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3D display devices – **STANDARD PREVIEW**
Part 1-2: Generic – Terminology and letter symbols
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Dispositifs d'affichage 3D –
Partie 1-2: Généralités – Terminologie et symboles littéraux
IEC 62629-1-2:2013
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CONTENTS

FOREWORD.....	3
1 Scope.....	5
2 Terms and definitions	5
2.1 General terms	5
2.2 Terms related to components	6
2.3 Terms related to performance specifications.....	7
Annex A (informative) Definition guideline for terms which include “image”, “view” or “vision”	9
Annex B (informative) Classification of 3D display types	12
Annex C (informative) Relation between depth perception and 3D display	14
Annex D (informative) Lobe	15
Bibliography.....	16
Figure A.1 – Difference between “image” and “view”	9
Figure A.2 – Structure of multi-view display	10
Figure A.3 – Stereoscopic images and stereoscopic views.....	11
Figure B.1 – Classification of 3D display	13
Figure C.1 – Depth perception and 3D display	14
Figure D.1 – Lobe of autostereoscopic display	15

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3D DISPLAY DEVICES –**Part 1-2: Generic –
Terminology and letter symbols**

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International Standard IEC 62629-1-2 has been prepared by IEC technical committee 110: Electronic display devices.

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

FDIS	Report on voting
110/470/FDIS	110/479/RVD

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.

A list of all the parts in the IEC 62629 series, under the general title *3D display devices*, can be found on the IEC website.

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3D DISPLAY DEVICES –

Part 1-2: Generic – Terminology and letter symbols

1 Scope

This part of IEC 62629 provides a list of the terminologies that are frequently used in describing 3D display technologies in the IEC 62629 series. Terms for various 3D display technologies on stereoscopic, autostereoscopic, volumetric, and holographic displays are included.

2 Terms and definitions

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

2.1 General terms

2.1.1

3D display

display device giving depth perception with physiological depth cues

Note 1 to entry: Physiological depth cues include accommodation, convergence, binocular parallax, and motion parallax. The 3D display provides users with all or some of the physiological depth cues so that they can perceive depth. Physiological depth cues should be distinguished from pictorial depth cues which can also be provided by the usual 2D displays. Pictorial depth cues are features in an image that give a hint of the depth. Examples of pictorial depth cues are texture gradient, shadow, occlusion, and vanishing lines.

2.1.2

stereoscopic display

3D display providing binocular parallax

Note 1 to entry: See “autostereoscopic display”. For classification of the 3D displays, see Annex B.

2.1.3

autostereoscopic display

stereoscopic display that requires no viewing aids

Note 1 to entry: See “stereoscopic display”. For classification of the 3D displays, see Annex B.

2.1.4

two-view display

two-view autostereoscopic display

autostereoscopic display providing one stereoscopic view

Note 1 to entry: See “multi-view display”.

2.1.5

multi-view display

multi-view autostereoscopic display

autostereoscopic display providing multiple stereoscopic views

Note 1 to entry: See “two-view display”.

2.1.6

integral imaging display

integral imaging autostereoscopic display

autostereoscopic display that reproduces ray space

2.1.7

volumetric display

autostereoscopic display which forms a set of pixels distributed in space

2.1.8

stereoscopic image

pair of images with parallax shown on a stereoscopic display

Note 1 to entry: Stereoscopic images are made by capturing images of an object from slightly different positions and they are used as output of a stereoscopic display. See Annex A.

2.1.9

stereoscopic view

pair of sights provided by a stereoscopic display, which induce stereopsis

Note 1 to entry: Stereoscopic view is generally not the same as stereoscopic image. In some cases more than a single monocular image is projected on the retina of an eye. See Annex A.

2.1.10

monocular image

one part of a stereoscopic image

Note 1 to entry: See A.2.2.

2.1.11

monocular view

one part of a stereoscopic view

Note 1 to entry: See A.2.2.

2.1.12

designed viewing distance

viewing distance recommended by the manufacturer of the 3D display

Note 1 to entry: For a detailed measurement procedure, see IEC 62629-22-1.

2.1.13

lobe

space wherein one or multiple stereoscopic images are projected in correct angular order by an autostereoscopic display

Note 1 to entry: See Annex D.

