

No.: 0226 Glare on visual display terminals

○ Problem

Natural or unfavourably arranged artificial lighting may result in reflections on video display screens which impair the recognizability of the text and images on the screen. The greater concentration which this necessitates may in turn cause headaches, tension and fatigue in terminal users. Reflections on video display terminals must therefore be suppressed as far as possible.

DIN EN ISO 9241-7 defines three classes of video display terminal in terms of their freedom from glare. The definition of the classes appears obsolete, however. Owing to technical progress, monitors of the poorest class, III/III, have disappeared almost completely from the market, and almost all modern flat screens satisfy the requirements of Class I/I. Stronger differentiation and adaptation of the requirements concerning unwanted luminance to the definition of the classes therefore appears necessary.



Illustration 1
Model video display terminal workplace

○ Activities

In the course of a research project, a model video display terminal workplace was set up at the BIA at which reflections were deliberately created on the surface of a monitor. Illustration 1 shows the monitor being studied (1), the source of glare (2), the camera (3) used for measurement of the luminance distribution, and the computer used to assess the results (4). The source of glare was used to generate defined unwanted luminance on the monitor. Test subjects were instructed to correct errors in a text on the screen. They were then interviewed with the aid of a standard questionnaire. They were required to indicate the extent to which they were hindered by the glare and to what degree they were still able to fulfil the task. 60 test subjects assessed six different monitors in different classes, in each

case under six different glare conditions and in two different text display modes (normal and reverse video). At the same time, the black/white contrast of fields and individual characters was measured as a function of the unwanted luminance. The results of the study were quantified and computed statistically. The level of disturbance was placed in relation to the defined unwanted luminance and evaluated as a function of the measured contrast.

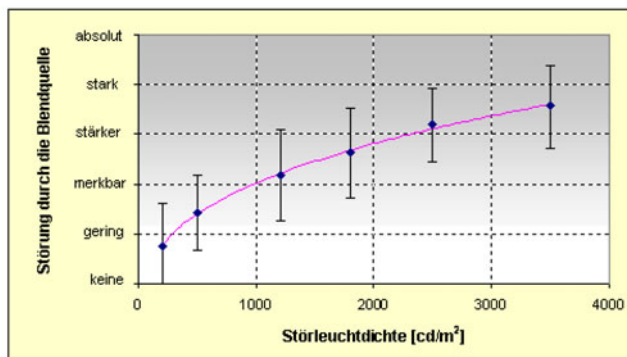


Illustration 2
Test subjects' judgement of the level of disturbance as a function of the unwanted luminance

○ Results and Application

Illustration 2 shows the relationship between unwanted luminance and the test subjects' assessment of the degree of disturbance for one monitor type. A statistical basis can be derived from the results for monitors of different reflection suppression classes for redefinition of the classes within the standard. The relationship between the field and character contrasts and the subjects' assessments also yields new scientific findings on the relationship between glare and perceived disturbance which are generally valid and independent of the methods employed.

○ Area of Application

Monitor manufacturers, standards committees, test bodies for monitors, purchasers and users of monitors

○ Additional Information

- DIN EN ISO 9241-7: Ergonomic requirements for office work with visual display terminals (VDTs) – Part 7: Requirements for display with reflections (12.98). Beuth, Berlin 1998

⇒ Expert assistance: BIA, Fachbereich 4: Arbeitsgestaltung – Physikalische Einwirkungen
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