



Use of Visible (Red) Dye Liquid Penetrant with Inspection of Safety Critical Components **AWB** 20-002 **Issue :** 2
Date : 20 November 2013

1. Applicability

All personnel conducting liquid penetrant inspection using the visible dye method.

2. Purpose

To advise personnel involved in using liquid penetrant for non-destructive inspection of the unsuitability of visible dye penetrant - predominately coloured red - for final inspection of safety critical components.

3. Background

The portability, low cost and ease of use of visible (usually red) dye penetrant has allowed this type of penetrant system to become the preferred option for many personnel inspecting safety critical components. However, ASTM E 1417 'Standard Practice for Liquid Penetrant Testing' prohibits the use of visible dye penetrant for final acceptance of inspection for aerospace products.

In addition to the above limitation, ASTM E 1417 also prohibits the use of visible dye penetrant before an inspection using a fluorescent dye penetrant. The chemical properties of visible dye penetrant 'quench' or destroy the fluorescence (glowing) of fluorescent dyes, degrading both the sensitivity of the inspection and the accuracy of any result.

CASA strongly supports and endorses both these limitations for visible dye penetrant systems.

National Airworthiness Authorities and Non-Destructive Testing professionals are concerned about the potential to compromise an inspection when using visible dye penetrant for final inspection of safety critical aircraft components and materials, which is contrary to the governing standards published for penetrant systems. The FAA was so concerned they issued a memorandum in 2000 to highlight the deficiencies when using visible dye penetrant for final inspection of safety critical components.

4. Recommendation

Before using dye penetrant, personnel certifying for penetrant inspection should familiarise themselves with the applicable standard, such as ASTM E 1417, for the method they are using and the procedure for inspection of the aircraft component or material.



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5. Enquiries

Enquiries with regard to the content of this Airworthiness Bulletin should be made via the direct link e-mail address:

AirworthinessBulletin@casa.gov.au

or in writing, to:

Airworthiness and Engineering Standards Branch
Standards Division
Civil Aviation Safety Authority
GPO Box 2005, Canberra, ACT, 2601

Enquiries regarding the technical content of this Airworthiness Bulletins should be made to the National Aerospace Non-Destructive Testing Board of Australia (NANDTBA) via e-mail address:
secretary@ndtboard.com