

SUPPLEMENT TO REPORT OF THE GRPE
PARTICLE MEASUREMENT PROGRAMME PMP

GOVERNMENT SPONSORED WORK PROGRAMMES - July 2003

(Transmitted by France)

**Supplement to annex 8 relative to inter-laboratory comparisons using
ELPI+CVS + HOT DILUTION**

EXECUTIVE SUMMARY

The objective of the french PMP subgroup work was to carry out an inter-laboratory comparison on the measurement of number of particles on Euro III gasoline and diesel (one equipped with a diesel particulate filter : DPF) light duty vehicles.

The inter-laboratory test was conducted in four laboratories using an Electrical Low Pressure Impactor (ELPI) and hot dilution.

The vehicles are tested over the current European cycle and using the procedure included in the existing European regulations.

The repeatability and reproducibility results observed in this study show that the test procedure developed using an ELPI + Hot Dilution is acceptable both for diesel and gasoline vehicles.

This study also points out the importance of the measurement of the air of the "tunnel blank" before testing.

Clearly, this methodology shows the effect of a DPF as we can observe the same level of particles number as in the "tunnel blank ".

SUMMARY REPORT

1. AIM

Development of a round robin test using an electrical low pressure impactor (ELPI) method and hot dilution in order to measure particle size and number on light duty vehicles, and conducted on chassis dynamometer under cold European driving Cycle (Cold EDC Test) specified in the Regulation.

The tests are performed according to a protocol prepared by the French Sub-Group, and based on existing European legislated procedures.

For calculation of distribution (size and number), data is split into the two phases of the EDC cycle ; ECE (0-780s) and EUDC (781-1180 s).

2. TEST PROGRAM

- ↪ Participating laboratories :
 - Institut Français du Pétrole (IFP)
 - PSA Peugeot Citroën
 - Renault
 - Union Technique de l'Automobile, du Motocycle et du Cycle (UTAC)

- ↪ Tested vehicles :
 - Diesel application :
 - Common rail direct injection engine with an oxydation catalytic converter (2 liters of cylinder, provided by UTAC) : Peugeot 307 HDI (Euro 3)
 - Common rail direct injection engine with a particle filter and an oxydation catalytic converter (2 liters of cylinder, provided by Peugeot) : Peugeot 307 DPF (Euro 3)

 - Gasoline application
 - Conventional MPI gasoline engine fitted with a 3 way catalytic converter (1.6 liter of cylinder, provided by Renault) : Renault Megane (Euro 3)

- ↪ Test fuel
 - Diesel :
 - Having a sulfur level < 10 ppm
 - Gasoline :
 - Having a sulfur level < 10 ppm

- ↪ Lubricant :
 - Having a sulfur content < 5000 ppm

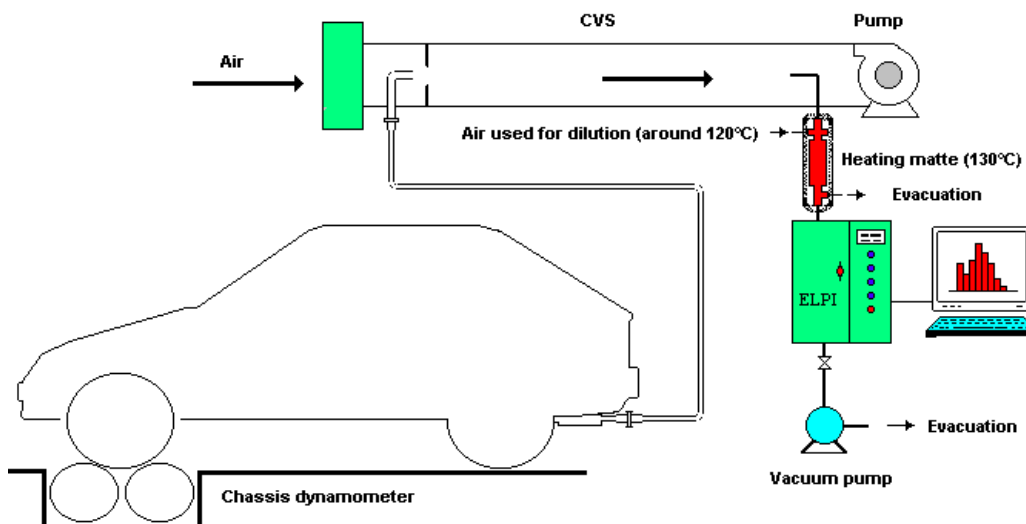
- ↪ Test cycle :
 - EDC with cold start

↪ Test protocol :

- Number and size distribution using a DEKATI Electrical Low Pressure Impactor covering particle cut sizes from 0.008 μm to 10 μm .
- CVS + sampling from the dilution tunnel.
- Collection Substrates : Aluminium foil greased (e.g. silicone fluid) on the impact plate to prevent particles bounce off.
- Using a dilutor (130°C, 10-20l/min) and hot air for dilution (temperature : \cong 120°C in order to minimize the nucleation particles).
- Total length of the antistatic tube used connecting the sample probe installed on the dilution tunnel to the ELPI \leq 3 meters.
- Measuring the blank CVS during 5 minutes before the test to check the cleanliness of the blank system and at the end of the test with engine stopped, continuing the acquisition during 5 minutes in order to control the initial condition of test.

The measurements are conducted without treatment of diluted exhaust gas before size measurement (without thermodenuder).

3. SYSTEM SET-UP



4. MEASUREMENTS

- ↪ Repeatability and reproducibility have been measured for the three tested vehicles on cold EDC.
- ↪ Results are also given separately under urban cycle and extra-urban cycle.
- ↪ CO, CO₂, HC, NO_x and particulates are also measured to detect an eventual variation of the vehicles.

5. RESULTS

Appendix 1 :

5.1 PEUGEOT 307 HDI – Diesel engine without DPF

Appendix 2 :

5.2 PEUGEOT 307 HDI - Diesel engine with DPF

Appendix 3 :

5.3 RENAULT Megane - Gasoline engine

Appendix 4 : Characteristics of vehicles tested

Appendix 5 : Fuel and lubricant specifications

APPENDIX 1

5.1 PEUGEOT 307 HDI – Diesel engine without DPF

5.1.1 Blank CVS

5.1.2 Repeatability and Reproducibility

- **Cold EDC test**
- **ECE (urban cycle) test**
- **EUDC (extra-urban cycle) test**

Blank CVS

**Blank CVS before the test with Hot dilution (around 120°C to prevent recondensation of the vapor),
Particle Number (1/km)**

Stage n:o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

													SUM		
LAB 1	Test n°1	3.05E+10	7.40E+09	2.62E+09	1.40E+09	7.59E+08	3.84E+08	3.02E+08	1.51E+08	1.01E+08	4.21E+07	3.33E+07	1.08E+07	4.37E+10	LAB 1
	Test n°2	3.52E+10	7.60E+09	3.64E+09	2.78E+09	8.92E+08	5.03E+08	4.31E+08	1.89E+08	7.00E+07	6.46E+07	4.85E+07	9.81E+06	5.14E+10	
	Test n°3	3.34E+10	7.63E+09	2.36E+09	1.97E+09	1.02E+09	5.90E+08	2.66E+08	1.53E+08	7.60E+07	3.74E+07	3.11E+07	6.68E+06	4.76E+10	
LAB 2	Test n°1	7.88E+10	3.81E+10	2.08E+10	1.11E+10	3.84E+09	1.01E+09	6.21E+08	2.34E+08	1.85E+08	1.07E+08	6.30E+07	3.09E+07	1.55E+11	LAB 2
	Test n°2	9.13E+10	1.62E+10	1.67E+10	7.94E+09	2.31E+09	8.96E+08	6.36E+08	2.04E+08	1.38E+08	6.99E+07	6.61E+07	2.49E+07	1.36E+11	
LAB 3	Test n°1	5.40E+10	1.28E+10	2.36E+10	2.07E+10	1.16E+10	2.80E+09	1.96E+09	5.80E+08	1.08E+08	3.25E+07	4.50E+07	1.77E+07	1.28E+11	LAB 3
	Test n°2	9.24E+10	2.91E+10	7.82E+09	3.19E+09	1.94E+09	6.76E+08	6.05E+08	4.24E+08	8.76E+07	2.10E+07	1.31E+08	4.24E+04	1.36E+11	
	Test n°3	7.43E+10	2.19E+10	7.12E+09	5.96E+09	4.89E+09	2.01E+09	1.16E+09	3.46E+08	1.52E+08	5.73E+07	3.20E+07	2.24E+07	1.18E+11	
LAB 4	Test n°1	5.23E+10	1.20E+10	6.99E+09	4.58E+09	4.80E+09	2.31E+09	6.33E+08	2.59E+08	9.67E+07	5.58E+07	2.29E+07	1.08E+07	8.41E+10	LAB 4
	Test n°2	4.44E+10	2.40E+09	1.21E+09	9.90E+08	1.31E+09	6.98E+08	4.26E+07	1.36E+08	7.96E+07	7.61E+06	2.73E+07	5.97E+06	5.12E+10	
	Test n°3	1.90E+11	2.75E+10	1.20E+10	7.47E+09	5.04E+09	1.94E+09	5.93E+08	3.77E+08	1.70E+08	1.20E+08	7.97E+07	3.20E+07	2.45E+11	
Mean =		7.06E+10	1.66E+10	9.53E+09	6.19E+09	3.50E+09	1.26E+09	6.59E+08	2.78E+08	1.15E+08	5.60E+07	5.27E+07	1.56E+07	1.09E+11	
SD =		4.55E+10	1.12E+10	7.75E+09	5.74E+09	3.19E+09	8.46E+08	5.16E+08	1.39E+08	3.99E+07	3.42E+07	3.16E+07	1.06E+07	6.15E+10	
%SD =		64	67	81	93	91	67	78	50	35	61	60	68	56.5	

Cold EDC Test

Peugeot 307 HDI tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY

Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12	SUM	
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085		
LAB 1	Test n°1	8.49E+13	3.25E+13	3.61E+13	1.10E+13	1.80E+12	2.39E+11	6.35E+10	2.08E+10	1.00E+10	5.51E+09	3.31E+09	1.59E+04	1.67E+14
	Test n°2	7.58E+13	2.81E+13	3.39E+13	1.15E+13	2.09E+12	3.01E+11	8.38E+10	2.80E+10	1.06E+10	5.28E+09	3.29E+09	6.26E+04	1.52E+14
	Test n°3	8.27E+13	3.15E+13	3.38E+13	1.29E+13	2.81E+12	4.11E+11	9.63E+10	2.95E+10	1.13E+10	5.47E+09	3.55E+09	1.46E+04	1.64E+14
	Mean =	8.11E+13	3.07E+13	3.46E+13	1.18E+13	2.23E+12	3.17E+11	8.12E+10	2.54E+10	1.06E+10	5.42E+09	3.38E+09	3.10E+04	1.61E+14
SD =	4.76E+12	2.33E+12	1.32E+12	1.02E+12	5.23E+11	8.74E+10	1.65E+10	4.41E+09	6.31E+08	1.23E+08	1.44E+08	2.73E+04	8.02E+12	
%SD =	5.9	7.6	3.8	8.6	23.4	27.6	20.4	17.3	5.9	2.3	4.3	88.1	5.0	
LAB 2	Essai n°1	6.70E+13	4.86E+13	3.99E+13	9.85E+12	1.59E+12	1.66E+11	4.85E+10	2.14E+10	9.78E+09	5.22E+09	3.64E+09	2.61E+09	1.67E+14
	Essai n°2	5.77E+13	4.16E+13	3.45E+13	9.25E+12	1.78E+12	1.88E+11	5.78E+10	2.13E+10	5.21E+09	6.01E+09	3.52E+09	2.57E+09	1.45E+14
	Mean =	6.23E+13	4.51E+13	3.72E+13	9.55E+12	1.68E+12	1.77E+11	5.32E+10	2.14E+10	3.09E+10	5.62E+09	3.58E+09	2.59E+09	1.56E+14
	SD =	6.54E+12	4.95E+12	3.82E+12	4.24E+11	1.36E+11	1.56E+10	6.68E+09	7.07E+07	2.99E+10	5.59E+08	8.49E+07	2.83E+07	1.53E+13
%SD =	10.5	11.0	10.3	4.4	8.1	8.8	12.4	0.3	96.7	9.9	2.4	1.1	9.8	
LAB 3	Test n°1	3.46E+13	2.06E+13	3.53E+13	1.97E+13	6.86E+12	9.26E+11	2.22E+11	3.36E+10	1.33E+10	6.02E+09	4.03E+09	2.68E+09	1.18E+14
	Test n°2	2.69E+13	1.56E+13	2.83E+13	1.90E+13	7.93E+12	1.00E+12	2.40E+11	3.52E+10	1.40E+10	6.28E+09	4.14E+09	2.70E+09	9.90E+13
	Test n°3	3.06E+13	1.51E+13	2.80E+13	1.97E+13	9.14E+12	1.25E+12	2.67E+11	3.81E+10	1.52E+10	6.76E+09	4.36E+09	2.88E+09	1.04E+14
	Mean =	3.07E+13	1.71E+13	3.05E+13	1.95E+13	7.97E+12	1.06E+12	2.43E+11	3.56E+10	1.42E+10	6.35E+09	4.18E+09	2.75E+09	1.07E+14
SD =	3.84E+12	3.05E+12	4.10E+12	3.91E+11	1.14E+12	1.70E+11	2.30E+10	2.29E+09	9.96E+08	3.74E+08	1.71E+08	1.11E+08	9.93E+12	
%SD =	12.5	17.8	13.4	2.0	14.3	16.1	9.4	6.4	7.0	5.9	4.1	4.0	9.3	
LAB 4	Test n°1	3.72E+13	2.69E+13	2.49E+13	1.64E+13	6.58E+12	8.46E+11	1.01E+11	3.00E+10	1.01E+10	4.65E+09	3.59E+09	2.74E+09	1.13E+14
	Test n°2	3.50E+13	2.30E+13	2.22E+13	1.67E+13	7.52E+12	9.11E+11	1.07E+11	3.18E+10	1.11E+10	5.18E+09	4.00E+09	2.93E+09	1.06E+14
	Test n°3	3.75E+13	2.14E+13	1.88E+13	1.60E+13	7.72E+12	8.22E+11	9.46E+10	2.94E+10	1.04E+10	4.78E+09	3.64E+09	2.70E+09	1.02E+14
	Mean =	3.66E+13	2.37E+13	2.20E+13	1.64E+13	7.27E+12	8.60E+11	1.01E+11	3.04E+10	1.05E+10	4.87E+09	3.74E+09	2.79E+09	1.07E+14
SD =	1.34E+12	2.82E+12	3.05E+12	3.60E+11	6.09E+11	4.59E+10	5.98E+09	1.26E+09	5.24E+08	2.79E+08	2.23E+08	1.26E+08	5.41E+12	
%SD =	3.7	11.9	13.9	2.2	8.4	5.3	5.9	4.2	5.0	5.7	6.0	4.5	5.1	

