

Possibility of frequency shift test on the road

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Study content



◎ Possibility of frequency shift test on the road

- Frequency shift test on the dynamometer
- Frequency shift test on the road
- Comparison of results of test on the dynamometer and road

◎ Minimum Level & Maximum Level

- Opinion on the Maximum Level

Frequency Shift test at the Road

◎ Kinds of Frequency shift test

Component test

- Need for separate equipment for speed change
- Verification of equipment – How would the speed change be verified?

Indoor test

- Measures for large vehicles(Insufficient capacity of the dynamometer)
- Issue of certification of the dynamometer and inputting of road load data

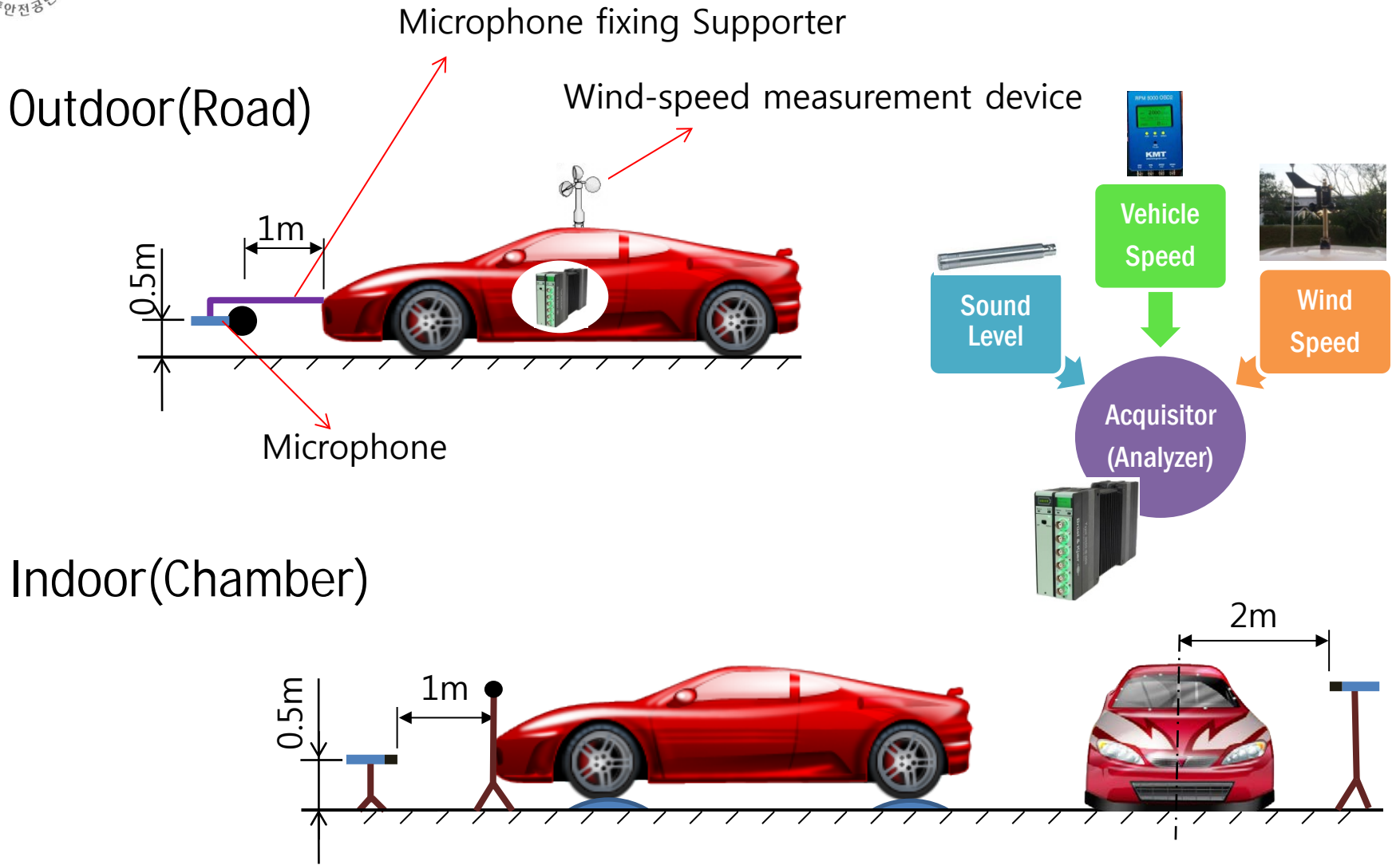
Test on the road

- Noise in the surroundings
- Effect of wind

Test vehicles

			
Vehicle name	CARENS	SANTAFE	LABO
Type	Passenger	Passenger	Truck
Fuel	LPG	Diesel	LPG
Displacement(cc)	1,999	1,995	796
Weight(kg)	1,520	1,760	760
Transmission	Automatic	Manual	Manual

