IEC 62875

Edition 1.0 2015-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Multimedia systems and equipment – Multimedia e-publishing and e-book technologies – Printing specification of texture map for auditory presentation of printed texts

Systèmes et appareils multimédia – Technologies de l'édition électronique multimédia et des livres électroniques – Spécification d'impression de la carte de texture pour la présentation auditive de textes imprimés

IEC 62875:2015-02(en-fr)

IEC Central Office
3, rue de Varembé
CH-1211 Geneva 20
Switzerland

Tel.: +41 22 919 02 11
info@iec.ch
www.iec.ch

About the IEC
The International Electrotechnical Commission (IEC) is the leading global organization that prepares and publishes International Standards for all electrical, electronic and related technologies.

About IEC publications
The technical content of IEC publications is kept under constant review by the IEC. Please make sure that you have the latest edition, a corrigendum or an amendment might have been published.

IEC publications search - webstore.iec.ch/advsearchform
The advanced search enables to find IEC publications by a variety of criteria (reference number, text, technical committee, …). It also gives information on projects, replaced and withdrawn publications.

IEC Just Published - webstore.iec.ch/justpublished
Stay up to date on all new IEC publications. Just Published details all new publications released. Available online and once a month by email.

IEC Customer Service Centre - webstore.iec.ch/csc
If you wish to give us your feedback on this publication or need further assistance, please contact the Customer Service Centre: sales@iec.ch.

IEC online collection - oc.iec.ch
Discover our powerful search engine and read freely all the publications previews. With a subscription you will always have access to up to date content tailored to your needs.

Electropedia - www.electropedia.org
The world's leading online dictionary on electrotechnology, containing more than 22 000 terminological entries in English and French, with equivalent terms in 18 additional languages. Also known as the International Electrotechnical Vocabulary (IEV) online.

A propos de l'IEC
La Commission Electrotechnique Internationale (IEC) est la première organisation mondiale qui élabore et publie des Normes internationales pour tout ce qui a trait à l'électricité, à l'électronique et aux technologies apparentées.

A propos des publications IEC
Le contenu technique des publications IEC est constamment revu. Veuillez vous assurer que vous possédez l'édition la plus récente, un corrigendum ou amendement peut avoir été publié.

Recherche de publications IEC - webstore.iec.ch/advsearchform
La recherche avancée permet de trouver des publications IEC en utilisant différents critères (numéro de référence, texte, comité d'études, …). Elle donne aussi des informations sur les projets et les publications remplacées ou retirées.

IEC Just Published - webstore.iec.ch/justpublished
Restez informé sur les nouvelles publications IEC. Just Published détaille les nouvelles publications parues. Disponible en ligne et une fois par mois par email.

Service Clients - webstore.iec.ch/csc
Si vous désirez nous donner des commentaires sur cette publication ou si vous avez des questions contactez-nous: sales@iec.ch.

IEC online collection - oc.iec.ch
Découvrez notre puissant moteur de recherche et consultez gratuitement tous les aperçus des publications. Avec un abonnement, vous aurez toujours accès à un contenu à jour adapté à vos besoins.

Electropedia - www.electropedia.org
Le premier dictionnaire d'électrotechnologie en ligne au monde, avec plus de 22 000 articles terminologiques en anglais et en français, ainsi que les termes équivalents dans 16 langues additionnelles. Egalement appelé Vocabulaire Electrotechnique International (IEV) en ligne.

IEC 62875

Edition 1.0 2015-02

INTERNATIONAL STANDARD

NORME INTERNATIONALE

colour inside

Multimedia systems and equipment – Multimedia e-publishing and e-book technologies – Printing specification of texture map for auditory presentation of printed texts

Systèmes et appareils multimédia – Technologies de l'édition électronique multimédia et des livres électroniques – Spécification d'impression de la carte de texture pour la présentation auditive de textes imprimés

INTERNATIONAL ELECTROTECHNICAL COMMISSION

COMMISSION ELECTROTECHNIQUE INTERNATIONALE

ICS 33.160

ISBN 978-2-8322-9335-5

CONTENTS

INTERNATIONAL ELECTROTECHNICAL COMMISSION

_____

MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA E-PUBLISHING AND E-BOOK TECHNOLOGIES – PRINTING SPECIFICATION OF TEXTURE MAP FOR AUDITORY PRESENTATION OF PRINTED TEXTS

