

noise localization and reduction of a respiratory system.

DEMCON MULTIPHYSICS

AUTHOR: ARNOUD VAN DER STELT

+31 (0)88 - 115 20 00

demcon.com/multiphysics

CONTACT US

Goal

Medical blowers for respiratory systems must meet strict noise production requirements. One of our clients, a designer of respiratory systems, asked us to localize the source of the noise production. After the identification of the problem areas, design changes could be made to meet the noise production requirements.

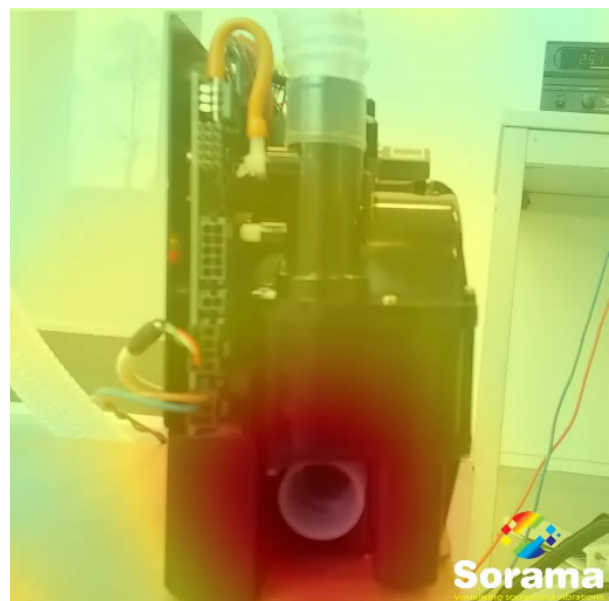


Figure 1. Snapshot from the acoustic sound camera, used to locate problem areas in the blower. The red area has the highest sound intensity.

Approach

The transmission of sound through the blower was experimentally investigated. Measurements with an acoustic sound camera, in a broad frequency range and from multiple orientations were conducted. Thereafter, the frequency spectrum was analyzed and the peaks were investigated.

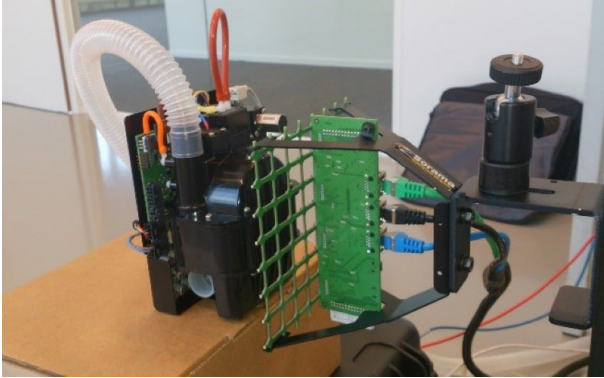


Figure 2. Experimental setup, showing the blower and the acoustic camera.

Results

The noise producing areas were redesigned, reducing the total sound pressure level and damping the peaks in the sound spectrum. Within a short time, our client's redesign met the strict noise requirements and the client was able to start production.

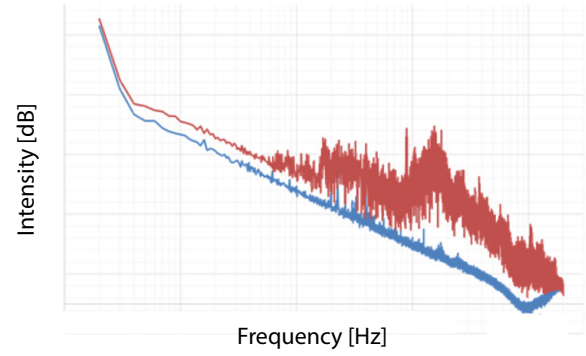


Figure 3. Noise spectrum, measured by the acoustic camera. The sound intensity is shown in red, and the background noise spectrum is shown in blue.