Concept



Test scene

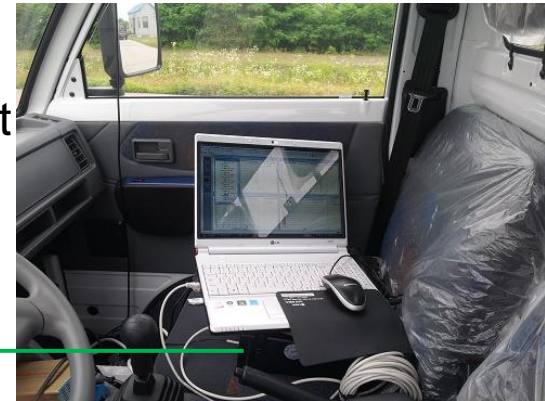
Semi-anechoic Chamber



Road



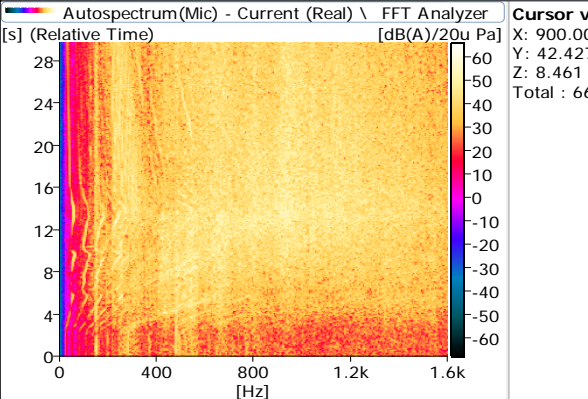
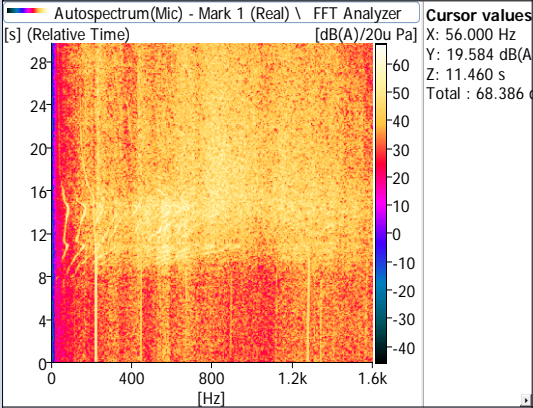
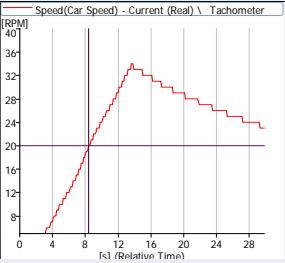
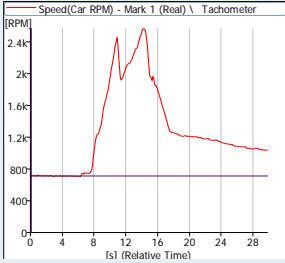
Speed measurement Device



