STANDARDS AND INFORMATION DOCUMENTS

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AES standard for audio preservation and restoration - Life expectancy of information stored in recordable compact disc systems - Method for estimating, based on effects of temperature and relative humidity

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AES38-2000
(r2010)

AES standard for audio preservation and restoration — Life expectancy of information stored in recordable compact disc systems — Method for estimating, based on effects of temperature and relative humidity

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Abstract

This standard specifies test methods for estimating the life expectancy of information stored in recordable compact disc systems. Only the effects of temperature and relative humidity on the media are considered.

Contents

Foreword

[This foreword is not a part of AES *standard for audio preservation and restoration — Life expectancy of information stored in recordable compact disc systems — Method for estimating, based on effects of temperature and relative humidity*, AES38-2000.]

This standard was prepared by the SC-03-03 Working Group on Optical Systems and Media of the SC-03 Subcommittee on the Preservation and Restoration of Audio Recording as part of project AES-X53, Test methods for estimating the life expectancy of information stored in recordable compact disc systems based on effects of temperature and relative humidity. The standard was developed as part of project AES-X80, Liaison with ANSI/PIMA IT9-5.

The writing group was lead by William Murray.

William Murray, chair SC-03-03
1999-12-24

AES standard for audio preservation and restoration — Life expectancy of information stored in recordable compact disc systems — Method for estimating, based on effects of temperature and relative humidity

1 General

1.1 Scope

This standard specifies test methods for estimating the life expectancy of information stored in recordable compact disc systems. Only the effects of temperature and relative humidity on the media are considered.

The standardized life expectancy estimated using this model is defined for discs maintained at 25 ℃ and 50 % RH. Discs exposed to more severe conditions of temperature and humidity are expected to experience a shorter life. The test plan documented in this standard does not attempt to model degradation due to exposure to light, corrosive gases, contaminants, or mishandling, and variations in the playback subsystem.

1.2 Purpose

The purpose of this standard is to establish a methodology for estimating the life expectancy of information stored in recordable compact disc systems. This methodology provides a technically and statistically sound procedure for obtaining and evaluating accelerated test data. The methodology deals only with the effects of temperature and humidity on the retrievability of stored information. For this reason, this standard is primarily directed to those storage applications, for example, libraries and archives, in which exposure to other influences potentially detrimental to information life expectancy, such as chemical agents, intense light sources, and improper handling, is controlled and minimized.

> NOTE It is possible that audio information can be played back using error correction from a disc that has exceeded its life expectancy according to this standard.

1.3 Summary

A sampling of eighty recorded discs is divided into five groups according to a specified plan. Each group of discs is exposed to one of five stresses, which are combinations of temperature and relative humidity. Periodically during the course of the exposure, each disc from each stress group has its block error rate measured. Data collected at each test interval for each individual disc are used to determine a lifetime for that disc. The disc lifetimes at each stress are fitted to a log-normal distribution to determine a mean lifetime for the stress. The resulting five mean lifetimes are regressed against temperature and relative humidity according to an Eyring acceleration model. This model is then used to estimate the distribution of lifetimes at a usage condition

1.4 Assumptions

The validity of the procedure defined by this standard relies on three assumptions. It is assumed that the sample life distribution is appropriately modeled by the log-normal distribution. Also, it is assumed that the kinetics of the dominant failure mechanism are appropriately modeled by an Eyring acceleration model. Finally, it is assumed that the dominant failure mechanism acting during use is the same as that at the accelerated conditions. Hamada and