

JOINT RESEARCH CENTRE  
Directorate F – Health, Consumers and Reference Materials

# CERTIFICATE OF ANALYSIS

ERM<sup>®</sup>-EF003

DIESEL (B7)			
	Certified value <sup>8)</sup>	Uncertainty <sup>9)</sup>	Unit
Fatty acid methyl ester content <sup>1)</sup>	6.88	0.17	% (V/V) <sup>6)</sup>
Mono-aromatic hydrocarbon content <sup>2)</sup>	18.8	0.7	% (m/m) <sup>7)</sup>
Di-aromatic hydrocarbon content <sup>2)</sup>	1.84	0.19	% (m/m) <sup>7)</sup>
Polycyclic aromatic hydrocarbon content <sup>2)</sup>	2.01	0.25	% (m/m) <sup>7)</sup>
Total aromatic hydrocarbon content <sup>2)</sup>	20.8	0.9	% (m/m) <sup>7)</sup>
Density (at 15.0 °C) <sup>3)</sup>	837.23	0.07	kg/m <sup>3</sup>
Kinematic viscosity (at 40.0 °C) <sup>4)</sup>	2.892	0.012	mm <sup>2</sup> /s
Lubricity <sup>5)</sup>	220	60	µm
<p>1) As defined by EN 14078:2014; 2) As defined by EN 12916:2016; 3) As defined by EN ISO 12185:1996; 4) As defined by EN ISO 3104:1996 5) As defined by EN 12156-1:2016. 6) As called in EN 14078:2014, which is equivalent to 10<sup>-2</sup> mL/mL; 7) As called in EN 12916:2006, which is equivalent to 10<sup>-2</sup> g/g. 8) Certified values are values that fulfil the highest standards of accuracy. The given values represent the unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory using one of the above mentioned methods for determination. The certified values and their uncertainties are traceable to the International System of Units (SI). 9) The uncertainty of the certified value is the expanded uncertainty with a coverage factor <math>k = 2</math> corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.</p>			

This certificate is valid for one year after purchase.

Sales date:

The minimum sample intake is the required sample volume stipulated in the respective standard methods.

Geel, February 2018

Signed: 

Dr Doris Florian  
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Indicative Values			
	Indicative value <sup>5)</sup>	Uncertainty <sup>6)</sup>	Unit
Tri+-aromatic hydrocarbon content <sup>1)</sup>	0.17	0.11	% (m/m) <sup>4)</sup>
Water content <sup>2)</sup>	0.0064	0.0029	% (m/m) <sup>4)</sup>
Sulfur content <sup>3)</sup>	7.5	1.6	mg/kg
<p>1) As defined by EN 12916:2016; 2) As defined by EN 12937:2000; 3) As defined by ISO 20846:2011.</p> <p>4) As called in EN 12916:2006 and EN 12937:2000, which is equivalent to 10<sup>-2</sup> g/g.</p> <p>5) Indicative values are values where the uncertainties were deemed too large to allow certification and are therefore less reliable than certified values. Great caution should be used when using these values. The given values are an unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory. The indicative values and their uncertainties are traceable to the International System of Units (SI).</p> <p>6) The uncertainty of the indicative value is the expanded uncertainty with a coverage factor <math>k = 2</math> corresponding to a level of confidence of about 95 % estimated in accordance with ISO/IEC Guide 98-3, Guide to the Expression of Uncertainty in Measurement (GUM:1995), ISO, 2008.</p>			

Additional Material Information	
	Value <sup>2)</sup> [h]
Oxidation stability at 100 °C <sup>1)</sup>	52
<p>1) As defined by EN 15751:2014.</p> <p>2) This value was obtained in the course of the study. However, it was outside the scope of the method EN 15751. Hence, it is stated without an uncertainty and gives merely information about this material property that may be of interest for the user. It is the unweighted mean value of the means of accepted sets of data, each set being obtained in a different laboratory.</p>	

## DESCRIPTION OF THE MATERIAL

ERM-EF003 is prepared from a typical commercial automotive diesel fuel containing a volume fraction of approximately 7 % biodiesel that is based on rapeseed oil fatty acid methyl ester with the addition of 1 g/kg antioxidant (butylhydroxytoluene), so-called 'diesel (B7)'. ERM-EF003 is filled in amber glass ampoules and each unit contains 27 mL of diesel (B7).

## ANALYTICAL METHODS USED FOR CERTIFICATION

Fatty acid methyl ester content: EN 14078:2014 (Infrared spectrometry method)

Mono-aromatic hydrocarbon content: EN 12916:2016 (High performance liquid chromatography method with refractive index detection)

Di-aromatic hydrocarbon content: EN 12916:2016 (High performance liquid chromatography method with refractive index detection)

Tri+-aromatic hydrocarbon content: EN 12916:2016 (High performance liquid chromatography method with refractive index detection)

Polycyclic aromatic hydrocarbon content: EN 12916:2016 (High performance liquid chromatography method with refractive index detection)

Total aromatic hydrocarbon content: EN 12916:2016 (High performance liquid chromatography method with refractive index detection)

Density (at 15.0 °C): EN ISO 12185:1996 (Oscillating U-tube method)

Kinematic viscosity (at 40.0 °C): EN ISO 3104:1996

Lubricity: EN 12156-1:2016 (High-frequency reciprocatingrig (HFRR))

Water content: 12937:2000 (Coulometric Karl Fischer titration method)

Sulfur content:20846:2011 (Ultraviolet fluorescence method)

Oxidation stability: 15751:2014 (Accelerated oxidation method)

## **PARTICIPANTS**

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## **SAFETY INFORMATION**

The usual hazard and precautionary phrases for diesel apply.



H304 - May be fatal if swallowed and enters airways.



H351 - Suspected of causing cancer.



P280 - Wear protective gloves/protective clothing/eye protection/face protection.

P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.

P308+P313 - IF exposed or concerned: Get medical advice/attention.

## INSTRUCTIONS FOR USE AND INTENDED USE

The units shall be vigorously shaken by turning it upside down for at least 2 min prior to opening to ensure material re-homogenisation.

The main purpose of these materials is to assess method performance, i.e. for checking accuracy of analytical results/calibration. As any reference material, it/they can be used for establishing control charts or validation studies.

## STORAGE

The materials should be stored at  $(18 \pm 5)$  °C in the dark.

However, the European Commission cannot be held responsible for changes that happen during storage of the material at the customer's premises, especially of opened samples.

## LEGAL NOTICE

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## NOTE

A detailed certification report is available at <https://crm.jrc.ec.europa.eu/>.

A paper copy is obtainable from the Joint Research Centre, Directorate F – Health, Consumers and Reference Materials on request.



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