Analyzer

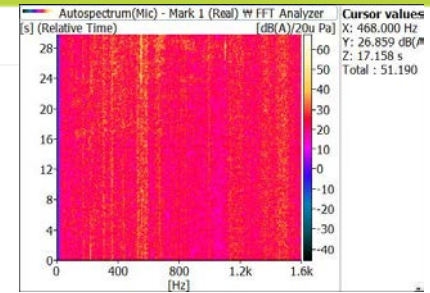
Test results - A Vehicle

◎ D gear

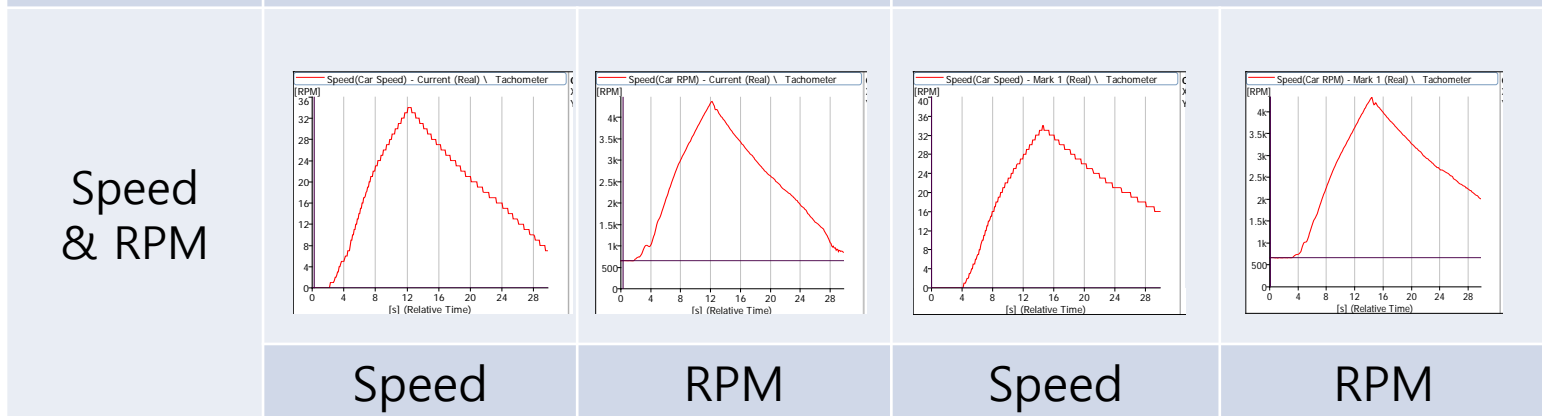
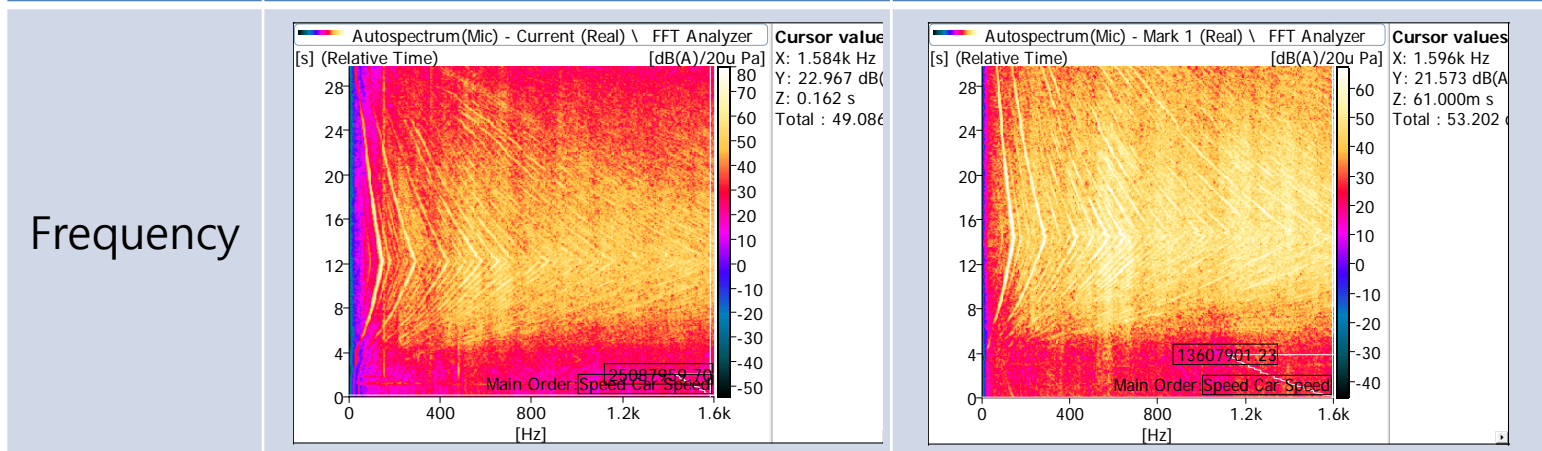
	Indoor		Outdoor	
Frequency	 <p>Autospectrum(Mic) - Current (Real) \ FFT Analyzer Cursor values: X: 900.00 Hz Y: 42.427 dB(A)/20μ Pa Z: 8.461 s Total : 66.6</p>		 <p>Autospectrum(Mic) - Mark 1 (Real) \ FFT Analyzer Cursor values: X: 56.000 Hz Y: 19.584 dB(A) Z: 11.460 s Total : 68.386</p>	
Speed & RPM	 <p>Speed(Car Speed) - Current (Real) \ Tachometer</p>		 <p>Speed(Car RPM) - Mark 1 (Real) \ Tachometer</p>	
	Speed	RPM	Speed	RPM

