Danell, M. N., Hartmeyer, S. L., - Abstract

The present simulation case study compares the impact of electric lighting distributions in relation to work-desk location and orientation on work-plane and eye-level illumination within a small private office. The aim of this study is to better understand the implications of lighting and furniture design decisions on ocular light exposure with consideration of work-plane illuminance based on current recommendations by the IES and the International WELL Building Institute. Five electric lighting configurations, 3 occupant seating locations, and 3 view directions were simulated and compared. No conditions met work-plane and eye-level illumination targets at the same time. Only by adjusting the spectrum and output intensity were both illumination targets achieved. Overall, vertical wall illumination when seated close to the illuminated wall resulted in the highest eye-level light exposure. These results indicate that vertical plane illumination can act as an effective lighting design for both horizontal and vertical illuminance when furniture configurations are selected accordingly.

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