



IPC-TM-650 TEST METHODS MANUAL

1.0 Scope This inspection method is designed to visually inspect for dicyandiamide, commonly called "dicy," that is not dissolved in the resin of prepreg materials in which it is used as a curing agent, by means of polarized lighting.

2.0 Applicable Documents None.

3.0 Test Specimens Unless otherwise specified, one ply of prepreg cut to 101.6 x 101.6 mm [4.0 x 4.0 in].

4.0 Apparatus or Material

4.1 An incidental light source such as a photographic light box, light table or illuminated microscope base. Light intensity shall be sufficient to detect small features of the specimen under fully polarized conditions, such as a 60 watt light bulb used in a light box.

4.2 A matched pair of polarizing filter lens.

4.3 A microscope capable of magnification at least 30X to 100X.

5.0 Procedure

5.1 Preparation

5.1.1 Place one polarizing filter directly over the light source. Place the specimen over the filter.

5.1.2 Place second polarizing filter over the specimen directly in line with the first filter.

5.1.3 Set microscope to desired magnification between 30X and 100X and position over the approximate center of the filters. For referee purposes, magnification shall be at 100X.

5.1.4 Focus microscope on the specimen through the top filter.

5.1.5 Rotate top filter 90° from bottom filter (see Figure 1).

5.2 Evaluation

5.2.1 Examine for the presence of dicy over the entire specimen, excluding the edges. The dicy (if present) will cause scattering of the polarized light which can then pass through the second filter in sufficient intensity to be visible.

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5.2.2 Careful scrutiny must be used to eliminate consideration of dust or cracks in the resin as dicy, because they will also diffuse polarized light. Severe incidence of undissolved dicy may be observed using partially or non-polarized light.

5.3 Report Presence of dicy shall be noted as per the degrees shown in Appendix A. Appearance as to the form, i.e., crystal, flake, or cluster, shall be reported.

6.0 Notes

6.1 Dicy is a curing agent used with epoxy resin; it is introduced at the resin mixing stage. If the mix is not homogeneous or is improperly done, particles of dicy may not dissolve or may be recrystallized. Dicy may also recrystallize during the treating operation. During lamination of the prepreg, dicy may contribute to the formation of voids or other defects.

6.2 Dicy Flake A loose mass of crystals, usually in the form of crystals radiating from a center point.

6.3 Dicy Cluster A concentration of crystals or flakes.

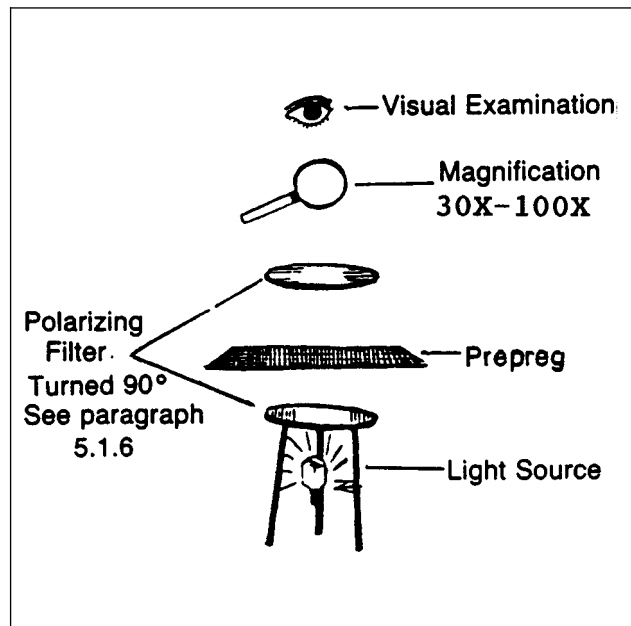
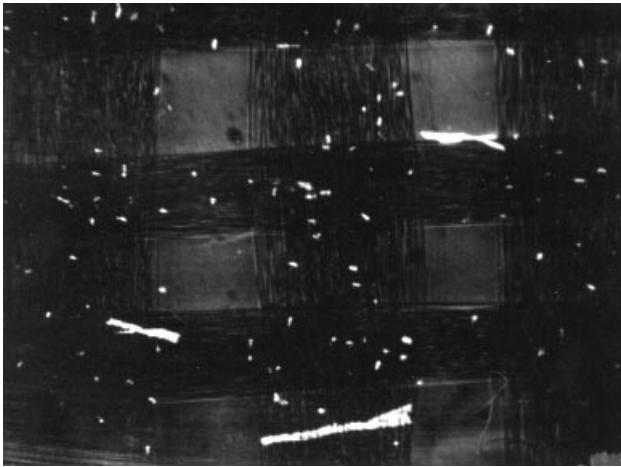


Figure 1 Dicy inspection set-up (expanded view)

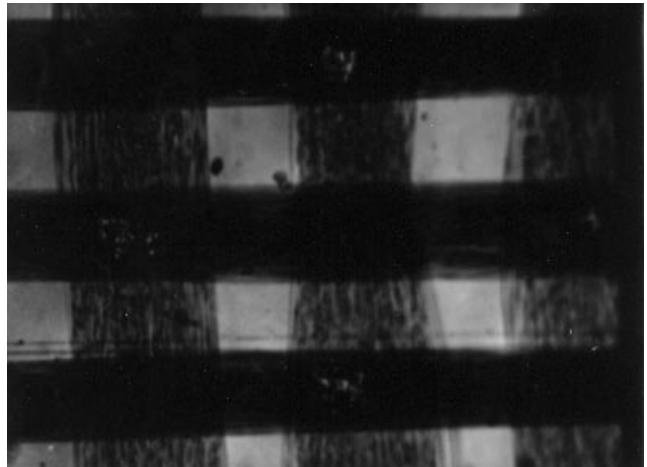
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Appendix A: [Photos of dicy in lowest, medium, high, and extreme levels.]

