

**Progress Report of the
VIAQ (Vehicle Interior Air Quality)
Informal Working Group**

13 January 2016

Report to the 72nd GRPE session

● VIAQ Background ToR and mandate

➤ **WP.29 Mandate**(ECE/TRANS/WP.29/1112)

“ AC.3 endorsed the proposed action plan to, in a first stage, collect information, review existing standards and develop recommendations.

“ End of mandate : November 2017

➤ **GRPE Adoption**(ECE/TRANS/WP.29/GRPE/70)

“ GRPE adopted the proposals for terms of reference to the IWG on VIAQ as reproduced in Annex VI of this report.

➤ **Review of VIAQ Terms of Reference**

“ The scope of the work is to develop a recommendation to harmonize test methods of interior air emissions emitted/generated from interior materials

- **VIAQ IWG Meetings since last GRPE**

- **2nd VIAQ IWG Meeting**

- “ Paris, France, 03-04 November 2015

- **3rd VIAQ IWG Meeting**

- “ Geneva, Switzerland, 13th January 2016

● **Topics/Issues**

➤ **VIAQ Organization**

“ Chair: JongSoon Lim, Korea

“ **Co-Chair : Yunshan GE, China**

(Elected by the group at the 2nd meeting)

“ Secretary: Andreas Wehrmeier, OICA

● Work Items – open issues

➤ Test Measurement Modes

✓ Background

Which test mode is the most suitable for the interior air emission.

Test mode	Descriptions
Ambient mode	simulates cars parked in the garage overnight.(ambient temp)
Parking mode	simulates cars parked outside in the sunlight(high temp)
Driving mode	simulates air-conditioning conditions right after parking mode(Idling)

✓ Discussion

“ Korea prefers only using Ambient mode.

“ EC, China and OICA prefers using the three modes (Ambient, Parking, Driving) test procedure like in ISO 12219-1.

✓ Proposal

“ Adopting the Ambient, Parking and Driving mode based on the ISO-standards with discussions continuing on the detailed parameters.

Each contracting party will have a choice of which test modes to adopt depending on their situation.

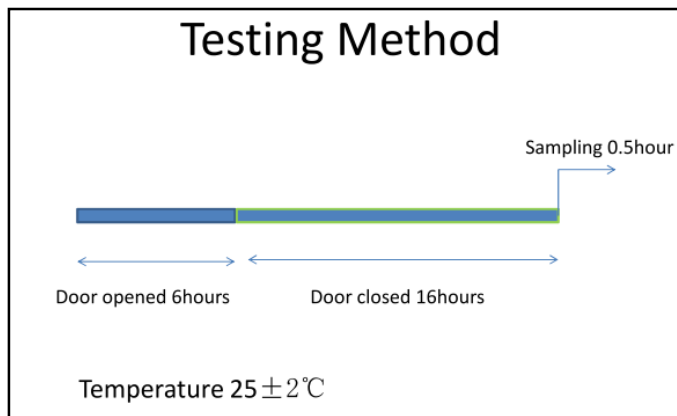
➤ Understanding Current VIAQ Test Methods

Time	Temp stabilize Min 12.hr	Ventilation 30min	Close door 2hr	Sampling 15min
Cabin Temp	$25^{\circ}\text{C} \pm 2^{\circ}\text{C}$			

<KOREA VIAQ Test Method>

Temperature in vehicle cabin Not controlled	Ambient mode: 1 h door open - minimum 8 h - door closed	Parking mode: - door closed - radiators on 400 W/m ² ± 50 W/m ²	Driving mode: - radiators on - door open max. 60 s - fan highest level or air-conditioning regulator on
	4 h		
23 °C	VOC/ carbonyl compounds	H ₂ CO	VOC/ carbonyl compounds
Sampling in vehicle cabin	30 min	30 min	30 min
Back- ground sampling	30 min	30 min	30 min

<ISO 12219-1 VIAQ Test Method>



<CHINA VIAQ Test Method>

**ISSUES CONCERNING AIR QUALITY
INSIDE THE VEHICLE**

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<Russian VIAQ Test Method>

● Work Items – open issues

➤ Substances to be measured

✓ Background

Many relevant substances(e.g. VOCs) with regard to Interior air quality

Target measurement substances are required before setting the test parameters.

