

Report expertise n. 6/13 of 18/02/2013 composed by n. 3 pages.

Applicant: Walter Stauder in the name and on behalf of DATACOL S.r.l. .
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Supervisor/Analyst: industrial chemical expert BUONANNO ROSARIO, enrolled in the College of Industrial Engineers Industrial experts and graduates of the Province of Caserta in n. order 759.

On the 29th of January of 2013 it was commissioned by the applicant to determine if the addition of the product called "cleaner diesel power plant - Z350250", produced and marketed by the applicant company (photographic record no. 1), added in diesel for automotive use (according to UNI EN 590:2010) at a **concentration of 0.2% v/v** may modify the physical and chemical characteristics of diesel for automotive use in accordance with the regulations in force and, if found, it can improve the quality of performance, is also required to demonstrate if the product has bactericidal properties.

For this purpose, the applicant delivery to the laboratory 10 liters of diesel fuel, previously purchased from a distributor, and n. 1 jar of the product to be put to test; the formulation and / or the composition of the product is not revealed to the writer. To answer the question of the applicant will be analyzed in accordance with the analytical methods specified in the UNI EN 590:2010, a sample of diesel for automotive use without additives and a sample of diesel for automotive use additives to 0.2 % v/v.

Proceed with the preparation of the samples thoroughly respecting the dilution ratios set by the applicant and are identified as follows:

- **sample n. 20121281/F - Gasolio TQ** (diesel for automotive use without additive)
- **sample n. 20121281/F - Gasolio 0,2** (diesel for auto motive use admixed to 0,2 % v/v)

the additive is completely miscible with diesel fuel for automotive use and at the end of the analysis we note the following results, shown in the tables below:

Table 1 : sample n. 20121281/F - Gasolio TQ

Parameter	Test Method	Units	Measured value	Minimum limit	Maximum limit
Density at 15°C	EN ISO 3675	kg/ m ³	835,2	820,0	845,0
Viscosity at 40°C	EN ISO 3104	mm ² /s	2,81	2,00	4,50
Water	EN ISO 12937	mg/kg	62		200
Cetane Index	EN ISO 4264		54,5	46,0	-
Flash Point	EN ISO 2719	°C	70	>55	-
Sulphur	EN ISO 20846	mg/kg	7,0	-	10,0
Particulate Matter	EN 12662	mg/kg	9,1	-	24,0
FAME content	EN 14078	% (V/V)	6,4	-	7,0
% (V/V) recovered at 250°C	EN ISO 3405	% (V/V)	34		<65
% (V/V) recovered at 350°C	EN ISO 3405	% (V/V)	94	85	
95 % (V/V) recovered at	EN ISO 3405	°C	353		360
Cetane Number	EN ISO 5165		53,8	51,0	-
Polycyclic aromatics	EN 12916	% (m/m)	3,0	-	8,0
Carbon residue	EN ISO 10370	% (m/m)	0,03	-	0,30
Ash	EN ISO 6245	% (m/m)	0,002	-	0,01
Copper corrosion	EN ISO 2160	class	1	class 1	
Oxidation Stability	EN ISO 12205	g/m ³	2	-	25
	EN 15751	h	24,1	20	-
Lubricity	EN ISO 12156	µm	218	-	460
Cold Filter Plugging Point (C.F.P.P.)	EN 116	°C, max.	-12	-	-10

The test methods specified refer to the last edition

Table 2 : sample n. 20121281/F - Gasolio 0,2

Parameter	Test Method	Units	Measured value	Minimum limit	Maximum limit
Density at 15°C	EN ISO 3675	kg/ m ³	835,0	820,0	845,0
Viscosity at 40°C	EN ISO 3104	mm ² /s	2,80	2,00	4,50
Water	EN ISO 12937	mg/kg	61		200
Cetane Index	EN ISO 4264		54,5	46,0	-
Flash Point	EN ISO 2719	°C	66,5	>55	-
Sulphur	EN ISO 20846	mg/kg	7,3	-	10,0
Particulate Matter	EN 12662	mg/kg	8,9	-	24,0
FAME content	EN 14078	% (V/V)	6,5	-	7,0
% (V/V) recovered at 250°C	EN ISO 3405	% (V/V)	34		<65
% (V/V) recovered at 350°C	EN ISO 3405	% (V/V)	94	85	
95 % (V/V) recovered at	EN ISO 3405	°C	355		360
Cetane Number	EN ISO 5165		55,3	51,0	-
Polycyclic aromatics	EN 12916	% (m/m)	2,9	-	8,0
Carbon residue	EN ISO 10370	% (m/m)	0,04	-	0,30
Ash	EN ISO 6245	% (m/m)	0,002	-	0,01
Copper corrosion	EN ISO 2160	class	1	class 1	
Oxidation Stability	EN ISO 12205	g/m ³	1	-	25
	EN 15751	h	>40	20	-
Lubricity	EN ISO 12156	µm	246	-	460
Cold Filter Plugging Point (C.F.P.P.)	EN 116	°C, max.	-11	-	-10

