EXTERNAL VISUAL INSPECTION

OF RESISTORS

ESCC Basic Specification No. 2054000

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DCR No.	CHANGE DESCRIPTION
838	Specification upissued to incorporate editorial changes per DCR.

TABLE OF CONTENTS

1 SCOPE

This specification to be read in conjunction with ESCC Basic Specification No. 20500 External Visual Inspection, contains additional specific requirements for Resistors. They shall apply, where relevant, to each device inspected.

2 GENERAL REQUIREMENTS

2.1 APPLICABILITY

The following criteria may not be varied or modified after commencing an inspection stage. Any ambiguity or proposed minor deviation shall be referred to the ESCC Executive for resolution and approval.

2.2 PROCEDURE

All items shall be examined in such a manner that a minimum of handling and movement of the component is involved.

3 EQUIPMENT REQUIRED

3.1 MAGNIFICATION

All items shall be examined with a stereoscopic microscope with a minimum magnification of 5 power (5x).

3.2 MOUNTING FIXTURES

Suitable fixtures may be used to assist in the inspection process, provided that they do not themselves cause damage to the device.

4 DETAILED REQUIREMENTS

4.1 REJECT CRITERIA

A component shall be rejected if it exhibits one or more of the defects listed in any of the following paragraphs of this Section.

Where applicable, drawings are included to provide additional explanatory material, but shall be considered as examples only.

4.2 LEAD CONDITIONS

4.2.1 Non-Insulated Leads

(a) Corrosion is evident.
(b) Plating damage exposing base material beyond 3mm from the case.
(c) Lead diameter is reduced by more than 10% in any part within 20mm of the case.
(d) Non-conductive material present on the lead, beyond 3mm from the case.

4.2.2 Insulated Leads

(a) Insulation damaged so that metallic conductor is visible.
(b) Holes or cracks visible in the insulation.

4.3 LEAD CONFIGURATION

(a) Round lead, twisted more than one revolution along the length (Figure 1).
(b) Leads kinked within 20mm of the case (Figure 2).
(c) Eccentricity of lead passing through end of body is greater than 10% of the body diameter: $d \geq 0.1D$ or 0.5mm, whichever is smaller (Figure 3).
(d) Any rigid lead tilted by more than 5° (Figure 4).
(e) Any lead printed beside 3mm of the case (Figure 4).

4.4 CASE OR PACKAGE

(a) Moulding eccentricity by more than 10% (Figure 5).
(b) Coating or moulding material showing holes or cracks whose depth cannot be determined.
(c) Coating or moulding material showing holes, cracks or scratches whose surface area exceeds 1% of the total surface area of the moulding or coating material.
(d) Part of the body or body lead connections are not covered by coating or moulding.
(e) Coating or moulding chipped and whose chippage area exceeds 5% of the total surface area of the moulding or coating material.
(f) Any surface contaminated by foreign material.
(g) Moulding flash or excess of moulding material at the end of the body (Figure 6).

4.5 ADDITIONAL REQUIREMENTS FOR WIREWOUND, CHASSIS-MOUNTED RESISTORS

4.5.1 Housing

(a) Contact area between the bottom of the housing and the surface plate is less than 50% (Figure 7).
(b) Cracks or scratches in plating whose surface area exceeds $5mm^2$ (Figure 8).
(c) Burrs exceeding 0.5mm (Figure 9).

4.5.2 Ends of the Enclosure (Figure 10)

(a) Caps visible due to a lack of coverage by moulding material.
(b) Cracks or scratches whose length exceeds one third of the diameter of the enclosure.

4.5.3 Eyelet Terminals (Figure 11)

(a) Hole partially covered by solder.
(b) Hole eccentricity more than 10%.
(c) Protuberance exceeding 0.5mm.

4.6 ADDITIONAL REQUIREMENTS FOR VARIABLE RESISTORS

(a) Head improperly formed or damaged.
(b) Screw head not fully accessible.
(c) Screw thread improperly formed or damaged.

5 FIGURES

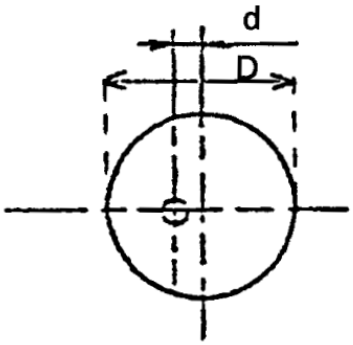
FIGURE 1 – TWISTED LEAD

NOTE:
1. See Para. 4.3(a).

