



**BUREAU  
VERITAS**

In April 2018, the independent and accredited laboratory Bureau Veritas analyzed a sample of road Diesel Oil treated with **XBEE Enzyme Fuel Technology**. The analysis demonstrated that such fuel, also known as Gasoil, remains in compliance with the EN 590 standard.

Conclusions by Bureau Veritas:

*"Testing was performed after laboratory hand-blend at 1:4000 Xbee additive doping rate, followed by two week retention period at constant temperature. The tested sample, blended with Xbee technology copes with the specification limits of EN590 standard."*

Analyses	Methods	Without XBEE	With XBEE	Units	Limits
Appearance at 20°C	Visual	Clear & Bright	Clear & Bright	-	Clear & Bright
Density at 15°C	ISO 12185		833.90	kg/m <sup>3</sup>	820 – 845
Cetane number	EN 15185		52.90	% vol	51.00 min
Cetane index	EN ISO 4264		53.40	% vol	46.00 min
Viscosity at 40°C	ISO 3104:1994		2.757	mm <sup>2</sup> /s	2.00 – 4.50
Flash point	EN ISO 2719		59.5	°C	55.0 min
Copper corrosion	EN ISO 2160		1a		n°1
Total contamination	EN 12662	<12	<12	mg/kg	24 max
Oxidation stability	ISO 12205		2.6	g/m <sup>3</sup>	25 max
Sulphur content	EN 24260		8.30	mg/kg	10.00 max
Carbon residue	EN ISO 10370		<0.1	% (m/m)	0.30 max
Ash content	EN ISO 6245		<0.001	% (m/m)	0.01 max
Distillation · % (v/v) recovered at 250°C · % (v/v) recovered at 350°C · 95% (v/v) recovered	EN ISO 3405		35.70 95.50 353.00	% (v/v) % (v/v) °C	65% max 85% min 360°C max
Lubricity	EN ISO 12156-1		210	µm	460 max
Conductivity	ISO 6297		521	pS/m	150 min
Polycyclic aromatic Hydrocarbons (PAH)	EN 12916	1.8	1.8	% (m/m)	8.0 max
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# BV - GASOIL EN 590

*Diesel – April 10, 2018*

Analyses	Methods	Without XBEE	With XBEE	Units	Limits
Water content	EN ISO 12937	30	30	mg/kg	200.00 max
Fatty acid methyl ester content (FAME)	EN 14078	7.20	7.11	% (v/v)	8.00 max
Cloud point	ISO 23015		-8	°C	-5 max
Cold flow properties (CFPP)	EN 116		-28	°C	-15 max
Mg content	EN 16576		<1.0	mg/L	2.0 max






# Annexes

Original reports

## CERTIFICAT D'ANALYSES N° 68180406

Opération : Essai en laboratoire  
Produit : Gazole EN590  
Client : Xbee  
Référence client : Contrat signé en date du 8 mars 2018

Origine de l'Echantillon : Station Total Mulhouse  
Nature de l'échantillon : Pompe 2  
Date de l'échantillonnage : 23/03/2018  
Référence Bureau Veritas : 8104240/1

Tests	Méthodes	Unités	Résultats	Limites	Conformité
Aspect	Visuelle	-	Clair et Limpide	Clair et Limpide	
Teneur en eau	NF EN ISO 12937	mg/kg	30	200 max	
Contamination totale	NF EN 12662	mg/kg	<12	24 max	
Teneur en EMAG	NF EN 14078	% (v/v)	7,2	8,0 max	
Hydrocarbures aromatiques Polycycliques	NF EN 12916	% (m/m)	1,8	8,0 max	

### Commentaires

Résultats conformes aux limites fixées par la spécification CSR 4-0-06 du 15 Novembre 2016

### Emission du rapport d'essai

Emis le : 10/04/2018  
Analysé le : 23/03/2018

Adèle Bruntz



# CERTIFICATE OF ANALYSIS N° 68180407

Operation : Testing  
Product : Diesel EN590  
Client : Xbee  
Client's ref. : Contract dated March 8th 2018

Sample Origin : Total oil station Mulhouse  
Sample type : Flowmeter # 2  
Testing on sample : After 1/4000 Xbee hand blend  
Sampling date : 23/03/2018  
Bureau Veritas Ref : 8104240/2

Tests	Methods	Units	Results	Limits	Interpretation
Visual aspect @ 20°C	Visual	-	Clear & Bright	Clear & Bright	
Density @ 15°C	EN ISO 12185	kg/m3	833,9	820,0-845,0	
Distillation	EN ISO 3405	-	-	-	
% (v/v) recovered @ 250°C	-	% (v/v)	35,7	65% max	
% (v/v) recovered @ 350°C	-	% (v/v)	95,5	85% min	
95% (v/v) recovered @	-	° C	353,0	360°C max	
Viscosity @ 40°C	EN ISO 3104	mm2/s	2,757	2,00-4,50	
Sulfur content	EN 24260	mg/kg	8,3	10,0 max	
Water content	EN ISO 12937	mg/kg	30	200 max	
Total contamination	EN 12662	mg/kg	<12	24 max	
Ash content	EN ISO 6245	% (m/m)	<0,001	0,01 max	
Cetane Number	EN 15185	indice	52,9	51,0 min	
Cetane Index	EN ISO 4264	indice	53,4	46,0 min	
Carbon Residue (on 10% distillation)	EN ISO 10370	% (m/m)	<0,01	0,30 max	
Copper corrosion	EN ISO 2160	Classe	1A	Classe 1	
Oxydation stability	EN ISO 12205	g/m3	2,6	25 max	
Flash Point	EN ISO 2719	° C	59,5	55 min	
Lubricity	EN ISO 12156-1	um	210	460 max	
Cloud Point	EN 23015	°C	-8	-5 max	
CFPP	EN 116	°C	-28	-15 max	
Conductivity	ISO 6297	pS/m	521	150 min	
Polycyclic aromatic content	EN 12916	% (m/m)	1,8	8,0 max	
Mg content	EN 16576	mg/l	<1	2,0 max	
FAME content	EN 14078	% (v/v)	7,11	8,0 max	

## Comments

Testing was performed after laboratory hand-blend at 1/4000 Xbee additive doping rate, followed by two week retention period at constant temperature. The tested sample, blended with Xbee technology copes with the specification limits of EN590 standard.

## Certificate of analysis issued on and by

Issued on : 10/04/2018  
Tested on : 04-10/04/2018

Adèle Bruntz

