EXTERNAL VISUAL INSPECTION OF ELECTROMAGNETIC RELAYS

ESCC Basic Specification No. 2053600

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DCR No.	CHANGE DESCRIPTION
1706	Specification upissued to incorporate changes per DCR.

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1 SCOPE

This Specification to be read in conjunction with ESCC Basic Specification No. 20500, External Visual Inspection, contains additional specific requirements for Electromagnetic Relays.

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 using a binocular or stereoscopic microscope. The magnification shall be X10.

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. Care shall be taken that adequate provision is made to avoid accidental damage.

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

4.2 TERMINALS

4.2.1 Flexible Terminals

Unless a terminal is described as rigid in the Detail Specification, the terminal is designed to be flexible and the following rejection criteria shall apply:

(a) Condition:

1) Exposed base material, in excess of terminal diameter or thickness, caused by chipped glass meniscus.
2) Exposed base material anywhere on the terminal within a distance of 20mm of the case, other than that caused by 1) above.
3) Exposed base material in excess of 5% of the surface area anywhere on the terminal, beyond a distance of 20mm from the case.
4) Non-conductive material on the terminal, beyond a distance of 1.5mm from the case.
5) Reduction of terminal diameter, width or thickness by more than 10% within 20mm of the case.
6) Nicks, fractures, non-uniformity or discolouration of coating, or abrasions exposing base material.

(b) Configuration:

1) Straight round terminals twisted more than 1 revolution per 30mm of length.
2) Terminals kinked, or bent and re-bent within 20mm of the case.
3) Terminals deviating from the specified direction by more than 1mm per any 5mm of length.
4) Eccentricity of the terminal passing through the centre of a glass-to-metal seal greater than 10% of the seal diameter (see Figure 1 in Para. 5.1).
5) Terminals tilted by more than five degrees (5°) (see Figure 2 in Para. 5.2).

4.2.2 Rigid Terminals

When a terminal is described as rigid in the Detail Specification, the following rejection criteria shall apply:

(a) Condition:

1) Exposed base material, in excess of terminal diameter or thickness, caused by chipped glass meniscus.
2) Exposed base material in excess of 5% of the surface area anywhere on the terminal other than that caused by (a); see also note below.

   NOTE:
   Exposed base material within 2.5mm from the body, resulting from wire wrappings during the terminal plating operation, is acceptable.
3) Non-conductive material on the terminal, beyond a distance of 2.5mm from the case.
4) Reduction of terminal diameter, width or thickness by more than 10%.
5) Nicks, fractures, non-uniformity or discolouration of coating, or abrasions exposing base material.

(b) Configuration:

1) Terminals kinked or bent by more than 5°.
2) Eccentricity of the terminal passing through the centre of a glass-to-metal seal greater than 10% of the seal diameter (see Figure 1 in Para. 5.1).
3) Terminals tilted by more than five degrees (5°) (see Figure 2 in Para. 5.2).

4.3 GLASS SEALS

(a) Filling, in glass-filled cases, protruding above the level of the case flange (see Figure 3 in Para. 5.3).

(b) Individual bubbles diameter more than a third of the minimum distance between the terminal and the header, or an area of adjacent bubbles in the seal area bigger than 12.5% of the seal area (see Figure 4 in Para. 5.4).

(c) Any foreign material in the glass seal with a maximum dimension greater than half the distance between the lead and the edge of the seal, or a grouping of smaller foreign materials whose overall maximum dimension exceeds 50% of the glass seal (see Figure 5 in Para. 5.5).

NOTE:
This criterion shall not apply if the foreign material is successfully removed. The glass seal shall be re-examined to verify there are no induced or hidden chips or cracks.

(d) Cracked or chipped glass seal (see Figure 6 in Para. 5.6).

(e) Incomplete wetting of terminal by glass (see Figure 7 in Para. 5.7).

4.4 HEADERS

(a) At least 98% of the headers shall be covered by a protective plating as defined in the Detail Specification.

(b) Header/can junctions shall be free from voids or pits.

(c) Tinning shall be smooth and bright.

4.5 CASE OR PACKAGE SEALING

(a) Lack of solder continuity around the complete perimeter of the case or solder protruding beyond the edge of the case.

(b) Weld spatters, lack of uniformity or continuity of weld.