FIGURE 2 – KINKED LEAD

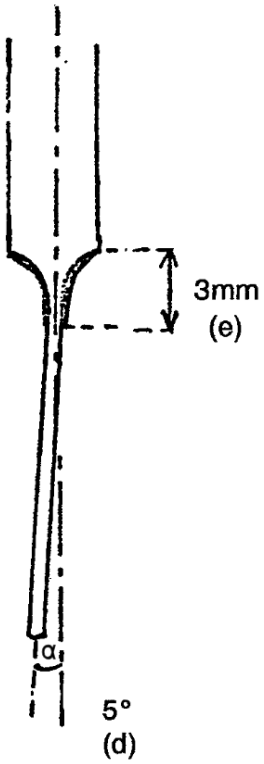
NOTE:
1. See Para. 4.3(b).

FIGURE 3 – ECCENTRICITY OF LEAD



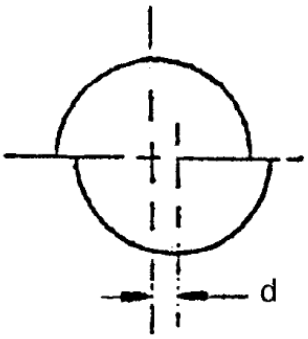
NOTE:
1. See Para. 4.3(c)

FIGURE 4 – TILTED LEAD



NOTE:
1. (d) and (e) relate to Paras. 4.3(d) and 4.3(e) respectively.

FIGURE 5 – MOULDING ECCENTRICITY

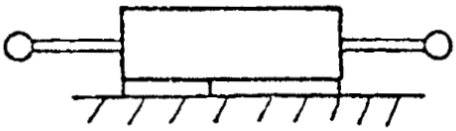


NOTE:
1. See Para. 4.4(a).

FIGURE 6 – MOULDING FLASH

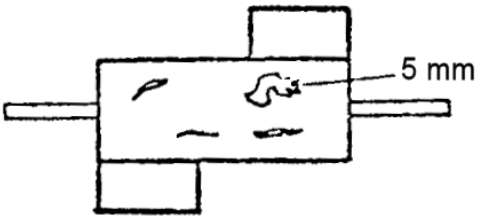
NOTE:
1. See Para. 4.4(g).

FIGURE 7 – CONTACT AREA BETWEEN HOUSING AND PLATE



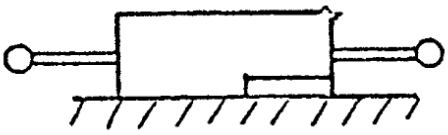
NOTE:
1. See Para. 4.5.1(a).

FIGURE 8 – CRACKS AND SCRATCHES IN PLATING



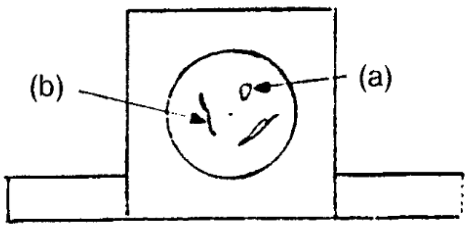
NOTE:
1. See Para. 4.5.1(b)

FIGURE 9 - BURRS



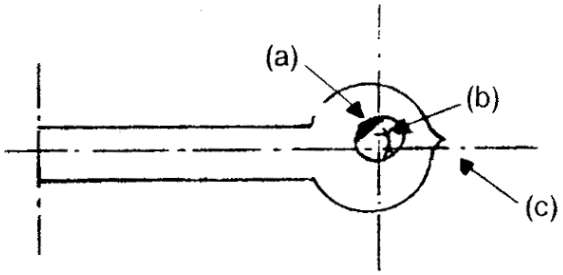
NOTE:
1. See Para. 4.5.1(c).

FIGURE 10 – ENDS OF THE ENCLOSURE



NOTE:
1. See Para. 4.5.2.

FIGURE 11 – EYELET TERMINALS



NOTE:
1. (a), (b) and (c) relate to Paras. 4.5.3(a), 4.5.3(b) and 4.5.3(c) respectively.