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de l'accréditation, de la sécurité et qualité
des produits et services

ILNAS-EN 16091:2011

Liquid petroleum products - Middle distillates and fatty acid methyl ester (FAME) fuels and blends - Determination of oxidation stability by

Flüssige Mineralölerzeugnisse -
Mitteldestillat- und
Fettsäuremethylesterkraftstoffe und
Mischungen - Bestimmung der
Produits pétroliers liquides - Distillats
moyens, esters méthyliques d'acides gras
(EMAG) et leurs mélanges -
Détermination de la stabilité à



National Foreword

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English Version

Liquid petroleum products - Middle distillates and fatty acid methyl ester (FAME) fuels and blends - Determination of oxidation stability by rapid small scale oxidation method

Produits pétroliers liquides - Distillats moyens, esters méthyliques d'acides gras (EMAG) et leurs mélanges - Détermination de la stabilité à l'oxydation par méthode d'oxydation accélérée à petite échelle

Flüssige Mineralölerzeugnisse - Mitteldestillat- und Fettsäuremethylesterkraftstoffe und Mischungen - Bestimmung der Oxidationsstabilität mit beschleunigtem Verfahren und kleiner Probenmenge

This European Standard was approved by CEN on 15 October 2011.

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Foreword

This document (EN 16091:2011) has been prepared by Technical Committee CEN/TC 19 "Gaseous and Liquid fuels, lubricants and related products of petroleum, synthetic and biological origin", the secretariat of which is held by NEN.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by May 2012, and conflicting national standards shall be withdrawn at the latest by May 2012.

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1 Scope

This European Standard specifies a method for the determination of the oxidation stability of middle distillate fuels, fatty acid methyl ester (FAME) fuel and blends thereof, under accelerated conditions, by measuring the induction period to the specified breakpoint in a reaction vessel charged with the sample and oxygen.

NOTE 1 For the purposes of this European Standard, the term “% (V/V)” is used to represent the volume fraction (φ).

NOTE 2 The induction period is used as an indication for the resistance of middle distillates, fatty acid methyl ester (FAME) fuels and blends thereof against oxidation. It should be recognized, however, that this correlation can vary markedly under different conditions with different FAMEs and diesel fuel blends.

NOTE 3 The presence of ignition improvers may lead to lower oxidation stability results determined by this method. It has for instance been observed that the addition of 2-ethyl hexyl nitrate (2EHN) can reduce the measured oxidation stability values.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN ISO 3170, *Petroleum liquids — Manual sampling (ISO 3170:2004)*

EN ISO 3171, *Petroleum liquids — Automatic pipeline sampling (ISO 3171:1988)*

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

3.1 breakpoint

point in the pressure-time curve, where the pressure in the vessel has dropped 10 % below the maximum pressure achieved in the current test run

3.2 induction period

time elapsed between starting the heating procedure of the reaction vessel, charged with sample and oxygen, and the breakpoint at 140 °C

4 Principle

At ambient temperature, a known volume of a sample is placed in a reaction vessel charged with oxygen to a pressure of 700 kPa \pm 5 kPa. The reaction vessel is heated to 140 °C. The pressure in the vessel drops as the oxygen is consumed during the oxidation of the sample. The pressure in the vessel is recorded at intervals of 1s until the breakpoint is reached. The elapsed time from start to the breakpoint is the induction period at the test temperature of 140 °C \pm 0,5 °C.

5 Reagents and materials

5.1 Cleaning solvent, for the removal of oxidation residues from the test vessel, of suitable purity to leave no residue on the apparatus.

NOTE Commercially available ethanol of approx. 95 % (V/V) purity was found to be suitable.