

Main aspects of ESTiMatE

- **Multidisciplinary approach** based on the study of kinetics, experiments and CFD to develop a reliable soot model that can provide good predictions for pollutants emissions in the aeronautical sector.
- **Developing computational frameworks** to include advanced soot models integrated into high-fidelity simulations.
- **Contributing to the characterisation and prediction** of fuel atomisation, mixing, combustion and subsequent emissions to increase the predictivity and reliability of soot predictions in the aeronautical sector.

Partners



Emissions Soot Model

Studying the formation of pollutants and soot in aeronautical combustors at conditions of relevance to engine operation

<https://estimate-project.eu/>



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Coordinated by:



Project objectives

- Develop a modelling strategy for soot formation in the combustion process
- Prepare advanced simulation software for the study of soot formation in aero-engines
- Aid the aeronautical industry to better understand and characterise pollutant emissions at engine-relevant conditions

The ESTiMatE approach is focused on four different areas:

- 1. Reference experiments:** experiments will be conducted in counter flow diffusion flames as well as validation of spray break-up models, multiphase reacting flow and soot formation.
- 2. Primary breakup:** development of a phenomenological primary breakup model from high-fidelity numerical simulations of air blast atomisers.

3. Soot model development: study of the fundamental mechanisms associated with soot formation and oxidation.

4. Turbulent combustion modelling: The project proposes several approaches to evaluate the impact of the combustion model on the soot predictions at different flow conditions which will provide fundamental knowledge on emissions prediction and strategies for mitigation.