

PROJECT

MACAO

Development of VOCs and ozone Micro-analysers based on microfluidic devices for Aircraft Cabin Air mOnitoring (MACAO)

Funding: European (Horizon 2020)

Duration: Feb 2016 - Dec 2020

Status: Complete

Total project cost: €436,250

EU contribution: €368,150



Call for proposal: H2020-CS2-CFP01-2014-01

[CORDIS RCN : 200128](#)

Objectives:

The origins of pollutants inside the aircraft cabin are various. Ozone comes from outside, particularly when the aircraft is flying at high altitudes near the stratospheric ozone layer. In addition to the materials emissions, carbonyl species can be also produced in the cabin by reaction of ozone with unsaturated VOCs.

Ozone and VOCs can cause acute respiratory problems, aggravate asthma and increase cardiopulmonary illnesses, with breathing discomfort, irritations and headaches after even short-term exposure.

None real-time instruments have been currently developed and specifically designed to meet the constraints in a aircraft, i.e. compactness, security, automatic pressure correction, the autonomy towards a large pure gas cylinder necessary for both its operating and its analytical procedure (blank).

The MACAO project aims at developing two analytical instruments to measure VOCs and ozone concentrations and based on microfluidic devices in order to address all the constraints mentioned above.

This project will be built on the experience gained in analytical development based on real-time monitoring (CNRS Strasbourg, IN'AIR SOLUTIONS), microfluidics (INSA Toulouse, CNRS Strasbourg) or in electronics and software development (TRONICO) by the partners. For instance, the micro-analyser of BTEX recently developed in Strasbourg will be updated to measure other VOCs such as ethanol or acetone.

The MACAO Project will be organised in 5 work Packages as follows:

WP1 : Project Management

WP2 : Specifications/state of the art/technological choices

WP3 : Development and validation of laboratory prototypes

WP4 : Development and validation of integrated demonstrators

WP5 : Communication & Dissemination

In addition, the start-up IN'AIR SOLUTIONS (Partner 4) being responsible for marketing the developed instruments may take advantage of technological advances in this project, for all indoor environments (aircrafts, housing, workplaces, industrial sites, public buildings, and so forth).

Parent Programmes:

[H2020-EU.3.4. - Horizon 2020: Smart, Green and Integrated Transport](#)

Institute type: Public institution

Institute name: European Commission

Funding type: Public (EU)

Lead Organisation:

Centre National De La Recherche Scientifique

Address:

3 rue Michel-Ange
75794 PARIS
France

Organisation Website:

<http://www.cnrs.fr>

EU Contribution: €130,250

Partner Organisations:

Institut National Des Sciences Appliquées

Address:

135 avenue de Ranguel
31077 TOULOUSE
France

Organisation Website:

<http://www.insa-toulouse.fr>

EU Contribution: €79,000

In'air Solutions

Address:

1 rue Blessig
67000 Strasbourg
France

EU Contribution: €14,875

Electronique Industrielle De L'ouest - Tronico Sas

Address:

Rue du bocage 26
85660 Saint Philbert de Bouaine
France

Organisation Website:

<http://www.tronico.com>

EU Contribution: €144,025

Technologies:

Aircraft operations and safety
Air quality measurements

Development phase: Research/Invention

STRIA Roadmaps: Vehicle design and manufacturing

Transport mode: Air transport

Transport sectors: Passenger transport

Transport policies: Safety/Security

Geo-spatial type: Other