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**Paper, board and pulps — Determination  
of pH of salted water extracts**

*Papier, carton et pâtes — Détermination du pH des extraits d'eau salée*



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 29681 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

## Introduction

It is well known that pulp fibres contain ionizable groups that are fixed to or present in the fibre wall. In order to fulfil the electro-neutrality, these groups are balanced by an equivalent number of positive charges, which can be either protons or various metal ions. Especially in pulp suspensions having a low ionic strength, this can give rise to a marked uneven distribution of mobile ions between the volume held by the fibre wall and the bulk suspension liquor. This means that the fibres act as an ion-exchanger. The ion-exchange can be modelled very well with the Donnan theory (References [3], [4] and [5]).

If a relatively clean fibre sample, e.g. fibres from a bleached chemical pulp of virgin fibres, is diluted in deionized water, the formed pulp suspension will have a very low ionic strength. In such a system, most of the cations present (including protons) will be concentrated in the water volume held by the fibre wall. If the pH is measured, it will be the pH of the bulk suspension liquor. By adding salt to the system during the soaking step in 8.1, the ion-exchange phenomena will be decreased so that the concentration of different cations will be the same in the water held by the fibre wall as in the bulk suspension liquor. Since process waters always contain a certain amount of ions, the measurement of pH after soaking in salted water will give a more realistic environment and thus more correct pH-values for clean pulp samples, i.e. samples with a low ionic strength.

It is necessary to be aware that the results will not be the same for pulps having a low ionic strength when measuring pH according to ISO 6588-1<sup>[1]</sup> or ISO 6588-2<sup>[2]</sup> and to this International Standard.

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# Paper, board and pulps — Determination of pH of salted water extracts

## 1 Scope

This International Standard specifies a method for the determination of the pH of an aqueous extract of paper, board and pulps, in which the soaking and the measuring are performed in salted water (0,1 M KCl solution).

This International Standard is applicable to all kinds of paper, board and pulps, but is specifically applicable to bleached pulps from virgin fibres and to pulp samples having a low ionic strength for which the pH-value using this International Standard will give more realistic results related to mill conditions than those obtained with ISO 6588-1 or ISO 6588-2.

When deionized water is used and the sample has a low ionic strength, the suspension will have a very low ionic strength and the pH-value obtained in the measurement will not be that of the sample but that of the distilled water. When salted water is used in the soaking, there will be no concentration difference between the fibre wall and the surrounding water, and the pH-value measured will be that of the sample (in the fibre wall).

The use of salted water when dealing with samples having a low ionic strength also promotes more stable and more accurate pH-readings.

## 2 Normative references

The following referenced documents are indispensable for the application 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 186, *Paper and board — Sampling to determine average quality*

ISO 7213, *Pulps — Sampling for testing*

## 3 Terms and definitions

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

### 3.1

#### **salted water**

weak potassium chloride (KCl) solution, prepared as described in 5.3

## 4 Principle

The sample is soaked in salted water (0,100 M KCl) for 1 h. Soaking can be performed either at a temperature between 20 °C and 25 °C or at 90 °C. The suspension is filtered through a filter and the pH is measured at a temperature between 20 °C and 25 °C.