FOREWORD

1) The International Electrotechnical Commission (IEC) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, IEC publishes International Standards, Technical Specifications, Technical Reports, Publicly Available Specifications (PAS) and Guides (hereafter referred to as "IEC Publication(s)"). Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
2) The formal decisions or agreements of IEC on technical matters express, as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested IEC National Committees.
3) IEC Publications have the form of recommendations for international use and are accepted by IEC National Committees in that sense. While all reasonable efforts are made to ensure that the technical content of IEC Publications is accurate, IEC cannot be held responsible for the way in which they are used or for any misinterpretation by any end user.
4) In order to promote international uniformity, IEC National Committees undertake to apply IEC Publications transparently to the maximum extent possible in their national and regional publications. Any divergence between any IEC Publication and the corresponding national or regional publication shall be clearly indicated in the latter.
5) IEC itself does not provide any attestation of conformity. Independent certification bodies provide conformity assessment services and, in some areas, access to IEC marks of conformity. IEC is not responsible for any services carried out by independent certification bodies.
6) All users should ensure that they have the latest edition of this publication.
7) No liability shall attach to IEC or its directors, employees, servants or agents including individual experts and members of its technical committees and IEC National Committees for any personal injury, property damage or other damage of any nature whatsoever, whether direct or indirect, or for costs (including legal fees) and expenses arising out of the publication, use of, or reliance upon, this IEC Publication or any other IEC Publications.
8) Attention is drawn to the Normative references cited in this publication. Use of the referenced publications is indispensable for the correct application of this publication.
9) Attention is drawn to the possibility that some of the elements of this IEC Publication may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 62875 has been prepared by technical area 10: Multimedia e-publishing and e-book technologies, of IEC technical committee 100: Audio, video and multimedia systems and equipment.

The text of this standard is based on the following documents:

CDV	Report on voting
100/2292/CDV	100/2400/RVC

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

This publication has been drafted in accordance with the ISO/IEC Directives, Part 2.

The committee has decided that the contents of this publication will remain unchanged until the stability date indicated on the IEC website under "http://webstore.iec.ch" in the data related to the specific publication. At this date, the publication will be

- reconfirmed,
- withdrawn,
- replaced by a revised edition, or
- amended.

A bilingual version of this publication may be issued at a later date.

IMPORTANT – The 'colour inside' logo on the cover page of this publication indicates that it contains colours which are considered to be useful for the correct understanding of its contents. Users should therefore print this document using a colour printer.

MULTIMEDIA SYSTEMS AND EQUIPMENT – MULTIMEDIA E-PUBLISHING AND E-BOOK TECHNOLOGIES – PRINTING SPECIFICATION OF TEXTURE MAP FOR AUDITORY PRESENTATION OF PRINTED TEXTS

1 Scope

The texture map for auditory presentation of printed texts is printed on paper or shown on display devices. This International Standard specifies the printing quality of this texture map on paper.

In order to ensure an interoperability of the texture map specified in IEC 62665, a printing specification based on the quality of this International Standard should be employed.

2 Normative reference

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

IEC 62665, *Multimedia systems and equipment – Multimedia e-publishing and e-books technologies – Texture map for auditory presentation of printed texts*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1
texture map
two dimensional cell patterns which include alignment lines and a data matrix

[SOURCE: IEC 62665, 2.1, modified – Definition has been clarified.]

3.2
data matrix
two dimensional cell patterns generated from text data compression and error correction encoding

3.3
cell
minimum square dot which constitutes a data matrix

3.4
alignment line
border line which encloses a texture map

Note 1 to entry: An alignment line consists of solid lines and tick marks. The solid lines have a cell's width and may partially be interrupted.

Note 2 to entry: For additional information on alignment lines, see IEC 62665.

3.5
tick mark
positioning mark which intersects perpendicularly with the solid lines and is given at equal intervals on the solid lines of an alignment line

Note 1 to entry: A tick mark indicates the unit boundary and has a cell's width.

3.6
quiet zone
non-printing area outside of a texture map

3.7
unit
square area which consists of 11 × 11 cells in a texture map

4 Printing specification

4.1 General

Texture maps generated by a system are specified by IEC 62665 and a printing quality of the texture maps has to be standardized to ensure interoperability of the printed texture maps.

Texture maps should be printed on paper with a resolution of ≥600 dpi (dots per inch, ≥23,622 dot/mm). In order to minimize specular reflection, a mat coated paper or a low reflection paper should be used.

4.2 Size of a texture map

Four sizes of a texture map are specified by IEC 62665 and they have their dimensions shown in Table 1.

