

EDS

Engineering,
GM DAEWOO Auto & Technology
Standards

METHOD OF LIQUID PENETRANT TEST

EDS-T-7124

ISSUED DATE: 1988. 11. 10

REVISED DATE: 2006. 06. 19

VERSION: 2

1. SCOPE

This standard specifies liquid penetrant testing (hereinafter referred to as test) for metallic materials such as ferrous and nonferrous metal and non-metallic materials such as plastic, glass, ceramic and its product(hereinafter referred to as test piece).

2. DEFINITIONS

2.1. Emulsifier: Substances which help penetrant washed with water, acting with unwashable penetrant such as oil

2.2. Water washable penetrant: A type of penetrant to be washed with water due to its inclusion of emulsifier.

2.3. Penetrant sensitivity: Performance of penetrant from penetration until it indicates flaws after being developed.

2.4. Application of penetrant: Applying an inspection material to the surface of test piece by dipping, brushing, spraying or any other method.

2.5. Penetrant application time: Time during which a kind of inspection material on the surface of the piece continues to be kept in a liquid condition without being dried.

2.6. Ultraviolet rays: Ultraviolet rays with a wave length of $3,200 \sim 4,000 \text{ \AA}$ which passed through filtering device.

2.7. Fluorescent: Visible ray which a chemical gives off under ultraviolet rays.

2.8. Developer: Substance which helps the pattern of flaws be recognized under ultraviolet rays or natural light by absorbing or siphoning off penetrant liquid which has penetrated into surface cracks or flaws.

3. QUALIFICATION OF TEST PERSONNEL

Test personnel shall be the one who has necessary qualifications (non-destructive test engineer) or sufficient knowledge and experience in this field.

4. MATERIAL

4.1. Selection of material

Unless otherwise specified, all the inspection materials such as penetrant, emulsifier, and developer shall be the ones which come up to the international standard and shall not be harmful to human body and shall be suitable for each test method.

4.2. Guidance for use

Application time of emulsifier, and concentration and mixing procedure of wet developer shall conform to the manufacturer's order.

4.3. Check

The sensitivity of penetrant in use within tank shall be checked at least per month, by comparing it with that of standard penetrant. Check by comparing indication degrees with each other after dipping the test pieces having already known flaws into both penetrants respectively and then developing them under the same condition. If pollution, decrease in penetrability or in fluorescence is found in penetrant in use, this penetrant liquid shall be disposed.

4.4. Preservation

4.4.1. Penetrant and emulsifier

Penetrant and emulsifier never fail to keep the cap closed when in disuse to prevent entering of dusts or vaporizing of moisture. When in use, parts drenched with moisture shall not be recklessly dipped into penetrant or emulsifier.

4.4.2. Developer

Care shall be taken lest dry developer should form into lumps in case of long-term preservation or should be filled with moisture. Spray type developer shall be preserved in cold and dark place as sealed.

5. PROCESS

5.1. Classification

Penetrant tests are classified as follows.

Type I - Fluorescent penetrant

- A - Water-washable
- B - Post-emulsifiable
- C - Solvent-removable

Type II - Dye penetrant

- A - Water-washable
- B - Post-emulsifiable
- C - Solvent-removable

5.2. Selection of test method

Personnel who designs item requiring test shall specify the type and method of the test in drawings or specification and determine the evaluation standard with the size of flaws or its density. Unless otherwise specified, test personnel shall perform the test with the most appropriate method.