



REPORT ON FLOW VISUALIZATION TEST OF FORD C307 TYPE REGISTERS

July 2003

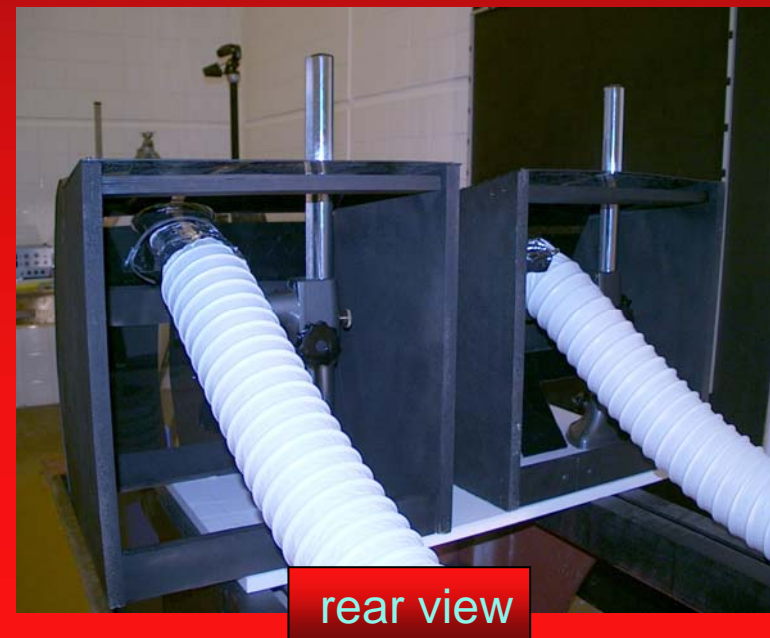
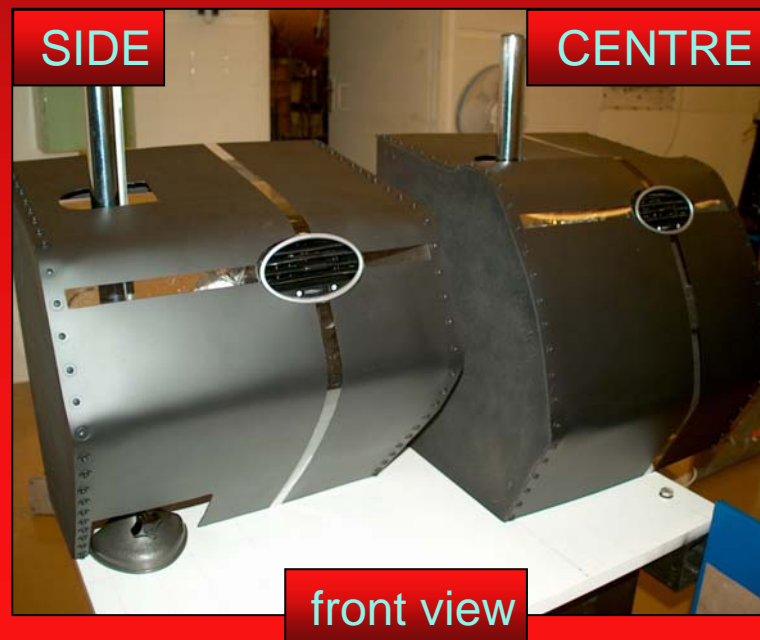