✓ Discussion

According to the existing standards, - Substances to be measured:

Formaldehyde, Acetaldehyde, Benzene, Toluene, Xylene, Ethylbenzene, Styrene, and Acrolein. These are the most relevant substances. An odor test will not be a part of the method.

◆ Comparison of VIAQ Substances Limits

CAS No.	Substances (unit : $\mu\text{g}/\text{m}^3$)	IARC	KOREA	CHINA	JAPAN (JAMA)	WHO	OEHHA REL* (US CA.GOV)		
							Acute	8-hours	Chronic
50-00-0	Formaldehyde	1	210	100	100	100	55	9	9
71-43-2	Benzene	1	30	110	-	-	27	3	3
75-07-0	Acetaldehyde	2B	-	50	48	50	470	300	140
100-41-4	Ethyl Benzene	2B	1,000	1,500	3,800	-	-	-	2,000
100-42-5	Styrene	2B	220	260	220	260	21,000	-	900
107-08-8	Acrolein	3	50	50	-	-	2.5	0.7	0.35
108-88-3	Toluene	3	1,000	1,100	260	260	37,000	-	300
1330-20-7	Xylene	3	870	1,500	870	-	22,000	-	700
Total			7 types	8 types	9 types*	-			

* JAPAN(JAMA) : Tetra decane $330 \mu\text{g}/\text{m}^3$, Di-n-butyl phthalate $220 \mu\text{g}/\text{m}^3$, Di-2-ethylhexyl phthalate $120 \mu\text{g}/\text{m}^3$

* OEHHA REL : Office of Environmental Health Hazard Assessment, Reference Exposure Levels(OEHHA.ca.gov)

● Work Items – open issues

➤ Test Procedure Parameters

“ Vehicle Categories:

Passenger car, Category M1 or Category 1-1 vehicle+, respectively.

“ Age of vehicle at measurement:

28d \pm 5 days after vehicle has left production/assembly line

“ Sampling:

protection covers should stay in the vehicle and be taken off one day before the measurement.

“ Soak time:

Stabilization is reached after approx 10 h. To facilitate the test procedure, it is recommended to have a 14h \pm 2h soak time.

● Work Items – open issues

➤ Test Procedure Parameters

“ **Preconditioning time** (doors open): 30 min

“ **Temperature for ambient mode:** $25^{\circ}\text{C} \pm 2^{\circ}\text{C}$. Temperature has to be as close as possible to 25°C . Deviations have to be documented.

