

## American Association for Aerosol Research - Abstract Submission

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## Abstract View

### **Application of the Mobile Aerosol Lung Deposition Apparatus (MALDA) on Estimation of Ultrafine Welding Fume Respiratory Deposition**

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#### **Abstract**

In this study, a mobile aerosol lung deposition apparatus (MALDA) that utilized a set of physiologically representative human airway replicas with different numbers of airway generations was developed. Laboratory evaluation tests were conducted using ultrafine welding fume particles. The ultrafine welding fume particles were generated in a welding fume chamber and delivered to the MALDA for respiratory deposition experiments. A differential method was adopted to calculate the deposition of ultrafine welding fumes in the human tracheobronchial airways. The estimation of the respiratory deposition was facilitated by an empirical model developed according to the experimental data acquired. The estimated cumulative respiratory deposition ranged from approximately 9% to 31% for ultrafine welding fume particles between 10 nm and 100 nm in diameter. This finding indicates the feasibility and suitability of applying MALDA as a useful tool for on-site workplace respiratory deposition measurement for other workplace ultrafine particles.

Software design by Donald Dabdub.