DEPARTMENT of FLUID MECHANICS
Budapest University of Technology and Economics

OBJECTIVES

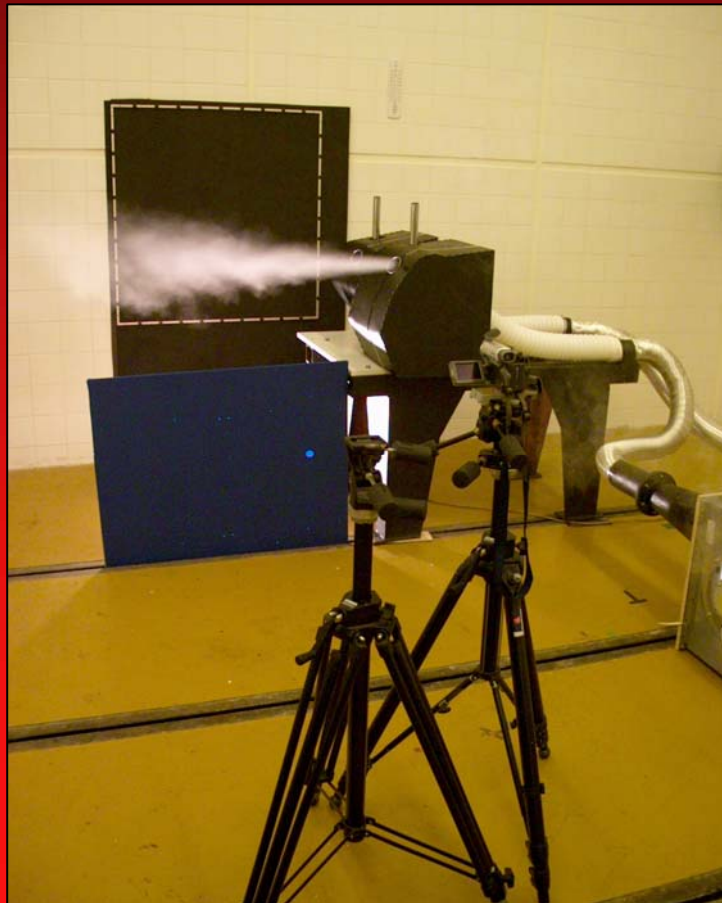
The **Cascade Engineering Europe** (H-2314 Halásztelek, Kisgyár u. 23.) has commissioned the **Department of Fluid Mechanics** (Budapest University of Technology and Economics (H-1111 Budapest, Bertalan L. u. 4-6.) to carry out **flow visualization tests** of passenger compartment air intake No. C307, including investigations of leakage and sealing, air jet direction (SDS 6.0, IP-5018, 4-CC0005B, 4-CC000C) as well as air path. The two *FORD C307* type car registers for placing in **SIDE** and **CENTRE** position on the driver's side are provided by the *Client*.

The results of the flow visualization tests are summarized in this presentation.



EXPERIMENTAL FACILITY

Separate flow facility is compiled for each register. Volume air flow rate of $q_v=0.030 \text{ m}^3/\text{s}$ is set via regulator of the fan's rotational speed. Flow tracer particles (fine oil smoke) are produced by smoke generator and injected into the air flow at the inlet of the fans. Flexible tubing is connected to the registers. Homogeneously distributed seeding is illuminated by laser and normal light sheet.



RESULTS of FLOW VISUALIZATION

Laser and light sheets are used for illumination.

Digital images: photographs and video files are recorded and processed digitally.

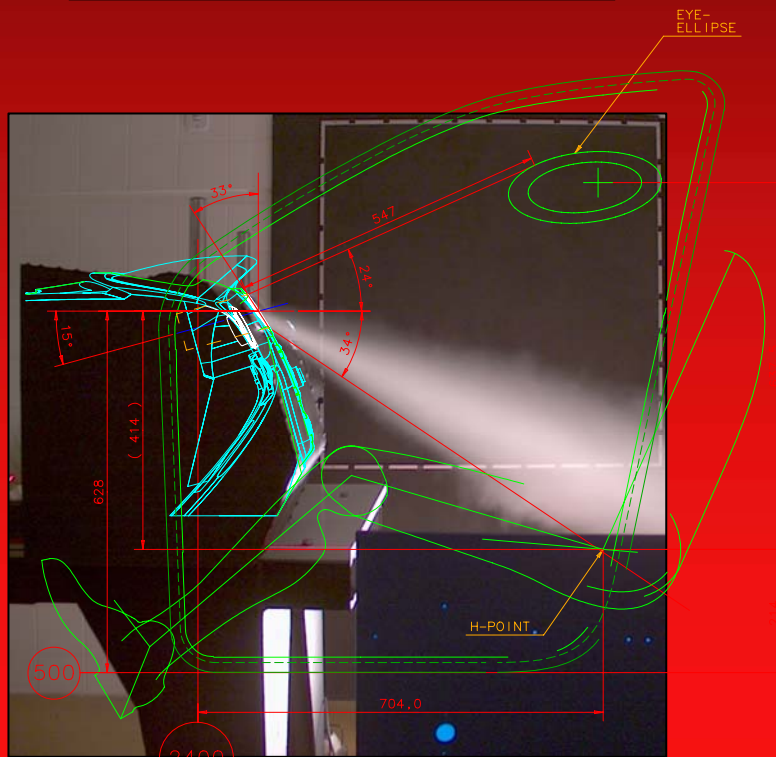
PHOTO: HEWLETT PACKARD digital camera 2.4 Megapixel

