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Determination of antibacterial activity and
efficacy of water-absorbent polyacrylate
for urine absorbing products

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Foreword

This Japanese Industrial Standard has been established by the Minister of Economy, Trade and Industry, through deliberations at the Japanese Industrial Standards Committee in accordance with the Industrial Standardization Act.

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Determination of antibacterial activity and efficacy of water-absorbent polyacrylate for urine absorbing products

1 Scope

This Japanese Industrial Standard specifies the antibacterial activity test method and antibacterial efficacy requirement for water-absorbent polyacrylate with antibacterial finish used for urine absorbing products.

2 Normative references

Part or all of the provisions of the following standards, through reference in this text, constitute provisions of this Standard. The most recent editions of the standards (including amendments) indicated below shall be applied.

- JIS K 0950 *Sterilized plastic petri dishes*
- JIS K 0970 *Piston pipettes*
- JIS K 1441 *Ammonium chloride*
- JIS K 3800 *Class II biological safety cabinets*
- JIS K 8150 *Sodium chloride (Reagent)*
- JIS K 8180 *Hydrochloric acid (Reagent)*
- JIS K 8263 *Agar (Reagent)*
- JIS K 8576 *Sodium hydroxide (Reagent)*
- JIS K 8731 *Urea (Reagent)*
- JIS K 9007 *Potassium dihydrogen phosphate (Reagent)*
- JIS K 9017 *Dipotassium hydrogenphosphate (Reagent)*
- JIS K 9020 *Disodium hydrogenphosphate (Reagent)*
- JIS L 0803 *Standard adjacent fabrics for staining of colour fastness test*
- JIS R 3505 *Volumetric glassware*
- JIS Z 2801 *Antibacterial products — Test for antibacterial activity and efficacy*
- JIS Z 8401 *Rounding of numbers*
- JIS Z 8805 *Glass electrodes for measurement of pH*
- ISO 17190-5 *Urine-absorbing aids for incontinence — Test methods for characterizing polymer-based absorbent materials — Part 5 : Gravimetric determination of free swell capacity in saline solution*

3 Terms and definitions

For the purpose of this Standard, the following terms and definitions apply.

3.1

control specimen

specimen used to validate the test effectiveness

Note 1 to entry A control specimen is a 100 % cotton standard adjacent fabric [cotton (No. 3-1)] specified in **JIS L 0803**, washed for ten washing cycles without detergents or brighteners and then air-dried, each washing cycle consisting of a 10 min-washing using water at a temperature of 60 °C and two runs of 5-min rinsing.

3.2

water-absorbent polyacrylate

chemical compound primarily composed of partial light metal salt of slightly cross-linked polyacrylic acid capable of absorbing and retaining water or aqueous liquid 10 to 1 000 times heavier than itself

Note 1 to entry Specific examples of the primary component are as follows :

- polyacrylic acid partial sodium salt;
- polyacrylic acid partial potassium salt;
- starch graft polyacrylic acid partial sodium salt.

3.3

antibacterial activity

activity to mitigate the growth of bacteria

3.4

antibacterial finish

treatment designed to mitigate the growth of bacteria on the water-absorbent polyacrylate

3.5

antibacterial activity value

in the test where the water-absorbent polyacrylate under test and control specimen (cotton fabric) are inoculated with bacteria and then incubated, the difference between the arithmetic average of common logarithm of the number of viable bacteria obtained from three control specimens after an 18 h incubation, and that obtained from three water-absorbent polyacrylate test specimens after an 18 h incubation

3.6

antibacterial efficacy

efficacy of antibacterial activity shown by antibacterial finish

Note 1 to entry It is evaluated by the antibacterial activity value.

4 Antibacterial efficacy

When the antibacterial activity value determined by the test method specified in this Standard is 2.0 or higher, the antibacterial water-absorbent polyacrylate shall be regarded as having antibacterial efficacy.

An antibacterial activity value higher than 2.0 may be used as a criterion for judgement of antibacterial efficacy if so agreed between the test client and the test operator.

5 Test method

5.1 Bacteria used for test

The bacteria to be used for the test shall be as follows. The test shall be conducted for each bacterial strain.

- a) *Staphylococcus aureus*
- b) *Escherichia coli*

The bacteria to be used in the test shall be identical to those listed in Table 1, which are preserved by the members of the World Federation for Culture Collections (WFCC) or Japan Society for Microbial Resources and Systematics (JSMRS). The strains used in the test shall be stated in the test report together with their supply sources and strain codes.

Table 1 Bacterial strains for testing

Bacteria type	Strain code	Preservation agency
<i>Staphylococcus aureus</i>	ATCC 6538P	American Type Culture Collection
	FDA 209P	Food and Drug Administration
	NBRC 12732	Biological Resource Center, National Institute of Technology and Evaluation
	CIP 53.156	Collection des Bacteries de l'Institut Pasteur Deutsche
	DSM 346	Sammlung von Mikroorganismen und Zellkulturen GmbH
<i>Escherichia coli</i>	NCIB 8625	National Collection of Industrial and Marine Bacteria Ltd.
	ATCC 8739	American Type Culture Collection
	NBRC 3972	Biological Resource Center, National Institute of Technology and Evaluation
	CIP 53.126	Collection des Bacteries de l'Institut Pasteur Deutsche
	DSM 1576	Sammlung von Mikroorganismen und Zellkulturen GmbH
	NCIB 8545	National Collection of Industrial and Marine Bacteria Ltd.

5.2 Chemicals, materials, instruments and apparatuses

Unless otherwise specified, the chemicals, materials, instruments and apparatuses used for the test specified in this Standard shall be as follows.

a) Chemicals

- ammonium chloride, of guaranteed grade specified in **JIS K 1441**;