20NRM04 MetrIAQ

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

Webinar on

"*Metrology for Indoor Air Quality – Reference materials for QA/QC of the emission test chamber procedure*"

11 April 2024

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The EMPIR initiative is co-funded by the European Union's Horizon 2020 research and innovation programme and the EMPIR Participating States

EMPIR – European Metrology Programme for Innovation and Research

Goals

- It shall improve measurement to drive innovation and competitiveness and to support societal challenges and regulation
- It enables European metrology institutes, industrial organisations and academia to collaborate in joint research oriented projects

Organisation

- Implemented by EURAMET (European Association of National Metrology Institutes)
- Jointly funded by the EMPIR participating countries and the European Union
- Budget of approximately 600 M€ over seven years (H2020)

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What's it all about?

It's about reference materials for…

…Materials Emissions Testing

…Indoor Air Monitoring and…

Measurement Uncertainty

Why?

To improve measurement capabilities

To improve comparability between measurements

To fulfil requirements

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Emission test chamber method (EN 16516)

8.4.2 External references

Notified and accredited laboratories shall verify performance of the whole method by comparing against external references and by following the quality control requirements of ISO 16000-3, ISO 16000-6, EN ISO 16000-9 and EN ISO 16000-11.

NOTE Use of external reference materials spiked with VOCs with known emission rate, and with known emission decay profiles, are a useful tool for evaluating the performance of the whole procedure against primary standards, provided the quality of the reference materials is known. Alternatively, the recovery tests described in EN ISO 16000-9 can be used to determine test chamber sink effects.

Participation in round robin tests and relevant independent analytical proficiency testing schemes is useful for comparing performance against a group of laboratories and is strongly recommended.

CEN TC 351/WG 2 has submitted standardisation need to EURAMET for research on reference materials to be considered in the EMPIR Call 2020

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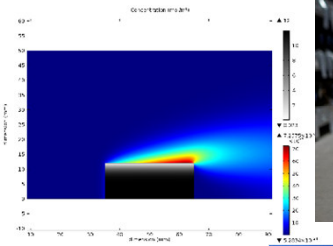
MetrIAQ Objectives

1. Development of an emission reference material (ERM) that releases (assessment) relevant compounds with a temporarily stable emission profile (decrease < 10% over at least 14 days)

2. Development of a numerical model to calculate the emission profile as well as the uncertainty

3. Development of gaseous primary as well as certified reference materials (gPRM/gCRM) with (assessment)relevant compounds

4. Internal and external validation of the developed reference products



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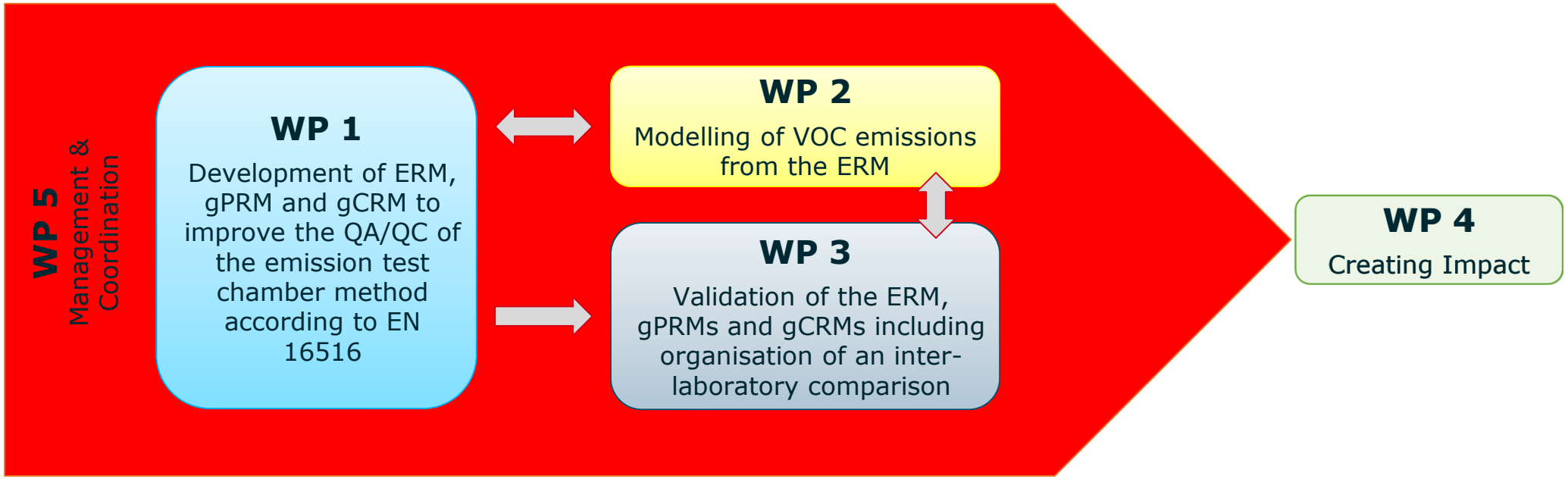
Project Structure



