

The Introduction of The Outcomes; Implementation of Vehicle Indoor Air Quality (VIAQ)

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1. Background
2. Case Study in Korea
3. Results of Implementation of VIAQ Regulation
4. Conclusions

- Increasing concerns about **Vehicle Indoor Air Quality (VIAQ)**
 - Various chemical materials to harmful to human body are emitted from vehicle interior materials
- Researching & Managing vehicle indoor air quality by many countries
 - Netherlands, France, Sweden, Germany, Japan, USA, China, Korea
 - ISO Standard (12219-1:2012), China (GB/T 27630-2011), Korea (Notification No. 2007-539)



**Need to unified regulation on vehicle indoor air quality (VAIQ)
to protect driver's health and safe driving**

- Sick House Syndrome & Sick Car Syndrome: became a social issue
 - ✓ New car driver feel a headache, eye irritation, sneeze and so on
 - ✓ The main cause is the chemical materials that emitted from vehicle interiors



<Media :KBS news “Hazardous substances in new car interiors”>

Interview: I feel slight headache and dizzy...

Case Study in Korea (Survey Results)

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- Surveyed 800 people who purchased a new car (2006)
- ✓ Feeling the physical symptoms under driving: 51.5%,
- ✓ Headache 31.5%, Eyes irritation 31%, Sneeze 15.8%, Fatigue 11.1%...

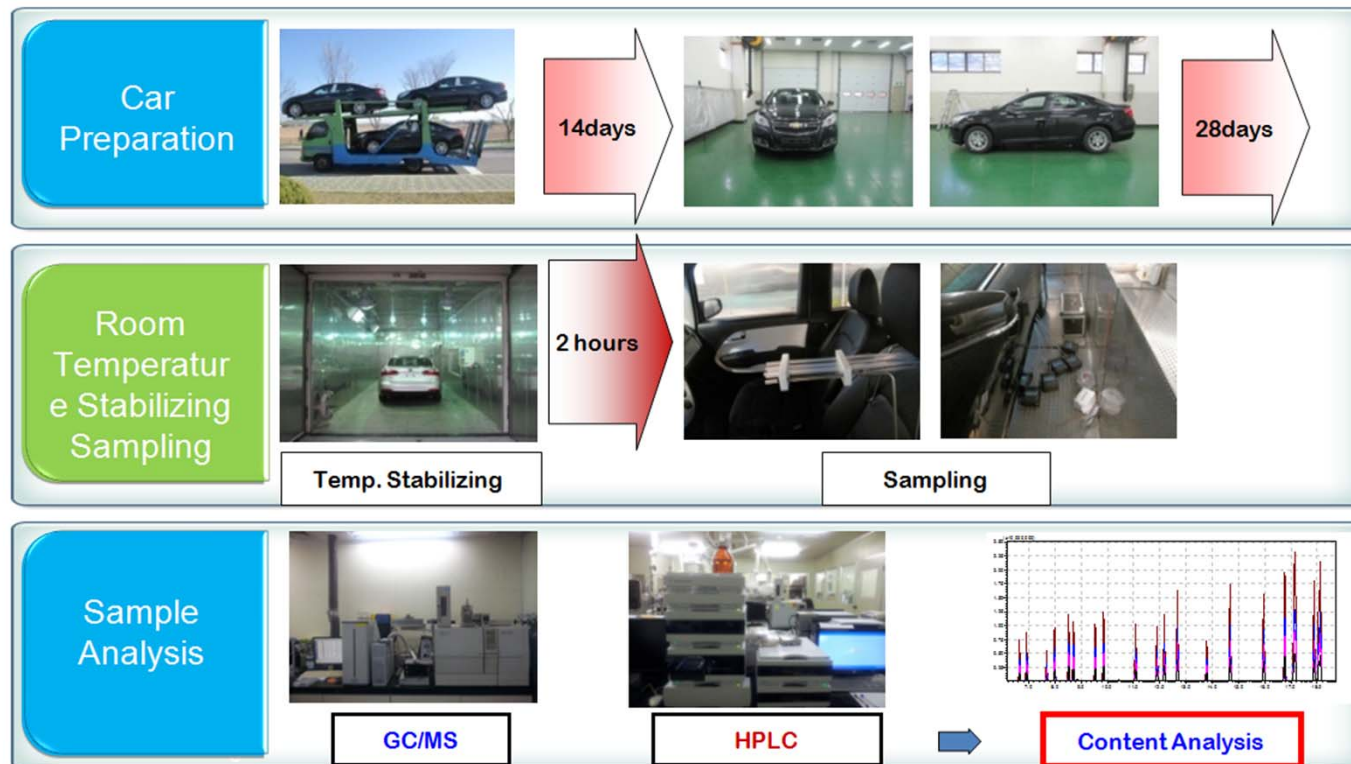


Case Study in Korea

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- Korean government established VIAQ guideline in 2007
- Verification test : 2011~ , No penalty but notification to consumer
 - ❖ Verification test whether automobile manufactures comply with VIAQ guideline



Results of Implementation of VIAQ

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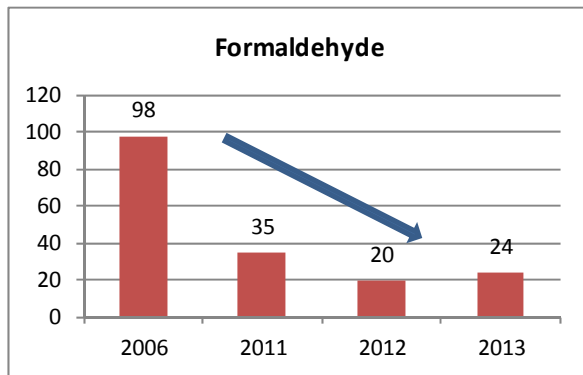
- Verification test results of VIAQ year by year

