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INDOOR/OUTDOOR CORRELATIONS REGARDING INDOOR AIR POLLUTION WITH PARTICULATE MATTER

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Abstract

This paper presents the results of a case study conducted between 2.04 and 24.04.2013 in order to establish the most relevant indicators that characterize the influence of outdoor air pollution, with particulate matter having a nominal diameter less than 2.5µm (PM2.5), on the quality of indoor air from a new building. The tests consisted in simultaneous determination of the daily average PM2.5 concentrations at four indoor sites and at one outside, nearby the building. The average PM2.5 concentration was 38.41±7.4µg/m³, but only 70% of the outdoor performed tests were above the daily limit of 35µg/m³, set by the U.S. Environmental Protection Agency. The indoor air pollution with PM2.5 was lower than outdoor with an average concentration of 21.78±6.22 µg/m³. Both Pearson’s statistical correlation analysis and linear regression analysis showed a good direct correlation between indoor and outdoor PM2.5 concentrations, the proper insulation of the building and the absence of major indoor sources of PM2.5 particles. The results of this study demonstrated that for a new building the indoor/outdoor (I/O) ratio and infiltration factor (F_{in}) could give a correct estimation of the outdoor air pollution influence on the indoor air quality. Further information could be provided by statistical correlation and linear regression analysis; the value of the intercept could be a good indicator of the presence of indoor sources.

Key words: I/O ratio, indoor air, infiltration factor, penetration factor, PM2.5

Received: May, 2014; Revised final: July, 2015; Accepted: September, 2015

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