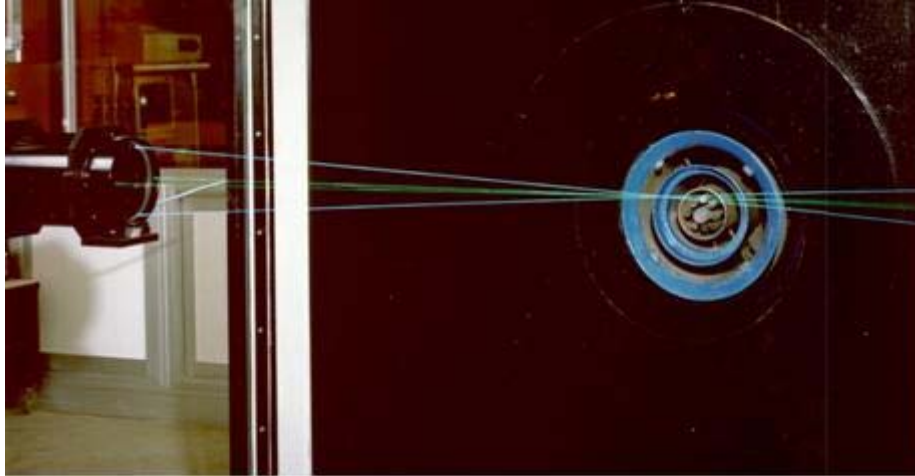


Burners Aerodynamic Laboratory

Brief description: in this laboratory is possible to perform a deep characterization of the aerodynamic “cold” flow field generated by a burner or any combustion device. Tests are mainly carried out to understand the air distribution and the mixing of the fuel. The data produced with this analysis are a useful input for the validation of mathematical models.



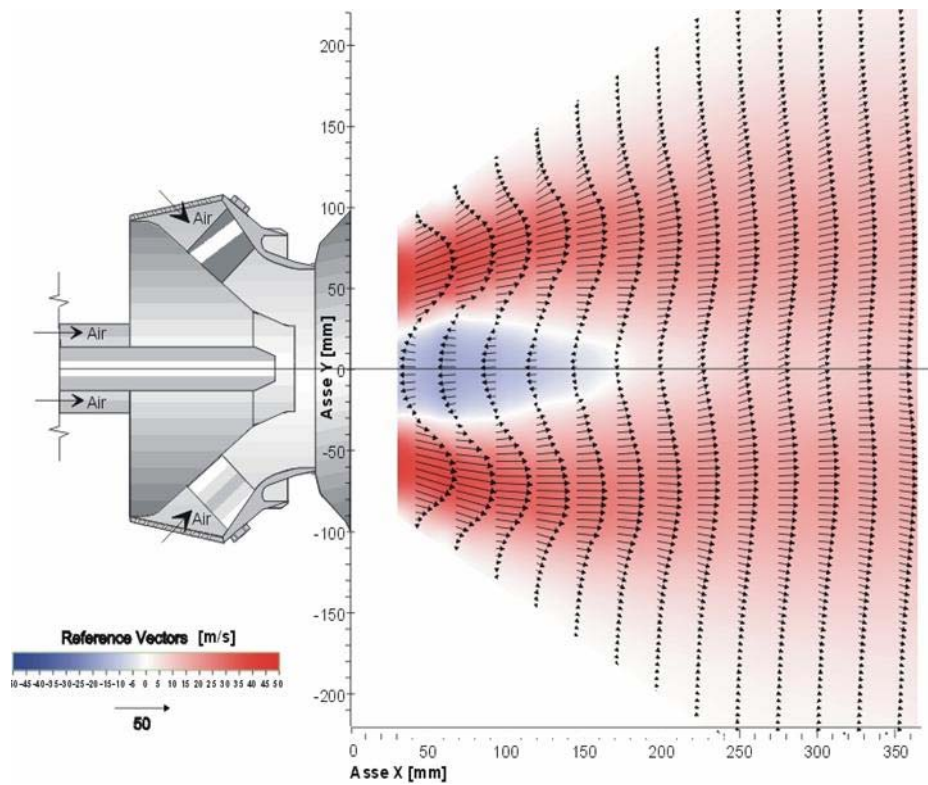
LDV measurements with the 5 MWth TEA Burner

Characteristics: different fans are available and they can be used depending by the conditions that need to be reproduced in the tests. The air flow rate can vary between 490 and 20000 m³/h with a head pressure varying between 70 and 1170 mmH₂O.