Test results - A Vehicle

◎ 1st Gear

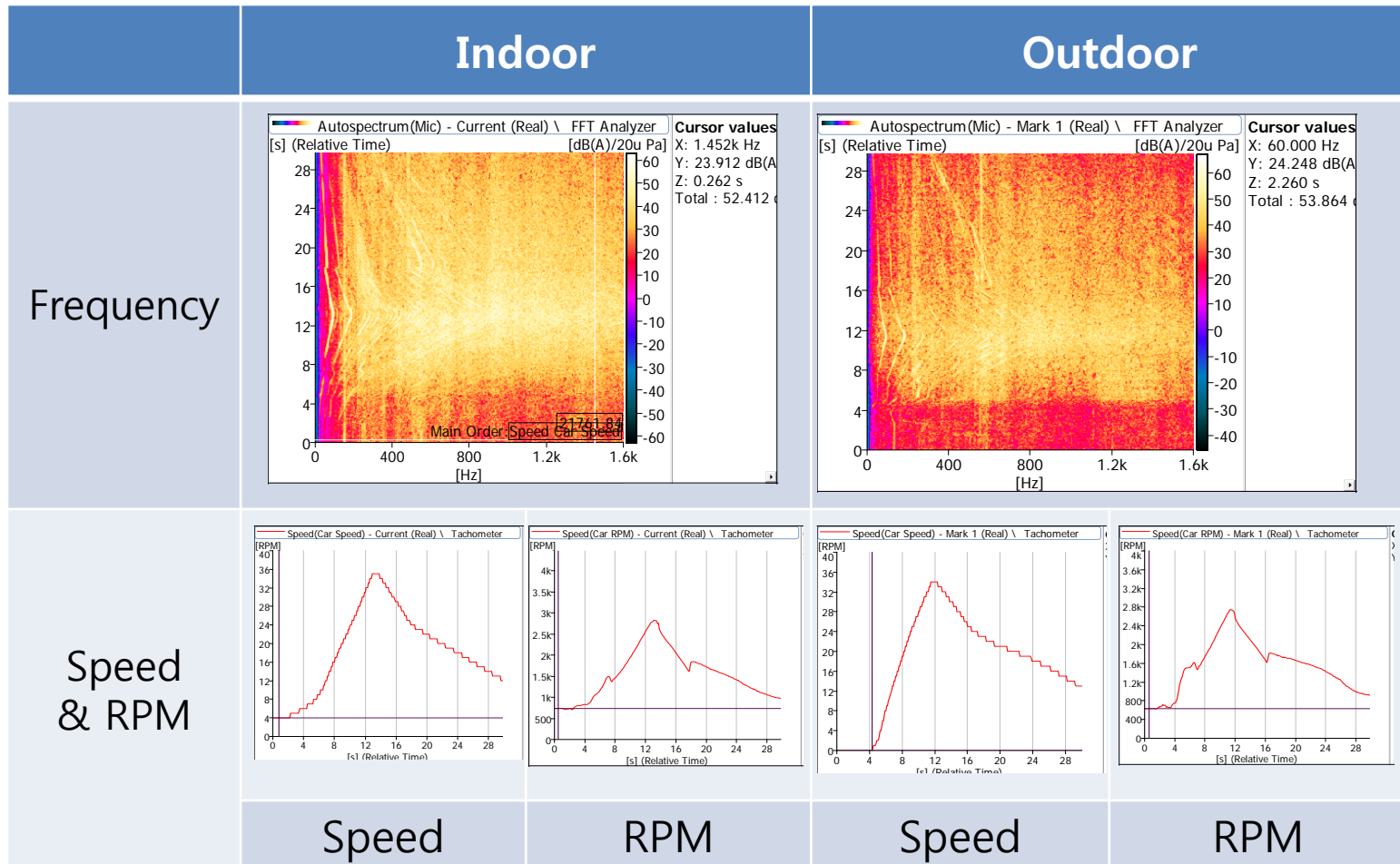


	Indoor	Outdoor
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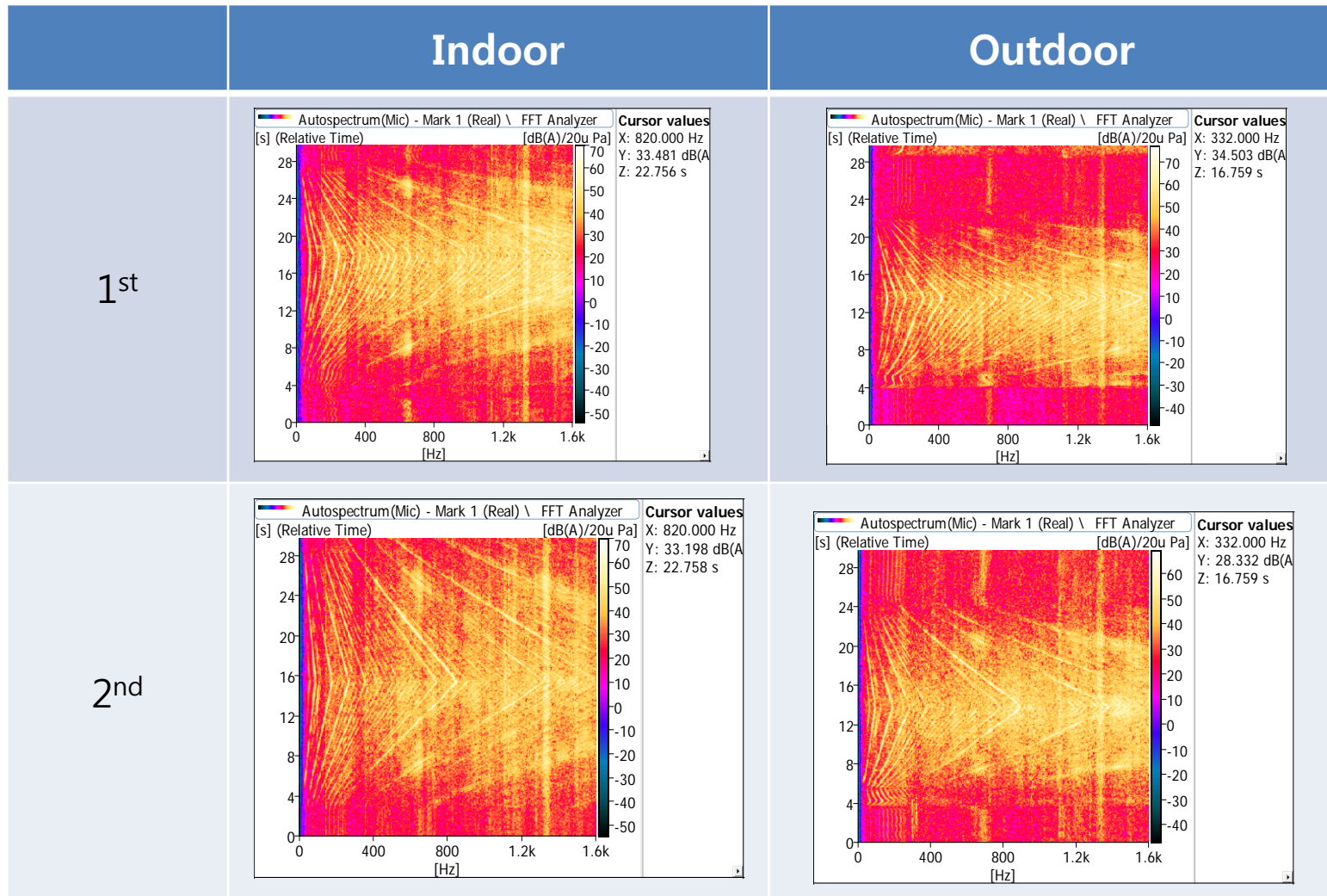
Test results - A Vehicle

