ISO/TR 20278:2015-12 (E)

Unwanted reflections from the active and inactive areas of display surfaces visible during use

Contents

Page

Foreword v

1 Scope 1

2 Terms and definitions 1

3 Unwanted reflections within the context of the ISO 9241-3xx series 2
3.1 Glare and unwanted reflections 2
3.2 Direct glare in the context of the ISO 9241-3xx standards series 2
3.3 Glare by reflection 3

4 Visual discomfort and glare while using computer displays 3
4.1 Asthenopia 3

5 Unwanted reflections from displays 3
5.1 General 3
5.2 Glare and unwanted reflections on screens in the ISO 9241-3xx series 4

6 Pertinent regulations regarding glare and unwanted reflections 4
6.1 European Directive 90-270 -- On the minimum safety and health requirements for work with display screen equipment 4
6.2 The meaning of disturbing glare within the ISO 9241-3xx series 4
6.2.1 General 4
6.2.2 CIE definitions of discomfort glare and disability glare 4
6.2.3 Unwanted reflections as currently specified and limited in ISO 9241-303, 9241-305 and 9241-307 for the active area of displays (screens) 5
6.3 Interaction between specular, diffuse and haze reflection components 6
6.3.1 General 6
6.3.2 Recognition of the interaction of unwanted reflection components in the ISO 9241-3xx series 6

7 Luminance balance 6

8 Glare and the ambient illumination in the office-working environment 6
8.1 Ambient illuminance 6
8.2 Arrangement of the computer work area 7
8.3 Surface finishes (reflectivity) 7
8.3.1 General 7
8.3.2 Conversion of specular gloss values to specular reflectance values 8

9 Literature review of research regarding unwanted reflections from the bezel, screen housing, or other inactive areas of the display visible during use 8
9.1 General 8
9.2 Bezel gloss 8
9.2.1 Howarth and Hodder, 2004 8
9.2.2 Béland and Andrén 8
9.2.3 Howarth and Hodder, 2013 8
9.3 Bezel reflectance 9
9.3.1 General 9
9.3.2 Hunter, et al 9
9.3.3 Soderston, et al 9

9.3.4 Béland and Andrén 10
9.3.5 Howarth and Hodder 11
9.3.6 Conclusions from the literature regarding bezel gloss and reflectance 11

10 A review of the literature regarding eyestrain due to vergence and accommodative demands of glare reflections 11
10.1 Accommodative stress 11
10.2 Vergence stress 12

11 Summary and conclusions 12

Bibliography 14