

This is a preview of "ISO/TR 17534-4:2020". [Click here to purchase the full version from the ANSI store.](#)

First edition
2020-11

Acoustics — Software for the calculation of sound outdoors —

Part 4: Recommendations for a quality assured implementation of the COMMISSION DIRECTIVE (EU) 2015/996 in software according to ISO 17534-1

*Acoustique — Logiciels de prévision de bruit dans l'environnement —
Partie 4: Recommandations pour l'assurance qualité de la mise
en œuvre de la DIRECTIVE (UE) 2015/996 de la COMMISSION
EUROPÉENNE dans les logiciels selon l'ISO 17534-1*



Reference number
ISO/TR 17534-4:2020(E)

© ISO 2020



COPYRIGHT PROTECTED DOCUMENT

© ISO 2020

All rights reserved. Unless otherwise specified, or required in the context of its implementation, no part of this publication may be reproduced or utilized otherwise in any form or by any means, electronic or mechanical, including photocopying, or posting on the internet or an intranet, without prior written permission. Permission can be requested from either ISO at the address below or ISO's member body in the country of the requester.

ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Email: copyright@iso.org
Website: www.iso.org

Published in Switzerland

This is a preview of "ISO/TR 17534-4:2020". Click here to purchase the full version from the ANSI store.

Contents

	Page
Foreword	v
Introduction	vi
1 Scope	1
2 Normative references	1
3 Terms and definitions	1
4 Identification of the official documentation	1
5 Uniform and agreed interpretation of ambiguities	2
5.1 General.....	2
5.2 Sloping objects.....	2
5.3 Equivalent heights.....	2
5.4 Alternative statistical approach.....	3
5.5 Octave band centre frequency f_m	3
5.6 Ground factor of the source area, G_S	3
5.7 Distances in Figure 2.5.b of CNOSSOS-EU:2015.....	3
5.8 Equivalent heights in Equation (2.5.20) of CNOSSOS-EU:2015.....	3
5.9 Rayleigh's Criterion.....	4
5.10 Parameter e	4
5.11 Diffraction under favourable conditions.....	4
5.12 Error in Figure 2.5.f and Equation (2.5.29) of CNOSSOS-EU:2015.....	5
5.13 Lateral diffraction.....	5
5.14 Reflection on nearly vertical objects.....	6
5.15 Retrodiffraction.....	6
6 Test cases	7
6.1 General.....	7
6.2 Test cases with intermediate and final results.....	8
6.2.1 TC01-TC03 — Flat ground with homogeneous acoustic properties.....	8
6.2.2 TC01 — Reflecting ground ($G = 0$).....	8
6.2.3 TC02 — Mixed ground ($G = 0,5$).....	9
6.2.4 TC03 — Porous ground ($G = 1$).....	10
6.2.5 TC04 — Flat ground with spatially varying acoustic properties.....	10
6.2.6 TC05 — Ground with spatially varying heights and acoustic properties.....	12
6.2.7 TC06 — Reduced receiver height to include diffraction in some frequency bands.....	14
6.2.8 TC07 — Flat ground with spatially varying acoustic properties and long barrier.....	17
6.2.9 TC08 — Flat ground with spatially varying acoustic properties and short barrier.....	20
6.2.10 TC09 — Ground with spatially varying heights and and acoustic properties and short barrier.....	24
6.2.11 TC10 — Flat ground with homogeneous acoustic properties and cubic building — Receiver at low height.....	30
6.2.12 TC11 — Flat ground with homogeneous acoustic properties and cubic object - receiver at large height.....	33
6.2.13 TC12 — Flat ground with homogeneous acoustic properties and polygonal object — Receiver at low height.....	38
6.2.14 TC13 — Ground with spatially varying heights and acoustic properties and polygonal object.....	42
6.2.15 TC14 — Flat ground with homogeneous acoustic properties and polygonal object — Receiver at large height.....	47
6.2.16 TC15 — Flat ground with homogeneous acoustic properties and four buildings.....	53
6.2.17 TC16 — Reflecting barrier on ground with spatially varying heights and acoustic properties.....	57

This is a preview of "ISO/TR 17534-4:2020". [Click here to purchase the full version from the ANSI store.](#)

6.2.18	TC17 — Reflecting barrier on ground with spatially varying heights and acoustic properties — Reduced receiver height.....	62
6.2.19	TC18 — Screening and reflecting barrier on ground with spatially varying heights and acoustic properties.....	66
6.2.20	TC19 — Complex object and 2 barriers on ground with spatially varying heights and acoustic properties.....	70
6.2.21	TC20 — Ground with spatially varying heights and acoustic properties.....	76
6.2.22	TC21 — Building on ground with spatially varying heights and acoustic properties.....	78
6.2.23	TC22 — Building with receiver backside on ground with spatially varying heights and acoustic properties.....	84
6.2.24	TC23 — Two buildings behind an earth-berm on flat ground with homogeneous acoustic properties.....	89
6.2.25	TC24 — Two buildings behind an earth-berm on flat ground with homogeneous acoustic properties – receiver position modified.....	94
6.2.26	TC25 — Replacement of the earth-berm by a barrier.....	100
6.2.27	TC26 — Road source with influence of retrodiffraction.....	106
6.2.28	TC27 — Source located in flat cut with retro-diffraction.....	109
6.2.29	TC28 — Propagation over a large distance with many buildings between source and receiver.....	114
6.3	Summary of the final results.....	121
7	Example of a template form for the declaration of conformity.....	122
	Bibliography.....	124

This is a preview of "ISO/TR 17534-4:2020". [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.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular, the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see www.iso.org/directives).

