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(JSNDI/JSA)

**Test method for leaks using
ammonia gas**

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Foreword

This translation has been made based on the original Japanese Industrial Standard revised by the Minister of Economy, Trade and Industry through deliberations at the Japanese Industrial Standards Committee, as the result of proposal for revision of Japanese Industrial Standard submitted by The Japanese Society for Non-destructive Inspection (JSNDI)/Japanese Standards Association (JSA) with the draft being attached, based on the provision of Article 12 Clause 1 of the Industrial Standardization Law applicable to the case of revision by the provision of Article 14. Consequently **JIS Z 2333** : 1993 is replaced with this Standard.

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Test method for leaks using ammonia gas

1 Scope This Japanese Industrial Standard specifies the method of test for leaks in which the ammonia gas leaking from the test object such as tank (single wall, double wall, fuel tank), vessel (pressure vessel, vacuum vessel), ammonia storage (a large capacity refrigerating system, fertilizer store house), parts (laminating specification, backing specification, double wall specification), sealed part by different material (glass, metal) and others (complicated piping system, flexible container) is detected by developer.

Moreover, this test is available to detect the leak rate up to approximately $1 \times 10^{-8} \text{ Pa} \cdot \text{m}^3/\text{s}$.

2 Normative references The following standards contain provisions which, through reference in this Standard, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

JIS G 4305 *Cold rolled stainless steel plates, sheets and strip*

JIS Z 2300 *Terms and definitions of nondestructive testing*

JIS Z 2329 *Methods for bubble leak testing*

3 Definitions For the purposes of this Standard, the definitions given in **JIS Z 2300** and the following definition apply.

- a) **capillary system leak test specimen (AMM-L/I)** ammonia leak test specimen in which the capillaries with a known pore size of leak and a fixed length are embedded

4 Principle The developers, which are applied to the surface of test object by coating, tape, etc., are chemically reached with a very small amount of ammonia gas leaking from the test object to change the colour from yellow to blue. The leak location and leak rate are detected by observing the colour change of these developers and their diameter of colour change.

5 Test apparatus

5.1 Pressure gauge (including a vacuum gauge) The appropriate pressure gauge, which is calibrated beforehand in consideration of the measuring range and precision, shall be used.

5.2 Ammonia leak test specimen The ammonia leak test specimen shall be used so as to set the test conditions (gas concentration, test pressure, standing time, performance of developer, and test temperature) and confirm the detecting sensitivity at actual leak test depending on the condition of test object and be usually a leak container or a capillary system leak specimen of not more than $1 \times 10^{-4} \text{ Pa} \cdot \text{m}^3/\text{s}$ in leak rate. The example of capillary system leak test specimen (AMM-L/I) is shown in figure 1 and the example in use is shown in figure 2.

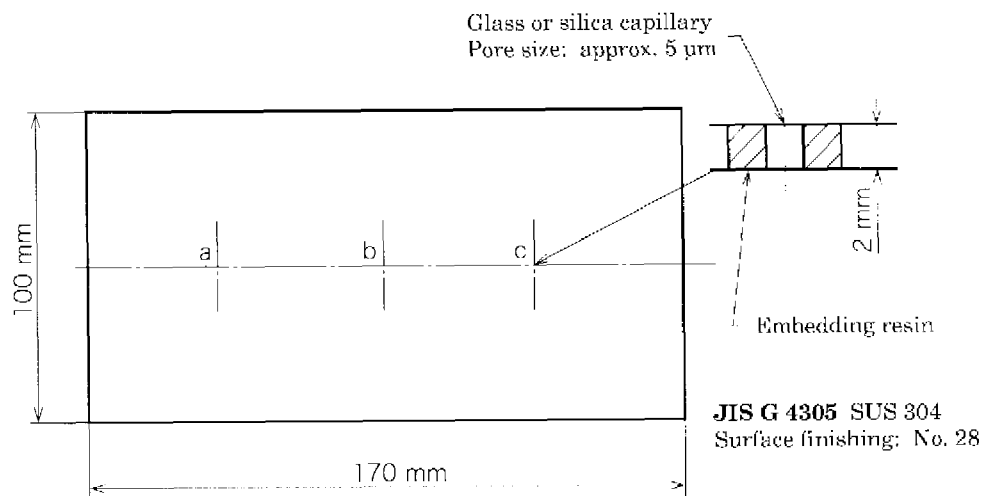


Figure 1 Ammonia leak test specimen (example of capillary system leak test specimen)

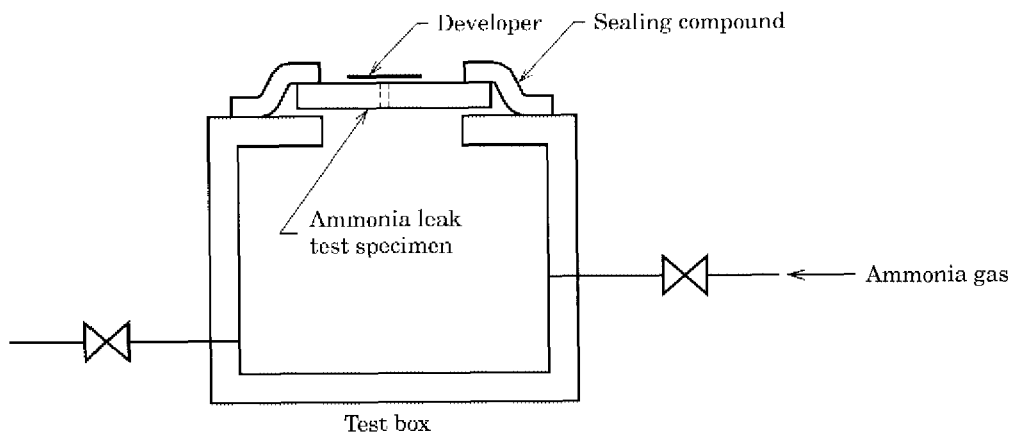


Figure 2 Example in use for ammonia leak test specimen

5.3 Ammonia densitometer or detecting tube The ammonia densitometer or detecting tube shall be capable of measuring the ammonia concentration at the time of testing.

5.4 Other test apparatus

- a) **Case of pressure method** The pressure method shall be as follows:
 - 1) Compressor, cylinder or other pressure device
 - 2) Pressure reducing valve
- b) **Case of vacuum method** The vacuum method shall be as follows:
 - 1) Vacuum box
 - 2) Air ejector or other vacuum pump