REPRODUCIBILITY

Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12	SUM	
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085		
LAB 1	Test n°1	8.49E+13	3.25E+13	3.61E+13	1.10E+13	1.80E+12	2.39E+11	6.35E+10	2.08E+10	1.00E+10	5.51E+09	3.31E+09	1.59E+04	1.67E+14
	Test n°2	7.58E+13	2.81E+13	3.39E+13	1.15E+13	2.09E+12	3.01E+11	8.38E+10	2.60E+10	1.06E+10	5.28E+09	3.29E+09	6.26E+04	1.52E+14
	Test n°3	8.27E+13	3.15E+13	3.38E+13	1.29E+13	2.81E+12	4.11E+11	9.63E+10	2.95E+10	1.13E+10	5.47E+09	3.55E+09	1.46E+04	1.64E+14
LAB 2	Essai n°1	6.70E+13	4.86E+13	3.99E+13	9.85E+12	1.59E+12	1.66E+11	4.85E+10	2.14E+10	9.78E+09	5.22E+09	3.64E+09	2.61E+09	1.67E+14
	Essai n°2	5.77E+13	4.16E+13	3.45E+13	9.25E+12	1.78E+12	1.88E+11	5.78E+10	2.13E+10	5.21E+09	6.01E+09	3.52E+09	2.57E+09	1.45E+14
LAB 3	Test n°1	3.46E+13	2.06E+13	3.53E+13	1.97E+13	6.86E+12	9.26E+11	2.22E+11	3.36E+10	1.33E+10	6.02E+09	4.03E+09	2.68E+09	1.18E+14
	Test n°2	2.69E+13	1.56E+13	2.83E+13	1.90E+13	7.93E+12	1.00E+12	2.40E+11	3.52E+10	1.40E+10	6.28E+09	4.14E+09	2.70E+09	9.90E+13
	Test n°3	3.06E+13	1.51E+13	2.80E+13	1.97E+13	9.14E+12	1.25E+12	2.67E+11	3.81E+10	1.52E+10	6.76E+09	4.36E+09	2.88E+09	1.04E+14
LAB 4	Test n°1	3.72E+13	2.69E+13	2.49E+13	1.64E+13	6.58E+12	8.46E+11	1.01E+11	3.00E+10	1.01E+10	4.65E+09	3.59E+09	2.74E+09	1.13E+14
	Test n°2	3.50E+13	2.30E+13	2.22E+13	1.67E+13	7.52E+12	9.11E+11	1.07E+11	3.18E+10	1.11E+10	5.18E+09	4.00E+09	2.93E+09	1.06E+14
	Test n°3	3.75E+13	2.14E+13	1.88E+13	1.60E+13	7.72E+12	8.22E+11	9.46E+10	2.94E+10	1.04E+10	4.78E+09	3.64E+09	2.70E+09	1.02E+14
Mean =	5.18E+13	2.77E+13	3.05E+13	1.47E+13	5.07E+12	6.42E+11	1.26E+11	2.88E+10	1.53E+10	5.56E+09	3.73E+09	1.98E+09	1.31E+14	
SD =	2.23E+13	1.04E+13	6.54E+12	3.97E+12	3.01E+12	3.86E+11	7.84E+10	5.88E+09	1.24E+10	6.45E+08	3.49E+08	1.28E+08	2.83E+13	
%SD =	43	38	21	27	59	60	62	20	81	12	9	64	22	

Reproducibility limit

Peugeot 307 HDI.

Cold EDC Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.240	136	0.037	0.330	0.370	0.022	5.16
	Test n°2	0.200	138	0.035	0.340	0.370	0.023	5.22
	Test n°3	0.170	138	0.030	0.330	0.360	0.025	5.23
Mean =		0.203	137	0.034	0.333	0.367	0.023	5.20
SD =		0.035	1.14	0.004	0.006	0.006	0.002	0.04
%SD =		17.3	0.8	10.6	1.7	1.6	6.5	0.7

LAB 2	Test n°1	0.245	137	0.033	0.341	0.374	0.028	5.21
	Test n°2	0.228	138	0.030	0.347	0.376	0.027	5.25
Mean =		0.237	138	0.032	0.344	0.375	0.028	5.23
SD =		0.012	0.64	0.002	0.004	0.001	0.001	0.03
%SD =		5.1	0.5	6.7	1.2	0.4	2.6	0.5

LAB 3	Test n°1	0.259	138	0.039	0.320	0.359	0.030	5.30
	Test n°2	0.223	135	0.032	0.323	0.355	0.034	5.20
	Test n°3	0.220	135	0.033	0.313	0.346	0.030	5.18
Mean =		0.234	136	0.035	0.319	0.353	0.031	5.23
SD =		0.022	1.66	0.004	0.005	0.007	0.002	0.06
%SD =		9.3	1.2	10.9	1.6	1.9	7.4	1.2

LAB 4	Test n°1	0.226	137	0.030	0.369	0.399	0.033	5.19
	Test n°2	0.213	138	0.029	0.361	0.390	0.032	5.22
	Test n°3	0.209	138	0.027	0.349	0.376	0.029	5.24
Mean =		0.216	138	0.029	0.360	0.388	0.031	5.22
SD =		0.009	0.62	0.002	0.010	0.012	0.002	0.03
%SD =		4.1	0.5	5.3	2.8	3.0	6.6	0.5

Cold EDC Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)	
LAB 1	Test n°1	0.240	136	0.037	0.330	0.370	0.022	5.16	LAB 1
	Test n°2	0.200	138	0.035	0.340	0.370	0.023	5.22	
	Test n°3	0.170	138	0.030	0.330	0.360	0.025	5.23	
LAB 2	Test n°1	0.245	137	0.033	0.341	0.374	0.028	5.21	LAB 2
	Test n°2	0.228	138	0.030	0.347	0.376	0.027	5.25	
LAB 3	Test n°1	0.259	138	0.039	0.320	0.359	0.030	5.30	LAB 3
	Test n°2	0.223	135	0.032	0.323	0.355	0.034	5.20	
	Test n°3	0.220	135	0.033	0.313	0.346	0.030	5.18	
LAB 4	Test n°1	0.226	137	0.030	0.369	0.399	0.033	5.19	LAB 4
	Test n°2	0.213	138	0.029	0.361	0.390	0.032	5.22	
	Test n°3	0.209	138	0.027	0.349	0.376	0.029	5.24	
Mean =		0.221	137	0.032	0.338	0.370	0.028	5.22	
SD =		0.024	1.19	0.004	0.017	0.015	0.004	0.04	
%SD =		10.8	0.9	11.2	5.1	4.1	13.8	0.7	

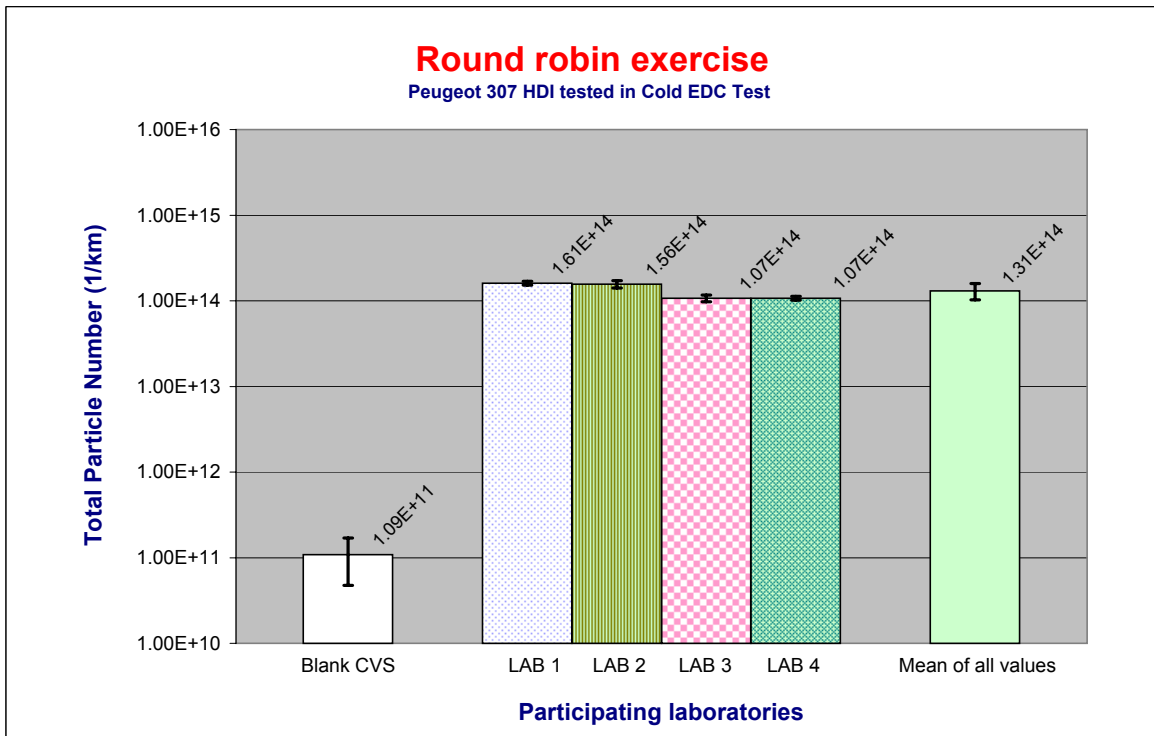
Cold EDC Test

Cold EDC Test

Only the average results are presented

Etage n° =	Dp (µm)	Blank CVS before the test	LAB 1	LAB 2	LAB 3	LAB 4	Mean of all values
1	0.008	7.06E+10	8.11E+13	6.23E+13	3.07E+13	3.66E+13	5.18E+13
2	0.030	1.66E+10	3.07E+13	4.51E+13	1.71E+13	2.37E+13	2.77E+13
3	0.063	9.53E+09	3.46E+13	3.72E+13	3.05E+13	2.20E+13	3.05E+13
4	0.109	6.19E+09	1.18E+13	9.55E+12	1.95E+13	1.64E+13	1.47E+13
5	0.173	3.50E+09	2.23E+12	1.68E+12	7.97E+12	7.27E+12	5.07E+12
6	0.267	1.26E+09	3.17E+11	1.77E+11	1.06E+12	8.60E+11	6.42E+11
7	0.407	6.59E+08	8.12E+10	5.32E+10	2.43E+11	1.01E+11	1.26E+11
8	0.655	2.78E+08	2.54E+10	2.14E+10	3.56E+10	3.04E+10	2.88E+10
9	1.021	1.15E+08	1.06E+10	3.09E+10	1.42E+10	1.05E+10	1.53E+10
10	1.655	5.60E+07	5.42E+09	5.62E+09	6.35E+09	4.87E+09	5.56E+09
11	2.520	5.27E+07	3.38E+09	3.58E+09	4.18E+09	3.74E+09	3.73E+09
12	4.085	1.56E+07	8.02E+12	2.59E+09	2.75E+09	2.76E+09	1.98E+09
Total Particle Number (1/km) =		1.09E+11	1.61E+14	1.56E+14	1.07E+14	1.07E+14	1.31E+14
SD =		6.15E+10	8.02E+12	1.53E+13	9.93E+12	5.41E+12	2.83E+13

Note . = Value no treated



For information

Cold EDC Test

Peugeot 307 HDI tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY

dN/dlogDp (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

LAB 1	Test n°1	1.38E+14	1.08E+14	1.47E+14	5.25E+13	9.52E+12	1.28E+12	3.01E+11	1.08E+11	4.75E+10	2.99E+10	1.58E+10	3.88E+04
	Test n°2	1.23E+14	9.32E+13	1.38E+14	5.52E+13	1.10E+13	1.61E+12	3.97E+11	1.36E+11	5.00E+10	2.87E+10	1.58E+10	1.53E+05
	Test n°3	1.34E+14	1.05E+14	1.38E+14	6.20E+13	1.49E+13	2.20E+12	4.57E+11	1.54E+11	5.34E+10	2.97E+10	1.70E+10	3.56E+04
	Mean =	1.31E+14	1.02E+14	1.41E+14	5.65E+13	1.18E+13	1.70E+12	3.86E+11	1.33E+11	5.03E+10	2.94E+10	1.62E+10	7.57E+04
SD =	7.71E+12	7.75E+12	5.40E+12	4.88E+12	2.76E+12	4.68E+11	7.84E+10	2.30E+10	2.99E+09	6.69E+08	6.89E+08	6.67E+04	
%SD =	5.9	7.6	3.8	8.6	23.4	27.6	20.4	17.3	5.9	2.3	4.3	88.1	

SUM

4.57E+14
4.23E+14
4.56E+14

4.45E+14
1.96E+13
4.4

LAB 2	Test n°1	1.09E+14	1.66E+14	1.80E+14	4.51E+13	6.95E+12	1.02E+12	2.36E+11	1.13E+11	4.31E+10	2.99E+10	1.63E+10	6.62E+09
	Test n°2	9.35E+13	1.42E+14	1.55E+14	4.24E+13	7.75E+12	1.15E+12	2.81E+11	1.13E+11	2.29E+11	3.45E+10	1.58E+10	6.52E+09
	Mean =	1.01E+14	1.54E+14	1.68E+14	4.38E+13	7.35E+12	1.09E+12	2.59E+11	1.13E+11	1.36E+11	3.22E+10	1.61E+10	6.57E+09
	SD =	1.07E+13	1.68E+13	1.73E+13	1.93E+12	5.68E+11	9.66E+10	3.19E+10	1.07E+08	1.32E+11	3.22E+09	3.71E+08	7.42E+07
%SD =	10.6	10.9	10.3	4.4	7.7	8.9	12.3	0.1	96.7	10.0	2.3	1.1	

5.08E+14
4.43E+14

4.75E+14
4.59E+13
9.7

LAB 3	Test n°1	5.74E+13	7.43E+13	1.50E+14	8.42E+13	3.00E+13	5.69E+12	1.08E+12	1.78E+11	5.82E+10	3.47E+10	1.80E+10	6.79E+09
	Test n°2	4.46E+13	5.63E+13	1.21E+14	8.12E+13	3.47E+13	6.16E+12	1.17E+12	1.86E+11	6.13E+10	3.62E+10	1.85E+10	6.84E+09
	Test n°3	5.08E+13	5.43E+13	1.19E+14	8.40E+13	4.00E+13	7.69E+12	1.30E+12	2.02E+11	6.69E+10	3.90E+10	1.95E+10	7.30E+09
	Mean =	5.09E+13	6.16E+13	1.30E+14	8.31E+13	3.49E+13	6.51E+12	1.18E+12	1.89E+11	6.21E+10	3.66E+10	1.86E+10	6.98E+09
SD =	6.38E+12	1.10E+13	1.75E+13	1.67E+12	4.99E+12	1.05E+12	1.12E+11	1.21E+10	4.37E+09	2.16E+09	7.61E+08	2.82E+08	
%SD =	12.5	17.8	13.4	2.0	14.3	16.1	9.4	6.4	7.0	5.9	4.1	4.0	

4.03E+14
3.45E+14
3.58E+14

3.69E+14
3.05E+13
8.3

LAB 4	Test n°1	6.48E+13	8.33E+13	1.05E+14	8.18E+13	3.49E+13	4.62E+12	4.90E+11	1.56E+11	4.82E+10	2.55E+10	1.71E+10	7.06E+09
	Test n°2	6.10E+13	7.14E+13	9.33E+13	8.35E+13	3.99E+13	4.97E+12	5.16E+11	1.65E+11	5.30E+10	2.84E+10	1.91E+10	7.55E+09
	Test n°3	6.53E+13	6.63E+13	7.91E+13	7.99E+13	4.10E+13	4.49E+12	4.58E+11	1.53E+11	4.94E+10	2.62E+10	1.73E+10	6.94E+09
	Mean =	6.37E+13	7.37E+13	9.24E+13	8.17E+13	3.86E+13	4.70E+12	4.88E+11	1.58E+11	5.02E+10	2.67E+10	1.78E+10	7.18E+09
SD =	2.34E+12	8.74E+12	1.28E+13	1.80E+12	3.23E+12	2.50E+11	2.90E+10	6.55E+09	2.50E+09	1.53E+09	1.06E+09	3.25E+08	
%SD =	3.7	11.9	13.9	2.2	8.4	5.3	5.9	4.2	5.0	5.7	6.0	4.5	

