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JIS Z 2343-1 : 2001

**Non-destructive testing—
Penetrant testing—
Part 1 : General principles—
Method for liquid penetrant testing
and classification of the penetrant
indication**

ICS 19.100

Descriptors : non-destructive testing, penetration tests

Reference number : JIS Z 2343-1 : 2001 (E)

Foreword

This translation has been made based on the original Japanese Industrial Standard established by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Law. Consequently, **JIS Z 2343 : 1992** was withdrawn and replaced with **JIS Z 2343-1** to **JIS Z 2343-4**.

For the purpose of conformity to the International Standard, **JIS Z 2343-1 : 2001** has been prepared based on the first edition of **EN 571-1 (ISO/DIS 3452-1) Non-destructive testing—Penetrant testing—Part 1 : General principles** published in 1997.

JIS Z 2343 consists of the following parts with the title of “Non-destructive testing—Penetrant testing”.

- JIS Z 2343-1** *Part 1 : General principles—Method for liquid penetrant testing and classification of the penetrant indication*
- JIS Z 2343-2** *Part 2 : Testing of penetrant materials*
- JIS Z 2343-3** *Part 3 : Reference test blocks*
- JIS Z 2343-4** *Part 4 : Equipment*

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**Non-destructive testing—
Penetrant testing—
Part 1 : General principles—
Method for liquid penetrant testing and
classification of the penetrant indication**

Introduction JIS Z 2343-1 : 2000 has been prepared based on the first edition of EN 571-1 (ISO/DIS 3452-1) *Non-destructive testing—Penetrant testing—Part 1 : General principles* published in 1997 without modifying the technical contents, but some parts (classification of indications and discontinuities, marking, etc.) which are not stated in the European Standard are added without modifying the contents of the former Japanese Industrial Standard. Annex A is normative and cited from the European Standard.

1 Scope This Standard specifies a method of penetrant testing used to detect discontinuities, e.g. cracks, laps, folds, porosity and lack of fusion, which are open to the surface of the material in manufacturing process or in service and products to be tested (hereafter referred to as “test objects”), and specifies classification of penetrant indication by discontinuities. It is mainly applied to metallic materials, but can also be performed on other materials, provided that they are inert to the test media and they are not excessively porous. Examples of which are castings, forgings, welds, ceramics, etc.

This Standard is not intended to be used for acceptance criteria and gives no information relating to the suitability of individual test systems for specific applications nor requirements for test equipment.

The term “discontinuity” is used here in the sense that no evaluation concerning acceptability or non-acceptability is included. Methods for determining and monitoring the essential properties of penetrant testing products to be used are specified in JIS Z 2343-2 and JIS Z 2343-3.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. If the indication of the year of coming into effect is given to these referred standards, only the edition of indicated year constitutes the provision of this Standard but the revision and amendment made thereafter are not applied. The normative references without the indication of the year of coming into effect (or the year of publication) apply limiting only to the most recent edition (including the amendment).

JIS G 0431 *Qualification and certification of non-destructive testing (NDT) personnel for steel products*

Remarks : Provisions cited from ISO 11484 : 1994 *Steel tubes for pressure purposes—Qualification and certification of non-destructive testing (NDT) personnel* are equivalent to the corresponding parts of the said standard.

JIS W 0905 *Aerospace, nondestructive inspection personnel qualification and certification*

JIS Z 2300 *Glossary of terms used in nondestructive testing*

JIS Z 2305 *Non-destructive testing—Qualification and certification of personnel*

Remarks : Provisions cited from **ISO 9712 : 1999** *Non-destructive testing—Qualification and certification of personnel* are equivalent to the corresponding parts of the said standard.

JIS Z 2343-2 *Non-destructive testing—Penetrant testing—Part 2 : Testing of penetrant materials*

Remarks : **ISO 3452-2 : 2000** *Non-destructive testing—Penetrant testing—Part 2 : Testing of penetrant materials* is identical with the said standard.

JIS Z 2343-3 *Non-destructive testing—Penetrant testing—Part 3 : Reference test blocks*

Remarks : Provisions cited from **ISO 3452-3 : 1998** *Non-destructive testing—Penetrant testing—Part 3 : Reference test blocks* are equivalent to the corresponding part of the said standard.

JIS Z 2343-4 *Non-destructive testing—Penetrant testing—Part 4 : Equipment*

Remarks : **ISO 3452-4 : 1998** *Non-destructive testing—Penetrant testing—Part 4 : Equipment* is identical with the said standard.

ISO 3059 *Non-destructive testing—Penetrant testing and magnetic particle testing—Viewing conditions*

3 Definitions For the purposes of this Standard the definitions of **JIS Z 2300** apply.

4 Safety precautions As penetrant inspection techniques often require the use of harmful, flammable and/or volatile materials, certain precautions shall be taken.

Prolonged or repeated contact of these materials with the skin or any mucous membrane should be avoided.

Working areas shall be adequately ventilated and sited away from sources of heat, sparks and naked flames in accordance with legal regulations, Industrial safety and health Law and Fire service Law.

The penetrant testing products and equipment shall be used with care and always in compliance with the instructions supplied by the manufacturer.

When using UV-A sources, care shall be taken to ensure that unfiltered radiation from the UV-A source does not directly reach the eyes of the operators. Whether it forms an integral part of the lamp or is a separate component, the UV-A filter shall always be maintained in good condition.

There are legislation and regulation regarding health, safety, pollution and storage, etc.

5 General requirements

5.1 General items General requirements shall be as follows:

- a) At the time of selecting the test method, considering the kind and size of discontinuity anticipated, usage, surface roughness, dimensions and quantity of test objects, and properties of the test medium to be used, the test method to be applied