

INCH-POUND

MIL-R-26/2D  
w/Amendment 1  
18 November 2010  
SUPERSEDING  
MIL-R-26/2D  
15 September 2006

## MILITARY SPECIFICATION SHEET

RESISTOR, FIXED, WIREWOUND (POWER TYPE),  
STYLES RW20, RW21, RW22, RW23, and RW24

THIS SPECIFICATION IS INACTIVE FOR NEW DESIGN (SEE 6.3)

This specification is approved for use by all Departments  
and Agencies of the Department of Defense.

The requirements for acquiring the product described herein  
shall consist of this specification sheet and [MIL-PRF-26](#).

### 1. SCOPE

1.1 Scope. This specification covers the associated requirements for styles RW20, RW21, RW22, RW23, and RW24, wirewound inductive resistors.

1.2 Part or Identifying Number (PIN). Resistors covered by this specification are identified by a PIN, which consists of the style designation, characteristic, and coded resistive value. The PIN is derived in accordance with MIL-PRF-26 and is in the following form:

<u>RW24</u>	<u>V</u>	<u>100</u>
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Style	Characteristic	Resistance
(1.2.1)	(1.2.2)	(1.2.3)

1.2.1 Style. The style is identified by the two-letter symbol "RW" followed by a two-digit number.

1.2.2 Characteristic. The characteristic is identified by a single letter that identifies the maximum continuous operating temperature (surface hot spot), the minimum insulation resistance value at the end of the moisture resistance test, and the resistance temperature characteristic in accordance with [table I](#).

1.2.3 Resistance. The nominal resistance expressed in ohms is identified by a three-digit number; the first two digits represent significant figures and the last digit specifies the number of zeroes to follow. When resistance values less than 10 ohms are required, the letter "R" is substituted for one of the significant digits to represent the decimal point. When the letter "R" is used, succeeding digits of the group represent significant figures as shown in the following example.

R10 = 0.1 ohm  
1R0 = 1.0 ohm

Comments, suggestions, or questions on this document should be addressed to: DLA Land and Maritime, ATTN: VAT, Post Office Box 3990, Columbus, Ohio 43218-3990 or by email [Resistor@dla.mil](mailto:Resistor@dla.mil). Since contact information can change, you may want to verify the currency of this address information using the ASSIST Online database at <https://assist.daps.dla.mil/>.

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Minimum and maximum resistance values are as specified herein. The standard values for every decade should follow the sequence demonstrated for the "10 to 100" decade shown in accordance with MIL-PRF-26.

TABLE I. Characteristic.

Symbol	Maximum continuous operation temperature <u>1/</u>	Minimum insulation resistance at end of moisture resistance	Resistance temperature characteristic (ppm/°C)
V <u>2/</u>	350°C	100 Megohms	$0 \pm 260 \geq 20$ ohms $0 \pm 400 \geq 10$ ohms to < 20 ohms $0 + 400, -200 \geq 1$ ohm to < 10 ohms $0 + 500, -100 \geq 0.499$ ohm to < 1 ohm $0 + 650, -100 \geq 0.1$ ohm to < 0.499 ohm

1/ This temperature is also the maximum permissible hot-spot surface temperature.

2/ Inductive wirewound.

## 2. APPLICABLE DOCUMENTS

2.1 General. The documents listed in this section are specified in sections 3 and 4 of this specification. This section does not include documents cited in other sections of this specification or recommended for additional information or as examples. While every effort has been made to ensure the completeness of this list, document users are cautioned that they must meet all specified requirements documents cited in sections 3 and 4 of this specification, whether or not they are listed.

### 2.2 Government documents.

2.2.1 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 cited in the solicitation or contract (see 6.2).

#### DEPARTMENT OF DEFENSE SPECIFICATION

MIL-PRF-26 - Resistors, Fixed, Wire Wound (Power Type), General Specification for.

(Copies of these documents are available online at <https://assist.daps.dla.mil/quicksearch/> or from the Standardization Document Order Desk, 700 Robbins Avenue, Building 4D, Philadelphia, PA 19111-5094).