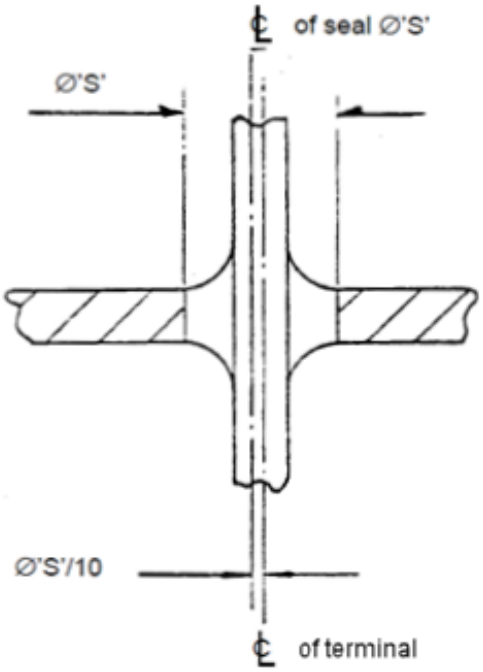
(c) Reduction of design sealing area by more than 20% due to undercutting of sealing material or misalignment of case parts.

4.6 CASE CONCENTRICITY

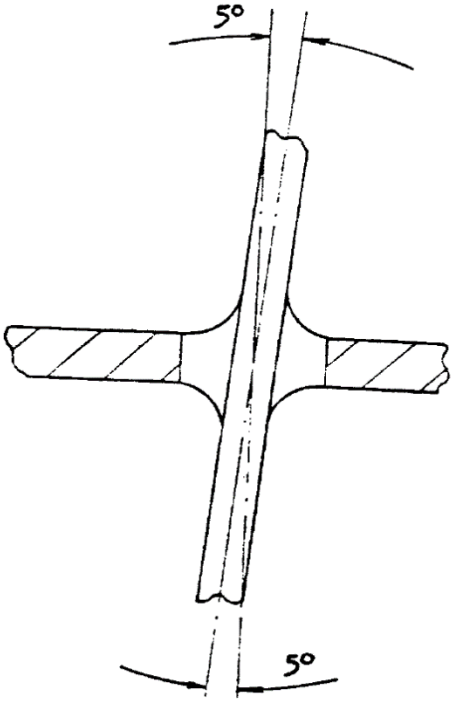
(a) Minimum case perimeter to header perimeter clearance, in plan view, less than 70% of the maximum clearance (see Figure 8 in Para. 5.8).