◎ 2nd Gear



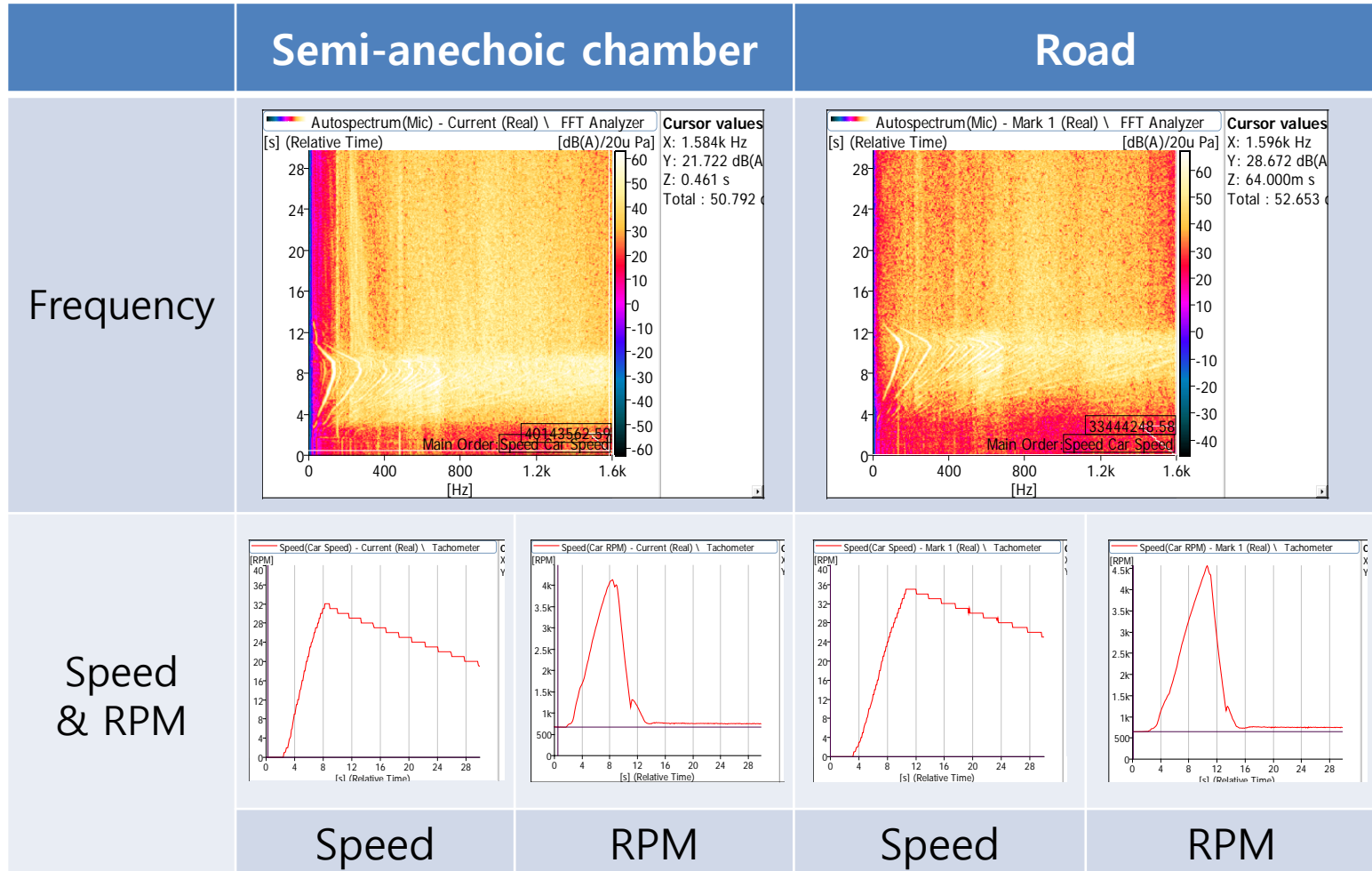
Test results - C Vehicle

◎ Labo(C-vehicle)



