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International Standard 5630/4

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Paper and board — Accelerated ageing — Part 4 : Dry heat treatment at 120 or 150 °C

Papier et carton — Vieillissement accéléré — Partie 4 : Traitement à la chaleur à 120 ou 150 °C

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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 5630/4 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 4 : Dry heat treatment at 120 or 150 °C

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 3 : Moist heat treatment at 80 °C and 65 % relative humidity.

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

1 Scope and field of application

This part of ISO 5630 specifies a procedure for heat treatment of paper and board in air at relatively high temperature and the general procedure for testing for heat-treated material. It is primarily intended for high purity papers such as are used for insulation in electrical equipment.

NOTE — Other standards of relevance to electrical papers are IEC Publications 216-1 and 2, IEC Publication 554-2 and IEC Publication 554-3-1.

This part of ISO 5630 does not contain any statement about the tests to be made on the paper. It is left to the parties concerned to determine which tests are appropriate for the type of paper being evaluated.

2 References

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

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

IEC Publication 216, *Guide for the determination of thermal endurance properties of electrical insulating materials*

— *Part 1 : General procedures for the determination of thermal endurance properties, temperature indices and thermal endurance profiles.*

— *Part 2 : List of materials and available tests.*

IEC Publication 554, *Specification for cellulosic papers for electrical purposes*

— *Part 2 : Methods of test.*

— *Part 3 : Specifications for individual materials — Sheet 1 : General purpose electrical paper.*

3 Principle

Heating of test pieces of paper or board in a closed oven either for 168 h at 120 °C (Procedure A) or for 24 h at 150 °C (Procedure B). Comparison of properties of the sample before and after this heat treatment.

NOTE — The two procedures are not necessarily equivalent, and in a specification for a particular paper the procedure to be used should be stated.

4 Apparatus

4.1 Oven, ventilated with a rate of air change of not less than 10 changes per hour, capable of maintaining an air temperature of 120 ± 2 °C (Procedure A) or 150 ± 2 °C (Procedure B), and so designed that, during the test, test pieces are not exposed to light nor to direct radiation from heating elements.