

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

# CERTIFICATE OF ANALYSIS

ERM<sup>®</sup>- EF318k

GAS OIL		
Mass Fraction		
	Certified value <sup>1)</sup> [mg/kg]	Uncertainty <sup>2)</sup> [mg/kg]
Solvent Yellow 124 <sup>3)</sup> (SY124)	8.70	0.12
<p>1) This value was derived from the gravimetric preparation of SY124 in gas oil. The certified value and its uncertainty are traceable to the International System of Units (SI).</p> <p>2) The uncertainty is the expanded uncertainty of the certified value 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> <p>3) N-ethyl-N-[2-(1-isobutoxyethoxy)ethyl]-4-(phenylazo)aniline, CAS No 34432-92-3.</p>		

This certificate is valid for one year after purchase.

Sales date:

The minimum amount of sample to be used is 20 µL.

Geel, July 2018

Signed: 

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Additional Material Information	
Density	
	Value <sup>1)</sup> [kg/m <sup>3</sup> ]
Density at 15 °C <sup>2)</sup>	833.4
<p>1) This value corresponds to the unweighted mean value of two replicates performed in 3 independent 50 mL aliquots of the material. For each aliquot 13 units of ERM-EF318k were pooled.</p> <p>2) ISO 12185:1996 method was used to determine the density of the material at 15 °C by a single laboratory. The repeatability of the measurements according to ISO 12185:1996 is 0.2 kg/m<sup>3</sup> and the reproducibility is 0.5 kg/m<sup>3</sup>. The Additional Material Information value gives merely information about other material properties that may be of interest for the user.</p>	

## DESCRIPTION OF THE MATERIAL

ERM<sup>®</sup>-EF318k is a matrix material certified for the mass fraction of SY124. The starting material was commercially available B0 gas oil (B0: free of biodiesel) which was spiked with a SY124 reference material certified for mass %. ERM-EF318k was prepared gravimetrically using calibrated balances and the mass fraction was confirmed by independent measurements using the European Union Reference Method for the Determination of Solvent Yellow 124 in Gas Oil and Kerosene (also known as the Community Reference Method).

The commutability of ERM-EF318k with routine samples that might contain biodiesel was tested during a dedicated study. ERM-EF318k is commutable with commercial gas oils for the Community Reference Method.

The material is available in amber glass ampoules containing at least 4.2 mL of gas oil which were sealed under an atmosphere of argon.

## ANALYTICAL METHODS USED FOR CERTIFICATION

The certified value was obtained from gravimetric preparations, taking into account the purity of the base materials. The certified value was confirmed in two laboratories by HPLC-UV as an independent verification method. This method is described in: T. Linsinger et al. (2004): Validation of the European Union's Reference Method for the Determination of Solvent Yellow 124 in Gas Oil and Kerosene, Energy & Fuels 18: 1851 – 1854.

The water content was determined by coulometric Karl-Fischer titration.

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

## PARTICIPANTS

European Commission, Joint Research Centre, Directorate F – Health, Consumers and Reference Materials, Geel, BE

(accredited to ISO Guide 34 for production of certified reference materials, BELAC No. 268-RM)

Bildungs- und Wissenschaftszentrum der Bundesfinanzverwaltung, Wissenschaftliches Referat München, Markt-Schwaben, DE

(measurements under the scope of ISO/IEC 17025 accreditation, DAkkS No D-PL-11069-05-00)

Bildungs- und Wissenschaftszentrum der Bundesfinanzverwaltung, Wissenschaftliches Referat München, Markt-Schwaben, DE

(measurements under the scope of ISO/IEC 17025 accreditation, DAkkS No D-PL-11069-05-00)

Laboratorium Douane & Accijnzen, Vilvoorde, BE

(measurements under the scope of ISO/IEC 17025 accreditation, BELAC No 426-TEST)

## SAFETY INFORMATION

The usual safety precautions for laboratory chemicals apply. The main hazard is the gas oil rather than the SY124.

The classification is according to Regulation (EC) No. 1272/2008 and the usual hazard and precautionary phrases for gas oil diesel apply:

H226 - Flammable liquid and vapour

H304 - May be fatal if swallowed and enters airways

H332 - Harmful if inhaled

H373 - May cause damage to organs through prolonged or repeated exposure

H411 - Toxic to aquatic life with long lasting effects

P261 - Avoid breathing dust/fume/gas/mist/vapours/spray

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

P301+P310 - IF SWALLOWED: Immediately call a POISON CENTER

P308+P313 - IF EXPOSED OR CONCERNED: Get medical advice/attention

## INSTRUCTIONS FOR USE AND INTENDED USE

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

### Use as a calibrant

It is not recommended to use this matrix material as calibrant. If used nevertheless, the uncertainty of the certified value shall be taken into account in the estimation of the measurement uncertainty.

### Comparing an analytical result with the certified value

A result is unbiased if the combined standard uncertainty of measurement and certified value covers the difference between the certified value and the measurement result (see also ERM Application Note 1, [www.erm-crm.org](http://www.erm-crm.org)).

When assessing the method performance, the measured values of the CRMs are compared with the certified values. The procedure is summarised here:

- Calculate the absolute difference between mean measured value and the certified value ( $\Delta_{\text{meas}}$ ).
- Combine the measurement uncertainty ( $u_{\text{meas}}$ ) with the uncertainty of the certified value ( $u_{\text{CRM}}$ ):  $u_{\Delta} = \sqrt{u_{\text{meas}}^2 + u_{\text{CRM}}^2}$
- Calculate the expanded uncertainty ( $U_{\Delta}$ ) from the combined uncertainty ( $u_{\Delta}$ ) using an appropriate coverage factor, corresponding to a level of confidence of approximately 95 %
- If  $\Delta_{\text{meas}} \leq U_{\Delta}$  then no significant difference exists between the measurement result and the certified value, at a confidence level of approximately 95 %.

### Use in quality control charts

The material can be used for quality control charts. Using CRMs for quality control charts has the added value that a trueness assessment is built into the chart.

## STORAGE

The material can be stored at room temperature. Care should be taken to avoid exposure to light or other radiation.

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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