

Submitted by the experts from IPIECA and OICA

Working paper No. FQ-06-02

(6th FQ meeting, 9 June 2010)

Progress report on IPIECA-OICA discussions

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The text reproduced below was prepared by the experts from IPIECA and OICA to report back on the third joint meeting between IPIECA and OICA in response to the GRPE Informal Group on Fuel Quality request for the auto and oil industry to work together on the issue of fuel harmonization. Reference should be made to all documents elaborated by the FQ Informal Group and the GRPE reports on that issue. In particular, the last GRPE held in January 2010 “welcomed the intention of IPIECA and OICA to hold a further joint meeting in Washington to resolve the remaining parameters. GRPE agreed to resume consideration of the fuel quality parameters at its next session in June 2010 on the basis of an updated proposal.” The Washington meeting was convened under this premise.

## Minutes of Fuel Quality meeting between IPIECA and OICA

19 – 20 April, 2010

### Venue:

American Petroleum Institute, Washington, D.C.

### Discussion:

Following the January 2009 GRPE mandate to continue the discussion on the development of a WP29 guideline (refer to FQ-01-01/GRPE-55-14), OICA and IPIECA met for the third time to continue the discussions to develop the technical details of the basic fuel quality parameters that could form part of the WP 29 guideline linking key market fuel quality parameters and the functioning of vehicle emission control equipment (Euro II through Euro IV).

Although UNEP had agreed to chair the meeting, the closure of European airspace due to volcanic ash precipitation precluded their attendance. The meeting was therefore chaired informally by those present.

Participants introduced themselves and announced their detailed affiliations. The agenda was adopted as drafted.

In a similar process to before, the group reviewed in detail and worked on the tables produced as an output of the September 2009 meeting held in Paris between IPIECA and OICA. The results of this review are shown in Attachment 1 (Gasoline) and Attachment 2 (Diesel).

The aim of these tables is to link the vehicle technology levels associated with the required market fuel quality, to ensure proper functioning of the emission control equipment installed in vehicles. The meeting continued to work on the fuel specifications, however it proved difficult to get agreement on actual values in respect of the agreed parameters. One possible option to make progress could be to refer to qualifying footnotes and annexes, in order to provide more detailed information regarding the various fuel parameters that need to be taken into account. A first attempt to follow this route has been done and the draft result is reported herewith.

### Next Steps:

The above mentioned approach based on footnotes and annexes has yet to be confirmed and finalised. Guidance by GRPE would be appreciated in order to enable further work progress.

Moreover, during the course of the Paris meeting in 2009, it had been agreed that there was a need to add explanatory text, which it was proposed would be prepared in the course of 2010.

Given that the current mandate for the group is set to expire, in a first step, in November 2010, both associations agreed to complete all remaining work by September 2010. Given the fact that the next GRPE meeting will take place in January 2011, it is proposed that WP29 in November 2010 submits these work results to GRPE, for discussion and adoption at its session in January 2011.

It is proposed that the outcome achieved is converted to a document which would be submitted either as an annex to the corresponding UNECE Regulations (R.83, R.49, and possibly R.101), or as an annex to Consolidated Resolution RE3, to which the various Regulation could refer to.

The action items to summarize discussion in Washington DC are as follows:

### Action Items to prepare the guideline:

1. Clean up the draft tables, footnotes and annexes for review by all, as a record of the discussion in

Washington and also for continuing the discussion, and finalise preamble, before submitting to GRPE/WP29 (OICA & IPIECA)

2. Write a description of emissions control technologies that are and are not included in the scope. The positioning of this description in the document will be determined later (OICA)
3. Write a description of fuel adulteration and include as part of the “good housekeeping” section (IPIECA)
4. Write an overview of the role of different fuel specifications (for example, flash point for safety) that are not necessarily included in the gasoline and diesel tables (IPIECA). This could be added to the preamble.
5. Create a glossary of abbreviations and terms (OICA & IPIECA)