-> jpg pictures

VIDEO: SONY DCR-TRV33E miniDV digital handycam

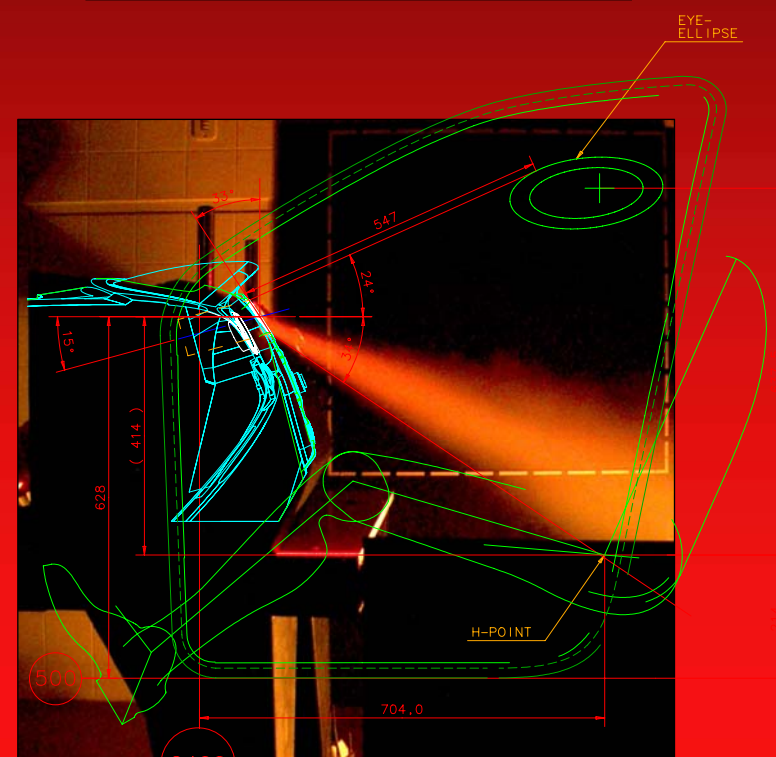
-> avi videofiles

light sheet illumination



C.V.3.jpg

laser sheet illumination



C.V.3_L.jpg

THE OVAL REGISTER
FORENSIC INVESTIGATION
FLOW DIRECTION
CENTRE REGISTERS

THE OVAL REGISTER
FORENSIC INVESTIGATION
FLOW DIRECTION
CENTRE REGISTERS

RESULTS of FLOW VISUALIZATION

Video documentation when air jets
are illuminated with light sheet.

CENTRE register

Click on the images to play the video!

