Abstract

This thesis deals with the issue of high exposure of dust particles PM10, PM2.5 a PM1 in two specific climbing gyms in Prague. The source of these particles is linked to the use of magnesia alba that the climbers use to dry up the skin of their hands. The thesis analyzes the expected correlation between the dust particles concentration and the current number of visitors of the climbing gym. The dust particles are proven to have a negative effect on the health of individuals. The dust particles measured in this thesis are able to penetrate the respiratory tract.

The size segregated aerosol was measured using DustTrak DRX. It is a laser nephelometer. In one of the gyms, a gravimetric analysis was performed, using a Harvard impactor that measures the PM10 concentration. All measurements were performed within the period of 20.4.2016 – 5.2.2017.

In the climbing center Mammut, the PM10 exposure was measured at 0,125 – 0,167 mg*m⁻³, which could quadruple in the most frequented time periods. The climbing gym SmichOFF measured the maximum levels of PM10 at 0,368 – 0,901 mg*m⁻³. Both climbing centers exceeded the average daily imission limits for PM10 and PM2.5.

From the health perspective, it is recommended to prevent such high exposure levels or lower the concentrations in the climbing gyms by suitable ventilation or air-conditioning systems.

Key words: PM10, PM2.5, PM1, aerosol, dust particles, magnesia alba