Lighting Evaluation in the Office Environment

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INDOOR LIGHTING

- most diffused "adverse agent" in the work environment
- exposed subjects progressively increasing due to shift from "manual work" towards "conceptual work" (blue collar towards white collar)
- lighting conditions (natural and artificial) are believed to play an essential role in causing "occupational asthenopia"

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PHOTOMETRY & PHYSIOLOGY

Environmental light that effectively reaches the operator's retina is limited by:

- the shielding action of the osteo-cutaneous orbitary protuberances, eyelashes and eyebrows
- the selective action of the pupil
- the position of the head (strongly influenced by the task)

Only light that reaches the retina can produce discomfort and disturbances

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THE OCCUPATIONAL VISUAL FIELD

It is defined as the zone in which the worker, because of task constraints, must direct his/her gaze for extended periods of time

It roughly approximates a cone with its vertex at the midpoint of the worker's eyes (*nasion*) and with an irregular base

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PHOTOMETRY AT THE WORKPLACE

- illuminance appears to be inadequate to quantify the amount of light that actually reaches the operator's eyes
- luminance is more appropriate for "occupational photometry" purposes

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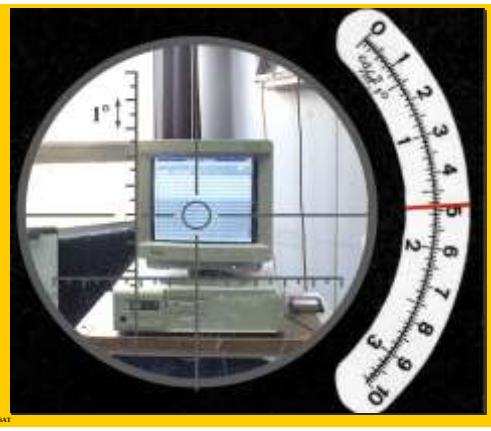

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Workstation	Floor	Room no.	Photo no.	Luminance ratio	Occupational Visual Field Ratios
1	2	35	9	High	Left (min - max = 30/9000 cd/m²)
2	5	04	18	Slightly high	Right (min - max = 8/1200 cd/m²)
3	8	10	27	High	Central-left (min - max = 5/2500 cd/m²)
4	8	28-32	29	Slightly high	Left (min - max = 10/2000 cd/m²)
5	10	06-08	33	Adequate	
6	10	20	34	High	Central-right (min - max = 15/4000 cd/m²)
7	11	08	36	Slightly high	Right (min - max = 10/2100 cd/m²)
8	13	07-01	43	Slightly high	Central (min - max = 10/2000 cd/m²)
9	15	24	49	Adequate	
10	17	24-26	55	Slightly high	Central-left (min - max = 8/1400 cd/m²)

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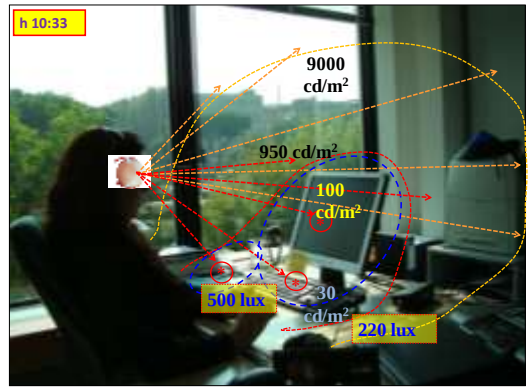

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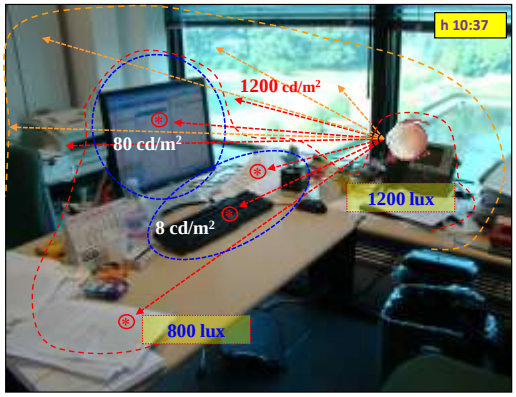

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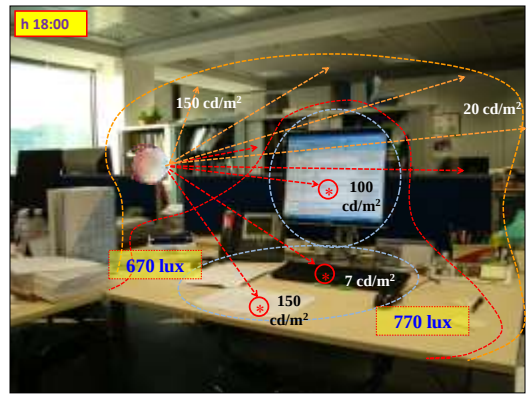

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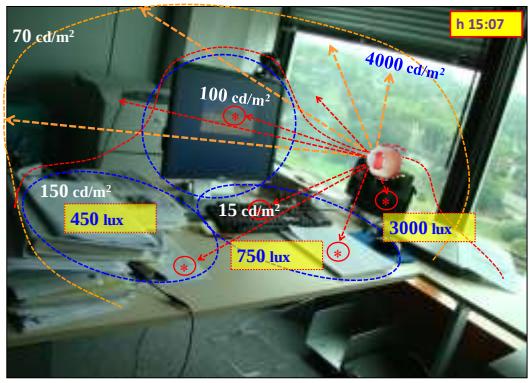

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CONCLUSIONS

Luminance is more appropriate for occupational photometry purposes (lighting risk assessment)

Our results show that, whithin the Occupational Visual Field illuminance is not changing intensively, while luminances are varying of hundreds of times

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