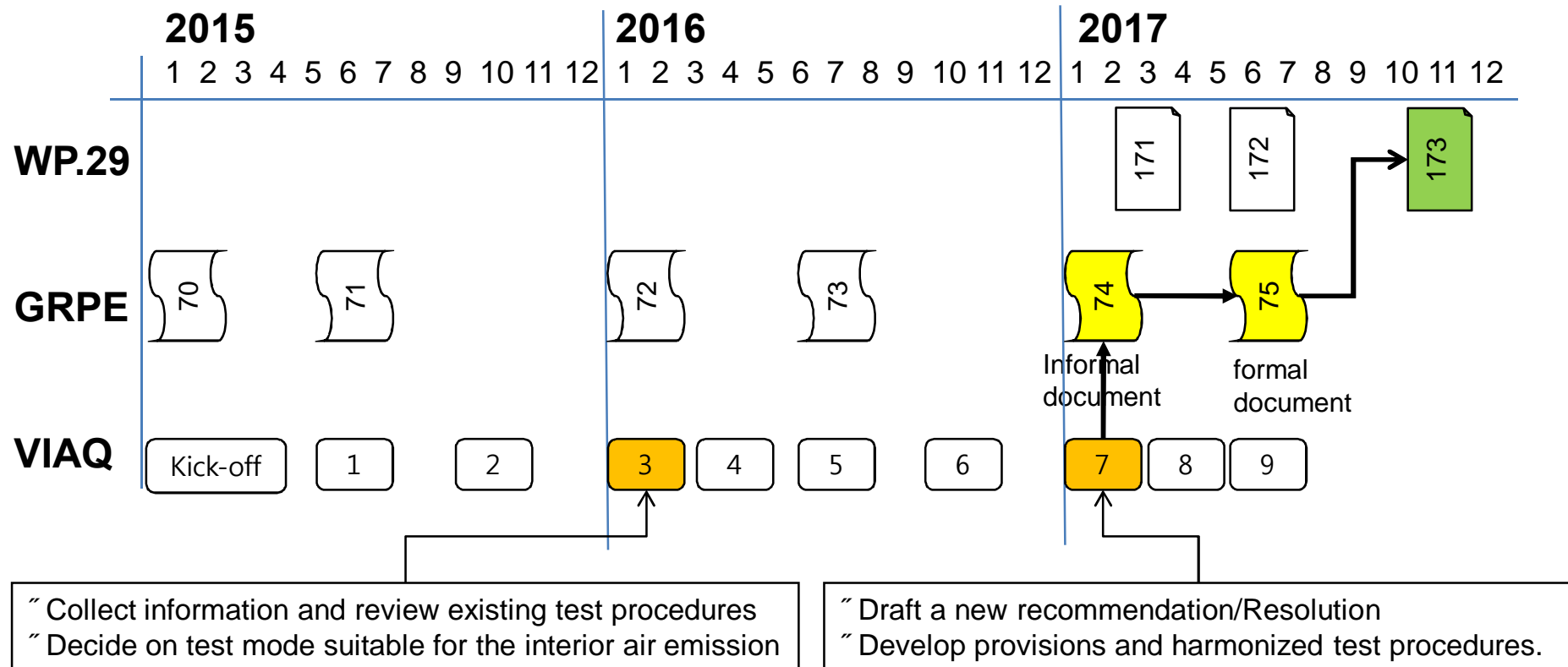
“ **Humidity for ambient mode:** $50\% \pm 10\%$ (relative humidity)

“ **Measurement point for temperature and humidity:** one at driver seat (nose position) and one outside vehicle (1m from vehicle)

“ **Sampling point:** Driver seat (nose position)

“ **Analytics:** Aldehydes according to ISO 16000-3 and VOCs according to ISO 16000-6

● Roadmap



- **January 2017** : Present a final draft report as an informal document to GRPE
- **November 2017** : Possible adoption of Recommendation(R.E.3, SR1 or mutual resolution)

- **Next VIAQ IWG Meeting**

- **4th VIAQ IWG Meeting**

- “ Asia or Paris, March 2016(TBD)

- **5th VIAQ IWG Meeting**

- “ Geneva, Switzerland, June, during 73rd GRPE

- “ Half a day requested

● 71th GRPE Session Report (ECE/TRANS/WP.29/GRPE/71)

XV. Vehicles Interior Air Quality (VIAQ) (agenda item 14)

Documentation: Informal document GRPE-71-30

64. The Chair of the IWG on VIAQ reported on the first meeting of the group held prior to GRPE (GRPE-71-30). He provided some information on the organization and road map of the group as well as on the work to be done.

65. The expert from the Russian Federation stated that the work should not only focus on the interior air emissions generated from interior materials but also on the air pollutants entering the vehicle together with the intake air from outside.

66. GRPE considered the inclusion in the scope of interior air pollutants from the outside air as a possible extension of the mandate at a later stage. GRPE acknowledged the progress made by the IWG on VIAQ and noted the request for a meeting room for half a day during the GRPE week in January 2016.