Gasoline parameters <sup>2</sup>	Euro 2 emissions enabling fuel <sup>3</sup>	Euro 3 emissions enabling fuel <sup>4</sup>	Euro 4 emissions enabling fuel <sup>5</sup>	Test method
Sulphur (mg/kg or ppm)	≤ 500	≤ 150	≤ 50 <sup>6</sup>	EN ISO 20846 EN ISO 20884
<b>Metal Content</b>				
Lead <sup>7</sup> (g/l)	no intentional addition, with max ≤ 0,013	no intentional addition, with max ≤ 0,005	no intentional addition, with max ≤ 0,005	EN 237
Manganese <sup>8</sup> (mg/l)	==	==	==	ICP or ASTM D 7111
Iron <sup>9</sup> (mg/l)	==	==	==	ICP or ASTM D 7111
Phosphorus (mg/l)	no intentional addition	no intentional addition	no intentional addition	EN 14107
Oxygen <sup>10</sup> (% m/m)	==	==	==	EN 1601 EN 13132
Oxygenates (% v/v) - methanol (not discussed in detail) - ethanol <sup>11</sup>	[≤ 3,0] See Annex 1	== See Annex 1	== See Annex 1	EN 1601 EN 13132
RVP (kPa)	See Annex 1	See Annex 1	See Annex 1	EN 13016/1 DVPE
Density (kg/m <sup>3</sup> ) Consider deleting this parameter	To be addressed later	To be addressed later	To be addressed later	EN ISO 3675 EN ISO 12185
RON (-) <sup>12</sup>	See Annex 1	See Annex 1	See Annex 1	EN ISO 5164
MON (-) <sup>13</sup>	See Annex 1	See Annex 1	See Annex 1	EN ISO 5163

<sup>1</sup> The selection of a Euro emissions enabling gasoline should be based on specific objectives for improving local air quality and the corresponding vehicle technologies needed to achieve these objectives.

<sup>2</sup> See Good Housekeeping and Enforcement from PCFV brochure (ACTION: clarify which brochure this is) and CEN/TR 15367

<sup>3</sup> See UN-ECE R.83.03 and R.49

<sup>4</sup> See UN-ECE R.83.05 (row A) and R.49

<sup>5</sup> See UN-ECE R.83.05 (row B) and R.49

<sup>6</sup> Clarify the footnote: UNEP decision taken at the 4th global PCFV meeting, 14 - 15 December 2005 at UNEP Headquarters in Nairobi, Kenya.

<sup>7</sup> Potassium-containing additives may be used in Lead Replacement Petrol (LRP).

<sup>8</sup> The European Commission has established limit values for manganese content to be implemented from 1 January 2011, and is assessing the impact of manganese on health and the environment as mandated by the EU Fuel Quality Directive (2009/30/EC). The manganese content in gasoline is also limited in China (GB 17930-2006) and in Beijing (DB 11/238-2007).

<sup>9</sup> The iron content in gasoline is currently limited in Vietnam (TCVN 6776:2005) and in China (GB 17930-2006).

<sup>10</sup> The oxygen content and the vehicle technology must be fully compatible in order to ensure satisfactory vehicle performance and compliance with emissions standards.

<sup>11</sup> The ethanol content and the vehicle technology must be fully compatible in order to ensure satisfactory vehicle performance and compliance with emissions standards. Many engine and vehicle manufacturers have established acceptable operating limits for ethanol concentrations and specifications. For more information, see the vehicle owner's manuals and ethanol specifications that apply in the European Union (EN 15376) and United States (ASTM D 4806).

<sup>12</sup> Add footnote on the relevance of RON to emissions performance

<sup>13</sup> Add footnote on the relevance of MON to emissions performance

## Explanatory Annex 1 on Gasoline Parameters (Attachment 1)

### Sulphur

Add a short explanation here

### Manganese

Add a short explanation here

### Iron

Add a short explanation here

### Phosphorus

Add a short explanation here

### Oxygen

Add a short explanation here

### Methanol

Add a short explanation here

### Ethanol

In Europe, the ethanol concentration was limited to 5% v/v for gasoline enabling Euro 2 emissions standards. This limit was raised to 10% v/v ethanol for gasoline enabling Euro 5 emissions standards according to the Fuels Quality Directive (2009/30/EC). In the US, the ethanol concentration is limited to 10% vol for non-Flex-Fuel Vehicles (FFV) and the US is reviewing a waiver to increase the ethanol concentration in gasoline to 15% vol in these vehicles. Up to 85% vol ethanol is allowed in US FFVs. In Brazil, the ethanol concentration is limited to 18-22% vol for non-FFVs and from 18-22% vol to 93% vol for FFVs. In Thailand, the ethanol concentration is limited to 20% vol for a specified fuel volume. In Japan, the ethanol concentration is limited to 3% vol. In the rest of the world, the maximum ethanol concentration is generally limited to 10% vol.

