) - Optional

8. DATE OF SUBMISSION (YYMMDD)

(TO DETACH THIS FORM, CUT ALONG THIS LINE.)