5 FIGURES

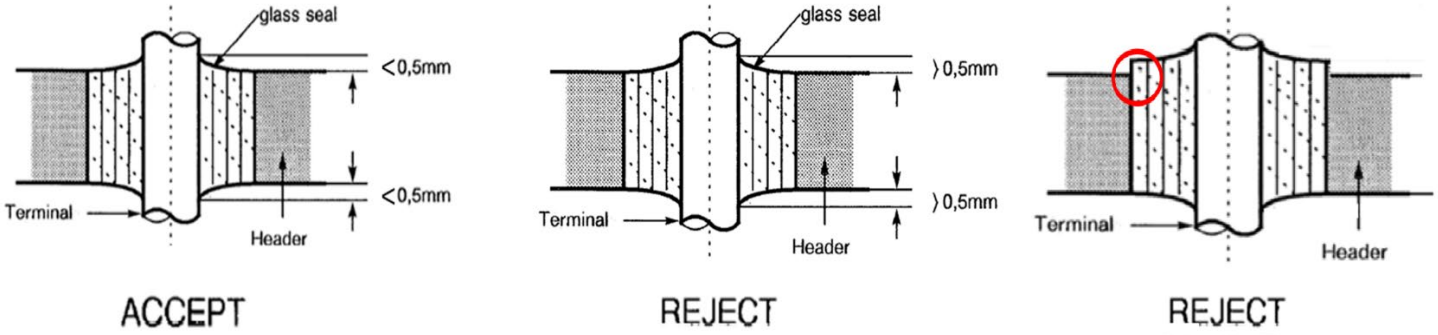
5.1 FIGURE 1: TERMINAL ECCENTRICITY



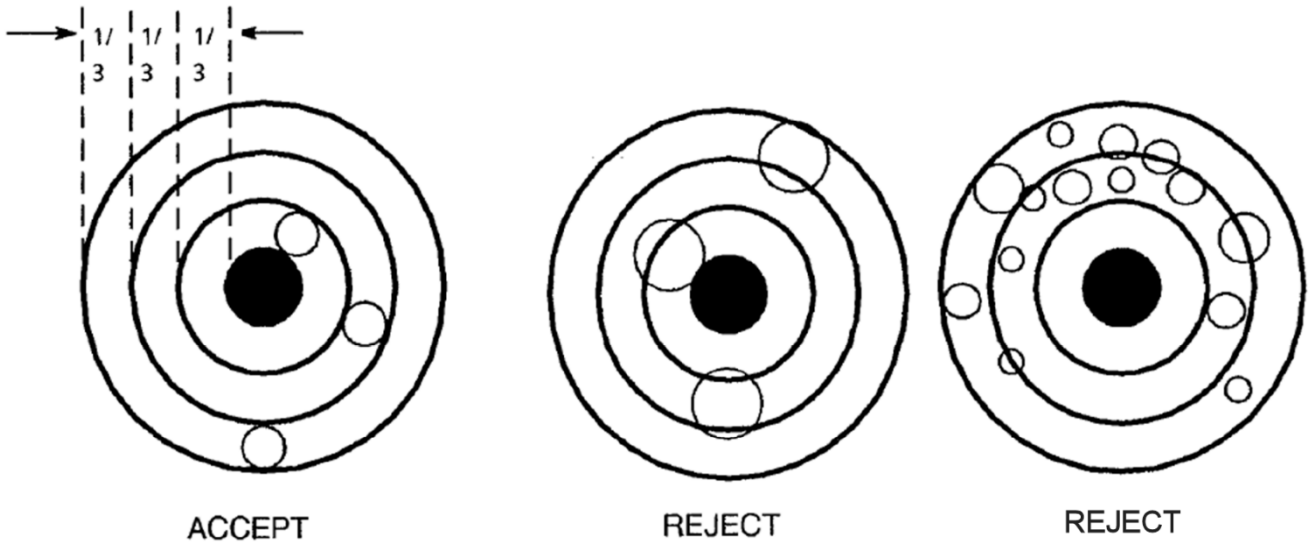
5.2 FIGURE 2: TERMINAL TILT



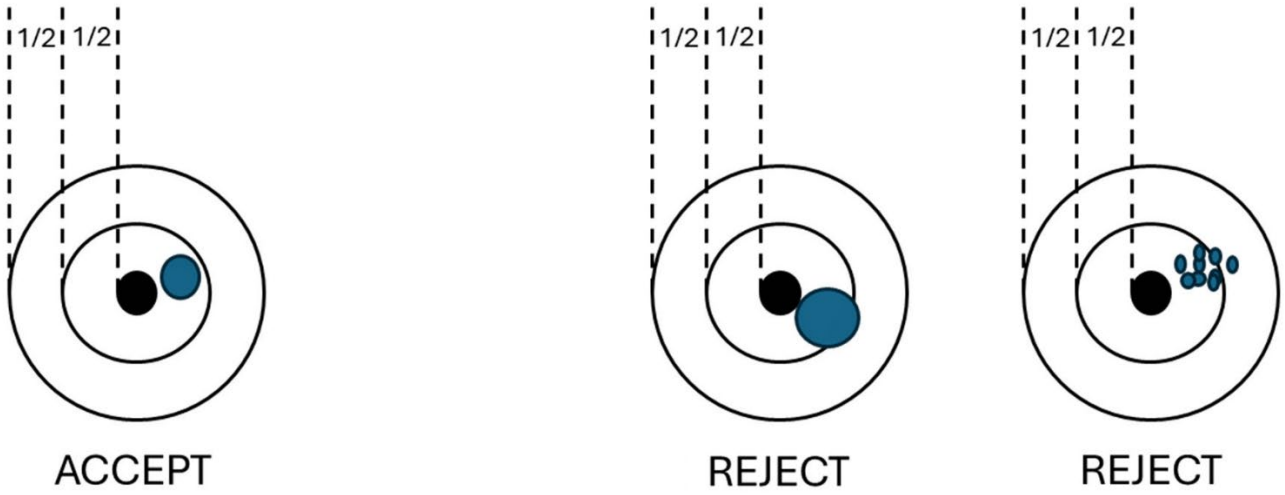
5.3 FIGURE 3: PROTRUSION OF THE FILLING



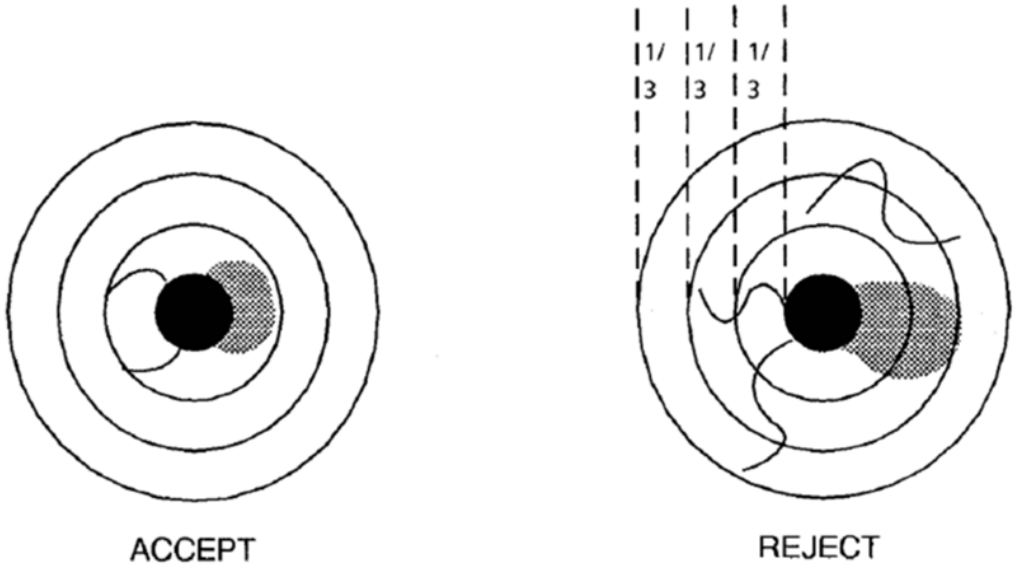