YEAR	Item	Formaldehyde	Toluene	Ethylbenzene	Styrene	benzene	Xylene
Limit($\mu\text{g}/\text{m}^3$)		250	1,000	1,600	300	30	870
2006 (36 model) Before VIAQ regulation	Averg.	98	518	222	64	111	828
	Min	22	51	49	12	7	112
	Max	955	2384	632	185	385	2164
2011 (9 model) After VIAQ regulation	Averg.	35	1046	102	14	-	-
	Min	8	108	20	7	-	-
	Max	56	2846	470	25	-	-
2012 (8 model) After VIAQ regulation	Averg.	20	328	66	33	7	199
	Min	4	85	18	4	5	45
	Max	49	753	131	136	13	379
2013 (4 model) After VIAQ regulation	Averg.	24	206	28	5	1	80
	Min	5	65	8	3	1	21
	Max	38	430	51	7	3	140

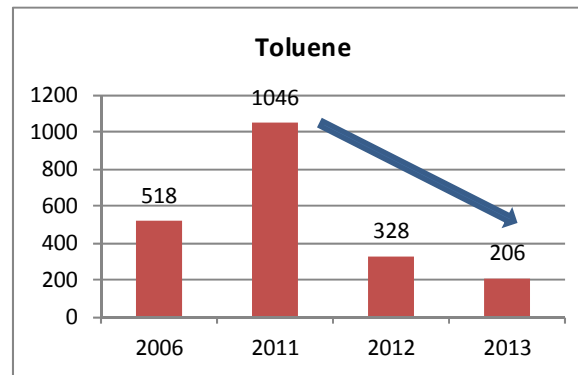
Results of Implementation of VIAQ

- Comparison of 2006 (Not Apply) and 2011~2013 (VIAQ)

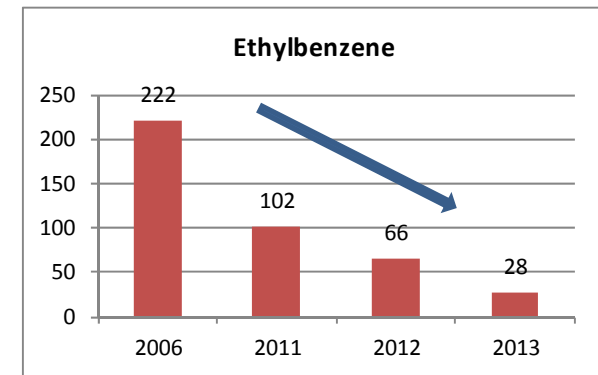
- ✓ After the VIAQ regulation, vehicle indoor air quality levels drastically improved
- ✓ VIAQ management regulation is proven to be effective to reduce VOCs inside new vehicle



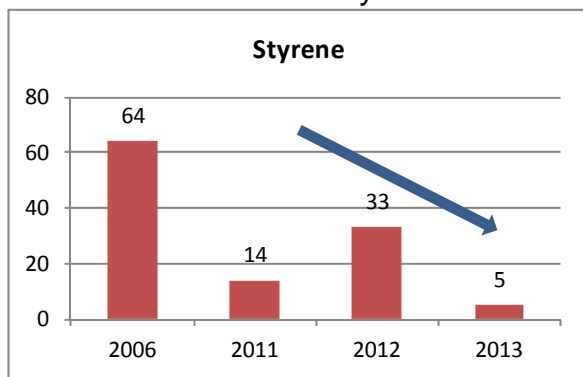
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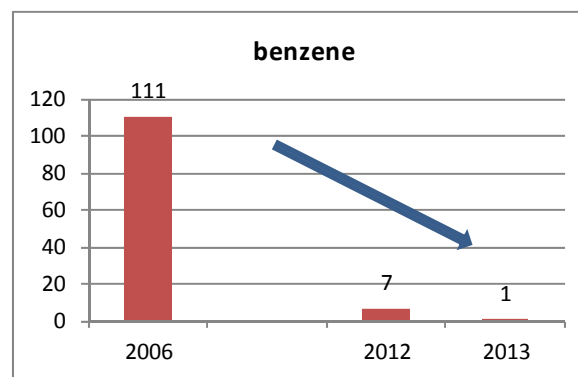
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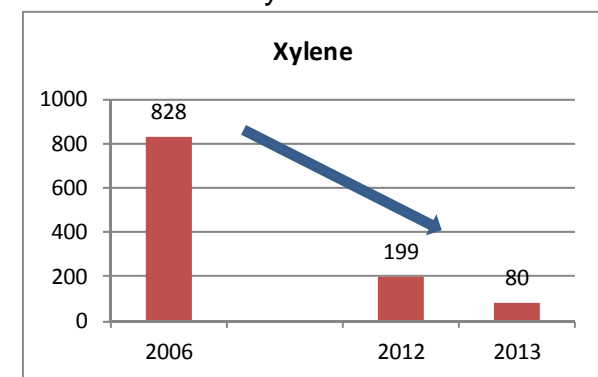
< Ethylbenzene>



<Styrene>



<benzene>



< Xylene>

- To protect driver and passenger's health and safe driving, Korea has been applied VIAQ regulation since 2011
- After applying the VIAQ regulation, vehicle indoor air quality levels have been improved rapidly. It has been proved that VAIQ is effective
- Need to unified regulation on vehicle indoor air quality (VAIQ) to protect driver's health and safe driving

Thank you very much ! !



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