

ENDOTOXIN LEVELS IN FORKLIFT'S FILTERS AND THE IMPORTANCE OF MAINTENANCE ENFORCEMENT

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Many studies have already linked endotoxin exposure, especially in workplaces, to airways disease, yet threshold limit values have not been set, nor a standardized procedure for the analysis of endotoxin levels. Inhaled endotoxins may cause bronchial asthma and may increase the allergic response in hypersensitive people. Endotoxins are biologically active lipopolysaccharides (LPSs) produced by the most external layer of cellular walls of gram (-) bacteria. They are commonly found at workplaces where large amounts of bioaerosols are generated, like in waste sorting plants, where microorganisms growing on organic residue are present at high concentration in the air. Endotoxins are relatively heat stable so they are released into the air during cell growth and after cells' death when the integrity of the cell wall is ruptured.

Up to the present, endotoxin values are measured with non-uniform methods and therefore values are of limited benefit for assessment and limits' establishment.

In this study, eleven filters belonging to the filtration system from forklifts operating in one waste sorting industry located in the Lisbon region and one control filter were analyzed. The 11 filters were used in forklifts between 794 and 22,240 working h. All the assessed filters were composed by activated charcoal and belong to category 2 (pores typically from 3.0 µm or greater dimension) according to protection requirements (EN 15695) ensuring protection against dust inside the cabinet. In these settings, criteria for filter replacement in the air conditioning system are dependent on visual observation by the maintenance service to accomplish preventive maintenance program. Endotoxin levels were analysed following the European Standard (2003) EN 14031 and varied between 3,6 EU/cm² and > 625 EU/cm². Considering that standard filters have an area of about 1226 cm², the total charge of endotoxins in the studied filters ranges from 4382 EU to 766 250 EU which raises questions about the **safety** and for how long it is safe to keep the filters in use in this and other particular settings.

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