3.75E+14
3.55E+14
3.37E+14

3.55E+14
1.91E+13
5.4

REPRODUCIBILITY

dN/dlogDp (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

LAB 1	Test n°1	1.38E+14	1.08E+14	1.47E+14	5.25E+13	9.52E+12	1.28E+12	3.01E+11	1.08E+11	4.75E+10	2.99E+10	1.58E+10	3.88E+04
	Test n°2	1.23E+14	9.32E+13	1.38E+14	5.52E+13	1.10E+13	1.61E+12	3.97E+11	1.36E+11	5.00E+10	2.87E+10	1.58E+10	1.53E+05
	Test n°3	1.34E+14	1.05E+14	1.38E+14	6.20E+13	1.49E+13	2.20E+12	4.57E+11	1.54E+11	5.34E+10	2.97E+10	1.70E+10	3.56E+04
	LAB 2	1.09E+14	1.66E+14	1.80E+14	4.51E+13	6.95E+12	1.02E+12	2.36E+11	1.13E+11	4.31E+10	2.99E+10	1.63E+10	6.62E+09
LAB 3	Test n°1	5.74E+13	7.43E+13	1.50E+14	8.42E+13	3.00E+13	5.69E+12	1.08E+12	1.78E+11	5.82E+10	3.47E+10	1.80E+10	6.79E+09
	Test n°2	4.46E+13	5.63E+13	1.21E+14	8.12E+13	3.47E+13	6.16E+12	1.17E+12	1.86E+11	6.13E+10	3.62E+10	1.85E+10	6.84E+09
	Test n°3	5.08E+13	5.43E+13	1.19E+14	8.40E+13	4.00E+13	7.69E+12	1.30E+12	2.02E+11	6.69E+10	3.90E+10	1.95E+10	7.30E+09
	LAB 4	6.48E+13	8.33E+13	1.05E+14	8.18E+13	3.49E+13	4.62E+12	4.90E+11	1.56E+11	4.82E+10	2.55E+10	1.71E+10	7.06E+09
LAB 4	Test n°1	6.10E+13	7.14E+13	9.33E+13	8.35E+13	3.99E+13	4.97E+12	5.16E+11	1.65E+11	5.30E+10	2.84E+10	1.91E+10	7.55E+09
	Test n°2	6.53E+13	6.63E+13	7.91E+13	7.99E+13	4.10E+13	4.49E+12	4.58E+11	1.53E+11	4.94E+10	2.62E+10	1.73E+10	6.94E+09
	Mean =	8.55E+13	9.27E+13	1.30E+14	6.83E+13	2.46E+13	3.72E+12	6.07E+11	1.51E+11	6.91E+10	3.12E+10	1.73E+10	5.06E+09
	SD =	3.48E+13	3.53E+13	2.96E+13	1.70E+13	1.44E+13	2.35E+12	3.82E+11	3.13E+10	5.35E+10	4.32E+09	1.32E+09	3.26E+09
%SD =	41	38	23	25	59	63	63	21	77	14	8	64	

SUM

4.57E+14
4.23E+14
4.56E+14
5.08E+14
4.43E+14
4.03E+14
3.45E+14
3.58E+14
3.75E+14
3.55E+14
3.37E+14

4.05E+14
5.61E+13
14

Reproducibility limit

ECE Test

Peugeot 307 HDI.

ECE Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.660	176	0.083	0.470	0.550	0.023	6.69
	Test n°2	0.550	179	0.078	0.480	0.550	0.024	6.81
	Test n°3	0.460	180	0.067	0.460	0.530	0.026	6.84

Mean =	0.557	178	0.076	0.470	0.543	0.024	6.78
SD =	0.100	2.23	0.008	0.010	0.012	0.002	0.08
%SD =	18.0	1.3	10.8	2.1	2.1	6.3	1.2

LAB 2	Test n°1	0.655	181	0.078	0.487	0.565	0.026	6.90
	Test n°2	0.606	181	0.070	0.473	0.543	0.026	6.87

Mean =	0.631	181	0.074	0.480	0.554	0.026	6.89
SD =	0.035	0.35	0.006	0.010	0.016	0.000	0.02
%SD =	5.5	0.2	7.6	2.1	2.8	0.0	0.3

LAB 3	Test n°1	0.699	182	0.088	0.461	0.549	0.029	7.03
	Test n°2	0.602	179	0.075	0.452	0.527	0.031	6.90
	Test n°3	0.593	177	0.076	0.443	0.519	0.030	6.84

Mean =	0.631	180	0.080	0.452	0.532	0.030	6.92
SD =	0.059	2.53	0.007	0.009	0.016	0.001	0.10
%SD =	9.3	1.4	9.1	2.0	2.9	3.3	1.4

LAB 4	Test n°1	0.595	179	0.072	0.483	0.554	0.034	6.82
	Test n°2	0.556	180	0.069	0.485	0.554	0.033	6.85
	Test n°3	0.552	182	0.065	0.492	0.556	0.031	6.92

Mean =	0.568	181	0.069	0.487	0.555	0.033	6.86
SD =	0.024	1.41	0.004	0.005	0.001	0.002	0.05
%SD =	4.2	0.8	5.1	1.0	0.2	4.7	0.7

ECE Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
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LAB 1	Test n°1	0.660	176	0.083	0.470	0.550	0.023	6.69	LAB 1
	Test n°2	0.550	179	0.078	0.480	0.550	0.024	6.81	
	Test n°3	0.460	180	0.067	0.460	0.530	0.026	6.84	
LAB 2	Test n°1	0.655	181	0.078	0.487	0.565	0.026	6.90	LAB 2
	Test n°2	0.606	181	0.070	0.473	0.543	0.026	6.87	
LAB 3	Test n°1	0.699	182	0.088	0.461	0.549	0.029	7.03	LAB 3
	Test n°2	0.602	179	0.075	0.452	0.527	0.031	6.90	
	Test n°3	0.593	177	0.076	0.443	0.519	0.030	6.84	
LAB 4	Test n°1	0.595	179	0.072	0.483	0.554	0.034	6.82	LAB 4
	Test n°2	0.556	180	0.069	0.485	0.554	0.033	6.85	
	Test n°3	0.552	182	0.065	0.492	0.556	0.031	6.92	

Mean =	0.593	180	0.075	0.471	0.545	0.029	6.86
SD =	0.065	2.01	0.007	0.016	0.014	0.004	0.08
%SD =	11.0	1.1	9.3	3.3	2.6	13.1	1.2

ECE Test Peugeot 307 HDI tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

													SUM	
LAB 1	Test n°1	1.68E+14	4.02E+13	3.56E+13	1.05E+13	1.68E+12	1.93E+11	6.00E+10	2.74E+10	1.44E+10	8.06E+09	5.06E+09	No	2.57E+14
	Test n°2	1.36E+14	3.60E+13	3.61E+13	1.08E+13	1.83E+12	2.62E+11	8.03E+10	3.37E+10	1.55E+10	7.95E+09	4.98E+09		2.21E+14
	Test n°3	1.45E+14	4.09E+13	3.70E+13	1.20E+13	2.33E+12	3.32E+11	8.53E+10	3.48E+10	1.46E+10	7.34E+09	5.07E+09	measured	2.37E+14
	Mean =	1.50E+14	3.90E+13	3.63E+13	1.11E+13	1.94E+12	2.63E+11	7.52E+10	3.20E+10	1.48E+10	7.78E+09	5.04E+09	No	2.39E+14
SD =	1.67E+13	2.62E+12	6.93E+11	7.87E+11	3.41E+11	6.94E+10	1.34E+10	3.97E+09	5.65E+08	3.89E+08	4.71E+07		1.77E+13	
%SD =	11.2	6.7	1.9	7.1	17.5	26.4	17.8	12.4	3.8	5.0	0.9	calculated	7.4	
LAB 2	Test n°1	1.17E+14	5.28E+13	3.37E+13	7.77E+12	1.08E+12	1.28E+11	5.65E+10	3.05E+10	1.52E+10	8.12E+09	5.65E+09	4.32E+09	2.13E+14
	Test n°2	1.07E+14	5.46E+13	3.65E+13	9.04E+12	1.59E+12	1.77E+11	6.31E+10	3.18E+10	1.55E+10	8.30E+09	5.78E+09	4.38E+09	2.09E+14
	Mean =	1.12E+14	5.37E+13	3.51E+13	8.41E+12	1.34E+12	1.52E+11	5.98E+10	3.12E+10	1.53E+10	8.21E+09	5.71E+09	4.35E+09	2.11E+14
	SD =	7.36E+12	1.30E+12	1.99E+12	9.01E+11	3.64E+11	3.45E+10	4.67E+09	9.27E+08	1.84E+08	1.24E+08	8.96E+07	4.49E+07	2.76E+12
%SD =	6.6	2.4	5.7	10.7	27.2	22.6	7.8	3.0	1.2	1.5	1.6	1.0	1.3	
LAB 3	Test n°1	6.74E+13	3.13E+13	4.33E+13	2.02E+13	5.90E+12	6.68E+11	1.96E+11	4.22E+10	1.90E+10	8.74E+09	6.05E+09	4.42E+09	1.69E+14
	Test n°2	5.22E+13	2.37E+13	3.40E+13	2.01E+13	7.15E+12	8.20E+11	2.14E+11	4.28E+10	1.91E+10	8.73E+09	6.13E+09	4.26E+09	1.38E+14
	Test n°3	5.8E+13	2.2E+13	3.3E+13	2.1E+13	8.7E+12	1.1E+12	2.5E+11	4.8E+10	2.2E+10	9.8E+09	6.6E+09	4.7E+09	1.44E+14
	Mean =	5.93E+13	2.58E+13	3.67E+13	2.04E+13	7.24E+12	8.60E+11	2.19E+11	4.42E+10	1.99E+10	9.10E+09	6.26E+09	4.47E+09	1.51E+14
SD =	7.64E+12	4.86E+12	5.77E+12	4.62E+11	1.39E+12	2.15E+11	2.59E+10	3.03E+09	1.43E+09	6.30E+08	2.89E+08	2.52E+08	1.63E+13	
%SD =	12.9	18.9	15.7	2.3	19.3	25.0	11.8	6.8	7.2	6.9	4.6	5.6	10.8	
LAB 4	Test n°1	7.16E+13	3.87E+13	2.92E+13	1.63E+13	5.29E+12	6.27E+11	8.92E+10	3.55E+10	1.46E+10	7.14E+09	5.34E+09	4.73E+09	1.62E+14
	Test n°2	6.76E+13	3.23E+13	2.53E+13	1.73E+13	6.92E+12	7.48E+11	9.70E+10	3.85E+10	1.62E+10	7.94E+09	5.94E+09	5.12E+09	1.50E+14
	Test n°3	6.39E+13	2.90E+13	2.11E+13	1.68E+13	7.44E+12	7.32E+11	9.46E+10	3.71E+10	1.57E+10	7.69E+09	5.73E+09	4.89E+09	1.39E+14
	Mean =	6.77E+13	3.33E+13	2.52E+13	1.68E+13	6.55E+12	7.02E+11	9.36E+10	3.70E+10	1.55E+10	7.59E+09	5.67E+09	4.92E+09	1.50E+14
SD =	3.84E+12	4.97E+12	4.08E+12	5.24E+11	1.12E+12	6.55E+10	3.98E+09	1.46E+09	7.87E+08	4.08E+08	3.03E+08	1.95E+08	1.14E+13	
%SD =	5.7	14.9	16.2	3.1	17.2	9.3	4.3	4.0	5.1	5.4	5.3	4.0	7.6	

REPRODUCIBILITY Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

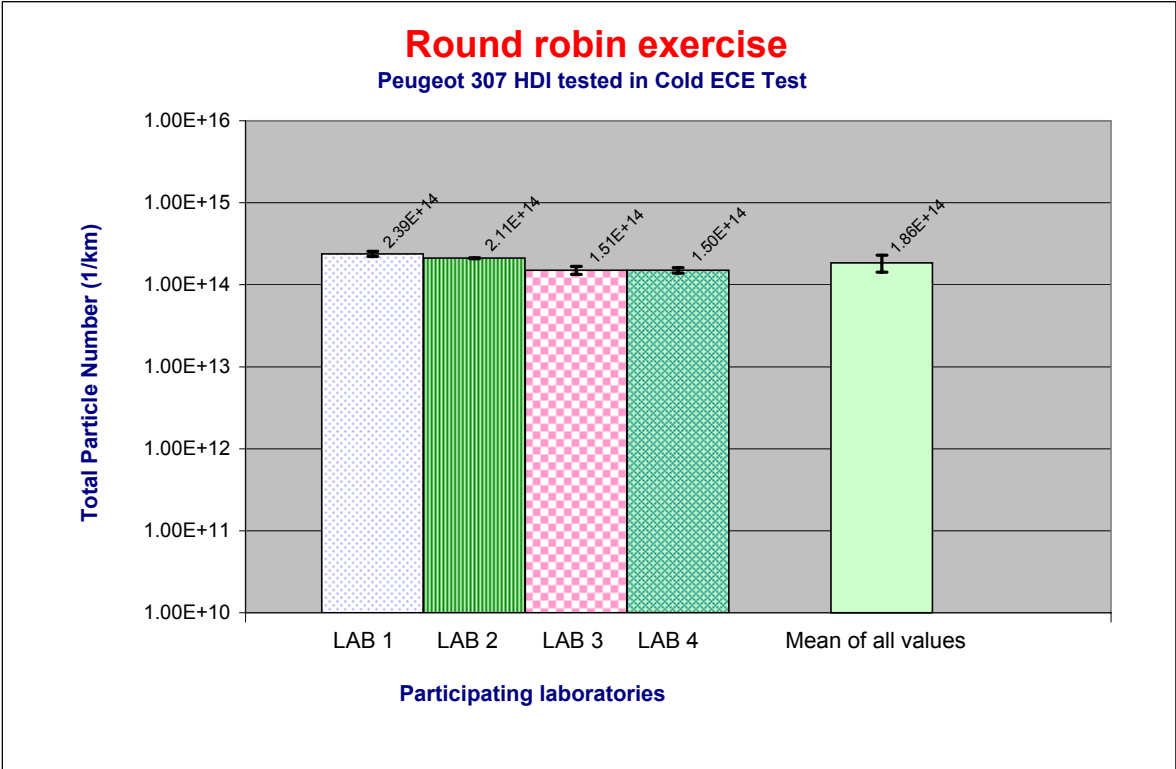
													SUM	
LAB 1	Test n°1	1.68E+14	4.02E+13	3.56E+13	1.05E+13	1.68E+12	1.93E+11	6.00E+10	2.74E+10	1.44E+10	8.06E+09	5.06E+09		2.57E+14
	Test n°2	1.36E+14	3.60E+13	3.61E+13	1.08E+13	1.83E+12	2.62E+11	8.03E+10	3.37E+10	1.55E+10	7.95E+09	4.98E+09		2.21E+14
	Test n°3	1.45E+14	4.09E+13	3.70E+13	1.20E+13	2.33E+12	3.32E+11	8.53E+10	3.48E+10	1.46E+10	7.34E+09	5.07E+09		2.37E+14
LAB 2	Test n°1	1.17E+14	5.28E+13	3.37E+13	7.77E+12	1.08E+12	1.28E+11	5.65E+10	3.05E+10	1.52E+10	8.12E+09	5.65E+09	4.32E+09	2.13E+14
	Test n°2	1.07E+14	5.46E+13	3.65E+13	9.04E+12	1.59E+12	1.77E+11	6.31E+10	3.18E+10	1.55E+10	8.30E+09	5.78E+09	4.38E+09	2.09E+14
	Mean =	1.12E+14	5.37E+13	3.51E+13	8.41E+12	1.34E+12	1.52E+11	5.98E+10	3.12E+10	1.53E+10	8.21E+09	5.71E+09	4.35E+09	2.11E+14
LAB 3	Test n°1	6.74E+13	3.13E+13	4.33E+13	2.02E+13	5.90E+12	6.68E+11	1.96E+11	4.22E+10	1.90E+10	8.74E+09	6.05E+09	4.42E+09	1.69E+14
	Test n°2	5.22E+13	2.37E+13	3.40E+13	2.01E+13	7.15E+12	8.20E+11	2.14E+11	4.28E+10	1.91E+10	8.73E+09	6.13E+09	4.26E+09	1.38E+14
	Test n°3	5.82E+13	2.22E+13	3.28E+13	2.10E+13	8.68E+12	1.09E+12	2.47E+11	4.77E+10	2.15E+10	9.82E+09	6.59E+09	4.75E+09	1.44E+14
LAB 4	Test n°1	7.16E+13	3.87E+13	2.92E+13	1.63E+13	5.29E+12	6.27E+11	8.92E+10	3.55E+10	1.46E+10	7.14E+09	5.34E+09	4.73E+09	1.62E+14
	Test n°2	6.76E+13	3.23E+13	2.53E+13	1.73E+13	6.92E+12	7.48E+11	9.70E+10	3.85E+10	1.62E+10	7.94E+09	5.94E+09	5.12E+09	1.50E+14
	Test n°3	6.39E+13	2.90E+13	2.11E+13	1.68E+13	7.44E+12	7.32E+11	9.46E+10	3.71E+10	1.57E+10	7.69E+09	5.73E+09	4.89E+09	1.39E+14
Mean =	9.59E+13	3.85E+13	3.32E+13	1.47E+13	4.54E+12	5.25E+11	1.17E+11	3.65E+10	1.65E+10	8.17E+09	5.67E+09	4.61E+09	1.86E+14	
SD =	4.05E+13	1.05E+13	6.07E+12	4.83E+12	2.86E+12	3.21E+11	6.81E+10	5.95E+09	2.32E+09	7.40E+08	5.10E+08	3.10E+08	4.30E+13	
%SD =	42	29	18	33	63	61	58	16	14	9	9	7	23	

