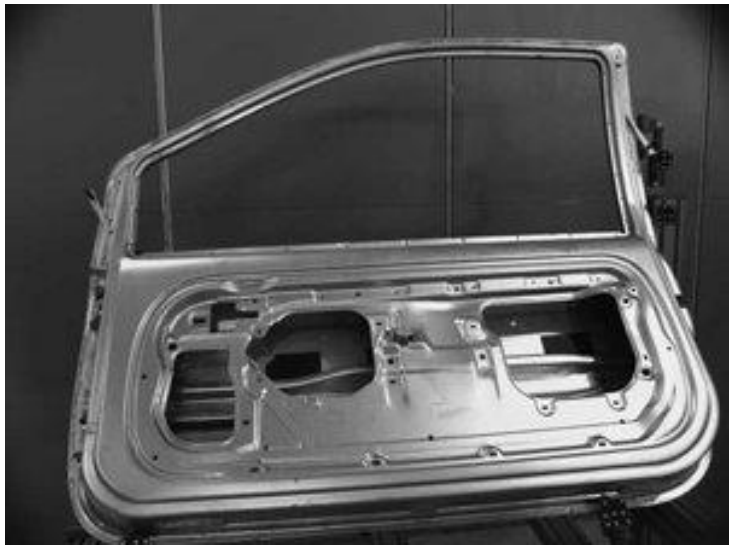
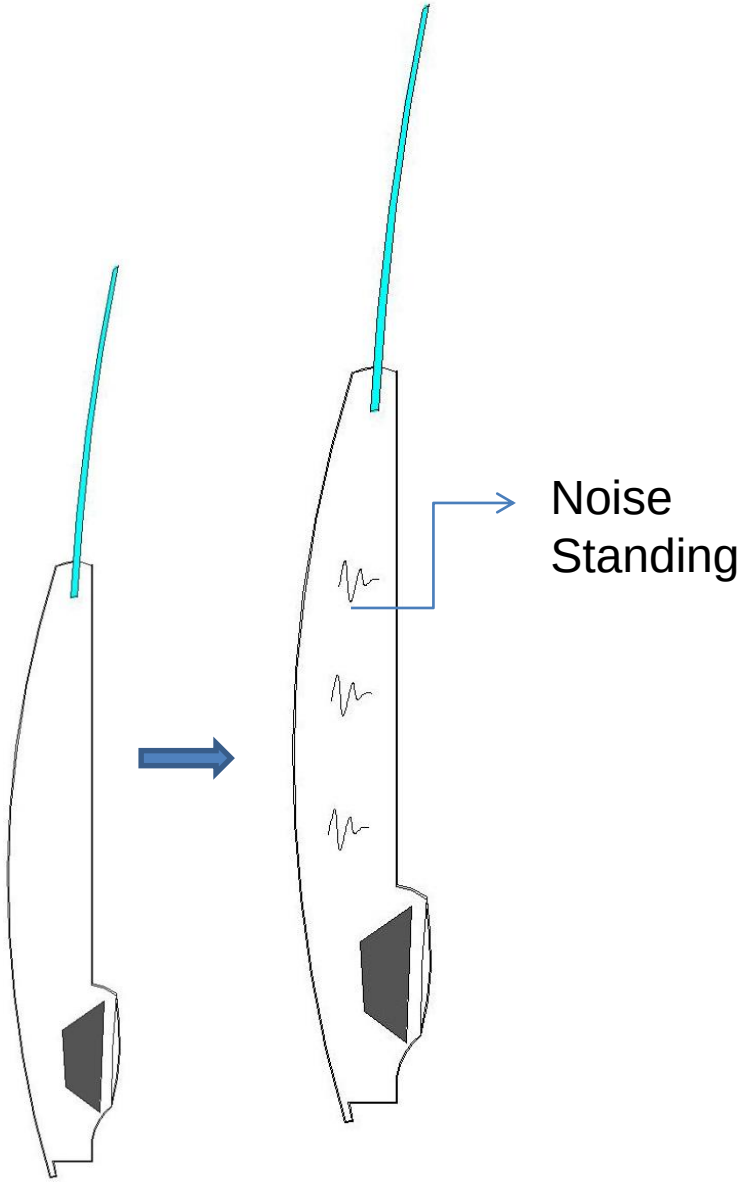
Aplikasi Acourete pada Insulasi Pintu Mobil

Acourete
Acoustics and Noise Control Company

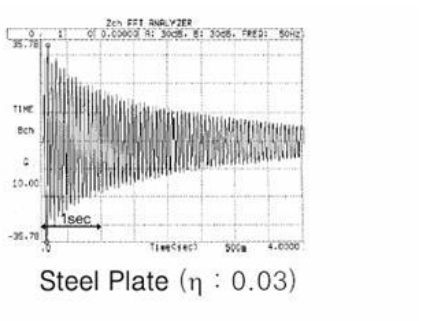
NOISE ON DOOR





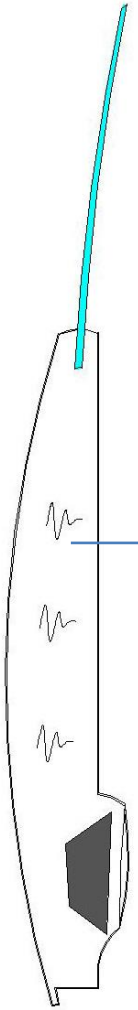
Potongan
Pintu

NOISE ON DOOR

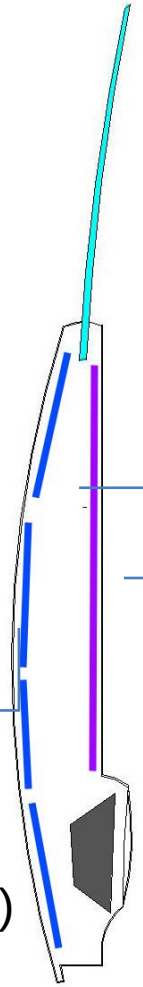


Steel Plate (η : 0.03)

