
International Standard



5630/2

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Paper and board — Accelerated ageing — Part 2 : Moist heat treatment at 90 °C and 25 % relative humidity

Papier et carton — Vieillissement accéléré — Partie 2 : Traitement à la chaleur humide à 90 °C et 25 % d'humidité relative

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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.

Draft International Standards adopted by the technical committees are circulated to the member bodies for approval before their acceptance as International Standards by the ISO Council. They are approved in accordance with ISO procedures requiring at least 75 % approval by the member bodies voting.

International Standard ISO 5630/2 was prepared by Technical Committee ISO/TC 6, *Paper, board and pulps*.

Users should note that all International Standards undergo revision from time to time and that any reference made herein to any other International Standard implies its latest edition, unless otherwise stated.

Paper and board — Accelerated ageing —

Part 2 : Moist heat treatment at 90 °C and 25 % relative humidity

0 Introduction

Exposure of paper or board to a hostile environment, such as some types of radiation, elevated temperature, or chemical attack over a period of hours, may provide information concerning the natural changes that may occur in the material over a period of years.^[1,2]

Hostile environments that have been used include exposure to dry heat, to heat and moisture, to visible and ultraviolet radiation, and to sulfur dioxide gas.

Properties compared before and after such exposure include mechanical, chemical and optical properties.

It has been determined that the degradation of cellulose is very sensitive to moisture.^[3,4] Comparison of accelerated ageing with natural ageing indicates that some moisture should be present in an accelerated ageing atmosphere.^[5,6] Dry accelerated ageing of cellulose is much less sensitive and probably does not rank papers in order of stability as accurately as moist accelerated ageing. It is much simpler to use and may be adequate for many purposes, but moist accelerated ageing should be used where the greatest correlation with natural ageing is needed.

ISO 5630 at present consists of the following parts :

Part 1 : Dry heat treatment.

Part 2 : Moist heat treatment at 90 °C and 25 % relative humidity.

Part 4 : Dry heat treatment at 120 or 150 °C.

A method of accelerating the ageing of paper and board at 80 °C and 65 % relative humidity will form the subject of ISO 5630/3.

1 Scope and field of application

This part of ISO 5630 specifies a procedure for humidified heat treatment of paper or board and the general procedure for testing the heat-treated materials. This method is based on work on printing and writing papers, but may be used with discretion for other types of paper and board.

The procedure is not recommended for papers such as resin-impregnated or varnish-treated papers which increase in physical strength on heating.

The procedure is not applicable to certain electrical insulating papers, for which different conditions apply.

NOTE — ISO 5630/4 is primarily intended for high purity papers such as are used for insulation in electrical equipment.

2 References

ISO 186, *Paper and board — Sampling to determine average quality.*

ISO 187, *Paper and board — Conditioning of samples.*

3 Principle

Comparison of the properties of paper or board before and after "accelerated ageing" in a humidified atmosphere at an elevated temperature.

4 Apparatus

4.1 Apparatus, for maintaining an atmosphere at a temperature of $90 \pm 0,2$ °C and $25 \pm 0,5$ % relative humidity.

A suitable apparatus is described in the annex.

A humidity oven may be used if the tolerances for temperature and relative humidity can be met.

NOTE — Graminski *et al.*^[3,4] have shown that the rate of degradation of folding endurance and of zero span tensile strength can be approximately doubled by raising the relative humidity at 90 °C from 20 % to 30 %. Therefore, the temperature must be controlled to less than 0,5 °C (preferably 0,1 °C) in order to hold the relative humidity variations within 1 %.

4.2 Test equipment, complying with the relevant International Standard test method, if any, or with another appropriate standard test method.

Some important test methods that may be used to check the degradation of paper during ageing include pH, brightness, folding endurance and tearing resistance.