Reproducibility limit

ECE Test Only the average results are presented

Etage n° =	Dp (µm)		LAB 1	LAB 2	LAB 3	LAB 4		Mean of all values
1	0.008		1.50E+14	1.12E+14	5.93E+13	6.77E+13		9.59E+13
2	0.030		3.90E+13	5.37E+13	2.58E+13	3.33E+13		3.65E+13
3	0.063		3.63E+13	3.51E+13	3.67E+13	2.52E+13		3.32E+13
4	0.109		1.11E+13	8.41E+12	2.04E+13	1.68E+13		1.47E+13
5	0.173		1.94E+12	1.34E+12	7.24E+12	6.55E+12		4.54E+12
6	0.267		2.63E+11	1.52E+11	8.60E+11	7.02E+11		5.25E+11
7	0.407		7.52E+10	5.98E+10	2.19E+11	9.36E+10		1.17E+11
8	0.655		3.20E+10	3.12E+10	4.42E+10	3.70E+10		3.65E+10
9	1.021		1.48E+10	1.53E+10	1.99E+10	1.55E+10		1.65E+10
10	1.655		7.78E+09	8.21E+09	9.10E+09	7.59E+09		8.17E+09
11	2.520		5.04E+09	5.71E+09	6.26E+09	5.67E+09		5.67E+09
12	4.085		Value no treated	4.35E+09	4.47E+09	4.92E+09		4.61E+09
Total Particulate Number (1/km) =			2.39E+14	2.11E+14	1.51E+14	1.50E+14		1.86E+14
SD =			1.77E+13	2.76E+12	1.63E+13	1.14E+13		4.30E+13

Note . = Value no treated



EUDC Test

Peugeot 307 HDI.

EUDC Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.000	113	0.010	0.260	0.270	0.022	4.26
	Test n°2	0.000	113	0.010	0.260	0.270	0.022	4.29
	Test n°3	0.000	113	0.009	0.250	0.260	0.024	4.29
Mean =		0.000	113	0.010	0.257	0.267	0.023	4.28
SD =		0.000	0.49	0.001	0.006	0.006	0.001	0.02
%SD =		#DIV/0!	0.4	6.0	2.2	2.2	5.1	0.4

LAB 2	Test n°1	0.007	112	0.007	0.257	0.264	0.028	4.23
	Test n°2	0.008	114	0.006	0.273	0.280	0.027	4.30
Mean =		0.008	113	0.007	0.265	0.272	0.028	4.27
SD =		0.001	1.27	0.001	0.011	0.011	0.001	0.05
%SD =		9.4	1.1	10.9	4.3	4.2	2.6	1.2

LAB 3	Test n°1	0.003	112	0.010	0.238	0.248	0.030	4.30
	Test n°2	0.003	110	0.007	0.248	0.255	0.035	4.22
	Test n°3	0.003	110	0.008	0.238	0.246	0.030	4.22
Mean =		0.003	111	0.008	0.241	0.250	0.032	4.25
SD =		0.000	1.16	0.002	0.006	0.005	0.003	0.05
%SD =		0.0	1.0	18.3	2.4	1.9	9.1	1.1

LAB 4	Test n°1	0.015	113	0.006	0.303	0.310	0.0331	4.26
	Test n°2	0.015	113	0.006	0.290	0.296	0.0323	4.28
	Test n°3	0.013	113	0.005	0.268	0.274	0.0287	4.27
Mean =		0.014	113	0.006	0.287	0.293	0.031	4.27
SD =		0.001	0.31	0.001	0.018	0.018	0.002	0.01
%SD =		8.1	0.3	10.2	6.2	6.2	7.5	0.2

EUDC Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)	
LAB 1	Test n°1	0.000	113	0.010	0.260	0.270	0.022	4.26	LAB 1
	Test n°2	0.000	113	0.010	0.260	0.270	0.022	4.29	
	Test n°3	0.000	113	0.009	0.250	0.260	0.024	4.29	
LAB 2	Test n°1	0.007	112	0.007	0.257	0.264	0.028	4.23	LAB 2
	Test n°2	0.008	114	0.006	0.273	0.279	0.027	4.30	
LAB 3	Test n°1	0.003	112	0.010	0.238	0.248	0.030	4.30	LAB 3
	Test n°2	0.003	110	0.007	0.248	0.255	0.035	4.22	
	Test n°3	0.003	110	0.008	0.238	0.246	0.030	4.22	
LAB 4	Test n°1	0.015	113	0.006	0.303	0.310	0.033	4.26	LAB 4
	Test n°2	0.015	113	0.006	0.290	0.296	0.032	4.28	
	Test n°3	0.013	113	0.005	0.268	0.274	0.029	4.27	
Mean =		0.006	112	0.008	0.262	0.270	0.028	4.27	
SD =		0.006	1.21	0.002	0.020	0.019	0.004	0.03	
%SD =		97.26	1.07	24.34	7.76	7.21	15.34	0.71	

EUDC Test Peugeot 307 HDI tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12		
Dp	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085		
	SUM													
LAB 1	Test n°1	3.57E+13	2.79E+13	3.64E+13	1.12E+13	1.87E+12	2.65E+11	6.55E+10	1.68E+10	7.44E+09	4.00E+09	2.27E+09	2.52E+04	1.13E+14
	Test n°2	4.02E+13	2.33E+13	3.25E+13	1.19E+13	2.23E+12	3.23E+11	8.57E+10	2.14E+10	7.67E+09	3.70E+09	2.29E+09	9.92E+04	1.11E+14
	Test n°3	4.02E+13	2.33E+13	3.25E+13	1.19E+13	2.23E+12	3.23E+11	8.57E+10	2.14E+10	7.67E+09	3.70E+09	2.29E+09	9.92E+04	1.11E+14
	Mean =	3.87E+13	2.49E+13	3.38E+13	1.17E+13	2.11E+12	3.04E+11	7.90E+10	1.99E+10	7.60E+09	3.80E+09	2.29E+09	7.46E+04	1.12E+14
SD =	2.60E+12	2.66E+12	2.24E+12	4.22E+11	2.12E+11	3.39E+10	1.17E+10	2.64E+09	1.32E+08	1.75E+08	1.20E+07	4.27E+04	1.61E+12	
%SD =	6.7	10.7	6.6	3.6	10.0	11.2	14.8	13.3	1.7	4.6	0.5	57.3	1.4	
LAB 2	Test n°1	3.80E+13	4.62E+13	4.35E+13	1.11E+13	1.89E+12	1.88E+11	4.38E+10	1.61E+10	6.66E+09	3.53E+09	2.47E+09	1.63E+09	1.41E+14
	Test n°2	2.91E+13	3.41E+13	3.33E+13	9.37E+12	1.88E+12	1.95E+11	5.47E+10	1.52E+10	7.34E+09	4.69E+09	2.21E+09	1.52E+09	1.08E+14
	Mean =	3.35E+13	4.01E+13	3.84E+13	1.02E+13	1.88E+12	1.91E+11	4.93E+10	1.57E+10	4.00E+09	4.11E+09	2.34E+09	1.57E+09	1.24E+14
	SD =	6.30E+12	8.58E+12	7.22E+12	1.19E+12	4.66E+09	4.86E+09	7.64E+09	5.94E+08	4.72E+10	8.15E+08	1.84E+08	7.60E+07	2.32E+13
%SD =	18.8	21.4	18.8	11.6	0.2	2.5	15.5	3.8	117.9	19.8	7.9	4.8	18.7	
LAB 3	Test n°1	1.55E+13	1.44E+13	3.06E+13	1.94E+13	7.41E+12	1.08E+12	2.37E+11	2.87E+10	9.96E+09	4.45E+09	2.85E+09	1.67E+09	8.86E+13
	Test n°2	1.22E+13	1.09E+13	2.50E+13	1.83E+13	8.37E+12	1.11E+12	2.55E+11	3.07E+10	1.10E+10	4.85E+09	2.99E+09	1.79E+09	7.62E+13
	Test n°3	1.45E+13	1.09E+13	2.52E+13	1.89E+13	9.40E+12	1.34E+12	2.79E+11	3.26E+10	1.16E+10	4.98E+09	3.07E+09	1.79E+09	8.05E+13
	Mean =	1.41E+13	1.20E+13	2.69E+13	1.89E+13	8.39E+12	1.18E+12	2.57E+11	3.06E+10	1.08E+10	4.76E+09	2.97E+09	1.75E+09	8.18E+13
SD =	1.72E+12	2.02E+12	3.16E+12	5.30E+11	9.93E+11	1.47E+11	2.13E+10	1.95E+09	8.16E+08	2.75E+08	1.10E+08	6.99E+07	6.34E+12	
%SD =	12.2	16.8	11.7	2.8	11.8	12.5	8.3	6.4	7.5	5.8	3.7	4.0	7.8	
LAB 4	Test n°1	1.74E+13	2.01E+13	2.25E+13	1.65E+13	7.34E+12	9.74E+11	1.08E+11	2.69E+10	7.53E+09	3.23E+09	2.59E+09	1.60E+09	8.50E+13
	Test n°2	1.62E+13	1.77E+13	2.04E+13	1.64E+13	7.86E+12	1.00E+12	1.12E+11	2.80E+10	8.19E+09	3.59E+09	2.88E+09	1.67E+09	7.97E+13
	Test n°3	2.24E+13	1.70E+13	1.76E+13	1.56E+13	7.87E+12	8.74E+11	9.47E+10	2.50E+10	7.34E+09	3.11E+09	2.44E+09	1.44E+09	8.14E+13
	Mean =	1.87E+13	1.82E+13	2.02E+13	1.62E+13	7.69E+12	9.51E+11	1.05E+11	2.67E+10	7.69E+09	3.31E+09	2.64E+09	1.57E+09	8.20E+13
SD =	3.27E+12	1.60E+12	2.48E+12	5.14E+11	3.07E+11	6.85E+10	9.18E+09	1.52E+09	4.47E+08	2.52E+08	2.21E+08	1.16E+08	2.88E+12	
%SD =	17.5	8.7	12.3	3.2	4.0	7.2	8.7	5.7	5.8	7.6	8.4	7.4	3.3	

REPRODUCIBILITY Particle Number (1/km)

