

This is a preview of "ISO 9921:2003". [Click here to purchase the full version from the ANSI store.](#)

First edition
2003-10-15

Ergonomics — Assessment of speech communication

Ergonomie — Évaluation de la communication parlée



Reference number
ISO 9921:2003(E)

© ISO 2003

This is a preview of "ISO 9921:2003". [Click here to purchase the full version from the ANSI store.](#)

PDF disclaimer

This PDF file may contain embedded typefaces. In accordance with Adobe's licensing policy, this file may be printed or viewed but shall not be edited unless the typefaces which are embedded are licensed to and installed on the computer performing the editing. In downloading this file, parties accept therein the responsibility of not infringing Adobe's licensing policy. The ISO Central Secretariat accepts no liability in this area.

Adobe is a trademark of Adobe Systems Incorporated.

Details of the software products used to create this PDF file can be found in the General Info relative to the file; the PDF-creation parameters were optimized for printing. Every care has been taken to ensure that the file is suitable for use by ISO member bodies. In the unlikely event that a problem relating to it is found, please inform the Central Secretariat at the address given below.

© ISO 2003

All rights reserved. Unless otherwise specified, no part of this publication may be reproduced or utilized in any form or by any means, electronic or mechanical, including photocopying and microfilm, without permission in writing from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
Case postale 56 • CH-1211 Geneva 20
Tel. + 41 22 749 01 11
Fax + 41 22 749 09 47
E-mail copyright@iso.org
Web www.iso.org

Published in Switzerland

This is a preview of "ISO 9921:2003". [Click here to purchase the full version from the ANSI store.](#)

Contents

Page

Foreword	iv
Introduction	v
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Descriptions of speech communications	3
4.1 General	3
4.2 Speaker	3
4.3 Transmission channel	3
4.4 Listener	3
5 Performance of speech communications	3
5.1 General	3
5.2 Alert and warning situations	4
5.3 Person-to-person communications	4
5.4 Public address in public areas	4
5.5 Personal communication systems	5
5.6 Summary of recommended minimum performance	5
6 Assessment and prediction	5
6.1 General	5
6.2 Subjective assessment methods	5
6.3 Objective assessment and prediction methods	6
Annex A (normative) Speaker and listener characteristics	7
Annex B (informative) Subjective speech-intelligibility tests	9
Annex C (informative) Speech transmission index, STI	12
Annex D (informative) Overview of the means of communication and related parameters	14
Annex E (normative) Speech interference level, SIL	18
Annex F (informative) Intelligibility ratings for speech communications	19
Annex G (normative) Definition of symbols	22
Annex H (informative) Examples of applications of predictive intelligibility methods	23
Bibliography	28

This is a preview of "ISO 9921:2003". [Click here to purchase the full version from the ANSI store.](#)

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 9921 was prepared by Technical Committee ISO/TC 159, *Ergonomics*, Subcommittee SC 5, *Ergonomics of the physical environment*.

This first edition of ISO 9921 cancels and replaces ISO 9921-1:1996.

This is a preview of "ISO 9921:2003". [Click here to purchase the full version from the ANSI store.](#)

Introduction

The aim of standardization in the field of the ergonomic assessment of speech-communication is to recommend the levels of speech-communication quality required for conveying comprehensive messages in different applications. The quality of speech communication is assessed for the following cases:

- warning of hazard;
- warning of danger;
- information messages for work places, public areas, meeting rooms, and auditoria.

For some applications, direct communication between humans is considered while, in others, the use of electro-acoustic systems (e.g. PA systems) or personal communication equipment (e.g. telephone, intercom) will be the most convenient means of informing and instructing or exchanging information.

The use of auditory warning symbols other than speech is not included in this International Standard but is covered by ISO 7731.

Acoustical danger and warning signals are in general omni-directional and therefore may be universal in many situations. Auditory warnings are of great benefit in situations where smoke, darkness or other obstructions interfere with visual warnings.

It is essential that, in the case of verbal messages, a sufficient level of intelligibility is achieved, in the coverage area. If this cannot be achieved, non-voice warning signals (see ISO 7731, IEC 60849 and [4] in the Bibliography) or visual warning signals (see ISO 11429) may be preferable.

If acoustical signals are too loud, hearing damage or environmental problems may occur (e.g. noise nuisance to dwellings near railway platforms, road traffic, airports, etc.). Good design can minimize these negative aspects. In addition, prediction methods with sufficient accuracy are useful for consultants, suppliers and end-users and may thus reduce costs of necessary adjustments after installation of a system.

The communications might be directly between humans, through public address or intercom systems or by pre-recorded messages. In general, text-to-speech systems are not recommended because of the low intelligibility of these systems.

It is recognized that, in a general-purpose document, simple to apply and easily available tools for prediction and assessment should be described, as well as more sophisticated advanced technological methodologies.