### Density

Add a short explanation here

### Reid Vapour Pressure (RVP)

Add a short explanation here

### Research Octane Number (RON)

Add a short explanation here

### Motor Octane Number (MON)

Add a short explanation here

Diesel parameters <sup>15</sup> fuel	Euro 2 emissions enabling fuel <sup>16</sup>	Euro 3 emissions enabling fuel <sup>17</sup>	Euro 4 emissions enabling fuel <sup>18</sup>	Test method
Sulphur (mg/kg)	≤ 500	≤ 350	≤ 50 <sup>19</sup>	EN ISO 20846 EN ISO 20884
Ash (% m/m)	≤ 0,01 See Annex 2	≤ 0,01 See Annex 2	≤ 0,01 See Annex 2	EN/ISO 6245
Total Contamination (mg/kg)	≤ 24 See Annex 2	≤ 24 See Annex 2	≤ 24 See Annex 2	EN 12662
Water (mg/kg)	See Annex 2	See Annex 2	See Annex 2	EN ISO 12937
Cetane Number <sup>20</sup>	See Annex 2	See Annex 2	See Annex 2	EN ISO 5165
Cetane Index <sup>21</sup>	See Annex 2	See Annex 2	See Annex 2	EN ISO 4264
Density (kg/m <sup>3</sup> ) at 15°C (IPIECA proposes to delete this line and use the Annex to describe adulteration issues)	[800 - 860]	TBD	TBD	EN ISO 3675 EN ISO 12185
Viscosity <sup>22</sup> (mm <sup>2</sup> /s)	See Annex 2	See Annex 2	See Annex 2	EN ISO 3104
Flash Point (°C)	To be explained in preamble	To be explained in preamble	To be explained in preamble	EN ISO 2719
FAME <sup>23</sup> (% v/v)	==	==	==	EN 14078
Lubricity <sup>24</sup> (microns)	See Annex 2	See Annex 2	See Annex 2	ISO 12156-1

<sup>14</sup> The selection of a Euro emissions enabling gasoline should be based on specific objectives for improving local air quality and the corresponding vehicle technologies needed to achieve these objectives.

<sup>15</sup> See Good Housekeeping and Enforcement from PCFV brochure and CEN/TR 15367

<sup>16</sup> See UN-ECE R. 83.03 and R. 49

<sup>17</sup> See UN-ECE R. 83.05 (row A) and R. 49

<sup>18</sup> See UN-ECE 83.05 (row B) and R. 49

<sup>19</sup> Clarify this footnote as per the corresponding gasoline footnote: UNEP decision taken at the 4th global PCFV meeting, 14 - 15 December 2005 at UNEP Headquarters in Nairobi, Kenya. ~~If DPF, 10 ppm max [required].~~

<sup>20</sup> Add footnote on relevance of cetane number and country limits

<sup>21</sup> Add footnote on relevance of cetane index and country limits

<sup>22</sup> Add footnote to reference CEN/ASTM limits (for example)

<sup>23</sup> The FAME concentration and specifications and the vehicle technology must be fully compatible in order to ensure satisfactory vehicle performance and compliance with emissions standards. Many engine and vehicle manufacturers have established acceptable operating limits for FAME concentrations and specifications. For example, see vehicle owner's manuals and FAME specifications that apply in the European Union (EN 14214) and United States (ASTM D 6751). NOTE: Add prevailing country limits as was done in the ethanol section (Explanatory Annex 1).

<sup>24</sup> Diesel fuel lubricity usually improves with higher fuel sulfur concentrations. Acceptable fuel lubricity should be ensured because it is an important property for maintaining the long-term performance of fuel injection equipment.

Explanatory Annex 2 on Diesel Fuel Parameters (Attachment 2)

Sulphur

Add a short explanation here

Ash, Total Contamination, and Water Concentration

Vehicle problems can be caused by fuel contamination that occurs in the distribution system, after the fuel has left the refinery gate. It is important that the fuel supply and distribution facilities and equipment are properly maintained in order to avoid contamination by solid particles and water. Good housekeeping practices are recommended (see CEN/TR 15367).

Cetane Number

Add a short explanation here perhaps extracted from EN ISO 5165

Cetane Index

Add a short explanation here perhaps extracted from EN ISO 4264

Density

Add a short explanation here

Viscosity

Add a short explanation here perhaps extracted from EN ISO 3104

Flash Point

Add a short explanation here

FAME

Add a short explanation here

Lubricity

Add a short explanation here perhaps extracted from ISO 12156-1

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