Test results - A Vehicle

◎ Evaluation of the effect of wind



Characteristic of Windscreen

The product data from the manufacturer of a Windscreen

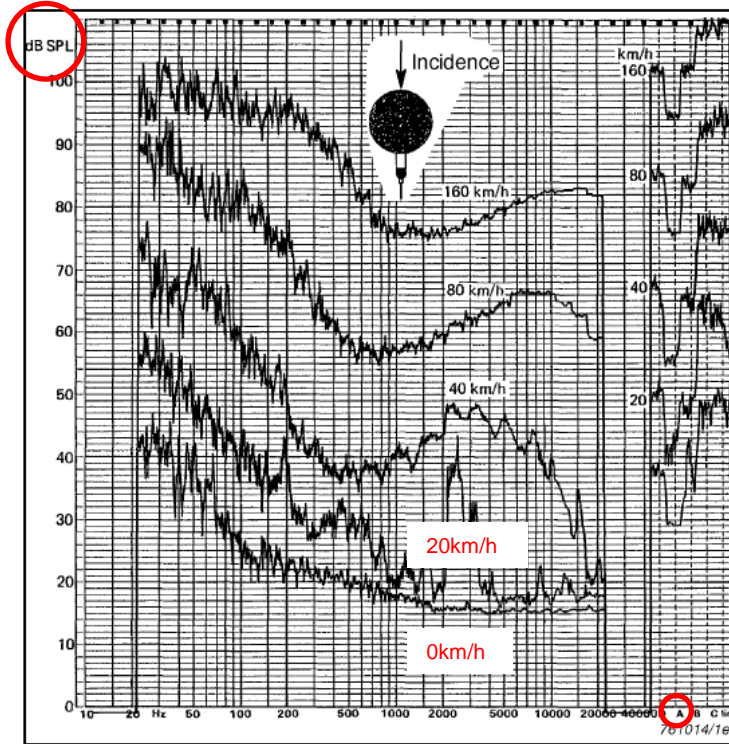


Fig.3 $1/3$ -octave wind induced noise levels at 0° incidence for Windscreen UA0237

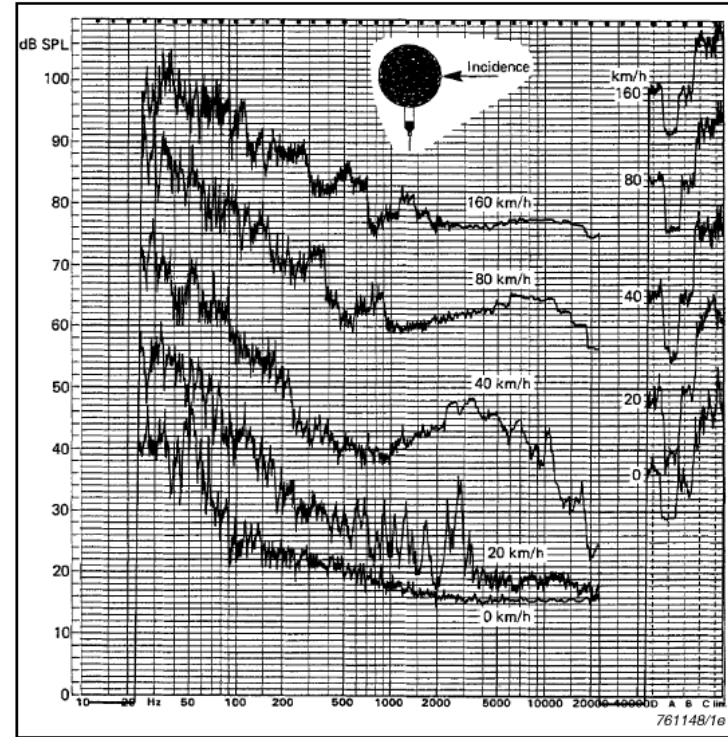
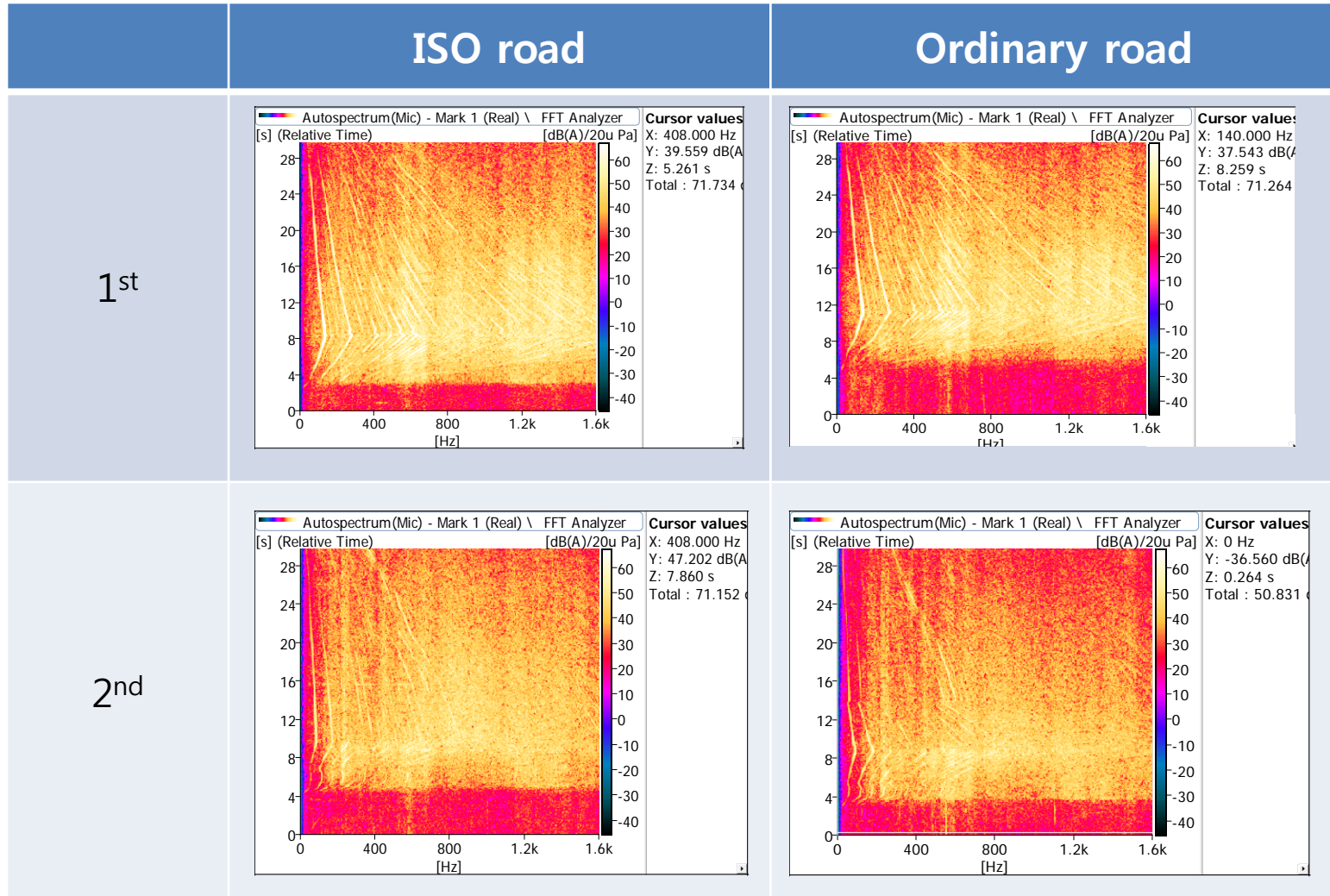