Grafik sebelum insulasi

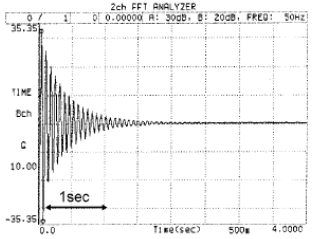


Standing wave



Acourete vibration damping (mat resin)

Potongan Pintu



Acourete Mat 2 (η : 0.14)

Grafik setelah insulasi

Hilang / berkurangnya standing wave

Acourete mat alu

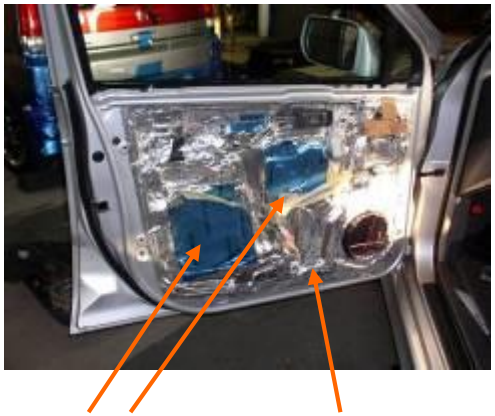
Materials for door damping

It is better to use both relatively soft and hard material in combination for door damping.
Steel plate of door is uneven by nature. Therefore resonate part and resonance frequency are different by each parts. These difference hit a sore note and become one of big factor of debased sound.
Comparing to use simple material, when we use hard and soft material in combination for damping, not only reduce resonance but also reduce variation of steel plate resonance and get rid of dull sound comes from resonance frequency difference.

Vibration-proof hard material
Aluminum coating
Polyurethane

Vibration-proof soft material
Aluminum coating butyl

Example of damping with combined material



Hard material Soft material

*Surface finishing after damping

Thin aluminum plate is on the damping material surface. With this aluminum plate, resonance moves to high frequency and enhance damping efficiency. But aluminum surface tend to throw back and then standing wave tend to occur between door interior and damping steel plate. In addition as for service hole, damping material itself could be a kind of drum membrane and it gives sound. To prevent this, it is recommended to make aluminum surface un-smooth with driver's haft or sharp-pointed tool after pasting damping material.

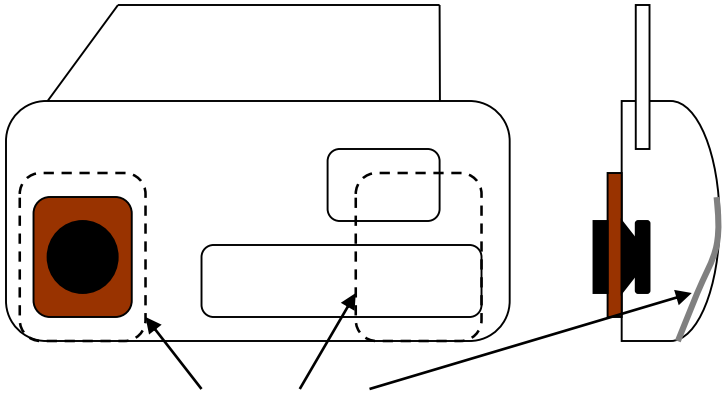
Damping for door interior.

Even if we carry out damping for the steel plate doors firmly however, the interior of a door resonates to the sound emitted from the speaker front. If resonance of door interior is large, the whole door will become like a speaker, and it will be in the state where the huge speaker with a small sound exists in the surroundings of a real speaker. Then, the accurate staging and imaging does not come out and sound quality also tend to decline. Therefore, it can be said that carrying out damping for the door interior has a very high effect.

* We can expect rather high effect by carrying out damping for the back side of door interior that much. Taking in to consideration of acoustic absorption effect, the soft butyl material is suitable for damping material.

Acoustic absorption

It can not always be said, but sound is get blocked when acoustic absorption is done too much, and the efficiency of speakers also falls and sound became small. Use acoustic absorption materials such as glass wool and a sponge type for getting rid of the standing wave in a door. Excess use of a acoustic-absorbing material for doors gives counter result.



About 30cm x 40cm acoustic-absorbing material

Paste acoustic-absorbing material being cut to about 30cmx40cm in right behind of the speaker and the most distant part from speaker. Better to use an acoustic-absorbing material without a water absorptive, since the inside of a door gets wet. Big size acoustic-absorbing material for big car and small for small car. Be sure not doing too much.

Stuffing tightly an acoustic-absorbing material is very effective, if the speaker fulfills some certain conditions.

1. Qts of Speaker is Low.
2. Surface area (10Cm or Less)
3. M0 (moving mass) is heavy.

Under such condition, "Acoustic suspension" type; which fully stuffs an acoustic-absorbing material behind of a speaker is very effective. However, such types of speakers are very few for car audio. It will be good to use to install the small diameter speaker for home audio in a kick panel etc.

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