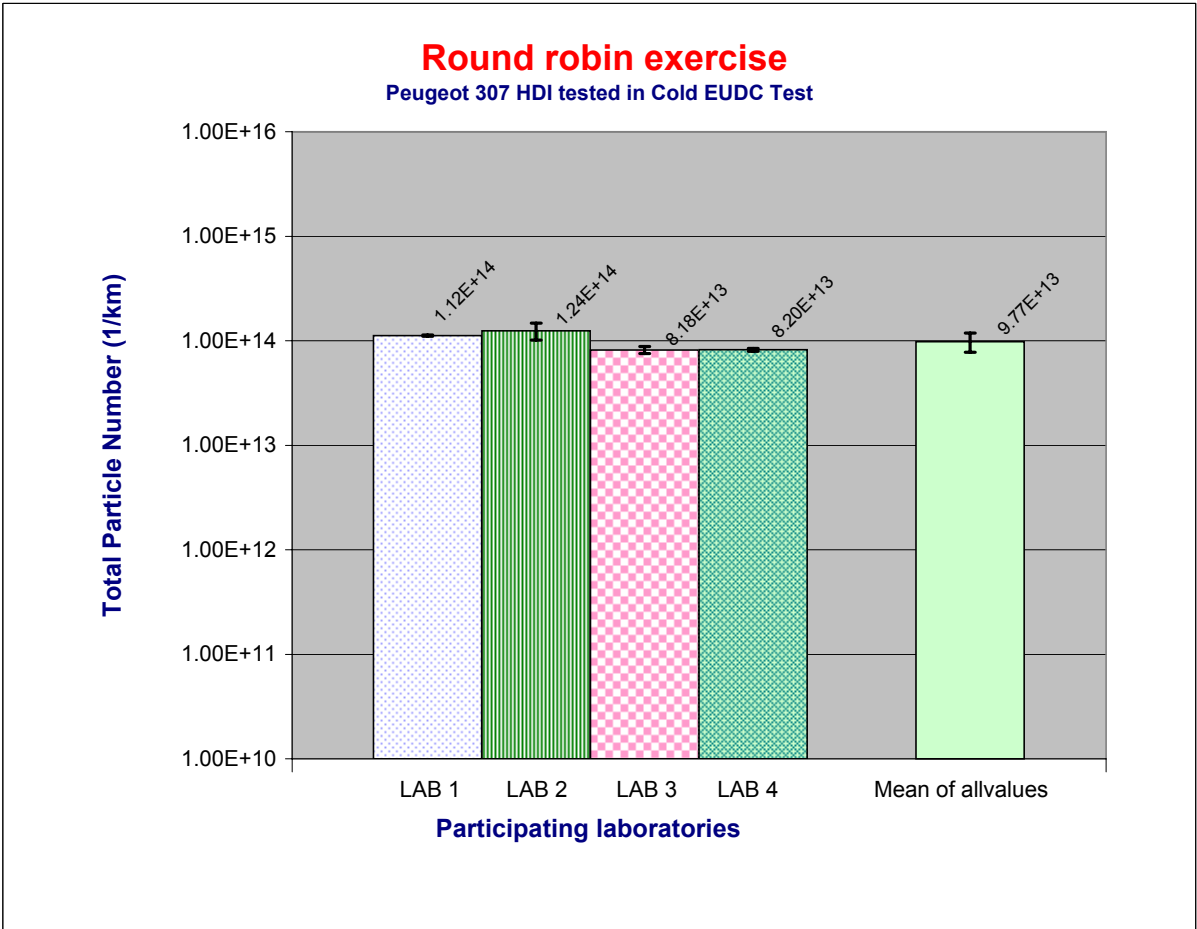
Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12		
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085		
	SUM													
LAB 1	Test n°1	3.57E+13	2.79E+13	3.64E+13	1.12E+13	1.87E+12	2.65E+11	6.55E+10	1.68E+10	7.44E+09	4.00E+09	2.27E+09	2.52E+04	1.13E+14
	Test n°2	4.02E+13	2.33E+13	3.25E+13	1.19E+13	2.23E+12	3.23E+11	8.57E+10	2.14E+10	7.67E+09	3.70E+09	2.29E+09	9.92E+04	1.11E+14
	Test n°3	4.02E+13	2.33E+13	3.25E+13	1.19E+13	2.23E+12	3.23E+11	8.57E+10	2.14E+10	7.67E+09	3.70E+09	2.29E+09	9.92E+04	1.11E+14
LAB 2	Test n°1	3.80E+13	4.62E+13	4.35E+13	1.11E+13	1.89E+12	1.88E+11	4.38E+10	1.61E+10	6.66E+09	3.53E+09	2.47E+09	1.63E+09	1.41E+14
	Test n°2	2.91E+13	3.41E+13	3.33E+13	9.37E+12	1.88E+12	1.95E+11	5.47E+10	1.52E+10	7.34E+09	4.69E+09	2.21E+09	1.52E+09	1.08E+14
	Test n°3	2.91E+13	3.41E+13	3.33E+13	9.37E+12	1.88E+12	1.95E+11	5.47E+10	1.52E+10	7.34E+09	4.69E+09	2.21E+09	1.52E+09	1.08E+14
LAB 3	Test n°1	1.55E+13	1.44E+13	3.06E+13	1.94E+13	7.41E+12	1.08E+12	2.37E+11	2.87E+10	9.96E+09	4.45E+09	2.85E+09	1.67E+09	8.86E+13
	Test n°2	1.22E+13	1.09E+13	2.50E+13	1.83E+13	8.37E+12	1.11E+12	2.55E+11	3.07E+10	1.10E+10	4.85E+09	2.99E+09	1.79E+09	7.62E+13
	Test n°3	1.45E+13	1.09E+13	2.52E+13	1.89E+13	9.40E+12	1.34E+12	2.79E+11	3.26E+10	1.16E+10	4.98E+09	3.07E+09	1.79E+09	8.05E+13
LAB 4	Test n°1	1.74E+13	2.01E+13	2.25E+13	1.65E+13	7.34E+12	9.74E+11	1.08E+11	2.69E+10	7.53E+09	3.23E+09	2.59E+09	1.60E+09	8.50E+13
	Test n°2	1.62E+13	1.77E+13	2.04E+13	1.64E+13	7.86E+12	1.00E+12	1.12E+11	2.80E+10	8.19E+09	3.59E+09	2.88E+09	1.67E+09	7.97E+13
	Test n°3	2.24E+13	1.70E+13	1.76E+13	1.56E+13	7.87E+12	8.74E+11	9.47E+10	2.50E+10	7.34E+09	3.11E+09	2.44E+09	1.44E+09	8.14E+13
Mean =	2.56E+13	2.23E+13	2.90E+13	1.46E+13	5.31E+12	6.97E+11	1.29E+11	2.39E+10	1.44E+10	3.98E+09	2.58E+09	1.19E+09	9.77E+13	
SD =	1.12E+13	1.06E+13	7.66E+12	3.59E+12	3.19E+12	4.37E+11	8.52E+10	6.09E+09	1.96E+10	6.56E+08	3.15E+08	7.71E+08	2.04E+13	
%SD =	44	47	26	25	60	63	66	25	136	16	12	65	21	

Reproducibility limit

EUDC Test Only the average results are presented

Etage n° =	Dp (µm)		LAB 1	LAB 2	LAB 3	LAB 4		Mean of all values
1	0.008		3.87E+13	3.35E+13	1.41E+13	1.87E+13		2.56E+13
2	0.030		2.49E+13	4.01E+13	1.20E+13	1.82E+13		2.23E+13
3	0.063		3.38E+13	3.84E+13	2.69E+13	2.02E+13		2.90E+13
4	0.109		1.17E+13	1.02E+13	1.89E+13	1.62E+13		1.46E+13
5	0.173		2.11E+12	1.88E+12	8.39E+12	7.69E+12		5.31E+12
6	0.267		3.04E+11	1.91E+11	1.18E+12	9.51E+11		6.97E+11
7	0.407		7.90E+10	4.93E+10	2.57E+11	1.05E+11		1.29E+11
8	0.655		1.99E+10	1.57E+10	3.06E+10	2.67E+10		2.39E+10
9	1.021		7.60E+09	4.00E+10	1.08E+10	7.69E+09		1.44E+10
10	1.655		3.80E+09	4.11E+09	4.76E+09	3.31E+09		3.98E+09
11	2.520		2.29E+09	2.34E+09	2.97E+09	2.64E+09		2.58E+09
12	4.085			1.57E+09	1.75E+09	1.57E+09		1.19E+09
Total Particulate Number (1/km) =			1.12E+14	1.24E+14	8.18E+13	8.20E+13		9.77E+13
SD =			1.61E+12	2.32E+13	6.34E+12	2.68E+12		2.04E+13

Note . = Value no treated



Graph : Particle Size Distribution

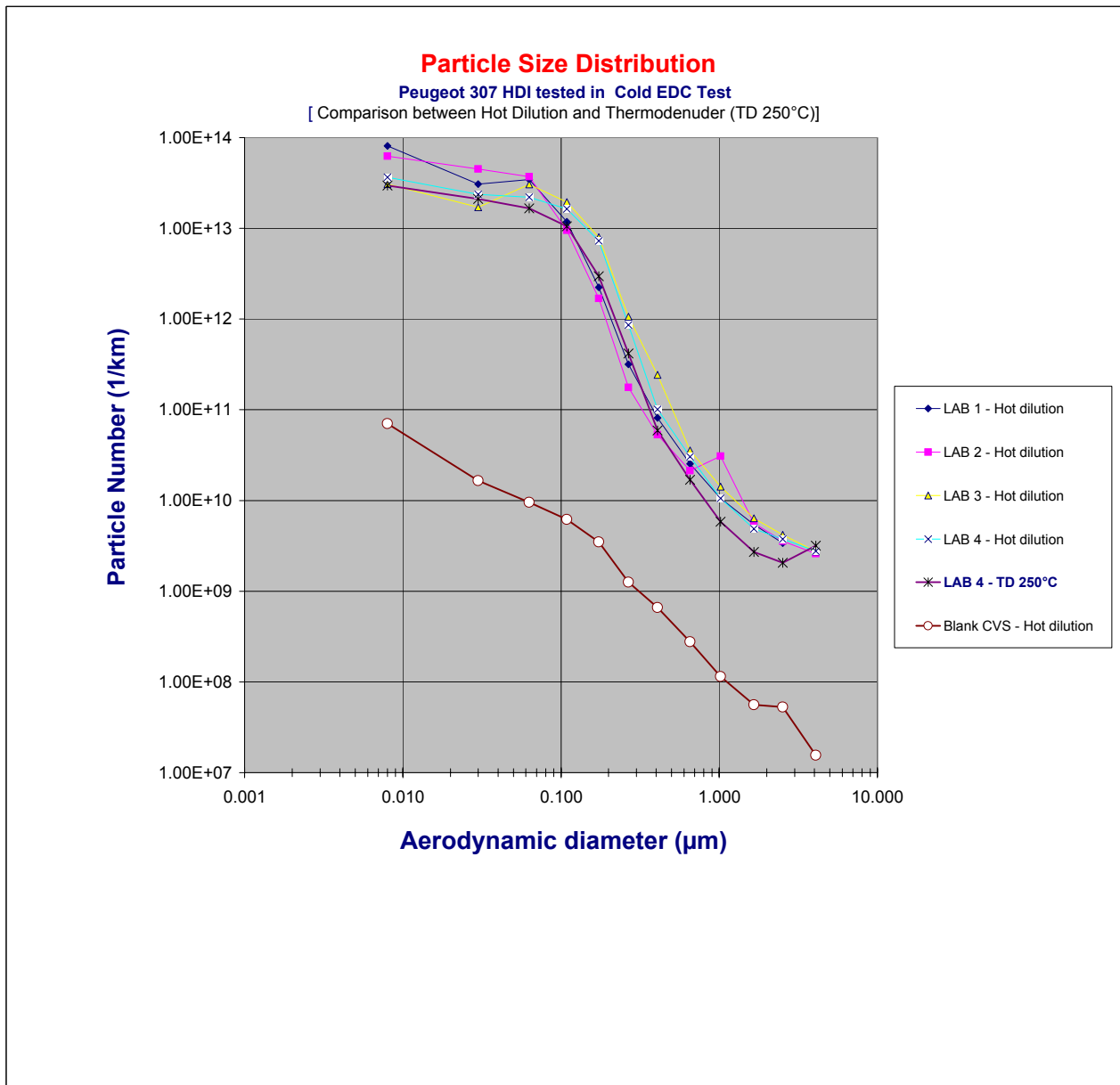
Cold EDC Test

Cold EDC Test **Particle Size Distribution**

Etagé n° =	Dp (µm)	LAB 1 - Hot dilution	LAB 2 - Hot dilution	LAB 3 - Hot dilution	LAB 4	
					Hot dilution	TD 250°C
1	0.008	8.11E+13	6.23E+13	3.07E+13	3.66E+13	2.96E+13
2	0.030	3.07E+13	4.51E+13	1.71E+13	2.37E+13	2.11E+13
3	0.063	3.46E+13	3.72E+13	3.05E+13	2.20E+13	1.66E+13
4	0.109	1.18E+13	9.55E+12	1.95E+13	1.64E+13	1.05E+13
5	0.173	2.23E+12	1.68E+12	7.97E+12	7.27E+12	2.97E+12
6	0.267	3.17E+11	1.77E+11	1.06E+12	8.60E+11	4.17E+11
7	0.407	8.12E+10	5.32E+10	2.43E+11	1.01E+11	5.91E+10
8	0.655	2.54E+10	2.14E+10	3.56E+10	3.04E+10	1.69E+10
9	1.021	1.06E+10	3.09E+10	1.42E+10	1.05E+10	5.84E+09
10	1.655	5.42E+09	5.62E+09	6.35E+09	4.87E+09	2.71E+09
11	2.520	3.38E+09	3.58E+09	4.18E+09	3.74E+09	2.06E+09
12	4.085		2.59E+09	2.75E+09	2.76E+09	3.18E+09
Total Particle Number (1/km) =		1.61E+14	1.56E+14	1.07E+14	1.07E+14	8.13E+13
SD =		8.02E+12	1.53E+13	9.93E+12	5.41E+12	2.17E+12
%SD =		5.0	9.8	9.3	5.1	2.7

Blank CVS / Mean of all values before the tests - Hot dilution
7.06E+10
1.66E+10
9.53E+09
6.19E+09
3.50E+09
1.26E+09
6.59E+08
2.78E+08
1.15E+08
5.60E+07
5.27E+07
1.56E+07
1.09E+11
6.15E+10
56.5

Note . = Value no treated
 TD 250°C = Thermodenuder set at 250°C, this given for information



APPENDIX 2

5.2 PEUGEOT 307 HDI – Diesel engine with DPF

5.2.1 Blank CVS

5.2.2 Repeatability and Reproducibility

- Cold EDC test
- ECE (urban cycle) test
- EUDC (extra-urban cycle) test

Blank CVS

**Blank CVS before the test with Hot dilution (around 120°C to prevent recondensation of the vapor),
Particle Number (1/km)**

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

LAB 1	Test n°1	4.59E+10	9.34E+09	2.84E+09	1.62E+09	8.76E+08	6.25E+08	2.69E+08	1.29E+08	7.99E+07	3.65E+07	2.95E+07	2.26E+07
	Test n°2	3.60E+10	4.62E+09	3.12E+09	1.30E+09	8.72E+08	5.38E+08	2.53E+08	8.81E+07	6.27E+07	3.60E+07	2.54E+07	1.09E+07
	Test n°3	4.54E+10	9.30E+09	2.89E+09	1.37E+09	8.78E+08	6.59E+08	2.53E+08	1.54E+08	7.25E+07	2.36E+07	2.94E+07	1.78E+07
LAB 2	Test n°1	7.09E+11	1.27E+11	1.79E+07	3.43E+08	3.67E+08	2.23E+09	1.63E+09	3.83E+08	1.68E+08	5.28E+07	7.08E+07	1.45E+07
	Test n°2	1.60E+11	5.43E+10	1.89E+10	1.01E+10	4.17E+09	1.77E+09	7.15E+08	4.00E+08	2.45E+08	8.08E+07	4.53E+07	1.70E+07
LAB 3	Test n°1	5.69E+10	1.61E+10	1.23E+10	8.92E+09	4.59E+09	1.42E+09	4.28E+08	2.60E+08	1.42E+08	1.35E+08	4.25E+07	2.57E+07
	Test n°2	3.41E+09	5.95E+08	4.95E+09	3.81E+09	2.00E+09	1.33E+08	2.55E+08	7.35E+07	7.48E+07	3.17E+07	4.21E+07	1.54E+07
	Test n°3	2.71E+10	2.28E+09	4.11E+09	3.45E+09	1.16E+09	3.93E+08	1.29E+08	1.55E+08	7.59E+07	3.68E+07	2.34E+07	1.24E+07
LAB 4	Test n°1	6.67E+10	5.69E+09	3.35E+09	3.99E+09	5.77E+08	9.87E+08	5.13E+08	1.72E+08	1.93E+08	7.89E+07	2.31E+07	4.27E+07
	Test n°2	1.98E+11	3.58E+10	8.95E+09	5.01E+09	3.38E+09	1.63E+09	1.00E+09	4.77E+08	3.48E+08	1.85E+08	6.54E+07	6.57E+07
	Test n°3	1.14E+11	5.31E+09	3.56E+09	1.41E+09	6.78E+08	3.83E+08	6.90E+07	2.01E+08	9.38E+07	3.50E+07	2.31E+07	3.24E+07