Fig.4 $1/3$ -octave wind induced noise levels at 90° incidence for Windscreen UA0237

1. The wind induced A-weighted noise level at 20km/h is about 42dB(A)
2. The tire noise would be also higher according to vehicle speed.

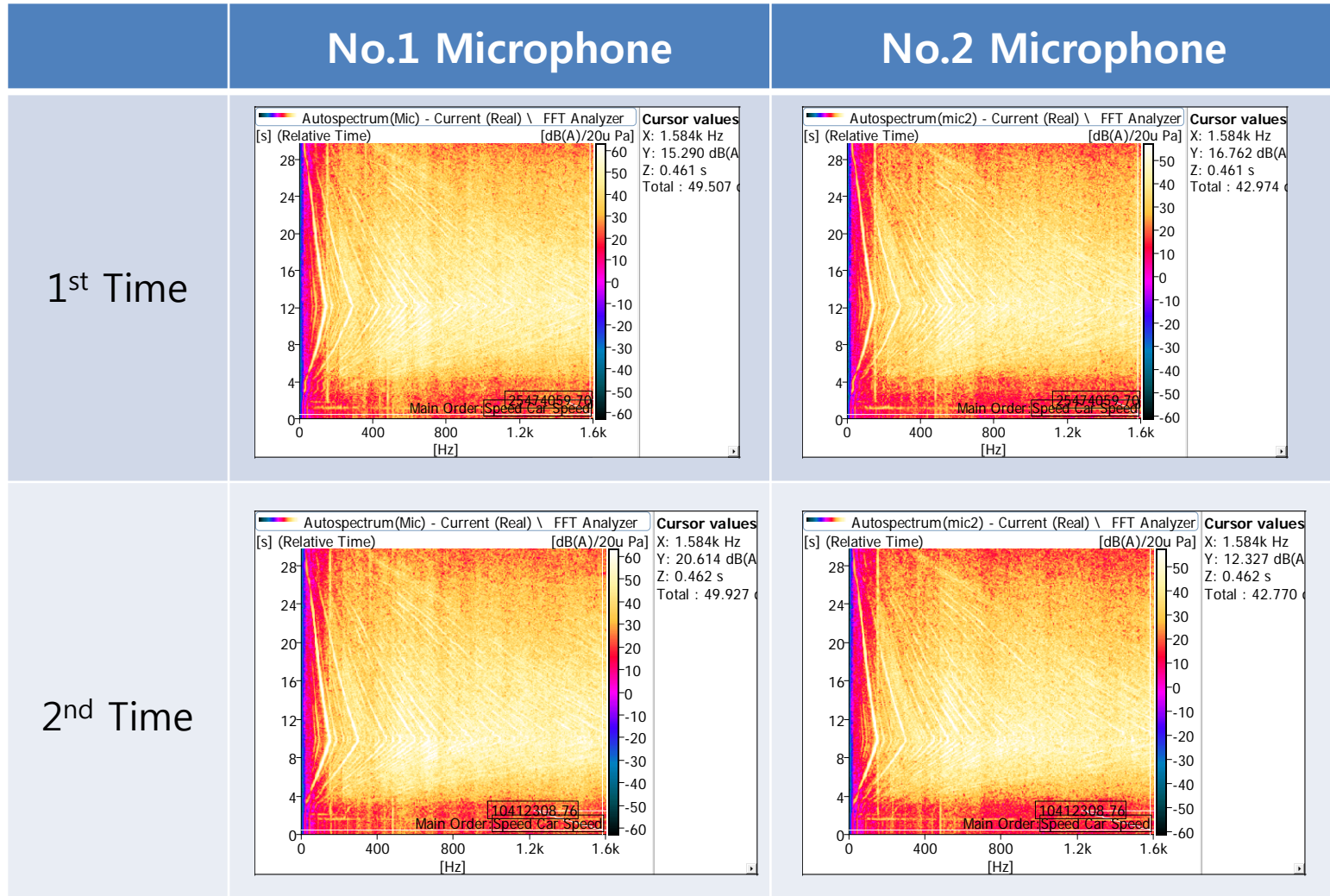
Test results - A Vehicle

◎ ISO 10844 Road & General Road



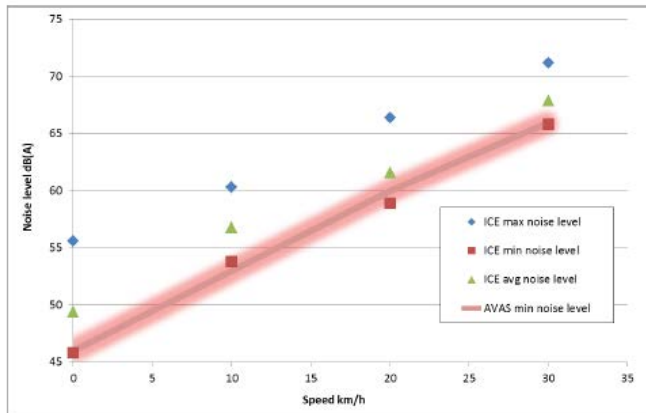
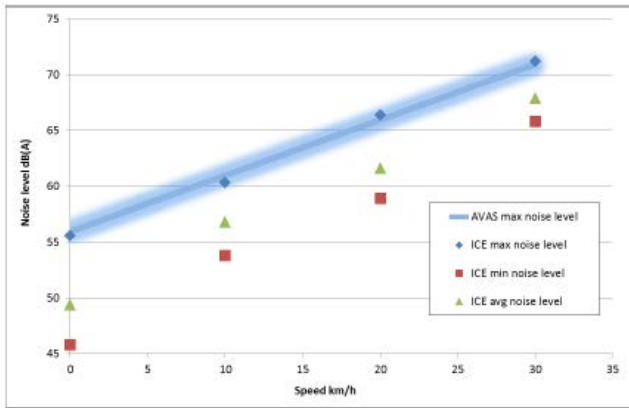
Test results - A Vehicle

◎ Compare the microphones No.1 and 2(in chamber)

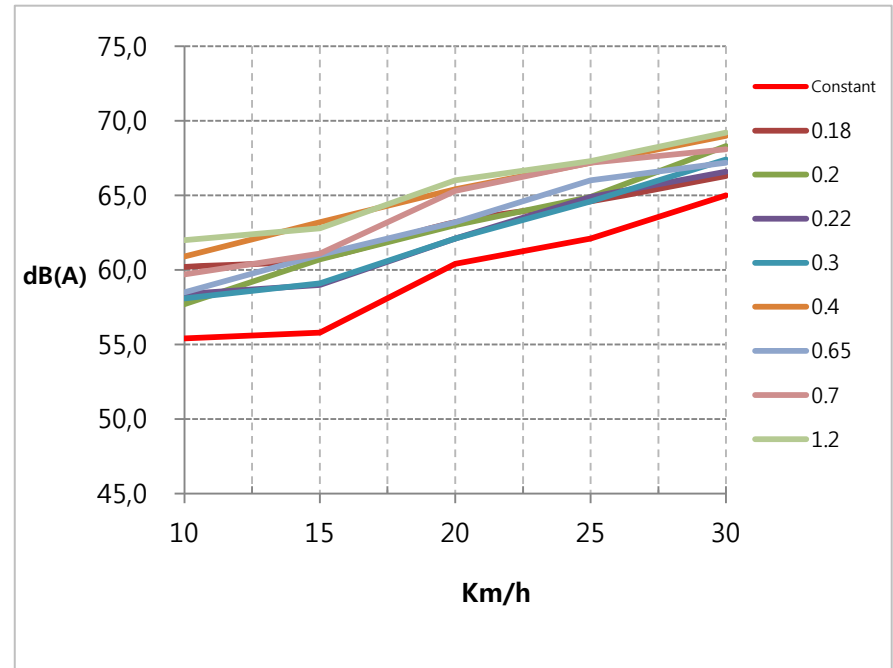


Minimum & Maximum

France



Korea



Conclusions

1. The test results in semi-anechoic chamber were similar to those of experiment on the road, and it is deemed that the test on the road may be possible.
2. Although there may be effect of wind on the road, it can be considered as insignificant problem, because the test is conducted at relatively low speed and the test examines the frequency shift in accordance with the speed rather than measuring the sound pressure level. But, more experiments would be needed because this experiment are the results on the ICE vehicles.

Conclusions

3. When we compare the test results that was introduced during the 2nd meeting and the values presented by France about minimum and maximum, they illustrate similar results. So, I think the opinion of France is appropriate.
4. Korea wishes to set the limit values not only for the minimum level but also the maximum level.

Thank you
for your attention!

