

**ANNEX A 1/2 - Fuel Quality limits – OICA proposal on GRPE two-step approach:**

Gasoline parameters	R83.03 (Euro 2)	R83.05 (row A) (Euro 3)	R83.05 (row B) (Euro 4)	Test method
<b>Step 1 parameters</b>				
Lead [g/l]	≤ 0,013	≤ 0,005	≤ 0,005	EN 237
Sulphur [mg/kg]	≤ 500	≤ 150	≤ 10 <sup>1</sup>	EN ISO 20846 EN ISO 20884
Metal Additives [mg/l]	----- Not permitted -----			ICP
Oxygen % [m/m]	≤ 2,7	≤ 2,7	≤ 2,7	EN 1601 EN 13132
Oxygenates % [v/v]				
- methanol	≤ 3,0	≤ 3,0	≤ 3,0	EN 1601 EN 13132
- ethanol	≤ 5,0	≤ 5,0	≤ 5,0	
- iso-propyl alcohol	≤ 10,0	≤ 10,0	≤ 10,0	
- iso-butyl alcohol	≤ 10,0	≤ 10,0	≤ 10,0	
- tert-butyl alcohol	≤ 7,0	≤ 7,0	≤ 7,0	
- ethers	≤ 15,0	≤ 15,0	≤ 15,0	
- other oxygenates	≤ 10,0	≤ 10,0	≤ 10,0	
RVP [kPa] <sup>2</sup>	35 - 100	45 – 100	45 – 100	EN 13016/1 DVPE
Density [kg/m <sup>3</sup> ]	725 - 780 <sup>3</sup>	720 – 775 <sup>3</sup>	720 – 775 <sup>3</sup>	EN ISO 3675 EN ISO 12185
RON [-]	≥ 95 <sup>3</sup>	≥ 95 <sup>3</sup>	≥ 95 <sup>3</sup>	EN ISO 5164
MON [-]	≥ 85 <sup>3</sup>	≥ 85 <sup>3</sup>	≥ 85 <sup>3</sup>	EN ISO 5163
<b>Step 2 parameters</b>				
Benzene % [v/v]	≤ 5	≤ 1	≤ 1	EN 238 EN 14517
Aromatics % [v/v]	-	≤ 42	≤ 35	EN 14517 & EN15553
Olefins % [v/v]	-	≤ 21 & 18	≤ 18	EN 14517 & EN15553
VLI (10VP + E70)	-	1050 – 1250	1050 - 1250	
FBP [°C]	<215	<210	<210	EN ISO 3405
E70 % [v/v]	15 - 47	20 – 50	20 – 50	EN ISO 3405
E100 % [v/v]	40 - 70	46 – 71	46 – 71	EN ISO 3405
E150 % [v/v]	≥ 75	≥ 75	≥ 75	EN ISO 3405
E180 % [v/v]	≥ 85	≥ 85	≥ 85	EN ISO 3405
Residue % [v/v]	< 2	<2	<2	EN ISO 3405

<sup>1</sup> Depending on the local market, a maximum of 50 is acceptable.

<sup>2</sup> The limits have to be set according to climatic and seasonal conditions. Upper limit of 65 for summer season is required.

<sup>3</sup> If these values are not currently met, local standards for density, MON, RON, subject to a RON value of not less than 90, have to be taken into account. At least, max. values for olefins and aromatics must be adhered to.

**ANNEX A 2/2 - Fuel Quality limits – OICA proposal on GRPE two-step approach:**

<b>Diesel parameters</b>	<b>R83.03 (Euro 2)</b>	<b>R83.05 (row A) (Euro 3)</b>	<b>R83.05 (row B) (Euro 4)</b>	<b>Test method</b>
<b>Step 1 parameters</b>				
Sulphur [mg/kg]	≤ 500	≤ 350	≤ 10 <sup>4</sup>	EN ISO 20846 EN ISO 20884
Ash % [m/m]	≤ 0,01	≤ 0,01	≤ 0,01	EN/ISO 6245
Total Contamination [mg/kg]	≤ 24	≤ 24	≤ 24	EN 12662
Cetane Number	≥ 49 <sup>5</sup>	≥ 51 <sup>5</sup>	≥ 51 <sup>5</sup>	EN ISO 5165
Cetane Index	≥ 46 <sup>5</sup>	≥ 46 <sup>5</sup>	≥ 46 <sup>5</sup>	EN ISO 4264
Density [kg/m <sup>3</sup> ]	820 – 860 <sup>5</sup>	820 – 845 <sup>5</sup>	820 – 845 <sup>5</sup>	EN ISO 3675 EN ISO 12185
Viscosity [mm <sup>2</sup> /s]	2,0 - 4,5 <sup>5</sup>	2,0 - 4,5 <sup>5</sup>	2,0 – 4,5 <sup>5</sup>	EN ISO 3104
Flash Point [°C]	> 55 <sup>5</sup>	> 55 <sup>5</sup>	> 55 <sup>5</sup>	EN ISO 2719
<b>Step 2 parameters</b>				
T50 [°C]	Report	T65 = 250 min	T65 = 250 min	EN ISO 3405
T85 [°C]	≤ 350	≤ 350	≤ 350	EN ISO 3405
T95 [°C]	≤ 370	≤ 360	≤ 360	EN ISO 3405
PAH % [m/m]	≤ 11	≤ 11	≤ 11	EN 12916
Carbon residue % [m/m]	≤ 0,3	≤ 0,3	≤ 0,3	EN ISO 10370
CFPP [°C]	< -44 to < +5	< -44 to < +5	< -44 to < +5	EN 116
Cloud Point [°C] (severe winter conditions)	< -34 to < -10	< -34 to < -10	< -34 to < -10	EN 23015
Water [mg/kg]	≤ 0,02	≤ 0,02	≤ 0,02	EN ISO 12937
Lubricity [micron]	---	≤ 460	≤ 460	EN ISO 12156-1

-----

<sup>4</sup> Depending on local market, a maximum of 50 is acceptable.

<sup>5</sup> If these values are not currently met, local standards for cetane, density, viscosity, flash point, subject to a cetane index of not less than 45, have to be taken into account. At least, max. values for PAH must be adhered to.