5.4 FIGURE 4: BUBBLES IN GLASS-TO-METAL SEAL



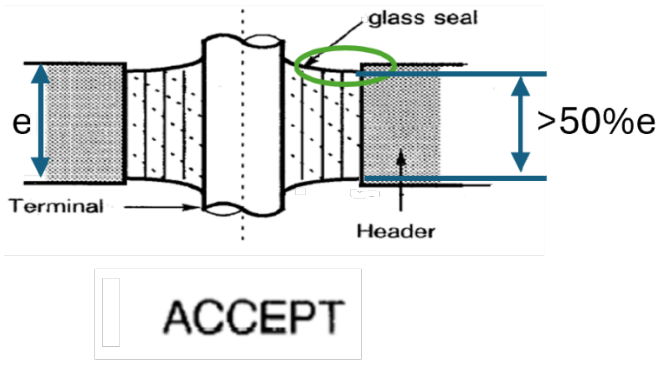
5.5 FIGURE 5: FOREIGN MATERIAL IN THE GLASS SEAL

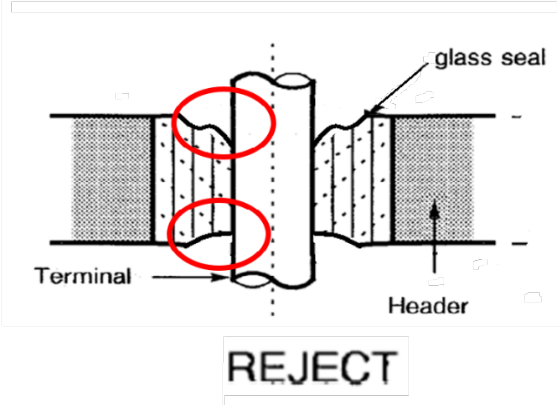


5.6 FIGURE 6: GLASS-TO-METAL SEAL CRACKS AND CHIP-OUTS



5.7 FIGURE 7: INCOMPLETE WETTING OF TERMINAL





5.8 FIGURE 8: CASE CONCENTRICITY