SUM

6.18E+10	LAB 1
4.69E+10	
6.10E+10	
8.42E+11	LAB 2
2.50E+11	
2.55E+11	LAB 3
1.01E+11	
1.54E+10	
3.89E+10	LAB 4
8.23E+10	
2.55E+11	
1.26E+11	

Mean =	1.37E+11	2.71E+10	6.34E+09	3.93E+09	1.78E+09	9.97E+08	5.11E+08	2.33E+08	1.41E+08	6.72E+07	3.80E+07	2.44E+07
SD =	1.91E+11	3.71E+10	5.40E+09	3.10E+09	1.47E+09	6.53E+08	4.41E+08	1.31E+08	8.66E+07	4.87E+07	1.62E+07	1.59E+07
%SD =	140	137	85	79	82	66	86	56	61	72	43	65

1.78E+11
2.27E+11
127.4

Cold EDC Test

Peugeot 307 HDI+DPF

Cold EDC Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.132	135.6	0.035	0.245	0.280	0.0005	5.11
	Test n°2	0.118	137.5	0.033	0.257	0.290	0.0008	5.18
	Test n°3	0.102	136.4	0.032	0.260	0.292	0.0004	5.14
Mean =		0.117	137	0.033	0.254	0.287	0.001	5.14
SD =		0.015	0.95	0.002	0.008	0.006	0.000	0.04
%SD =		12.7	0.7	5.0	3.1	2.2	36.7	0.7

LAB 2	Test n°1	0.300	136.0	0.058	0.305	0.363	0.0010	5.10
	Test n°2	0.271	135.6	0.052	0.283	0.335	0.0000	5.08
	Test n°3	0.280	136.0	0.051	0.297	0.348	0.0010	5.10
Mean =		0.284	135.9	0.054	0.295	0.349	0.0007	5.09
SD =		0.015	0.2	0.004	0.011	0.014	0.0006	0.01
%SD =		5.2	0.2	7.1	3.8	4.0	86.6	0.2

LAB 3	Test n°1	0.177	135.1	0.040	0.283	0.323	0.0004	5.16
	Test n°2	0.108	135.4	0.028	0.108	0.136	0.0024	5.16
	Test n°3	0.076	137.1	0.025	0.284	0.309	0.0001	5.22
Mean =		0.120	135.9	0.031	0.225	0.256	0.0010	5.18
SD =		0.052	1.1	0.008	0.101	0.104	0.0013	0.03
%SD =		42.9	0.8	25.6	45.0	40.7	133.2	0.7

LAB 4	Test n°1	0.081	138.8	0.022	0.319	0.341	0.0004	5.25
	Test n°2	0.095	139.9	0.031	0.300	0.331	0.0009	5.29
	Test n°3	0.122	140.7	0.030	0.303	0.333	0.0016	5.32
Mean =		0.099	139.8	0.028	0.307	0.335	0.0010	5.29
SD =		0.021	1.0	0.005	0.010	0.005	0.0006	0.04
%SD =		21.0	0.7	17.8	3.3	1.6	62.4	0.7

Cold EDC Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.132	135.6	0.035	0.245	0.280	0.0005	5.11
	Test n°2	0.118	137.5	0.033	0.257	0.290	0.0008	5.18
	Test n°3	0.102	136.4	0.032	0.260	0.292	0.0004	5.14
LAB 2	Test n°1	0.300	136.0	0.058	0.305	0.363	0.0010	5.10
	Test n°2	0.271	135.6	0.052	0.283	0.335	0.0000	5.08
	Test n°3	0.280	136.0	0.051	0.297	0.348	0.0010	5.10
LAB 3	Test n°1	0.177	135.1	0.040	0.283	0.323	0.0004	5.16
	Test n°2	0.108	135.4	0.028	0.108	0.136	0.0024	5.16
	Test n°3	0.076	137.1	0.025	0.284	0.309	0.0001	5.22
LAB 4	Test n°1	0.081	138.8	0.022	0.319	0.341	0.0004	5.25
	Test n°2	0.095	139.9	0.031	0.300	0.331	0.0009	5.29
	Test n°3	0.122	140.7	0.030	0.303	0.333	0.0016	5.32
Mean =		0.155	137.0	0.036	0.270	0.307	0.0008	5.17
SD =		0.082	1.9	0.011	0.056	0.059	0.0007	0.08
%SD =		52.8	1.4	31.6	20.6	19.4	86.3	1.5

Cold EDC Test Peugeot 307 HDI+DPF tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY Particle Number (1/km)

Stage n:o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

		SUM												
LAB 1	Test n°1	4.44E+10	8.91E+09	2.68E+09	1.86E+09	9.06E+08	6.51E+08	2.15E+08	9.79E+07	5.93E+07	4.32E+07	1.77E+07	2.39E+07	5.98E+10
	Test n°2	5.74E+10	7.19E+09	3.22E+09	1.58E+09	7.06E+08	3.90E+08	3.45E+08	1.39E+08	8.31E+07	3.08E+07	3.16E+07	1.93E+07	7.11E+10
	Test n°3	5.39E+10	7.59E+09	3.37E+09	1.86E+09	1.07E+09	4.72E+08	2.79E+08	1.16E+08	9.08E+07	3.20E+07	3.21E+07	1.97E+07	6.88E+10
	Mean =	5.19E+10	7.90E+09	3.09E+09	1.77E+09	8.94E+08	5.04E+08	2.80E+08	1.18E+08	7.77E+07	3.53E+07	2.71E+07	2.10E+07	6.66E+10
	SD =	6.71E+09	8.99E+08	3.65E+08	1.62E+08	1.83E+08	1.33E+08	6.47E+07	2.06E+07	1.64E+07	6.82E+06	8.19E+06	2.58E+06	5.95E+09
	%SD =	12.9	11.4	11.8	9.2	20.5	26.4	23.1	17.5	21.1	19.3	30.2	12.3	8.9
LAB 1	Test n°1	1.95E+11	4.89E+10	1.22E+10	8.72E+09	2.10E+09	2.33E+09	7.50E+08	3.98E+08	2.31E+08	9.17E+07	5.56E+07	2.31E+07	2.71E+11
	Test n°2	2.13E+11	6.67E+10	1.25E+10	7.55E+09	2.82E+09	1.09E+09	8.99E+08	2.98E+08	2.04E+08	7.20E+07	2.56E+07	1.91E+07	3.05E+11
	Test n°3	2.87E+11	5.26E+10	1.42E+10	5.98E+09	2.15E+09	1.89E+09	5.92E+08	3.73E+08	1.16E+08	8.92E+07	4.26E+07	2.41E+07	3.65E+11
	Mean =	2.32E+11	5.61E+10	1.30E+10	7.42E+09	2.36E+09	1.77E+09	7.47E+08	3.56E+08	1.83E+08	8.43E+07	4.13E+07	2.21E+07	3.14E+11
	SD =	4.88E+10	9.39E+09	1.11E+09	1.38E+09	4.05E+08	6.27E+08	1.54E+08	5.23E+07	6.00E+07	1.08E+07	1.50E+07	2.67E+06	4.77E+10
	%SD =	21.0	16.7	8.5	18.6	17.2	35.4	20.6	14.7	32.7	12.8	36.5	12.1	15.2
LAB 3	Test n°1	1.45E+11	4.01E+10	3.01E+10	1.57E+10	7.34E+09	2.87E+09	1.34E+09	8.63E+08	4.39E+08	3.90E+08	1.25E+08	7.36E+07	2.44E+11
	Test n°2	1.58E+10	5.54E+09	2.55E+10	2.38E+10	1.00E+10	9.10E+08	7.20E+08	2.97E+08	2.45E+08	1.16E+08	1.08E+08	4.84E+07	8.30E+10
	Test n°3	4.62E+10	8.02E+09	1.58E+10	1.41E+10	4.46E+09	8.89E+08	3.13E+08	4.56E+08	1.21E+08	8.56E+07	5.49E+07	2.95E+07	9.06E+10
	Mean =	6.88E+10	1.79E+10	2.38E+10	1.79E+10	7.28E+09	1.55E+09	7.90E+08	5.39E+08	2.69E+08	1.97E+08	9.61E+07	5.05E+07	1.39E+11
	SD =	6.73E+10	1.93E+10	7.26E+09	5.17E+09	2.79E+09	1.14E+09	5.15E+08	2.92E+08	1.60E+08	1.68E+08	3.66E+07	2.21E+07	9.07E+10
	%SD =	97.7	107.7	30.5	29.0	38.4	73.0	65.2	54.2	59.6	85.0	38.1	43.8	65.2
LAB 4	Test n°1	9.49E+10	7.02E+09	4.22E+09	3.97E+09	6.53E+08	6.73E+08	2.22E+08	1.38E+08	1.95E+08	4.46E+07	1.96E+07	3.02E+07	1.12E+11
	Test n°2	3.06E+11	3.84E+10	1.63E+10	9.49E+09	3.64E+09	3.04E+09	1.71E+09	8.20E+08	5.45E+08	2.64E+08	1.09E+08	8.92E+07	3.81E+11
	Test n°3	1.27E+11	1.05E+10	1.44E+09	2.36E+09	3.94E+08	5.65E+08	1.06E+08	1.54E+08	6.85E+07	3.40E+07	3.48E+07	3.24E+07	1.43E+11
	Mean =	1.76E+11	1.86E+10	7.31E+09	5.27E+09	1.56E+09	1.43E+09	6.79E+08	3.71E+08	2.70E+08	1.14E+08	5.46E+07	5.06E+07	2.12E+11
	SD =	1.14E+11	1.72E+10	7.89E+09	3.74E+09	1.80E+09	1.40E+09	8.93E+08	3.89E+08	2.47E+08	1.30E+08	4.81E+07	3.35E+07	1.47E+11
	%SD =	64.6	92.3	107.9	70.9	115.5	98.2	131.6	104.9	91.6	113.8	88.1	66.2	69.3

REPRODUCIBILITY Particle Number (1/km)

Stage n:o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

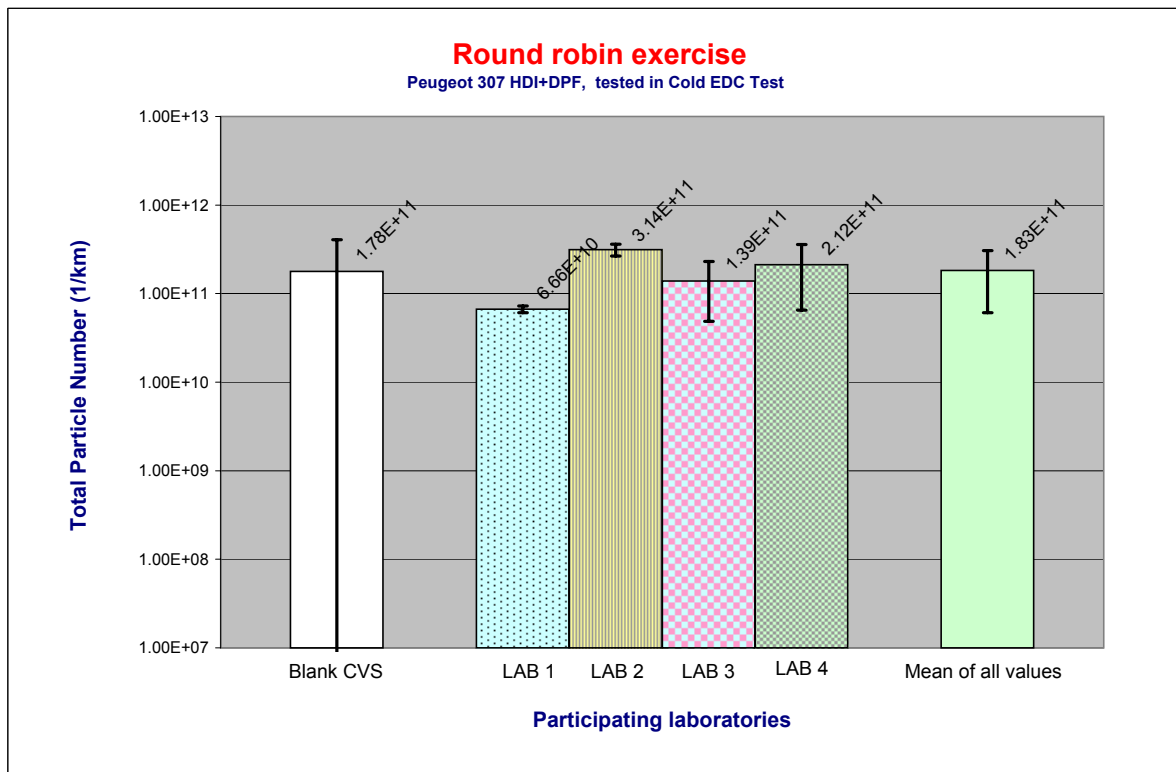
		SUM													
LAB 1	Test n°1	4.44E+10	8.91E+09	2.68E+09	1.86E+09	9.06E+08	6.51E+08	2.15E+08	9.79E+07	5.93E+07	4.32E+07	1.77E+07	2.39E+07	5.98E+10	LAB 1
	Test n°2	5.74E+10	7.19E+09	3.22E+09	1.58E+09	7.06E+08	3.90E+08	3.45E+08	1.39E+08	8.31E+07	3.08E+07	3.16E+07	1.93E+07	7.11E+10	
	Test n°3	5.39E+10	7.59E+09	3.37E+09	1.86E+09	1.07E+09	4.72E+08	2.79E+08	1.16E+08	9.08E+07	3.20E+07	3.21E+07	1.97E+07	6.88E+10	
LAB 2	Test n°1	1.95E+11	4.89E+10	1.22E+10	8.72E+09	2.10E+09	2.33E+09	7.50E+08	3.98E+08	2.31E+08	9.17E+07	5.56E+07	2.31E+07	2.71E+11	LAB 2
	Test n°2	2.13E+11	6.67E+10	1.25E+10	7.55E+09	2.82E+09	1.09E+09	8.99E+08	2.98E+08	2.04E+08	7.20E+07	2.56E+07	1.91E+07	3.05E+11	
	Test n°3	2.87E+11	5.26E+10	1.42E+10	5.98E+09	2.15E+09	1.89E+09	5.92E+08	3.73E+08	1.16E+08	8.92E+07	4.26E+07	2.41E+07	3.65E+11	
LAB 3	Test n°1	1.45E+11	4.01E+10	3.01E+10	1.57E+10	7.34E+09	2.87E+09	1.34E+09	8.63E+08	4.39E+08	3.90E+08	1.25E+08	7.36E+07	2.44E+11	LAB 3
	Test n°2	1.58E+10	5.54E+09	2.55E+10	2.38E+10	1.00E+10	9.10E+08	7.20E+08	2.97E+08	2.45E+08	1.16E+08	1.08E+08	4.84E+07	8.30E+10	
	Test n°3	4.62E+10	8.02E+09	1.58E+10	1.41E+10	4.46E+09	8.89E+08	3.13E+08	4.56E+08	1.21E+08	8.56E+07	5.49E+07	2.95E+07	9.06E+10	
LAB 4	Test n°1	9.49E+10	7.02E+09	4.22E+09	3.97E+09	6.53E+08	6.73E+08	2.22E+08	1.38E+08	1.95E+08	4.46E+07	1.96E+07	3.02E+07	1.12E+11	LAB 4
	Test n°2	3.06E+11	3.84E+10	1.63E+10	9.49E+09	3.64E+09	3.04E+09	1.71E+09	8.20E+08	5.45E+08	2.64E+08	1.09E+08	8.92E+07	3.81E+11	
	Test n°3	1.27E+11	1.05E+10	1.44E+09	2.36E+09	3.94E+08	5.65E+08	1.06E+08	1.54E+08	6.85E+07	3.40E+07	3.48E+07	3.24E+07	1.43E+11	
	Mean =	1.32E+11	2.51E+10	1.18E+10	8.08E+09	3.02E+09	1.31E+09	6.24E+08	3.46E+08	2.00E+08	1.08E+08	5.48E+07	3.60E+07	1.83E+11	
	SD =	9.86E+10	2.25E+10	9.32E+09	6.86E+09	2.99E+09	9.59E+08	4.93E+08	2.61E+08	1.52E+08	1.10E+08	3.79E+07	2.29E+07	1.22E+11	
	%SD =	74.6	89.5	79.0	84.9	98.8	73.0	79.1	75.5	76.2	101.6	69.3	63.6	66.9	