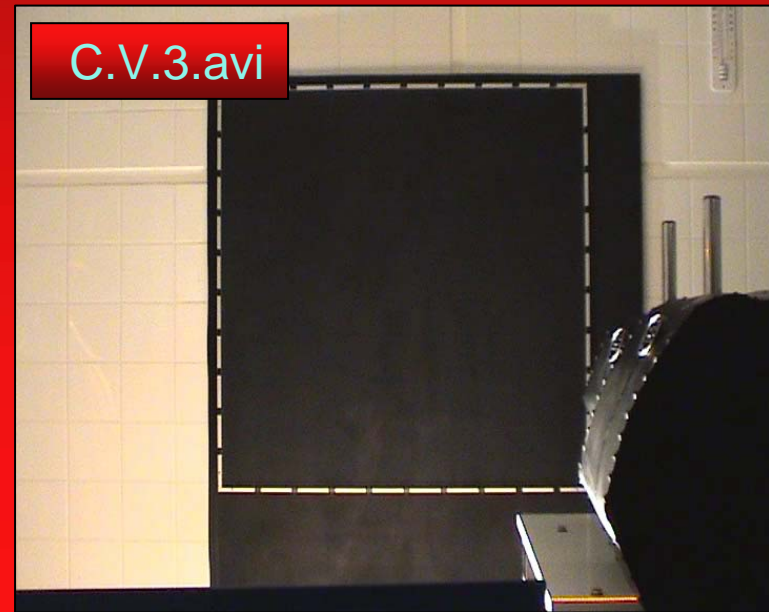
C.V.1.avi



C.V.2.avi



C.V.3.avi



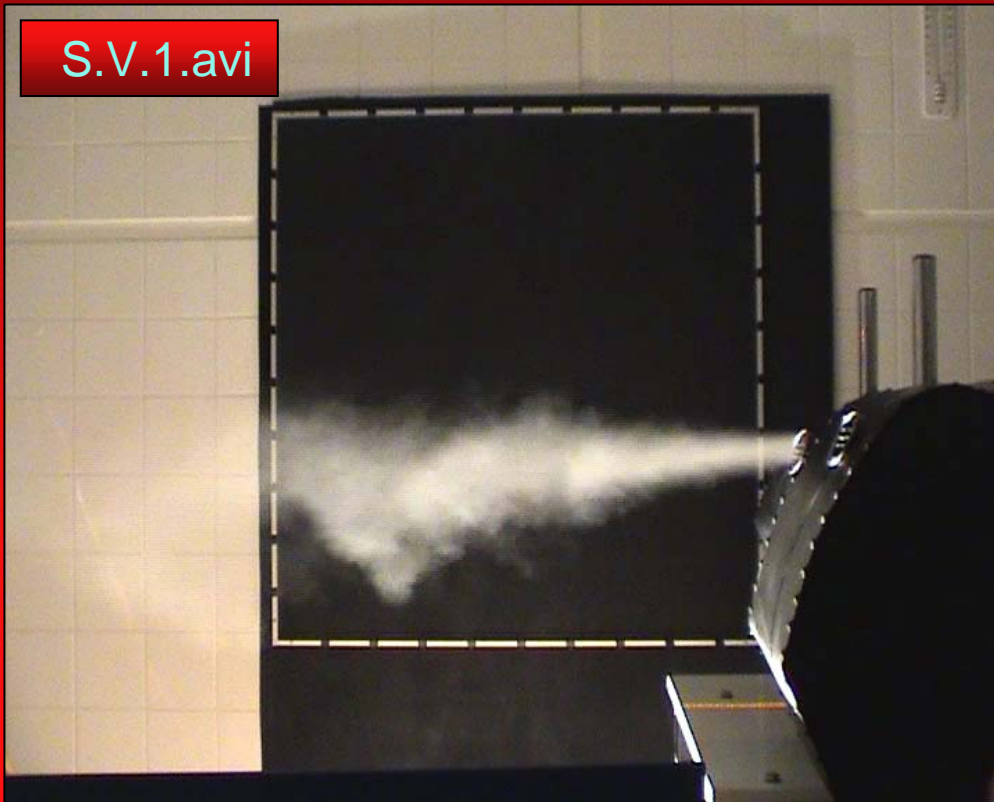
RESULTS of FLOW VISUALIZATION

Video documentation when air jets
are illuminated with light sheet.

SIDE register

Click on the images to play the video!

