ISO 9241-306:2018 (E)

Ergonomics of human-system interaction — Part 306: Field assessment methods for electronic visual displays

Contents

Foreword

Introduction

1 Scope

2 Normative references

3 Terms and definitions

4 Preparation for assessment

4.1 Cleaning
4.2 Set-up
4.3 Display warm-up
4.4 Control settings of the visual display

5 Assessment methods

5.1 Viewing conditions
5.1.1 Design viewing distance
5.1.2 Design viewing direction
5.1.3 Gaze and head tilt angles
5.1.4 Virtual images
5.2 Luminance
5.2.1 Illuminance
5.2.2 Display luminance
5.2.3 Luminance balance and glare
5.2.4 Luminance adjustment
5.3 Special physical environments
5.3.1 Vibration
5.3.2 Wind and rain
5.3.3 Excessive temperatures
5.4 Visual artefacts
5.4.1 Luminance non-uniformity
5.4.2 Colour non-uniformity
5.4.3 Contrast non-uniformity
5.4.4 Geometric distortions
5.4.5 Pixel faults
5.4.5.1 Pixel/subpixel stuck on
5.4.5.2 Pixel/subpixel stuck dim
5.4.5.3 Pixel/subpixel stuck off
5.4.6 Temporal instability (flicker)
5.4.7 Spatial instability (jitter)
5.4.8 Moiré effects
5.4.9 Other instabilities
5.4.10 Unwanted reflections
5.4.11 Unintended depth effects
5.5 Legibility and readability
5.5.1 Luminance contrast
5.5.2 Image polarity
5.5.3 Character height
5.5.3.1 Character height measured with comparator foil
5.5.3.2 Character size determined from pixel count and screen height
5.5.3.3 Screen height

5.5.4 Text size constancy
5.5.5 Character stroke width
5.5.6 Character width-to-height ratio
5.5.7 Character format
5.5.8 Between-character spacing
5.5.9 Between-word spacing
5.5.10 Between-line spacing
5.6 Legibility of information coding
5.6.1 Luminance coding
5.6.2 Absolute luminance coding
5.6.3 Blink coding
5.6.4 Colour coding
5.6.5 Geometrical coding
5.7 Legibility of graphics
5.7.1 Monochrome and multicolour object size
5.7.2 Contrast for object legibility
5.7.3 Grey and colour considerations for graphics
5.7.4 Background and surround image effects
5.7.5 Number of colours
5.7.5.1 General
5.7.5.2 Visual search for colour images
5.7.5.3 Colour interpretation from memory
5.8 Fidelity
5.8.1 Grey scale and gamma
5.8.2 Rendering of moving images
5.8.3 Colour misconvergence
5.8.4 Image formation time (IFT)
5.8.5 Spatial resolution

6 Other considerations

6.1 Isotropic surface
6.2 Anisotropic surfaces
6.3 Viewing angle range
6.4 Adjustability
6.5 Controllability
6.6 Luminous environment

Annex A (informative) Overview of the ISO 9241 series

Annex B (informative) Influences on ergonomics parameters of visual displays

Annex C (informative) Unwanted reflections

Annex D (informative) Definition and application of test charts for display output linearization for eight different ambient light reflections at office work places

D.1 Introduction, applications and changes compared to the previous edition
D.2 Definition of six test charts of this document for elementary or device hue output
D.2.1 Definition of six test charts for elementary hue output
D.3 Definition of eight contrast steps for elementary or device hue output
D.4 Output simulation for six test charts of ISO 9241-306 and for eight contrast steps
D.4.1 File for simulation of output properties with 8 and 24 pages for eight contrast steps
D.4.2 Simulation of file outputs with properties and questions for eight contrast steps
D.4.3 Visual inspection for equally spaced output of eight screen reflections
D.5 Questions for the visual evaluation and input-output relationship
D.6 Software tool for output linearization of the six original test files
D.6.1 Software tool for a gamma change of achromatic and chromatic original test files
D.6.2 Complete workflow for output linearization with test chart AE06 or AE17
D.7 Test reports by visual inspection of outputs in the central and frame area
D.7.1 General
D.7.2 Output linearization method and test report for computer and external displays
D.7.3 Test report Form A — Visual output inspection for the central area
D.7.4 Test Report Form B — Visual output inspection for the frame area
D.8 Colour output of an example sRGB printer device and rgb* devices
D.8.1 sRGB and rgb* output

Annex E (informative) Considerations for Cathode ray tube (CRT) displays

Page count: 55