Reproducibility limit

Cold EDC Test

Only the average results are presented

Etage n° =	Dp (µm)	Blank CVS before the test	LAB 1	LAB 2	LAB 3	LAB 4	Mean of all values
1	0.008	1.37E+11	5.19E+10	2.32E+11	6.88E+10	1.76E+11	1.32E+11
2	0.030	2.71E+10	7.90E+09	5.61E+10	1.79E+10	1.86E+10	2.51E+10
3	0.063	6.34E+09	3.09E+09	1.30E+10	2.38E+10	7.31E+09	1.18E+10
4	0.109	3.93E+09	1.77E+09	7.42E+09	1.79E+10	5.27E+09	8.08E+09
5	0.173	1.78E+09	8.94E+08	2.36E+09	7.28E+09	1.56E+09	3.02E+09
6	0.267	9.97E+08	5.04E+08	1.77E+09	1.55E+09	1.43E+09	1.31E+09
7	0.407	5.11E+08	2.80E+08	7.47E+08	7.90E+08	6.79E+08	6.24E+08
8	0.655	2.33E+08	1.18E+08	3.56E+08	5.39E+08	3.71E+08	3.46E+08
9	1.021	1.41E+08	7.77E+07	1.83E+08	2.69E+08	2.70E+08	2.00E+08
10	1.655	6.72E+07	3.53E+07	8.43E+07	1.97E+08	1.14E+08	1.08E+08
11	2.520	3.80E+07	2.71E+07	4.13E+07	9.61E+07	5.46E+07	5.48E+07
12	4.085	2.44E+07	2.10E+07	2.21E+07	5.05E+07	5.06E+07	3.60E+07
Total Particle Number (1/km) =		1.78E+11	6.66E+10	3.14E+11	1.39E+11	2.12E+11	1.83E+11
SD =		2.27E+11	5.95E+09	4.77E+10	9.07E+10	1.47E+11	1.22E+11



For information

Cold EDC Test

Peugeot 307 HDI+DPF, tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY

dN/dlogDp (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

													SUM	
LAB 1	Test n°1	7.19E+10	2.96E+10	1.09E+10	8.88E+09	4.79E+09	3.49E+09	1.02E+09	5.11E+08	2.81E+08	2.35E+08	8.47E+07	5.84E+07	1.32E+11
	Test n°2	9.29E+10	2.39E+10	1.31E+10	7.56E+09	3.73E+09	2.09E+09	1.63E+09	7.26E+08	3.94E+08	1.67E+08	1.51E+08	4.71E+07	1.46E+11
	Test n°3	8.73E+10	2.52E+10	1.38E+10	8.92E+09	5.67E+09	2.53E+09	1.32E+09	6.08E+08	4.30E+08	1.74E+08	1.54E+08	4.79E+07	1.46E+11
	Mean =	8.40E+10	2.62E+10	1.26E+10	8.45E+09	4.73E+09	2.70E+09	1.33E+09	6.15E+08	3.68E+08	1.92E+08	1.30E+08	5.11E+07	1.41E+11
	SD =	1.09E+10	2.99E+09	1.49E+09	7.77E+08	9.68E+08	7.14E+08	3.07E+08	1.08E+08	7.77E+07	3.70E+07	3.92E+07	6.29E+06	8.37E+09
	%SD =	12.9	11.4	11.8	9.2	20.5	26.4	23.1	17.5	21.1	19.3	30.2	12.3	5.9
LAB 2	Test n°1	3.17E+11	1.67E+11	5.49E+10	4.00E+10	9.19E+09	1.43E+10	3.65E+09	2.10E+09	1.01E+09	5.26E+08	2.50E+08	1.03E+08	9.09E+10
	Test n°2	3.45E+11	2.27E+11	5.64E+10	3.46E+10	1.23E+10	6.69E+09	4.38E+09	1.57E+09	8.97E+08	4.13E+08	1.15E+08	8.54E+07	1.02E+11
	Test n°3	4.65E+11	1.79E+11	6.42E+10	2.74E+10	9.37E+09	1.16E+10	2.88E+09	1.97E+09	5.10E+08	5.12E+08	1.92E+08	1.08E+08	1.22E+11
	Mean =	3.76E+11	1.91E+11	5.85E+10	3.40E+10	1.03E+10	1.09E+10	3.64E+09	1.88E+09	8.07E+08	4.84E+08	1.85E+08	9.89E+07	1.05E+11
	SD =	7.90E+10	3.20E+10	4.99E+09	6.31E+09	1.77E+09	3.85E+09	7.50E+08	2.76E+08	2.64E+08	6.17E+07	6.76E+07	1.19E+07	1.60E+10
	%SD =	21.0	16.7	8.5	18.6	17.2	35.4	20.6	14.7	32.7	12.8	36.5	12.1	15.2
LAB 3	Test n°1	1.45E+11	4.01E+10	3.01E+10	1.57E+10	7.34E+09	2.87E+09	1.34E+09	8.63E+08	4.39E+08	3.90E+08	1.25E+08	7.36E+07	2.44E+11
	Test n°2	1.58E+10	5.54E+09	2.55E+10	2.38E+10	1.00E+10	9.10E+08	7.20E+08	2.97E+08	2.45E+08	1.16E+08	1.08E+08	4.84E+07	8.30E+10
	Test n°3	4.62E+10	8.02E+09	1.58E+10	1.41E+10	4.46E+09	8.89E+08	3.13E+08	4.56E+08	1.21E+08	8.56E+07	5.49E+07	2.95E+07	9.06E+10
	Mean =	6.88E+10	1.79E+10	2.38E+10	1.79E+10	7.28E+09	1.55E+09	7.90E+08	5.39E+08	2.69E+08	1.97E+08	9.61E+07	5.05E+07	1.39E+11
	SD =	6.73E+10	1.93E+10	7.26E+09	5.17E+09	2.79E+09	1.14E+09	5.15E+08	2.92E+08	1.60E+08	1.68E+08	3.66E+07	2.21E+07	9.07E+10
	%SD =	97.7	107.7	30.5	29.0	38.4	73.0	65.2	54.2	59.6	85.0	38.1	43.8	65.2
LAB 4	Test n°1	1.65E+11	2.18E+10	1.77E+10	1.98E+10	3.46E+09	3.67E+09	1.08E+09	7.17E+08	9.31E+08	2.44E+08	9.32E+07	7.77E+07	2.35E+11
	Test n°2	5.34E+11	1.19E+11	6.84E+10	4.73E+10	1.93E+10	1.66E+10	8.27E+09	4.25E+09	2.80E+09	1.45E+09	5.22E+08	2.30E+08	8.22E+11
	Test n°3	2.22E+11	3.26E+10	6.06E+09	1.18E+10	2.09E+09	3.09E+09	5.13E+08	7.99E+08	3.27E+08	1.86E+08	1.66E+08	8.34E+07	2.80E+11
	Mean =	3.07E+11	5.79E+10	3.07E+10	2.63E+10	8.28E+09	7.79E+09	3.28E+09	1.92E+09	1.29E+09	6.26E+08	2.60E+08	1.30E+08	4.45E+11
	SD =	1.98E+11	5.34E+10	3.31E+10	1.86E+10	9.57E+09	7.65E+09	4.32E+09	2.02E+09	1.18E+09	7.12E+08	2.29E+08	8.62E+07	3.27E+11
	%SD =	64.6	92.3	107.9	70.9	115.5	98.2	131.6	104.9	91.6	113.8	88.1	66.2	73.4

REPRODUCIBILITY

dN/dlogDp (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

													SUM		
LAB 1	Test n°1	7.19E+10	2.96E+10	1.09E+10	8.88E+09	4.79E+09	3.49E+09	1.02E+09	5.11E+08	2.81E+08	2.35E+08	8.47E+07	5.84E+07	1.32E+11	LAB 1
	Test n°2	9.29E+10	2.39E+10	1.31E+10	7.56E+09	3.73E+09	2.09E+09	1.63E+09	7.26E+08	3.94E+08	1.67E+08	1.51E+08	4.71E+07	1.46E+11	
	Test n°3	8.73E+10	2.52E+10	1.38E+10	8.92E+09	5.67E+09	2.53E+09	1.32E+09	6.08E+08	4.30E+08	1.74E+08	1.54E+08	4.79E+07	1.46E+11	
LAB 2	Test n°1	3.17E+11	1.67E+11	5.49E+10	4.00E+10	9.19E+09	1.43E+10	3.65E+09	2.10E+09	1.01E+09	5.26E+08	2.50E+08	1.03E+08	9.09E+10	LAB 2
	Test n°2	3.45E+11	2.27E+11	5.64E+10	3.46E+10	1.23E+10	6.69E+09	4.38E+09	1.57E+09	8.97E+08	4.13E+08	1.15E+08	8.54E+07	1.02E+11	
	Test n°3	4.65E+11	1.79E+11	6.42E+10	2.74E+10	9.37E+09	1.16E+10	2.88E+09	1.97E+09	5.10E+08	5.12E+08	1.92E+08	1.08E+08	1.22E+11	
LAB 3	Test n°1	1.45E+11	4.01E+10	3.01E+10	1.57E+10	7.34E+09	2.87E+09	1.34E+09	8.63E+08	4.39E+08	3.90E+08	1.25E+08	7.36E+07	2.44E+11	LAB 3
	Test n°2	1.58E+10	5.54E+09	2.55E+10	2.38E+10	1.00E+10	9.10E+08	7.20E+08	2.97E+08	2.45E+08	1.16E+08	1.08E+08	4.84E+07	8.30E+10	
	Test n°3	4.62E+10	8.02E+09	1.58E+10	1.41E+10	4.46E+09	8.89E+08	3.13E+08	4.56E+08	1.21E+08	8.56E+07	5.49E+07	2.95E+07	9.06E+10	
LAB 4	Test n°1	1.65E+11	2.18E+10	1.77E+10	1.98E+10	3.46E+09	3.67E+09	1.08E+09	7.17E+08	9.31E+08	2.44E+08	9.32E+07	7.77E+07	2.35E+11	LAB 4
	Test n°2	5.34E+11	1.19E+11	6.84E+10	4.73E+10	1.93E+10	1.66E+10	8.27E+09	4.25E+09	2.80E+09	1.45E+09	5.22E+08	2.30E+08	8.22E+11	
	Test n°3	2.22E+11	3.26E+10	6.06E+09	1.18E+10	2.09E+09	3.09E+09	5.13E+08	7.99E+08	3.27E+08	1.86E+08	1.66E+08	8.34E+07	2.80E+11	
	Mean =	2.09E+11	7.33E+10	3.14E+10	2.16E+10	7.65E+09	5.73E+09	2.26E+09	1.24E+09	6.82E+08	3.75E+08	1.68E+08	8.27E+07	2.08E+11	
	SD =	1.70E+11	7.79E+10	2.30E+10	1.32E+10	4.81E+09	5.41E+09	2.28E+09	1.12E+09	6.69E+08	3.69E+08	1.23E+08	5.21E+07	2.04E+11	
	%SD =	81	106	73	61	63	94	101	90	98	99	73	63	98.3	

Reproducibility limit

ECE Test

Peugeot 307 HDI+DPF.

ECE Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.356	178.4	0.078	0.303	0.382	0.0005	6.73
	Test n°2	0.320	180.4	0.074	0.318	0.392	0.0010	6.81
	Test n°3	0.276	178.0	0.070	0.320	0.391	0.0005	6.71
Mean =		0.32	179	0.074	0.314	0.388	0.001	6.75
SD =		0.04	1.29	0.004	0.009	0.006	0.000	0.05
%SD =		12.7	0.7	5.4	2.9	1.5	43.3	0.7

LAB 1	Test n°1	0.785	178.5	0.133	0.329	0.462	0.0000	6.72
	Test n°2	0.708	179.1	0.121	0.328	0.449	0.0000	6.74
	Test n°3	0.729	117.5	0.119	0.332	0.451	0.0000	6.68
Mean =		0.741	158.4	0.124	0.330	0.454	0.0000	6.71
SD =		0.040	35.4	0.008	0.002	0.007	0.0000	0.03
%SD =		5.4	22.3	6.1	0.6	1.5	#DIV/0!	0.5

LAB 3	Test n°1	0.466	178.3	0.092	0.338	0.430	0.0002	6.82
	Test n°2	0.284	179.8	0.064	0.314	0.378	0.0037	6.86
	Test n°3	0.199	184.0	0.057	0.346	0.403	0.0000	7.01
Mean =		0.316	180.7	0.071	0.333	0.404	0.0013	6.90
SD =		0.136	3.0	0.019	0.017	0.026	0.0021	0.10
%SD =		43.1	1.6	26.1	5.0	6.4	157.1	1.5

LAB 4	Test n°1	0.221	184.7	0.054	0.399	0.453	0.0006	6.99
	Test n°2	0.256	182.6	0.075	0.363	0.438	0.0012	6.92
	Test n°3	0.327	182.7	0.072	0.362	0.434	0.0022	6.93
Mean =		0.268	183.3	0.067	0.375	0.442	0.0013	6.95
SD =		0.054	1.2	0.011	0.021	0.010	0.0008	0.04
%SD =		20.2	0.6	17.0	5.6	2.3	60.6	0.5

ECE Test		CO (g/km)	CO2 (g/km)	HC (g/km)	NOx (g/km)	HC+NOx (g/km)	Particulates (g/km)	Consumption BC (l/100km)
LAB 1	Test n°1	0.356	178.4	0.078	0.303	0.382	0.0005	6.73
	Test n°2	0.320	180.4	0.074	0.318	0.392	0.0010	6.81
	Test n°3	0.276	178.0	0.070	0.320	0.391	0.0005	6.71
LAB 2	Test n°1	0.785	178.5	0.133	0.329	0.462	0.0000	6.72
	Test n°2	0.708	179.1	0.121	0.328	0.449	0.0000	6.74
	Test n°3	0.729	117.5	0.119	0.332	0.451	0.0000	6.68
LAB 3	Test n°1	0.466	178.3	0.092	0.338	0.430	0.0002	6.82
	Test n°2	0.284	179.8	0.064	0.314	0.378	0.0037	6.86
	Test n°3	0.199	184.0	0.057	0.346	0.403	0.0000	7.01
LAB 4	Test n°1	0.221	184.7	0.054	0.399	0.453	0.0006	6.99
	Test n°2	0.256	182.6	0.075	0.363	0.438	0.0012	6.92
	Test n°3	0.327	182.7	0.072	0.362	0.434	0.0022	6.93
Mean =		0.411	175.3	0.084	0.338	0.422	0.0008	6.83
SD =		0.211	18.4	0.026	0.026	0.031	0.0011	0.11
%SD =		51.4	10.5	31.3	7.8	7.3	134.2	1.7

ECE Test

Peugeot 307 HDI+DPF, tested with Hot dilution (around 120°C to prevent recondensation of the vapor).