2.1.14

ray space

spatial and angular distribution of light reflected from the surface of an object

2.2 Terms related to components

2.2.1

active glasses

glasses whose left and right lenses alternate their optical characteristics, synchronizing with displayed sequential images on a stereoscopic display (e.g. synchronizing with TV fields, TV frame, etc.) to separate the displayed images into left and right monocular views

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Note 1 to entry: Usually left and right images are displayed alternately on a screen. When a left image is displayed, the left lens of the active glasses is turned on to transmit the image and the right lens is turned off to cut off the image. The lenses do not need a function for focusing light.

2.2.2

passive glasses

glasses whose left and right lenses have complementary but fixed optical characteristics to separate displayed images on a stereoscopic display into left and right monocular views

Note 1 to entry: Usually spatially divided left and right images are displayed at the same time on a screen; each divided segment in the screen emits polarized light to display the images and the left and right segments have orthogonal polarization. The left lens of the passive glasses has a polarization to pass the emitted light of the left images and to cut off that of the right images, while the right lens passes the right images and cuts off the left images.

2.2.3

polarized glasses

passive glasses equipped with two polarizers whose polarization properties are opposite to each other

Note 1 to entry: See “linearly polarized glasses” and “circularly polarized glasses”.

2.2.4

linearly polarized glasses

passive glasses equipped with two linear polarizers whose polarizing directions are orthogonal to each other

Note 1 to entry: See “polarized glasses” and “circularly polarized glasses”.

2.2.5

circularly polarized glasses

passive glasses equipped with two circular polarizers whose rotational directions of circular polarization are orthogonal to each other

Note 1 to entry: See “polarized glasses” and “linearly polarized glasses”.

2.2.6

patterned retarder

array of two kinds of optical phase retarders arranged alternatively in a plane

2.2.7

parallax barrier

barrier with an array of slits for providing one or multiple stereoscopic views

2.2.8

lenticular lens

lenticular sheet

set of semi-cylindrical lenses that are arranged side by side in a plane

2.2.9

fly-eye lens

set of lenslets that are arranged in a plane

2.3 Terms related to performance specifications

2.3.1

interocular chromatic difference

difference in chromaticity between left and right monocular views

Note 1 to entry: For a detailed measurement procedure, see IEC 62629-12-1.

2.3.2

interocular contrast difference

difference in contrast between left and right monocular views

Note 1 to entry: For a detailed measurement procedure, see IEC 62629-12-1.

2.3.3

interocular luminance difference

difference in luminance between left and right monocular views

Note 1 to entry: For a detailed measurement procedure, see IEC 62629-12-1

2.3.4

interocular crosstalk

luminance leakage into the observed monocular view of an eye from the monocular image for the other eye

Note 1 to entry: For a detailed measurement procedure, see IEC 62629-12-1.

2.3.5

3D crosstalk

luminance leakage into an observed monocular view from other monocular images that are not designed to be seen at the observing position

Note 1 to entry: For a detailed measurement procedure, see IEC 62629-22-1.

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Annex A (informative)

Definition guideline for terms which include “image”, “view” or “vision”

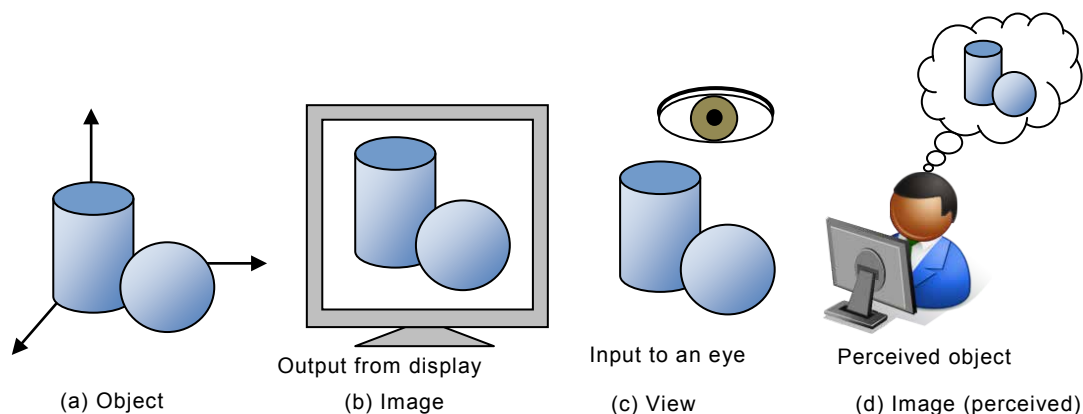
A.1 General

The terminology in Clause 2 avoids the definition of such short words as “image,” “view” or “vision” (even though those words are used in many terms in Clause 2), because defining them explicitly ends up confusing readers, as these words have multiple meanings in daily usage. Instead, a brief description on how a term which includes one of these words is defined is presented here to relieve readers’ confusion by indicating the reason why the short word causes trouble.