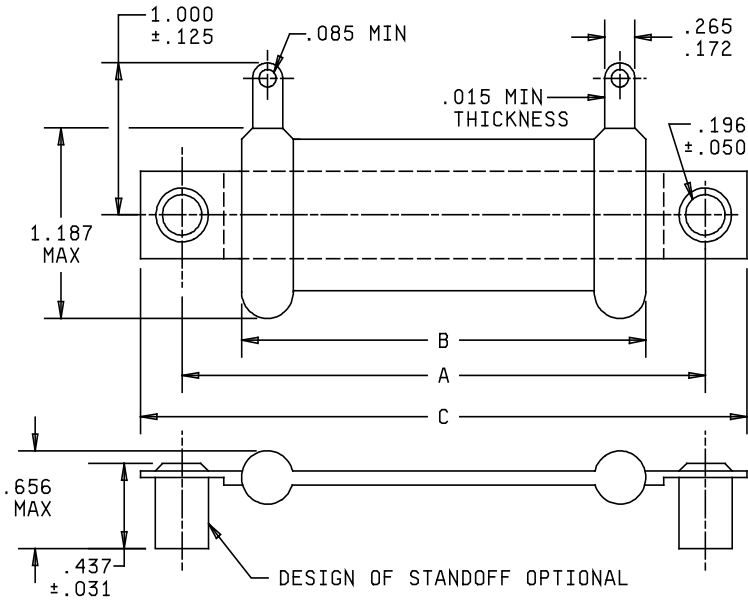
2.3 Order of precedence. Unless otherwise noted herein or in the contract, in the event of a conflict between the text of this document and the references cited herein (except for related specification sheets), the text of this document takes precedence unless otherwise noted. Nothing in this document, however, supersedes applicable laws and regulations unless a specific exemption has been obtained.

## 3. REQUIREMENTS

3.1 General. The requirements for acquiring the product described herein shall consist of this document and MIL-PRF-26.

3.2 Interface and physical dimension. Resistors shall meet the interface and physical dimensions specified on figure 1 and herein.

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Style	A ±.031	B ±.062	C +.156, -.062
RW20	2.000	1.250	2.500
RW21	2.750	2.000	3.250
RW22	4.250	3.500	4.750
RW23	5.500	4.750	6.000
RW24	6.750	6.000	7.250

<u>Inch</u>	<u>mm</u>	<u>Inch</u>	<u>mm</u>	<u>Inch</u>	<u>mm</u>	<u>Inch</u>	<u>mm</u>	<u>Inch</u>	<u>mm</u>
.015	0.38	.156	3.96	1.00	25.40	3.25	82.55	6.75	171.45
.031	0.79	.172	4.37	1.187	30.15	3.50	88.90	7.25	184.15
.050	1.27	.196	4.98	1.25	31.75	4.25	107.95		
.062	1.57	.265	6.73	2.00	50.80	4.75	120.65		
.085	2.16	.437	11.10	2.50	63.50	5.50	139.70		
.125	3.18	.656	16.66	2.75	69.85	6.00	152.40		

NOTES:

1. Dimensions are in inches.
2. Metric equivalents are given for general information only.

FIGURE 1. Styles RW20, RW21, RW22, RW23, and RW24.

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3.3 Power rating. The power rating shall be as specified in table II, based on full load operation at an ambient temperature of 25°C.

TABLE II. Power rating.

Resistor style	Power rating in watts (Characteristic V) <sup>1/</sup>
RW20	21
RW21	31
RW22	53
RW23	68
RW24	91

<sup>1/</sup> The power rating of center-tapped resistors shall be 90 percent of those shown.

3.4 Resistance. The minimum and maximum nominal resistance values shall be as specified in table III.

TABLE III. Minimum and maximum nominal resistance values.

Resistor style	Resistance values (ohms)	
	Minimum	Maximum
RW20	0.10	8,200
RW21		16,000
RW22		36,000
RW23		51,000
RW24		75,000

3.4.1 Standard resistance values. For standard resistance values see [MIL-PRF-26](#).

3.5 Resistance tolerance. These resistors have a resistance range of 0.10 ohm to 75,000 ohms with the following resistance tolerances:

- a. Resistors of less than 1 ohm in resistance value shall have a tolerance of  $\pm 10$  percent of the nominal resistance value. If center-tapped, the resistance tolerance between tap and terminal shall be  $\pm 10$  percent.
- b. Resistors of 1 ohm and over in resistance value shall have a tolerance of  $\pm 5$  percent of the nominal resistance value. If center-tapped, the resistance tolerance between tap and terminal shall be  $\pm 10$  percent.

3.6 Thermal shock. The resistors shall not change in resistance in excess of  $\pm(2$  percent +0.05 ohm).

3.7 Short-time overload. The resistors shall not change in resistance in excess of  $\pm(2$  percent +0.05 ohm).

3.8 High-temperature exposure. The resistors shall not change in resistance in excess of  $\pm(2$  percent +0.05 ohm).

3.9 Moisture resistance. The resistors shall not change in resistance in excess of  $\pm(2$  percent +0.05 ohm).

3.10 Low-temperature storage. The resistors shall not change in resistance in excess of  $\pm(2$  percent +0.05 ohm).

3.11 Life. The resistors shall not change in resistance in excess of  $\pm(3$  percent +0.05 ohm).

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3.12 Solderability. Solderability is applicable to this specification.

