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Assessment of numerical concentration of suspended particles and influence on breathing zone particle size distributions

Seyedtaghi Mirmohammadi, Mohsen Gorganifioozjaee, Jamshid Yazdani Charati, Syavash Etemadinejad, Saeid Abedian, Hosein Kariminia, Razye Yousefinejad and **Seide Sadat Shobeiri**
Mazandaran University of Medical Sciences, Iran

Airborne particulate matters (PM) as one of the air pollutants are environmental pollutants which usually have adverse effects on human health. Airborne PM exist in the workplaces and the industries with an aerodynamic diameter between 0.3 to 20 µm requirements of health significance. The present study aimed to determine the extent of the frequency distribution of PM and how particle emission in the different working units' factory of casting is done. Fifteen workstations were assessed for numerical concentration (count/liter) particles in the range 0.3 to 20 µm using GRIMM1100 real time portable and stationary aerosol ultrafine particle counters. As well as SPSS V-20 statistical software and 20 Mann-Whitney and GEE tests have been used to analyze the research data. Results of particles distribution measurement in numeric form has shown that the most frequency of PM was between 0.3 to 0.4 µm at 5 working tasks, also with a larger diameter of the particles, their number concentration per air volume being reduced during almost constant process. Comparison of the frequency of particle number with the various job duties revealed that the most contaminated part of the template as the drain unit has the highest density of the particles. Assessment of the indoor air parameters indicated that by increasing the air flow rate decrease the indoor air pollution in the workplace. As well as an increase in temperature and relative humidity on the workstations increased the frequency of particle number distributed in the working environment.

seyedtaghim@gmail.com