
International Standard



3453

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**Non-destructive testing — Liquid penetrant inspection —
Means of verification**

Essais non destructifs — Contrôle par ressuage — Moyens de vérification

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 3453 was prepared by Technical Committee ISO/TC 135, *Non-destructive testing*.

Non-destructive testing — Liquid penetrant inspection — Means of verification

1 Scope and field of application

1.1 This International Standard provides general guidance on the verification procedures to be applied when carrying out penetrant inspection, for example in accordance with ISO 3452.

NOTE — For the purpose of this International Standard, the terms and definitions given in the glossary of terms used in non-destructive testing (in preparation) apply.

1.2 These tests are intended to ensure that the penetrant system is functioning correctly and that there has been no harmful deterioration of the process materials during service.

1.3 Generally, the frequency of checking penetrant materials and black light sources will depend on the frequency and conditions of usage. Specific and maximum intervals should be recommended by the manufacturer.

2 References

ISO 3059, *Non-destructive testing — Method for indirect assessment of black light sources.*

ISO 3452, *Non-destructive testing — Penetrant inspection — General principles.*

3 Control of penetrant

3.1 The mass density shall be checked frequently and maintained in accordance with the manufacturer's instructions.

3.2 Visible dye intensity shall be checked frequently and maintained in accordance with the manufacturer's instructions. For checking purposes, 10 ml of the solution under test is added to 90 ml of colourless kerosene or other inert solvent in a graduated cylinder and mixed thoroughly, the same procedure being carried out on a standard reference penetrant (see the

note). The colour intensities of each sample are then compared by suitable means, for example in Nessler tubes in which working solutions are compared with diluted standard solutions. The penetrant under test shall be discarded if the colour intensities differ by more than 20 %.

3.3 Fluorescent dye intensity shall be checked frequently and maintained at 75 % at least of that of the standard reference liquid. For checking purposes, both used and reference penetrant samples are diluted to a 10 % solution in methylene chloride (dichloromethane). Equal quantities of each solution are then placed on filter paper and both papers dried in a suitable oven. The filter papers are viewed under a black light source at a distance of 0,5 m and, if a noticeable difference is observed after a period of up to 1 h, a further test for intensity shall be carried out in accordance with annex A of ISO 3059.

NOTE — In order to provide a standard reference for the check, a 0,5 l sample of all new batches of penetrants and emulsifiers should be taken and stored in airtight glass containers, protected from extremes of temperature and direct sunlight, and suitably identified to show the batch of materials to which they belong.

4 Control of developers

4.1 Dry powder developers shall be checked frequently for contamination with penetrant and shall be maintained in a dry fluffy condition.

4.2 Liquid developers shall be maintained within the working concentrations specified by the manufacturers and their mass density shall be checked frequently.

5 Control of black light

The output from black light sources shall be checked frequently and maintained at a level of not less than 50 relative units at the working surface as assessed in accordance with ISO 3059.