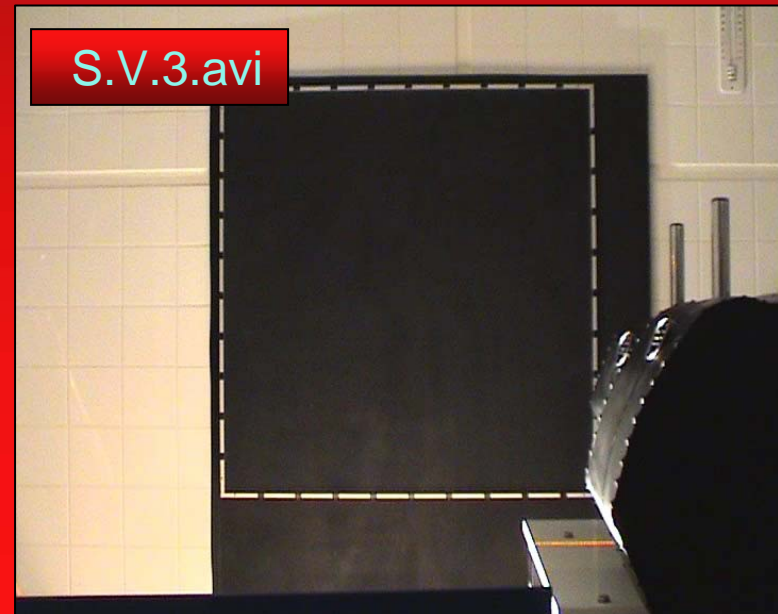
S.V.1.avi



S.V.2.avi

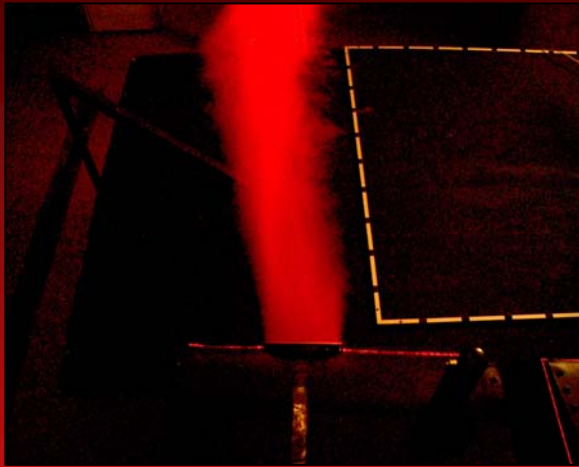


S.V.3.avi

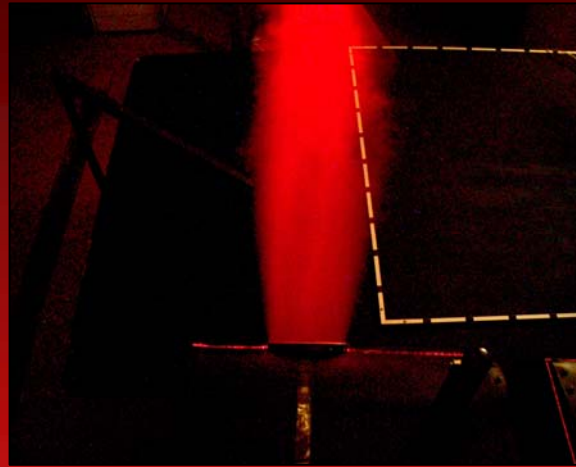


RESULTS of FLOW VISUALIZATION

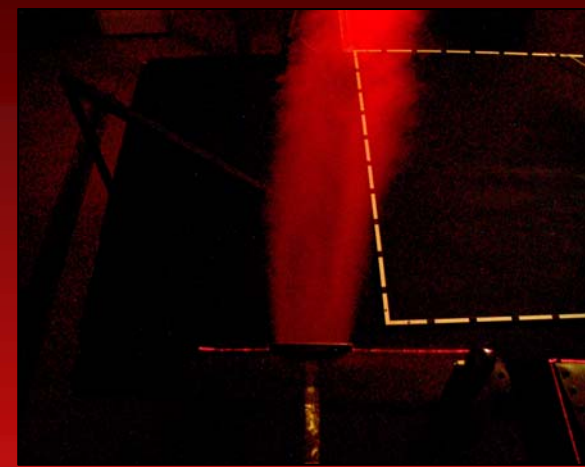
CENTRE register: horizontal cross-section of air path with laser sheet illumination



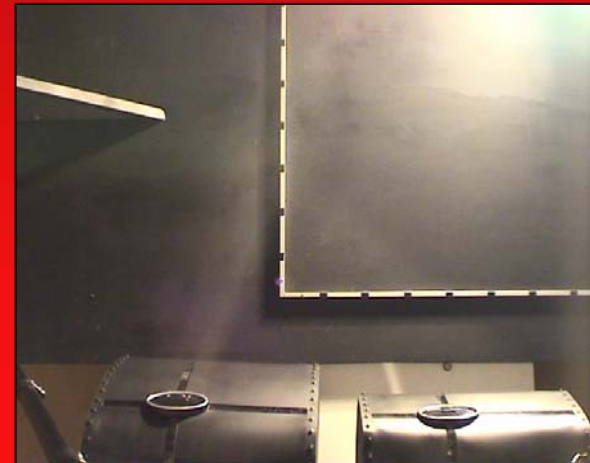
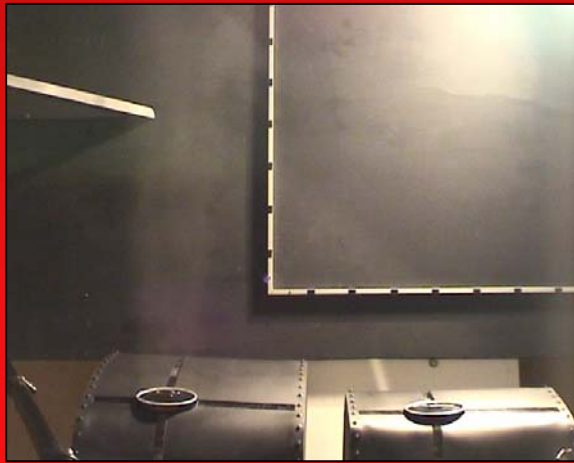
C.H.5_L.jpg



