

# **AES information document for transfer technologies - Stylus dimensions and selection**

Published by

**Audio Engineering Society, Inc.**

Copyright ©2010 by the Audio Engineering Society

## **Abstract**

This information document is aimed at the archivist, librarian or technician who needs to make transfers from mechanical sound records made during the past 100 years or more. Each period had its own technological style and there was little effective standardisation until the late 1940s. Making satisfactory and efficient transfers from these records means choosing an appropriate stylus to suit both the style of manufacture and also the physical condition of the particular specimen. This brief document sets out some guidance on stylus choice for vertical recordings on cylinders and discs, coarse-groove lateral recordings on disc, and comparatively modern microgroove records in both mono and stereo.

An AES standard implies a consensus of those directly and materially affected by its scope and provisions and is intended as a guide to aid the manufacturer, the consumer, and the general public. An AES information document is a form of standard containing a summary of scientific and technical information; originated by a technically competent writing group; important to the preparation and justification of an AES standard or to the understanding and application of such information to a specific technical subject. An AES information document implies the same consensus as an AES standard. However, dissenting comments may be published with the document. The existence of an AES standard or AES information document does not in any respect preclude anyone, whether or not he or she has approved the document, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standard. This document is subject to periodic review and users are cautioned to obtain the latest edition.

Document preview:  
for full document, go to  
[www.aes.org/publications/standards](http://www.aes.org/publications/standards)

## Contents

<b>Foreword</b> .....	<b>3</b>
<b>1 Introduction</b> .....	<b>4</b>
<b>2 Normative references</b> .....	<b>4</b>
<b>3 Parameters</b> .....	<b>4</b>
3.1 Disc .....	4
3.2 Transfer scenarios .....	5
<b>4 Stylus shapes</b> .....	<b>5</b>
4.1 General .....	5
4.2 Spherical tip .....	5
4.3 Ball tip .....	5
4.4 Bi-radial or elliptical tip .....	5
4.5 Line-contact styli .....	6
4.6 Truncated tip .....	6
<b>5 Recommendations</b> .....	<b>7</b>
5.1 General .....	7
5.2 Vertical recordings, acoustic .....	7
5.3 Lateral recordings, coarse-groove .....	7
5.3.1 Early acoustic .....	7
5.3.2 Late acoustic (1910 to 1926) .....	8
5.3.3 Early electric (1926 to 1955) .....	8
5.3.4 Late electric (1955 to 1960) .....	8
5.3.5 Instantaneous, laminated .....	8
5.3.6 Instantaneous uncoated metal discs .....	8
5.4 Lateral recordings, microgroove .....	8
<b>Annex A: References and bibliography</b> .....	<b>9</b>

## Foreword

This foreword is not part of the AES-16id-2010 *AES information document for transfer technologies - Stylus dimensions and selection*.

This information document was written jointly by members of the SC-03-02 Working Group on Transfer Technologies, part of the SC-03 Subcommittee on the Preservation and Restoration of Audio Recording, under the project AES-X106, *Stylus shape and size for transfer of records*.

The members of the writing group that developed this document in draft included: N. Bergh, G. Brock-Nannestad, S. Davies, S. Dorsey, L. Gaustad, E. Jacobs, C. Lacinak, F. Lechleitner, B. McCoy, D. Pomeroy, D. Schüller, S. Smolian, M. Yonge

Lars Gaustad  
Chair, working group SC-03-02

### Note on normative language

In AES standards documents, sentences containing the word “shall” are requirements for compliance with the document. Sentences containing the verb “should” are strong suggestions (recommendations). Sentences giving permission use the verb “may”. Sentences expressing a possibility use the verb “can”.

Document preview:  
for full document, go to  
[www.aes.org/publications/standards](http://www.aes.org/publications/standards)

# AES information document for transfer technologies - Stylus dimensions and selection

## 1 Introduction

It is a widely adopted rule that the best sounding stylus is also the correct one. In most cases, the judgment will be made aurally by the engineer who makes the transfer.

For the purpose of stylus selection, a turntable with two tone arms equipped with the same model of cartridge is very useful in supplying the signals to be compared immediately after each other. Performance will still be a compromise between the highest undistorted signal and the most pleasant background noise. The decision will always be subjective but may be confirmed using visual signal support as well. To shorten the process of stylus selection, some knowledge about the physical parameters of the groove are essential.

The text that follows will use a number of terms that were widely used when manufacture of these records was at its height, and which still appear in contemporary literature of those periods. From today's technological viewpoint, with its carefully-harmonised units, these terms may seem a little old-fashioned. However, to cater for the historian and the modern technician, we will quote dimensions in both traditional and SI units.

To clarify, the "mil" is a US term meaning one thousandth (1/1000) of an inch, and is exactly equivalent to 25,4 micrometres. A micrometre ( $\mu\text{m}$ ) is one millionth of a metre in modern *Systeme Internationale* (SI) units - that's 1/1000 of a millimetre - and is identical to the "micron", although this term is now deprecated in SI.

We use the term "stylus" throughout in the expectation that modern transcriptions will use modern lightweight pickups and diamond-tipped styli. If this were not the case, the traditional alternative term, "needle" would be equally fitting.

## 2 Normative references

No referenced documents are required for the application of this document.

## 3 Parameters

### 3.1 Disc

Key parameters include the groove profile, surface composition, and the overall condition of the playing surface of the disc.

Groove profile serves as an initial decision-making aid. It provides knowledge about the useful range of stylus dimensions in general.

Document preview:  
for full document, go to  
[www.aes.org/publications/standards](http://www.aes.org/publications/standards)