3.13 Terminal strength. The resistors shall not change in excess of  $\pm(1$  percent +0.05 ohm).

3.14 Dielectric withstanding voltage (barometric pressure, reduced, not applicable). The resistors shall not change in resistance in excess of  $\pm(1$  percent +0.05 ohm).

3.15 Pure tin. The use of pure tin, as an underplate or final finish is prohibited both internally and externally. Tin content of resistor components and solder shall not exceed 97 percent, by mass. Tin shall be alloyed with a minimum of 3 percent lead, by mass (see 6.5).

#### 4. VERIFICATION

4.1 Sampling and inspection. Sampling and inspection shall be in accordance with MIL-PRF-26.

4.2 Short-time overload. The maximum voltages shall be in accordance with table IV.

TABLE IV. Maximum voltages for short-time overload.

Resistor style	RW20	RW21	RW22	RW23	RW24
Voltage (volts max)	500	1,250	2,700	3,800	5,300

#### 5. PACKAGING.

5.1 Packaging. For acquisition purposes, the packaging requirements shall be as specified in the contract or order (see 6.2). When packaging of materiel is to be performed by DoD or in-house contractor personnel, these personnel need to contact the responsible packaging activity to ascertain packaging requirements. Packaging requirements are maintained by the Inventory Control Point's packaging activity within the Military Service or Defense Agency, or within the military services system commands. Packaging data retrieval is available from the managing Military Department's or Defense Agency's automated packaging files, CD-ROM products, or by contacting the responsible packaging activity

#### 6. NOTES

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

6.1 Notes. In addition to the notes specified herein, the notes specified in MIL-PRF-26 are applicable to this specification.

6.2 Acquisition requirements. Acquisition requirements are as specified in MIL-PRF-26.

- a. Title, number, and date of this specification, and the complete PIN (see 1.2).
- b. Unless otherwise specified (see 2.1), the versions of the individual documents referenced will be those in effect on the date of release of the solicitation.
- c. Packaging instructions (see 5.1).

6.3 Inactive for new design. The resistors specified herein are not to be used in new design. They are authorized for use in design contracts effective prior to 11 May 1973 and to support existing military equipment. Resistors specified in MIL-PRF-39007 are preferred for design.

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6.4 Derating. Resistors shall be derated, when necessary, in accordance with figure 2.

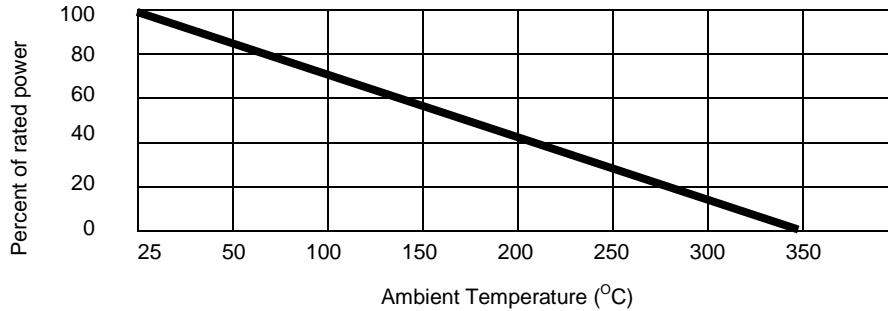


FIGURE 2. Derating curve for high ambient temperatures.

6.5 Tin whisker growth. The use of alloys with tin content greater than 97 percent, by mass, may exhibit tin whisker growth problems after manufacture. Tin whiskers may occur anytime from a day to years after manufacture and can develop under typical operating conditions, on products that use such materials. Conformal coatings applied over top of a whisker-prone surface will not prevent the formation of tin whiskers. Alloys of 3 percent lead, by mass, have shown to inhibit the growth of tin whiskers. For additional information on this matter, refer to [ASTM-B545](#) (Standard Specification for Electrodeposited Coatings of Tin).

6.6 Amendment notification. The margins of this specification are marked with vertical lines to indicate modification generated by this amendment. 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.

Custodians:  
Army - CR  
Navy - EC  
Air Force - 11  
DLA - CC

Preparing activity:  
DLA - CC  
(Project 5905-2011-002)

Review activities:  
Army - MI  
Navy - AS  
Air Force - 19

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