Table 1 – Sizes of a texture map

Size	Number of cells	Number of units	Dimensions at printing mm
XS	40 × 40	3 × 3	6,8 × 6,8
S	73 × 73	6 × 6	12,4 × 12,4
M	106 × 106	9 × 9	17,9 × 17,9
L	117 × 117	10 × 10	19,8 × 19,8

4.3 Printing quality of a texture map

4.3.1 Printing quality

Printing quality of a texture map is defined by the average Q of values of the following quality measures and indicated with the symbol A, B, C, D or F, as shown in Table 2.

The following aspects define the printing quality:

a) print contrast;
b) symmetry of cell pattern;
c) squareness;
d) size accuracy,
e) tick mark identification;
f) quiet zone sufficiency;

g) uselessness of error correction, and

h) decodability.

Table 2 – Printing quality of a texture map

Q (average of the values of quality measures a) through h))	Printing quality of a texture map
$3,4 \leqq Q \leqq 4,0$	A
$2,6 \leqq Q < 3,4$	B
$1,8 \leqq Q < 2,6$	C
$1,0 \leqq Q < 1,8$	D
$Q < 1,0$	F

4.3.2 Sampling line

The values of quality measures a) through d) are defined by scanning cells on 10 sampling lines (5 horizontal and 5 vertical lines). A sampling line connects the corresponding tick marks on the opposite alignment lines, as shown in Figure 1. For the size XS texture map, every tick mark is connected by a sampling line. For size S, M and L texture maps, every other tick mark is connected by a sampling line.

The values of quality measures a) through d) are defined by scanning cells on 10 sampling lines (5 horizontal and 5 vertical lines). A sampling line connects the corresponding tick marks on the opposite alignment lines, as shown in Figure 1. For the size XS texture map, every tick mark is connected by a sampling line. For size S, M and L texture maps, every other tick mark is connected by a sampling line.

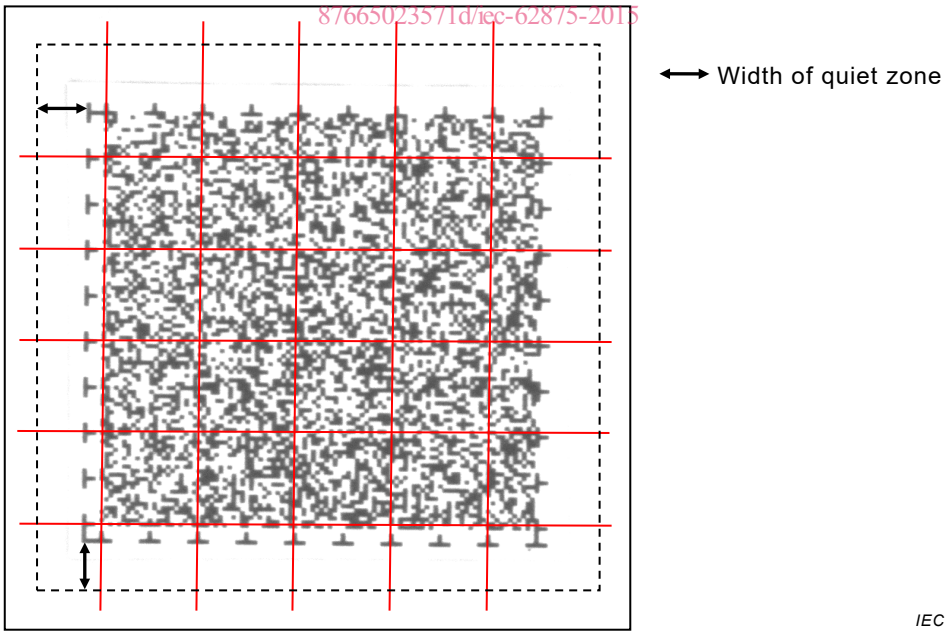

Figure 1 – Sampling lines in case of size M texture map

4.3.3 Quality measure

Each quality measure is defined as follows:

a) print contrast

For the reflectance pattern of white and black cells on scanning the sampling lines, using

RL_{min} minimum value of reflectance of white cells,

RL_{ave} average value of reflectance of white cells, and

RD_{max} maximum value of reflectance of black cells,

RC is defined as

$$RC = (RL_{min} - RD_{max}) / RL_{ave}. \quad (1)$$

The value of the print contrast is determined in accordance with the range of RC, as shown in Table 3.