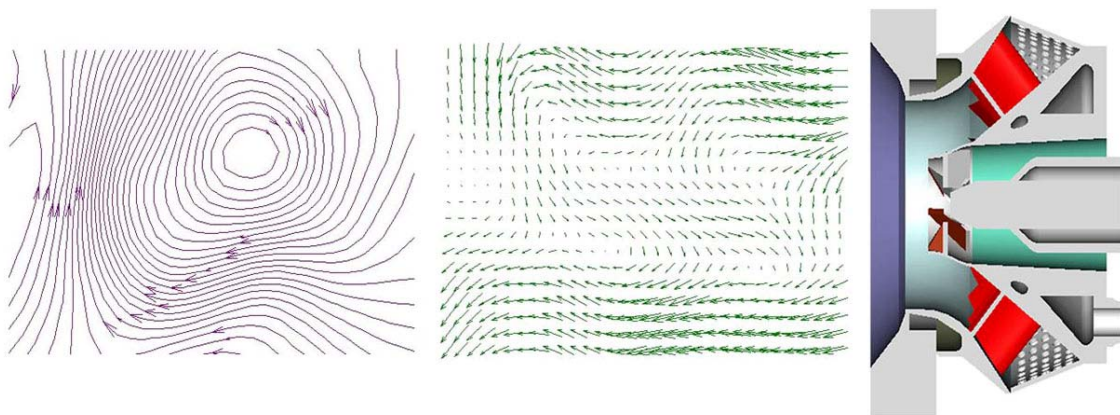
Available measurements equipment:

- Laser Doppler Velocimetry (LDV)
 - Turbulence measurement
 - Mean velocity measurement
- Laser Sheet Visualisation (LSV)
 - Mixing efficiency
- Particle Image Velocimetry (PIV)
 - Low Frequency velocity field measurements
- Hot Wire Anemometry (HWA)
 - High frequency velocity measurements
- Phase Doppler Particle Analyzer (PDPA)
 - Characterization (size, speed and concentration) of spray droplet produced by industrial atomizers

Examples of typical results:



LDV Measurements: velocity flowfield of the Siemens V64.3a GT burner

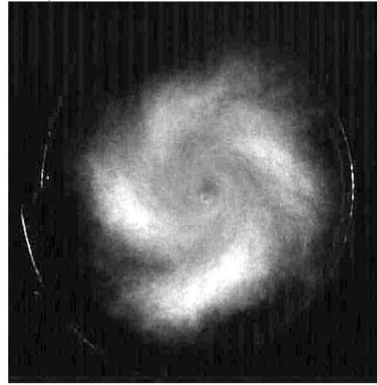
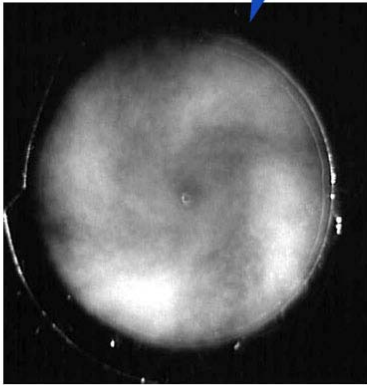


PIV measurements: constant velocity contours on a cross-section (left) and 2D velocity flowfield on a longitudinal section (right) of the Siemens V64.3a GT burner



Co-flow gas injector

Cross-flow gas injector



LSV Measurements: Flows mixing with two different kind of injection of the Mitsubishi DLN premixer