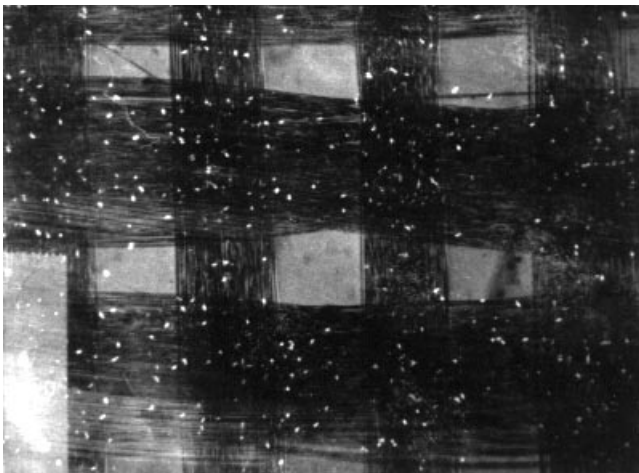
Degree 1



Degree 1



Degree 2



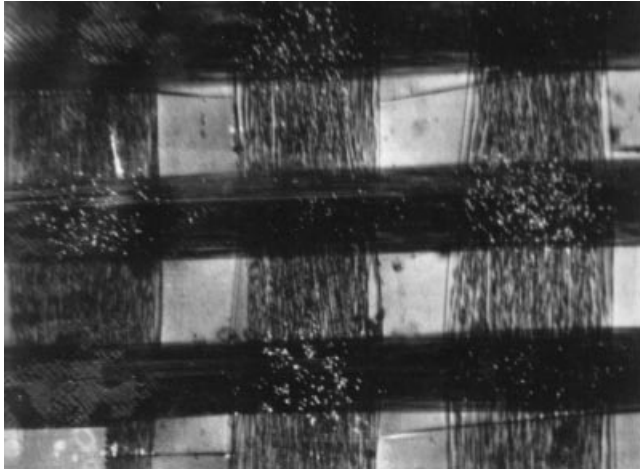
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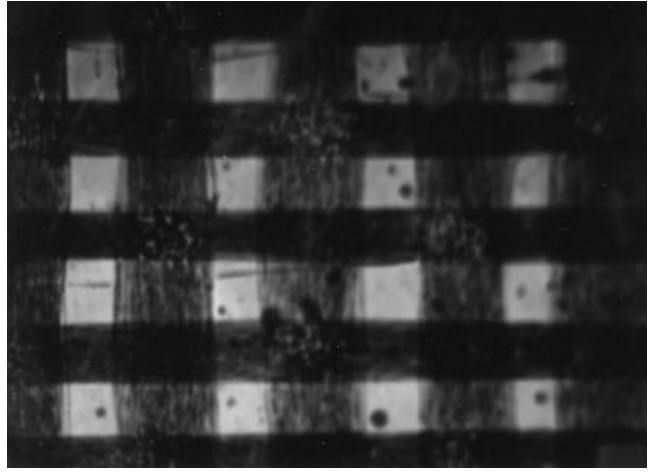
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DEGREES OF DICYANDIAMIDE (DICY) CRYSTALS

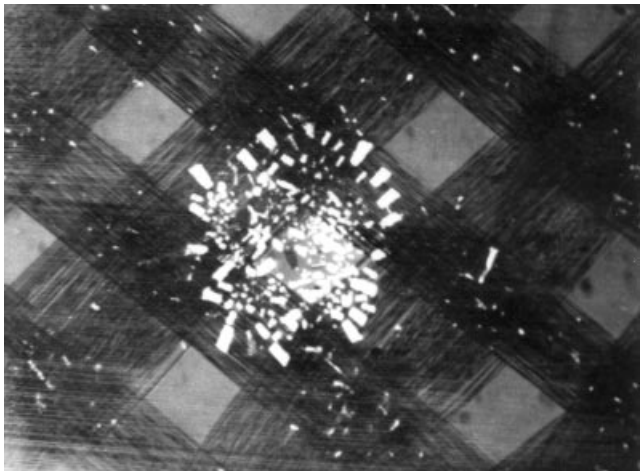
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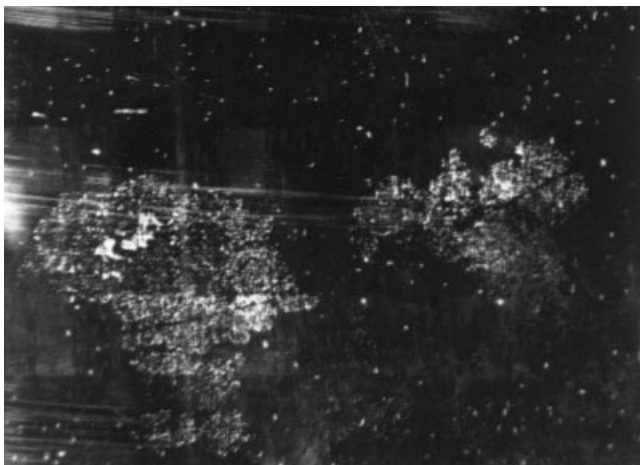
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Degree 4



Degree 4



Degree 5