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. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see www.iso.org/patents).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation of the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT), see www.iso.org/iso/foreword.html.

This document was prepared by Technical Committee ISO/TC 43, *Acoustics*, Subcommittee SC 1, *Noise*.

A list of all parts in the ISO 17534 series can be found on the ISO website.

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at www.iso.org/members.html.

This is a preview of "ISO/TR 17534-4:2020". [Click here to purchase the full version from the ANSI store.](#)

Introduction

The structure of the ISO 17534 series is shown in [Figure 1](#). ISO 17534-1 describes the general approach of the ISO 17534 series, aiming to facilitate a standardized interpretation and a verifiably consistent software implementation of outdoor sound calculation methods. ISO/TR 17534-2 contains general recommendations for test cases and for a quality assurance interface. Further parts of the ISO 17534 series each address a specific outdoor sound calculation method for which they provide an agreed interpretation of ambiguous aspects, a set of illustrative test cases along with reference solutions, and an example of a template form for the declaration of conformity for software developers.

This document addresses the calculation method laid down in the COMMISSION DIRECTIVE (EU) 2015/996, hereafter referred to as CNOSSOS-EU:2015.

The European Commission developed Common NOise aSSessment methOdS (CNOSSOS-EU) for road, railway, aircraft and industrial noise for the purpose of strategic noise mapping. CNOSSOS-EU aims at improving the consistency and comparability of noise assessment results across the EU Member States which are performed on the basis of the data becoming available through the consecutive rounds of strategic noise mapping in Europe.

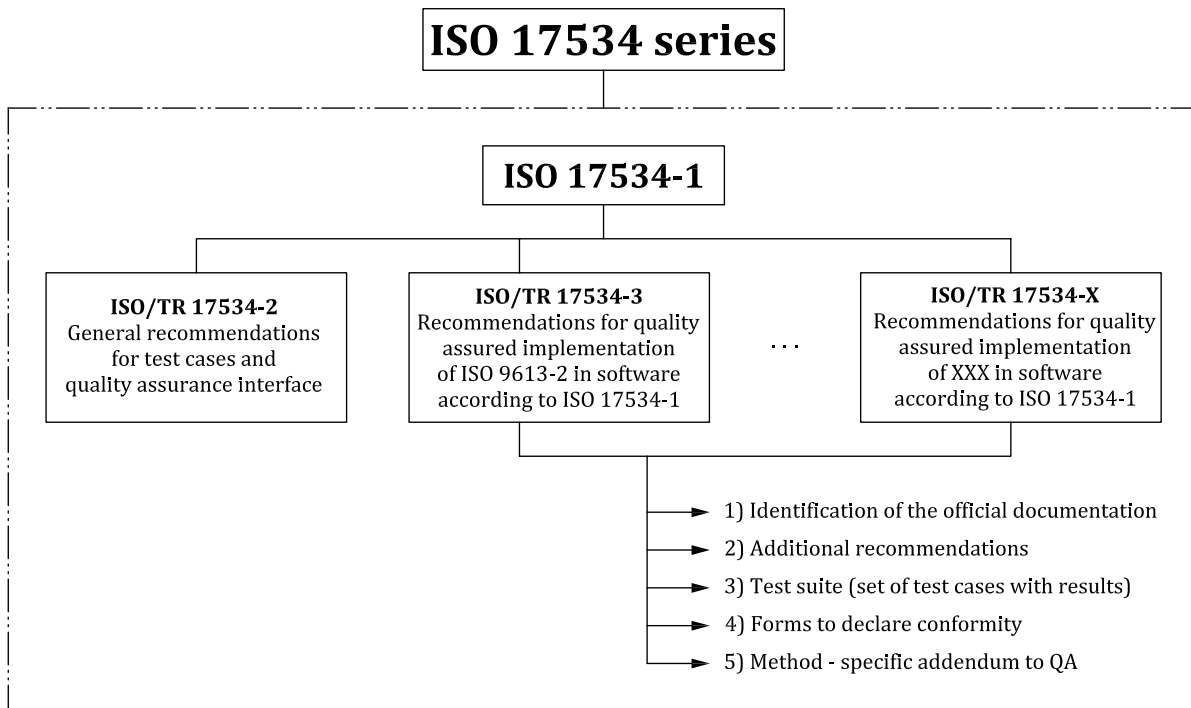


Figure 1 — Structure of the ISO 17534 series