C.H.1_L.jpg



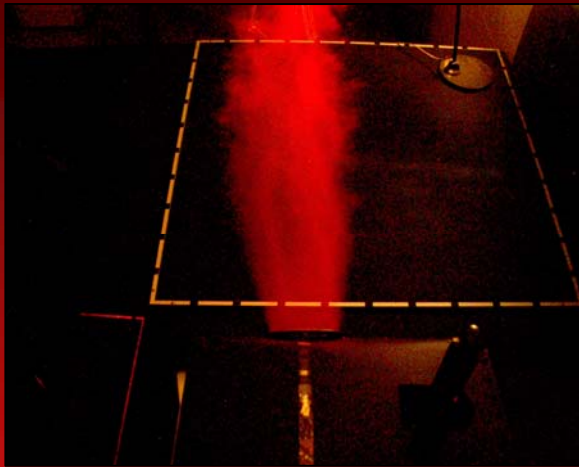
C.H.4_L.jpg



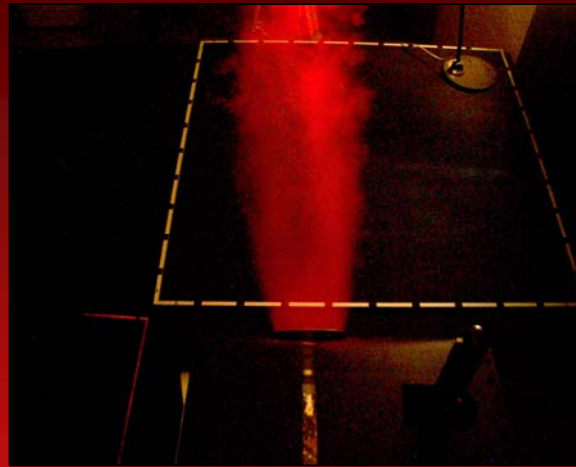
Click on the images to play the video!

RESULTS of FLOW VISUALIZATION

SIDE register: Horizontal cross-section of air path with laser sheet illumination



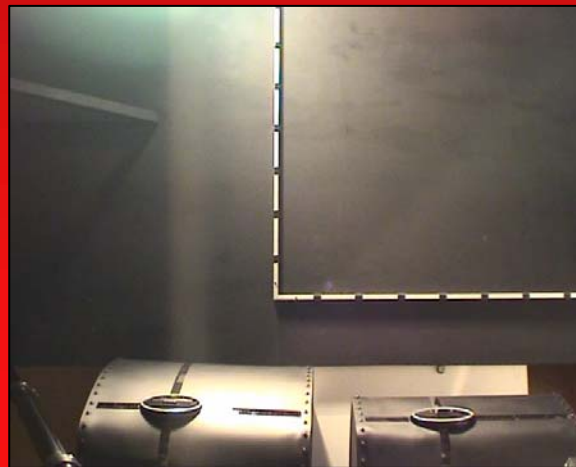
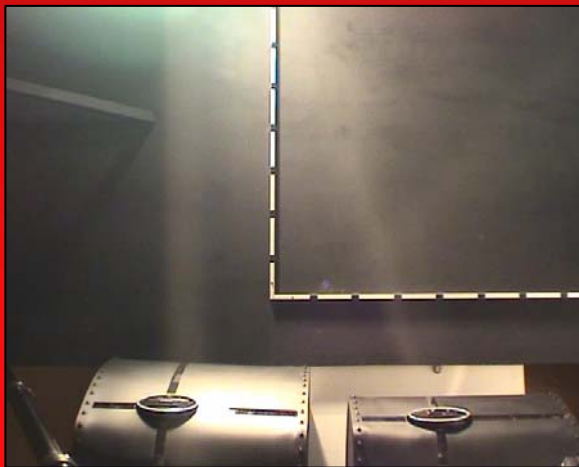
S.H.5_L.jpg



S.H.1_L.jpg



S.H.4_L.jpg



Click on the images to play the video!

RESULTS of FLOW VISUALIZATION

CENTRE register: vertical cross-section of air path with laser sheet illumination



C.V.1_L.jpg



C.V.3_L.jpg



C.V.2_L.jpg



C.V.3-2_L.jpg

RESULTS of FLOW VISUALIZATION

SIDE register: vertical cross-section of air path with laser sheet illumination



S.V.1_L.jpg



S.V.3_L.jpg



S.V.2_L.jpg



S.V.3-2_L.jpg