

20NRM04 MetrIAQ

Metrology for the determination of emissions of dangerous substances from building materials into indoor air

WP 2 Modelling of VOC emissions from the ERM

The aim of this work package is to support the preparation of the ERM prototype in [WP 1](#) and to develop a suitable numerical model for the behaviour of the VOC reservoir inside the ERM. The VOC mass transfer mechanisms in the ERM involve a series of steps from the VOC reservoir to the sampling point in the emission test chamber. The characteristic time of each transfer step (i.e. resistance to VOC transport) provides information on controlling phenomena of a system. The most important step in the transfer of VOC is the slowest step. On the other hand, quick steps can be considered in equilibrium with the slower steps.

In Task 2.1 the controlling steps in VOC transfer will be identified to support the design of the prototype ERM developed in Task 1.2 ([WP 1](#)).

In Task 2.2, a numerical model will be developed for the ERM, based on FEM. The numerical model will be used to predict the time dependent VOC emissions from the ERM, and to help to define the optimal configuration of the ERM (e.g. its dimensions and limitations regarding material properties), which will support the work in Task 1.2 ([WP 1](#)).

In Task 2.3, the performance of the numerical model of the ERM will be analysed and a validation and uncertainty evaluation of the model will be undertaken. Validating the models will not only verify the model's performance, moreover, it will improve the understanding of the uncertainty sources involved in the emission process. This knowledge will be used for the production of the final ERMs used for the inter-laboratory comparison (ILC) in Task 3.2 ([WP 3](#)).

Work package leader: [Politecnico di Torino \(POLITO\)](#)

Involved Partners: [BAM](#), [ZAG](#)