A.2 Definition guideline

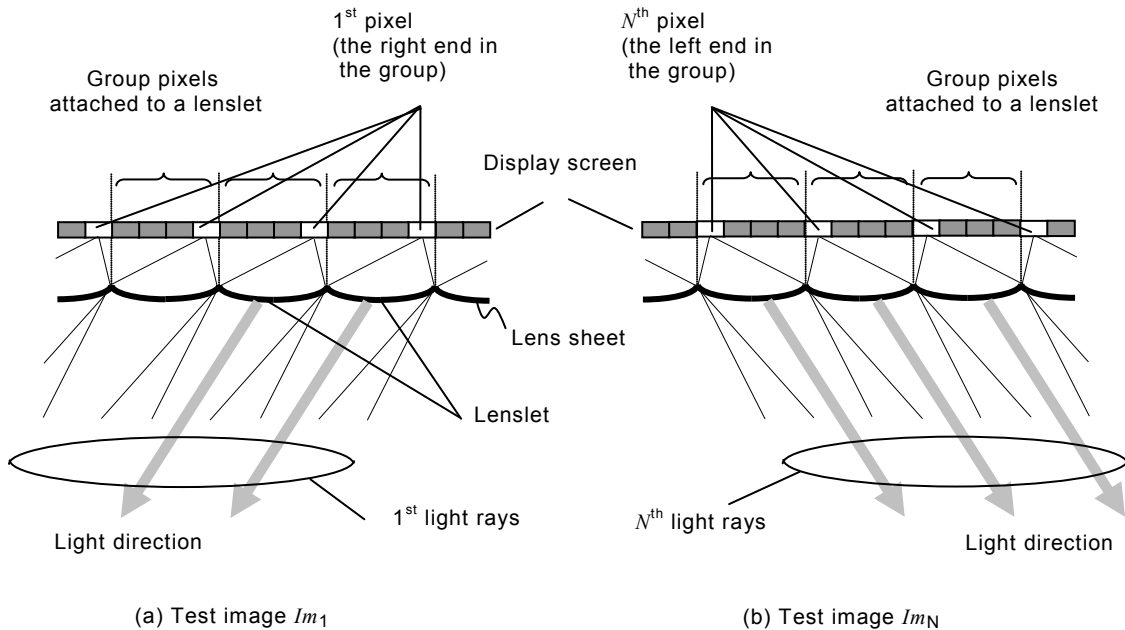
A.2.1 Stereoscopic image and stereoscopic view

“Image” and “view” are treated as an output from the display device and an input to a human eye respectively. However, “image” is allowed to have another meaning of perceived object in the brain as an exception because “image” is also treated as a product of “vision”, which means the brain’s information processing of the optical input to the eyes (see Figure A.1). Multi-view autostereoscopic displays make use of “group pixels,” a sequence of pixels that is periodically arranged on the horizontal line of the display screen to control the emission of light rays (see Figure A.2). Each i^{th} pixel in the “group pixels” emits a light ray in the specified direction and thus all of i^{th} pixels have the same light direction. An “image” is composed of a group of light rays in the same specified direction and therefore any two of the “images” derive from different light sources. This means that “images” are mutually independent. On the other hand, a human eye generally receives plural “images” because it has no filter that selects a specified “image” and thus neighboring “views” are supposed to include the same “image.” This means that “views” are not mutually independent. Readers’ confusion may come from unawareness of the difference between “image” and “view,” or readers may confuse what is presented to people with what is observed by people.



IEC 1582/13

Figure A.1 – Difference between “image” and “view”



IEC 1583/13

Figure A.2 – Structure of multi-view display¹

A.2.2 Convention in using the plural form of stereoscopic image and stereoscopic view

In this standard, “stereoscopic image” and “stereoscopic view” mean a pair of “images” and “views” as shown in Figure A.3. Therefore “stereoscopic image” and “stereoscopic view” include two “monocular images” and “monocular views”, respectively. The stereoscopic display using glasses and the two-view display present a single “stereoscopic view” in this sense. The multi-view display presents a collection of “stereoscopic views”.

¹ Taken from IEC 62629-22-1.