The Institute for Interconnecting and Packaging Electronic Circuits
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IPC-TM-650
TEST METHODS MANUAL

Number **2.1.5**	
Subject **Surface Examination, Unclad and Metal-Clad Material**	
Date **12/82**	Revision **A**
Originating Task Group **N/A**	

1.0 Scope This test method identifies the major areas of concern during a visual examination and describes the recommended procedures.

2.0 Application Documents None.

3.0 Test Specimen Any representative clad or unclad sample of printed wiring material.

4.0 Equipment/Apparatus Magnifier or microscope capable of up to 30X magnification, having a reticle capable of measuring to the nearest 0.001 in.

5.0 Procedures

5.1 Pinholes Pinholes are predetermined by visual examination using not less than 10X magnification on the specimen. Copper surfaces should be prepared by cleaning or light etching.

5.2 Pits and Dents The maximum total point count for pits and dents, per square foot of panel inspected is determined as follows:

Longest Dimension (inch)	*Point Value*
0.000 to 0.010 inclusive	1
0. 011 to 0.020 inclusive	2
0.021 to 0.030 inclusive	4
0.031 to 0.040 inclusive	7
over 0.040	30

Pits and dents should be determined visually using not less than 10X magnification on the specimen.

5.3 Scratches Scratches can be measured with the use of a microscope (30X maximum).

5.4 Wrinkles Wrinkles should be viewed by normal or corrected 20/20 vision.

5.5 Inclusions Inclusions should be measured using 18X to 30X magnification.

6.0 *Notes*

For additional reference see:
IPC-CF-150: Copper Foil
IPC-A-600: Acceptability of Printed Boards
MIL-P-13949: Laminate Materials