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Consortium

MetrIAQ

NMI's/DI's (DE, NL, TR)

BAM Bundesanstalt für Materialforschung und -prüfung

VSL Dutch Metrology Institute

TÜBİTAK UME

Test labs (BE, DK)

eurofins | Product Testing

vito

Academia (IT)

POLITECNICO DI TORINO

Research Institutes (DE, SI)

Fraunhofer IMM

ZAG ZAVOD ZA GRADBENIŠTVO SLOVENIJE — SLOVENIAN NATIONAL BUILDING AND CIVIL ENGINEERING INSTITUTE

Total budget
905 k€

Run-time
06.2021-05.2024

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Focus 1 – ERM with temporally constant emission rate

- Test standards require
  - Use of RM with known emission rate and participation in round robin tests
  - Determination of recovery to reveal sink effects in test chamber with stable source over 72 hours

➢ Project goal to combine both:

ERM with known VOC composition and stable compounds release

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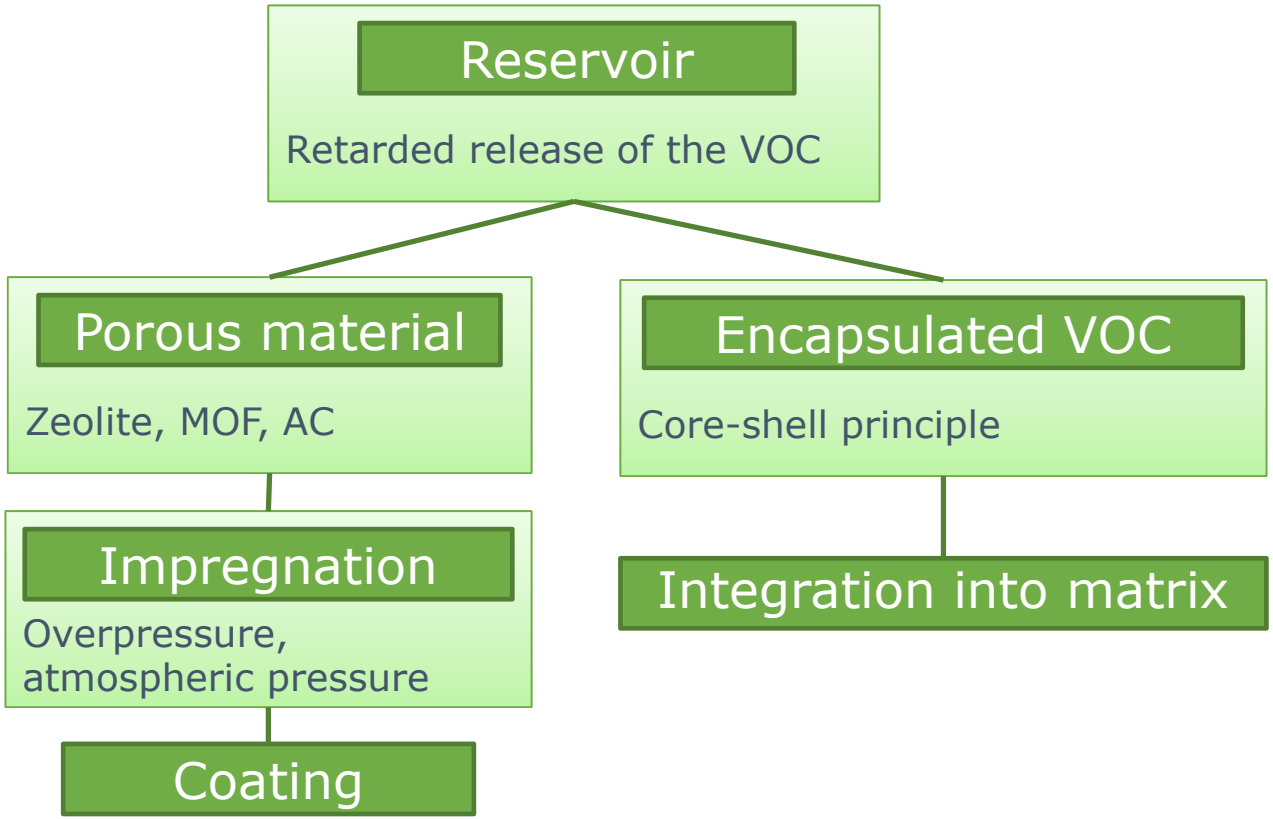
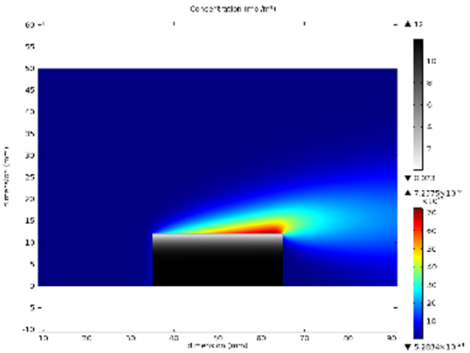
Focus 1 – ERM with temporally constant emission rate



- Combination of reservoir materials loaded with VOC enabling customised product preparation
