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Indoor Air 2014 - 13th International Conference on Indoor Air Quality and Climate • Pages 353 - 360 • 2014 • 13th International Conference on Indoor Air Quality and Climate, Indoor Air 2014 • Hong Kong • 7 July 2014 through 12 July 2014 • Code 110897

Document type

Conference Paper

Source type

Conference Proceedings

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Indoor air quality audit in two office buildings in Portugal

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Abstract

The indoor air quality that a building presents is not always from our knowledge. In fact, we may find ourselves exposed to an indoor air which can be harmful to human health, affecting the quality of life and productivity, which also will have economic repercussions at this level. Given the Portuguese law for energy and indoor air quality (IAQ) certification of large service buildings, the indoor air quality requirements were here presented and, in addition, this paper provides an overview of the current Portuguese IAQ technical procedures to audit existent buildings. It was also intended with this study to evaluate the indoor air quality experienced by the occupants of two office buildings, an old and a recent, with the same activity and occupancy, without air-conditioning systems, where were carried out indoor air quality characterizations and, in particular, have been assessed the CO₂ concentration and the typical renewal air exchange rates in different zones of the buildings, as a ventilation effectiveness monitoring. During the building's regular occupancy period, the authors have been done monitoring campaigns, which took place in winter and summer seasons. They have been detected that the values of some parameters under review were non-compliance situations in winter, in contrast with the summer due to the increase of ventilation promoted by the occupants taking advantage of the favourable conditions of the Mediterranean weather. Consequently, the proposed IAQ audit approach may be helpful to characterize indoor air pollutants, to evaluate the ventilation effectiveness and to correlate it with the indoor air quality perception and self-control actions of the occupants.

Author keywords

Energy and environment in buildings; Indoor air quality; Indoor air quality audit; Renewal air exchange rates; Ventilation effectiveness monitoring

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