The test methods specified refer to the last edition

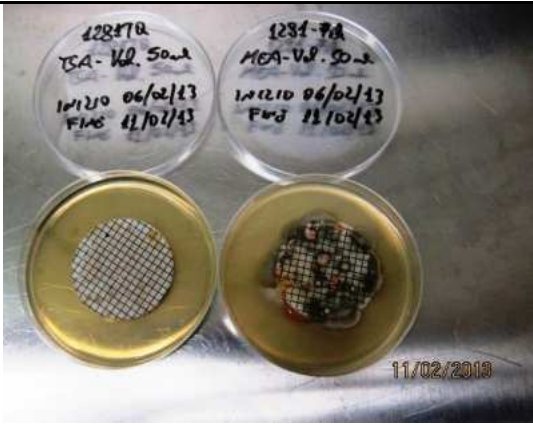

Summarizing the measured values in the following table, we have a complete picture of the effects caused by the addition of the additive to diesel for automotive use:

Table 3 : comparison of analytical results

Parameter	Units	20121281 - Gasolio TQ	20121281 - Gasolio 0,2
Density at 15°C	kg/ m ³	835,2	835,0
Viscosity at 40°C	mm ² /s	2,81	2,80
Water	mg/kg	62	61
Cetane Index		54,5	54,5
Flash Point	°C	70	66,5
Sulphur	mg/kg	7,0	7,3
Particulate Matter	mg/kg	9,1	8,9
FAME content	% (V/V)	6,4	6,5
% (V/V) recovered at 250°C	% (V/V)	34	34
% (V/V) recovered at 350°C	% (V/V)	94	94
95 % (V/V) recovered at	°C	353	355
Cetane Number		53,8	55,3
Polycyclic aromatics	% (m/m)	3,0	2,9
Carbon residue	% (m/m)	0,03	0,04
Ash	% (m/m)	0,002	0,002
Copper corrosion	class	1	1
Oxidation Stability	g/m ³	2	1
	h	24,1	>40
Lubricity	µm	218	246
Cold Filter Plugging Point (C.F.P.P.)	°C, max.	-12	-11

Table 3 shows clearly that the addition of the additive in the doses indicated implies an improvement of the characteristics **cetane number**, which expresses the delay of diesel fuel to ignite and begin to burn compared to the time at which it begins to be injected into the combustion chamber of the motor, and **oxidation stability**, which expresses the measure of the degree of acidity of the diesel fuel in contact with a particular material (induction period), causing a quantity of insoluble material (insoluble total), which is directly proportional to power oxidation of the fuel, in addition there are no values beyond the limits set by the UNI EN 590:2010.

The bactericidal properties of the product is tested by performing a double test of the microbial load, according to the analytical method IP 385, on diesel for automotive use without additive, identified as 20131281/F - Gasolio TQ, and the sample of diesel for automotive use additives to 0 , 2% v/v, identified as 20131281/F - Gasolio 0.2, from which were recorded the following results:

20121281 - Gasolio TQ	20121281 - Gasolio 0,2
Microbial: 2200 UFC / l	Microbial: 0 UFC / l
	

it is evident that the addition of the additive has completely cleared the microbial load resulting from diesel for automotive use.

Conclusions: The use of the product called "cleaner diesel power plant - Z350250" for use in diesel motor vehicles (according to UNI EN 590:2010) in concentration of 0.2% v / v does not change its characteristics according to UNI EN 590:2010, but it improves the cetane number, oxidation stability and the microbial load (presence of bacteria, fungi and yeasts).



Supervisor /analyst




industrial expert chemical Rosario Buonanno