INTERNATIONAL STANDARD

ISO 17190-8

Second edition
2020-10

Urine-absorbing aids for incontinence — Polyacrylate superabsorbent powders —

Part 8: Test method for determination of the permeability dependent absorption under pressure of saline solution by gravimetric measurement

Aides pour absorption d'urine — Méthodes d'essai pour caractériser les matériaux absorbants à base de polymères —

Partie 8: Détermination gravimétrique du débit

Reference number
ISO 17190-8:2020(E)

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Published in Switzerland

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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. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 173, *Assistive products*, Subcommittee SC 3, *Aids for ostomy and incontinence*.

This second edition cancels and replaces the first edition (ISO 17190-8:2001), which has been technically revised. The main changes compared to the previous edition are as follows:

— full text review and new laboratory analysis with statistical evaluation;

— descriptions of the equipment required and the handling procedure improved;

— request for duplication removed.

A list of all parts in the ISO 17190 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

Urine-absorbing aids for incontinence — Polyacrylate superabsorbent powders —

Part 8:
Test method for determination of the permeability dependent absorption under pressure of saline solution by gravimetric measurement

WARNING — This document does not claim to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this document to establish appropriate safety and health practices and determine the applicability of regulatory limitations prior to use. It is expected that the person performing this test has been fully trained in all aspects of this procedure.

1 Scope

This document provides a test method for measuring the permeability-dependent absorption under pressure (PDAUP) of polyacrylate superabsorbent powder, where permeability is a significant controlling factor under the conditions of the test.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 187, *Paper, board and pulps — Standard atmosphere for conditioning and testing and procedure for monitoring the atmosphere and conditioning of samples*

ISO 3696, *Water for analytical laboratory use — Specification and test methods*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at http://www.electropedia.org/

3.1
sample
product or portion of a product taken from a production lot for testing purposes and identifiable and traceable back to its origin

3.2
specimen
specific portion of the identified *sample* (3.1) upon which a test is performed

4 Principle

This method is a modified version of NWSP 242.0[5] and ISO 17190-7.

The test portion is weighed and spread evenly on the bottom filter screen closing a specified cylinder. A uniform pressure is applied on the test portion. The cylinder is then placed on a filter plate, which is placed in a Petri dish filled with saline solution. After an absorption time of 1 hour, the cylinder is removed from the filter plate and weighed to determine the amount of fluid absorbed.

During the test, a swollen gel layer is formed at the bottom of the cell through which liquid shall be actively drawn in order for further absorption to occur. Under the conditions of the test, the thickness of the swollen gel layer, its permeability and the absorption capacity of the polymer are significant factors. The results thus provide information that may be used to interpret the polymers absorption capacity under conditions where the permeability of the swollen gel is a controlling factor.

5 Reagents and materials

Use only reagents of recognized analytical grade, unless otherwise specified.

5.1 Water.

Grade 3 water in accordance with ISO 3696, with the exception that the conductivity can be as high as 30 µS/cm.

5.2 Sodium chloride solution.

5.2.1 0,9 % mass fraction of sodium chloride solution in water. Weigh (9,00 ± 0,01) g of sodium chloride into a 1 l beaker and add (991,0 ± 0,1) g of deionised water (grade 3). Stir until dissolved.

5.2.2 The conductivity of the solution should be checked prior to each use using properly calibrated measuring equipment. The expected conductivity of a 0,9 % saline solution is of the order of 1 600 S/m at 25 °C. Each testing lab shall determine the correct conductivity for the conditions obtaining in the lab. It is also recommended that the temperature of the solution be maintained at (23 ± 2) °C for the duration of the test. As this matches the required laboratory temperature it is not necessary to record the solution temperature.

6 Apparatus

The apparatus for measuring absorbency under pressure is illustrated on Figures A.1 and A.2. It comprises the following elements:

6.1 Petri dish or tray, large enough to accommodate the apparatus and supply sufficient saline solution to meet the absorption capacity of the sample for the duration of the test.

It is necessary to minimise evaporation of water, as this leads to increasing saline concentration during the test, without compromising the availability of sufficient saline to be absorbed by the polymer.

A practical solution is to use circular Petri dish of 20 cm diameter, which gives an area of about 314 cm^2, or a square dish of 20 cm per side, which gives an area of about 400 cm^2.

— The PDAUP requires much more saline than the equivalent superabsorbent polymer (AAP) and the dish or tray shall be refilled to the level of the ceramic filter plate on a regular basis.

6.2 Ceramic filter plate, at least 80 mm in diameter and at least 5 mm in thickness/ height, centred and bi-plane ground, with the outside edge not fused. The porosity should be 0 (nominal pore size 160-250 µm), in accordance with ISO 4793.