REPEATABILITY

Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

													SUM	
LAB 1	Test n°1	8.06E+10	1.60E+10	4.70E+09	3.27E+09	1.63E+09	1.20E+09	4.07E+08	1.66E+08	1.02E+08	7.66E+07	3.22E+07	4.35E+07	1.08E+11
	Test n°2	9.98E+10	1.28E+10	5.77E+09	2.85E+09	1.15E+09	7.01E+08	6.13E+08	2.47E+08	1.52E+08	5.23E+07	5.31E+07	3.55E+07	1.24E+11
	Test n°3	9.23E+10	1.42E+10	6.14E+09	3.36E+09	1.87E+09	8.64E+08	4.96E+08	2.06E+08	1.52E+08	5.47E+07	5.58E+07	3.58E+07	1.20E+11
	Mean =	9.09E+10	1.43E+10	5.54E+09	3.16E+09	1.55E+09	9.21E+08	5.05E+08	2.06E+08	1.36E+08	6.12E+07	4.70E+07	3.83E+07	1.17E+11
	SD =	9.69E+09	1.61E+09	7.46E+08	2.72E+08	3.69E+08	2.53E+08	1.03E+08	4.04E+07	2.91E+07	1.34E+07	1.29E+07	4.53E+06	8.25E+09
	%SD =	10.7	11.3	13.5	8.6	23.8	27.5	20.5	19.5	21.5	21.9	27.5	11.9	7.0
LAB 1	Test n°1	3.53E+11	8.23E+10	2.19E+10	1.53E+10	3.70E+09	4.05E+09	1.37E+09	6.80E+08	4.07E+08	1.72E+08	9.79E+07	4.02E+07	4.83E+11
	Test n°2	3.87E+11	1.12E+11	2.37E+10	1.42E+10	5.49E+09	1.98E+09	1.60E+09	5.63E+08	3.74E+08	1.31E+08	4.53E+07	3.46E+07	5.47E+11
	Test n°3	5.08E+11	9.47E+10	2.54E+10	1.07E+10	3.95E+09	3.28E+09	1.02E+09	6.60E+08	2.12E+08	1.65E+08	8.03E+07	4.33E+07	6.48049E+11
	Mean =	4.16E+11	9.63E+10	2.37E+10	1.34E+10	4.38E+09	3.10E+09	1.33E+09	6.35E+08	3.31E+08	1.56E+08	7.45E+07	3.94E+07	5.59E+11
	SD =	8.15E+10	1.49E+10	1.75E+09	2.37E+09	9.73E+08	1.04E+09	2.89E+08	6.25E+07	1.04E+08	2.21E+07	2.67E+07	4.39E+06	8.34E+10
	%SD =	19.6	15.5	7.4	17.7	22.2	33.7	21.8	9.8	31.5	14.2	35.9	11.1	14.9
LAB 3	Test n°1	2.81E+11	7.07E+10	5.26E+10	2.84E+10	1.37E+10	5.27E+09	2.33E+09	1.51E+09	7.85E+08	6.97E+08	2.26E+08	1.33E+08	4.57E+11
	Test n°2	3.94E+10	1.38E+10	5.97E+10	5.28E+10	2.06E+10	1.84E+09	1.26E+09	4.90E+08	3.99E+08	1.87E+08	1.83E+08	8.18E+07	1.91E+11
	Test n°3	1.20E+11	2.1E+10	3.7E+10	3.3E+10	1.1E+10	1.9E+09	6.1E+08	8.2E+08	2.4E+08	1.6E+08	1.0E+08	5.4E+07	2.25E+11
	Mean =	1.47E+11	3.52E+10	4.98E+10	3.80E+10	1.50E+10	3.01E+09	1.40E+09	9.40E+08	4.73E+08	3.47E+08	1.70E+08	8.95E+07	2.91E+11
	SD =	1.23E+11	3.10E+10	1.16E+10	1.30E+10	5.10E+09	1.96E+09	8.66E+08	5.19E+08	2.82E+08	3.03E+08	6.28E+07	4.02E+07	1.45E+11
	%SD =	83.9	88.1	23.2	34.2	33.9	65.0	61.7	55.2	59.6	87.2	36.9	44.9	49.8
LAB 4	Test n°1	1.69E+11	1.63E+10	8.75E+09	7.87E+09	1.29E+09	1.09E+09	4.19E+08	2.23E+08	3.47E+08	7.21E+07	3.42E+07	4.92E+07	2.06E+11
	Test n°2	5.34E+11	7.00E+10	2.93E+10	1.73E+10	6.66E+09	5.43E+09	2.98E+09	1.46E+09	9.72E+08	4.68E+08	1.93E+08	1.57E+08	6.69E+11
	Test n°3	2.20E+11	1.88E+10	2.83E+09	3.95E+09	6.87E+08	9.78E+08	1.59E+08	2.50E+08	1.26E+08	6.38E+07	6.21E+07	5.56E+07	2.48E+11
	Mean =	3.08E+11	3.50E+10	1.36E+10	9.71E+09	2.88E+09	2.50E+09	1.18E+09	6.43E+08	4.82E+08	2.01E+08	9.65E+07	8.72E+07	3.74E+11
	SD =	1.98E+11	3.03E+10	1.39E+10	6.87E+09	3.29E+09	2.54E+09	1.56E+09	7.04E+08	4.39E+08	2.31E+08	8.48E+07	6.03E+07	2.56E+11
	%SD =	64.2	86.6	102.0	70.7	114.1	101.7	131.4	109.6	91.1	114.8	87.9	69.2	68.4

REPRODUCIBILITY

Particle Number (1/km)

Stage n.o	1	2	3	4	5	6	7	8	9	10	11	12
Dp (µm)	0.008	0.030	0.063	0.109	0.173	0.267	0.407	0.655	1.021	1.655	2.520	4.085

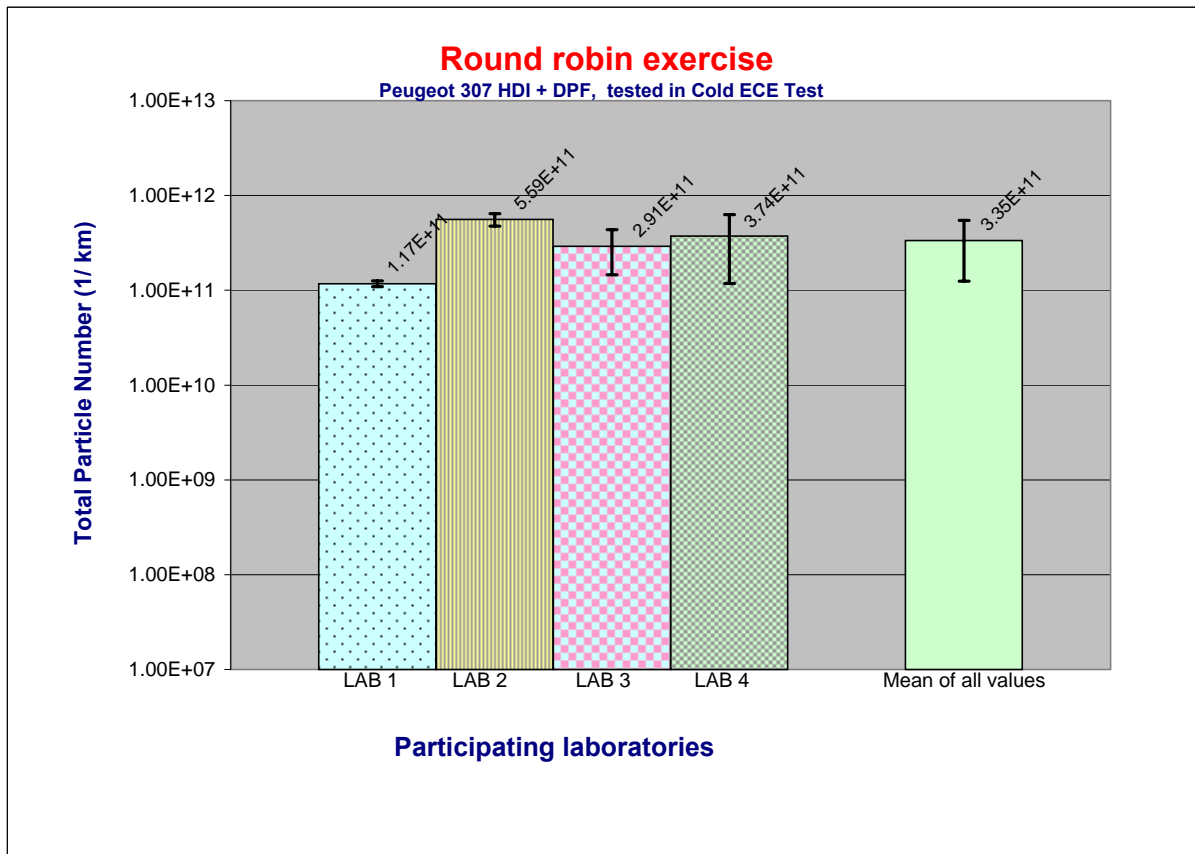
													SUM		
LAB 1	Test n°1	8.06E+10	1.60E+10	4.70E+09	3.27E+09	1.63E+09	1.20E+09	4.07E+08	1.66E+08	1.02E+08	7.66E+07	3.22E+07	4.35E+07	1.08E+11	LAB 1
	Test n°2	9.98E+10	1.28E+10	5.77E+09	2.85E+09	1.15E+09	7.01E+08	6.13E+08	2.47E+08	1.52E+08	5.23E+07	5.31E+07	3.55E+07	1.24E+11	
	Test n°3	9.23E+10	1.42E+10	6.14E+09	3.36E+09	1.87E+09	8.64E+08	4.96E+08	2.06E+08	1.52E+08	5.47E+07	5.58E+07	3.58E+07	1.20E+11	
LAB 2	Test n°1	3.53E+11	8.23E+10	2.19E+10	1.53E+10	3.70E+09	4.05E+09	1.37E+09	6.80E+08	4.07E+08	1.72E+08	9.79E+07	4.02E+07	4.83E+11	LAB 2
	Test n°2	3.87E+11	1.12E+11	2.37E+10	1.42E+10	5.49E+09	1.98E+09	1.60E+09	5.63E+08	3.74E+08	1.31E+08	4.53E+07	3.46E+07	5.47E+11	
	Test n°3	5.08E+11	9.47E+10	2.54E+10	1.07E+10	3.95E+09	3.28E+09	1.02E+09	6.60E+08	2.12E+08	1.65E+08	8.03E+07	4.33E+07	6.48E+11	
LAB 3	Test n°1	2.81E+11	7.07E+10	5.26E+10	2.84E+10	1.37E+10	5.27E+09	2.33E+09	1.51E+09	7.85E+08	6.97E+08	2.26E+08	1.33E+08	4.57E+11	LAB 3
	Test n°2	3.94E+10	1.38E+10	5.97E+10	5.28E+10	2.06E+10	1.84E+09	1.26E+09	4.90E+08	3.99E+08	1.87E+08	1.83E+08	8.18E+07	1.91E+11	
	Test n°3	1.20E+11	2.10E+10	3.71E+10	3.29E+10	1.07E+10	1.92E+09	6.15E+08	8.23E+08	2.36E+08	1.58E+08	1.02E+08	5.37E+07	2.25E+11	
LAB 4	Test n°1	1.69E+11	1.63E+10	8.75E+09	7.87E+09	1.29E+09	1.09E+09	4.19E+08	2.23E+08	3.47E+08	7.21E+07	3.42E+07	4.92E+07	2.06E+11	LAB 4
	Test n°2	5.34E+11	7.00E+10	2.93E+10	1.73E+10	6.66E+09	5.43E+09	2.98E+09	1.46E+09	9.72E+08	4.68E+08	1.93E+08	1.57E+08	6.69E+11	
	Test n°3	2.20E+11	1.88E+10	2.83E+09	3.95E+09	6.87E+08	9.78E+08	1.59E+08	2.50E+08	1.26E+08	6.38E+07	6.21E+07	5.56E+07	2.48E+11	
	Mean =	2.40E+11	4.52E+10	2.32E+10	1.61E+10	5.96E+09	2.38E+09	1.11E+09	6.06E+08	3.55E+08	1.91E+08	9.71E+07	6.36E+07	3.35E+11	
	SD =	1.71E+11	3.76E+10	1.91E+10	1.52E+10	6.15E+09	1.71E+09	8.55E+08	4.63E+08	2.70E+08	1.95E+08	6.68E+07	4.04E+07	2.11E+11	
	%SD =	71	83	82	94	103	72	77	76	76	102	69	64	62.9	

Reproducibility limit

ECE Test

Only the average results are presented

Etage n° =	Dp (µm)	LAB 1	LAB 2	LAB 3	LAB 4	Mean of all values
1	0.008	9.09E+10	4.16E+11	1.47E+11	3.08E+11	2.40E+11
2	0.030	1.43E+10	9.63E+10	3.52E+10	3.50E+10	4.52E+10
3	0.063	5.54E+09	2.37E+10	4.98E+10	1.36E+10	2.32E+10
4	0.109	3.16E+09	1.34E+10	3.80E+10	9.71E+09	1.61E+10
5	0.173	1.55E+09	4.38E+09	1.50E+10	2.88E+09	5.96E+09
6	0.267	9.21E+08	3.10E+09	3.01E+09	2.50E+09	2.38E+09
7	0.407	5.05E+08	1.33E+09	1.40E+09	1.18E+09	1.11E+09
8	0.655	2.06E+08	6.35E+08	9.40E+08	6.43E+08	6.06E+08
9	1.021	1.36E+08	3.31E+08	4.73E+08	4.82E+08	3.55E+08
10	1.655	6.12E+07	1.56E+08	3.47E+08	2.01E+08	1.91E+08
11	2.520	4.70E+07	7.45E+07	1.70E+08	9.65E+07	9.71E+07
12	4.085	3.83E+07	3.94E+07	8.95E+07	8.72E+07	6.36E+07
Total Particulate Number (1/km) =		1.17E+11	5.59E+11	2.91E+11	3.74E+11	3.35E+11
SD =		8.25E+09	8.34E+10	1.45E+11	2.56E+11	2.11E+11



EUDC Test

Graph : Particle Size Distribution

Cold EDC Test

APPENDIX 3

5.3 RENAULT Megane Gasoline engine

5.3.1 Blank CVS

5.3.2 Repeatability and Reproducibility

- Cold EDC test
- ECE (urban cycle) test
- EUDC (extra-urban cycle) test

Blank CVS

Cold EDC Test

ECE Test

EUDC Test

Graph : Particle Size Distribution

Cold EDC Test

APPENDIX 4

CHARACTERISTICS VEHICLES TESTED

APPENDIX 5

FUELS AND LUBRICANT SPECIFICATIONS