

INTERNAL VISUAL AND MECHANICAL

1. PURPOSE. The purpose of this examination is to verify that internal materials, design and construction are in accordance with the applicable acquisition document. This test is destructive and would normally be employed on a sampling basis in qualification or quality conformance inspection of a specific device type to demonstrate compliance with the acquisition document and to reveal any undocumented changes to the part type.

2. APPARATUS. Equipment used in this examination shall be capable of demonstrating conformance to the requirements of the applicable acquisition document and shall include optical equipment capable of magnification sufficient to verify all structural features of the devices.

3. PROCEDURE. The device shall be examined under a sufficient magnification to verify that all the internal materials, design and construction are in accordance with the requirements of the applicable design documentation or other specific requirements (see 4). Specimens of constructions which do not contain an internal cavity (e.g., encapsulated or embedded devices) or those which would experience destruction of internal features of interest as a result of opening, may be obtained by interception during manufacturing prior to encapsulation. Specimens of constructions with an internal cavity shall be selected from devices which have completed all manufacturing operations and they shall be delidded or opened or both taking care to minimize damage to the areas to be inspected. When specified by the applicable acquisition document, the interception procedure may be used to obtain specimens of constructions with an internal cavity.

3.1 Photographs of die topography and intraconnection pattern. When specified, an enlarged color photograph or transparency shall be made showing the topography of elements formed on the die or substrate and the metallization pattern. This photograph shall be at a minimum magnification of 80X except that if this results in a photograph larger than 8 inches x 10 inches, the magnification may be reduced to accommodate an 8 inches x 10 inches view.

3.2 Failure criteria. Devices which fail to meet the detailed requirements for materials, design and construction shall constitute a failure.

4. SUMMARY. The following details shall be specified in the applicable acquisition document:

- a. Any applicable requirements for materials, design and construction.
- b. Allowance for interception procedure of internal cavity devices, when applicable (see 3).
- c. Requirement for photographic record, if applicable (see 3.1), and disposition of photographs.