DISPERSION MODEL FOR TVOC EMISSIONS FROM SOLVENT-BASED PAINTS

C. JAYASINGHE[1] & T.M. PERERA[2]

[1] Professor, Department of Civil Engineering University of Moratuwa, Sri Lanka

[2] Postgraduate Research Student, Department of Civil Engineering University of Moratuwa, Sri Lanka

ABSTRACT

Indoor Air Quality (IAQ) plays a significant role in building related sicknesses, termed as Sick Building Syndrome (SBS). Several researchers have identified the building materials as sources of indoor pollution during construction and operation. Various types of paints have been studied for IAQ related emissions. This paper covers a study carried out on emissions generated from water based (Emulsion) and solvent based (Enamel) paints and the dispersion pattern of prominent pollutants such as Total Volatile Organic Compound (TVOC), Carbon Monoxide, Carbon Dioxide, Nitrogen Dioxide and particulate matter. A severe impact was observed from TVOC concentration. Therefore TVOC emissions were used to develop a computational model using IAQX software. Since the computational model has not converged well with the experimental dispersion curve, a further attempt was made to develop a mathematical model, which is of an exponential nature. However the computational model was used to predict the variation of peak TVOC concentrations and time of dispersion under different ventilation rates. The mathematical model has been recommended to work out the building flush out period and variation of TVOC concentration with the area of paint application. This model will benefit the building planners to create healthy indoor environments for the occupants.

KEYWORDS: Computational Model, Experimental Model, Mathematical Model, Solvent Based Paint, Water Based Paint