

# DAMPING MEASUREMENTS ON TRUCK CAB PLATES

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## 1. INTRODUCTION

It is always desirable to keep the noise and vibration levels as low as possible in the truck cabs. One of the measures to achieve this is to introduce damping in the cab structure. Sprayable damping material is advantageous from a production point of view and the purpose of the measurements described here was to compare different materials of this type.

## 2. MEASUREMENTS

First the damping properties was measured on Oberst beams, i.e. small beams of the cab plate, covered with the different damping materials.

The cab plate is 1 mm thick and the beams approx. 10 mm wide and 200 mm long.

The loss factor was measured with the resonance bandwidth method, using a Brüel & Kjær 3930 Complex modulus apparatus.

Then the damping was measured using real cab plate sections with damping material applied.

NB that it was not a complete cab but a wall section approx. 85 cm × 120 cm. Four identical sections were used.

The loss factor was checked for the undamped plates by simple reverberation time measurements with impact excitation.

Two of the plates were then treated with the damping material and the losses were measured again, this time with vibrator excitation and subsequent modal analysis to get the damping.

Impact excitation was avoided at this stage since we were afraid that this might damage the damping layer.

## 3. UNEXPECTED RESULTS

The result was rather surprising – the damped cab plates had a much lower damping than expected.

The Oberst beams give an indication of what might be possible since they are completely covered by the damping layer. For these a loss factor around or slightly below 10 % was found.

However, for the cab plates the loss factor was only around 1 %.

## 4. CONCLUSIONS

This discrepancy calls for further investigations.

The first idea to be investigated is if the placement of the damping material is unfavorable compared to the mode shapes. Possibly the areas between the damping layer and the plate boundary is vibrating too much with low damping. This shall be investigated with our scanning laser vibrometer and the result will be presented in the paper.

It is also interesting to make new measurements on the damped plates with another method. We will measure the reverberation time with (careful) impact excitation.

More factors to consider are:

- The size of the area covered with damping layer. The Oberst beams are completely covered while the damping on the cab plates only covers a small area.
- The boundary conditions. However, they are fairly similar. The cab plates were free hanging and the Oberst beams also have free boundaries except for the clamped end.