Table 3 – Value of print contrast

RC	Value of print contrast
$0,90 \leqq RC$	4
$0,85 \leqq RC < 0,90$	3
$0,80 \leqq RC < 0,85$	2
$0,75 \leqq RC < 0,80$	1
$RC < 0,75$	0

b) symmetry of cell pattern

For the reflectance pattern of white and black cells on scanning the sampling lines, using

RL_{ave} average value of reflectance of white cells, and

RD_{ave} average value of reflectance of black cells,

the threshold RT (see Figure 2) is defined as

$$RT = (RL_{ave} + RD_{ave}) / 2. \quad (2)$$

Using the maximum value WL_{max} and minimum values WL_{min} of

WL width of the reflectance pattern of 4 connected white cells (interval between the leading and trailing points crossing RT),

and the maximum value WD_{max} and minimum values WD_{min} of

WD width of the reflectance pattern of 4 connected black cells (interval between the leading and trailing points crossing the RT),

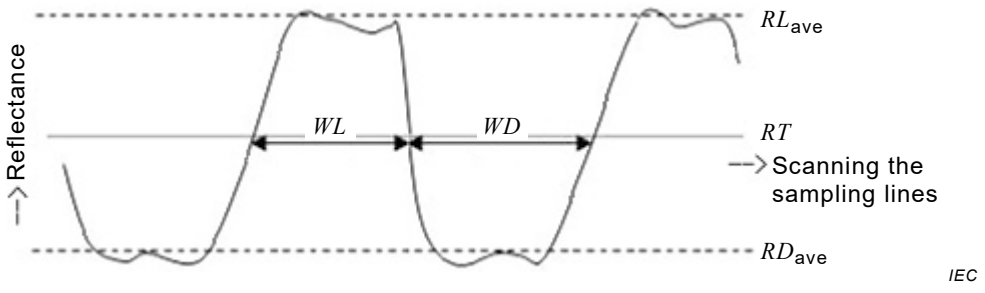

Figure 2 – Reflectance pattern of cells on scanning the sampling lines

WS is defined as

$$WS = |WD_{max} - WL_{min}| / WD_{max} \text{ (or } |WD_{min} - WL_{max}| / WL_{max}) \quad (3)$$

The value of the symmetry of cell pattern is determined in accordance with the range WS as shown in Table 4.

Table 4 – Value of symmetry of cell pattern

WS	Value of symmetry of cell pattern
$0,02 \geqq WS$	4
$0,05 \geqq WS > 0,02$	3
$0,10 \geqq WS > 0,05$	2
$0,15 \geqq WS > 0,10$	1
$WS > 0,15$	0

c) squareness

Using the average NX_{ave} of

NX number of cells between end points of tick marks on horizontal sampling lines (see Figure 3),

and the average NY_{ave} of

NY number of cells between end points of tick marks on vertical sampling lines,

Figure 3 – Length between end points of tick marks on a horizontal sampling line

NQ is defined as

$$NQ = |NX_{ave} - NY_{ave}| / (NX_{ave} + NY_{ave}) / 2. \quad (4)$$

The value of squareness is determined in accordance with the range of NQ as shown in Table 5.

Table 5 – Value of squareness

NQ	Value of squareness
$0,005 \geqq NQ$	4
$0,010 \geqq NQ > 0,005$	3
$0,020 \geqq NQ > 0,010$	2
$0,030 \geqq NQ > 0,020$	1
$NQ > 0,030$	0

d) size accuracy

Using

$(NX_{ave} + NY_{ave}) / 2$ average number of cells between end points of tick marks on a sampling line, and

NE standard number of cells between end points of tick marks on a sampling line (see Figure 1),

NN (normalized difference between them) is defined as

$$NN = |NE - (NX_{ave} + NY_{ave}) / 2| / NE. \quad (5)$$

The value of size accuracy is determined in accordance with the range of NN as shown in Table 6.

Table 6 – Value of size accuracy

NN	Value of size accuracy
0,005 ≧ NN	4
0,010 ≧ NN > 0,005	3
0,020 ≧ NN > 0,010	2
0,030 ≧ NN > 0,020	1
NN > 0,030	0

e) tick mark identification

Using

NI number of identified tick marks, and

NS standard number of tick marks,

ND is defined as

$$ND = |NS - NI|. \quad (6)$$

The value of tick mark identification is determined in accordance with the value of ND as shown in Table 7.

Table 7 – Value of tick mark identification

ND	Value of tick mark identification
ND = 0	4
ND ≧ 1	0

f) quiet zone sufficiency

Using

M horizontal and vertical width of the quiet zone,

the value of quiet zone sufficiency is determined in accordance with the value of M as shown in Table 8.

Table 8 – Value of quiet zone sufficiency

M mm	Value of quiet zone sufficiency
M ≧ 4	4
M < 4	0

g) uselessness of error correction

Using

NC number of error correction enforcements in text decoding of a texture map,

the value of uselessness of error correction is determined in accordance with the range of NC as shown in Table 9.