- Avoidance of colligative effects
- Modelling of mass transfer



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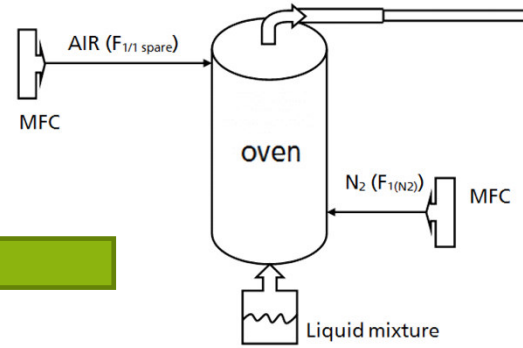
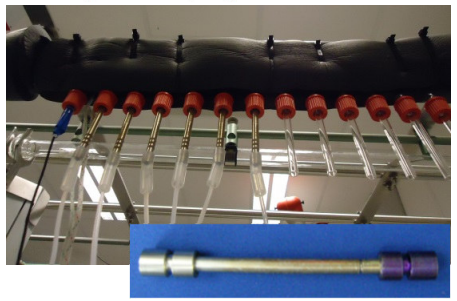
Focus 2 – Primary and certified gaseous reference materials (gPRM/gCRM)

Primary reference (gPRM)
(ISO 6142-1)
Target uncertainty: 5%
Shelf life: 1 year

Validation reference gas mixture against gPRM

gCRM





Reference gas mixture
(ISO 6145-4, -5)
Target uncertainty: 5%

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The project wants to deliver…

1. Novel emission reference materials (ERMs) for QA/QC measures fulfilling the requirements of test standards using emission test chambers

2. Novel gCRMs of relevant indoor air pollutants for provision of new calibration services

3. Numerical model to get deeper understanding of the processes of mass transfer from the material into the test chamber air supporting to improve the test procedure

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Thank you for your interest

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