BRITISH STANDARD

BS EN
14156:2003

Derivatives from coal pyrolysis — Coal tar based oils: Coal tar fuel — Specifications and test methods

The European Standard EN 14156:2003 has the status of a British Standard

ICS 75.160.20

National foreword

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The UK participation in its preparation was entrusted to Technical Committee CII/56, Derivatives from coal pyrolysis, which has the responsibility to:

— aid enquirers to understand the text;

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Derivatives from coal pyrolysis - Coal tar based oils: Coal tar fuel - Specifications and test methods

Produits dérivés de la pyrolyse de charbon - Produits à base de goudron de charbon : Combustibles - Spécifications et méthodes d'essai

Derivate der Kohlenpyrolyse - Heizöl aus Steinkohlenteeröl - Anforderungen und Prüfverfahren

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Contents

Foreword

This document (EN 14156:2003) has been prepared by Technical Committee CEN /TC 317, "Derivatives from coal pyrolysis", the secretariat of which is held by IBN.

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of an identical text or by endorsement, at the latest by January 2004, and conflicting national standards shall be withdrawn at the latest by January 2004.

Annex A is normative.

This document includes a Bibliography.

No existing European Standard is superseded. The standard is based on DIN 51603-2 and DIN 51603-4.

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1 Scope

This European Standard gives the specifications of and the test methods for liquid fuels derived from coal tar. The specifications also apply to shale oil, aromatic mineral oils, and lignite tar.

Preheating of liquid fuel oils according to this standard can be necessary for transport, storage, and combustion.

The mixing with fuel oils from other raw materials should be avoided.

This standard does not cover marine fuel applications.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 1014-1, *Wood preservatives - Creosote and creosoted timber - Methods of sampling and analysis – Part 1 : Procedure for sampling creosote*.

EN 12303:2000, *Coal tar based oils - Terminology*.

prEN 13991, *Derivatives from coal pyrolysis – Coal tar based oils: creosotes – Specifications and test methods*.

EN 24260, Petroleum products and hydrocarbons - Determination of sulfur content - Wickbold combustion method) (ISO 4260:1987).

EN ISO 2719, *Determination of flash point - Pensky-Martens closed cup method (ISO 2719:2002).*

EN ISO 3675, *Crude petroleum and liquid petroleum products - Laboratory determination of density - Hydrometer method (ISO 3675:1998).*

EN ISO 6245, *Petroleum products - Determination of ash (ISO 6245:2001).*

EN ISO 10370, *Petroleum products - Determination of carbon residue - Micro method (ISO 10370:1993).*

EN ISO 14596, *Petroleum products - Determination of sulfur content - Wavelength-dispersive X-ray fluorescence spectrometry (ISO 14596:1998).*

ISO 760, *Determination of water - Karl Fischer method (General method*).

ISO 3733, *Petroleum products and bituminous materials - Determination of water - Distillation method*.

DIN 51550, *Viscometry - Determination of viscosity - General principles.*

DIN 51900-1, *Testing of solid and liquid fuels - Determination of gross calorific value by the bomb calorimeter and calculation of net calorific value – Part 1 : Principles, apparatus, methods (Remark : Draft 06.1998 based on ISO 1928).*

DIN 51900-2, *Testing of solid and liquid fuels - Determination of the gross calorific value by the bomb calorimeter and calculation of net calorific value – Part 2 : Method using the isothermal water jacket calorimeter*.

DIN 53018-1, *Viscometry - Measurement of the dynamic viscosity of Newtonian fluids with Rotational Viscometers - Principles*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions given in EN 12303:2000 apply.

4 Sampling

Samples for the assessment of the requirements listed in Table 1 shall be taken in accordance with EN 1014-1.

5 Specifications and test methods

The following fuel grades have been defined. They mainly differ with regard to viscosity.

The properties depend on the origin of the raw materials and their processing technology.

The high viscous qualities fuel oil FD and fuel oil FE require heated storage and piping systems.

The fuel oils can also be used to replace coke as reducing agents in blast furnaces.

Table 1 — Specifications and test methods for coal tar fuel oils

Properties		Fuel Oil FA	Fuel Oil FB	Fuel Oil FC	Fuel Oil FD	Fuel Oil FE	Test Methods
Density 20 °C	g/ml	≤ 1,1	≤ 1,1	≤ 1,1	≤ 1,2	≤ 1,2	EN ISO 3675
Flash point closed cup	°C	≥ 85	≥ 85	≥ 75	≥ 61	≥ 85	EN ISO 2719
Kinematic viscosity at 20 °C	mm²/s	≤ 6	≤ 12	-	-	-	DIN 51550 and DIN 53018-1
at 50 °C	mm²/s	-	-	≤ 40	-	-	
at 70 °C	mm²/s	-	-	-	≤ 30	-	
at 75 °C	mm²/s	-	-	≤ 12	-	-	
at 90 °C	mm²/s	-	-	-	≤ 15	-	
at 100 °C	mm²/s	-	-	-	-	≤ 75	
Carbon yield	(m/m) %	≤ 0,5	≤ 1,0	≤ 16	≤ 16	≤ 25	EN ISO 10370
Sulfur	(m/m) %	≤ 0,2	≤ 0,8	≤ 0,5	≤ 1,0	≤ 0,9	EN 24260 [a]
Water content	(m/m) %	≤ 0,3	≤ 0,3	≤ 0,3	≤ 3,0	≤ 0,5	ISO 760 [b]
Calorific value	MJ/kg	≥ 38,7	≥ 37,8	≥ 38,5	≥ 35,0	≥ 35,0	DIN 51900-1 [c] and DIN 51900-2
Ash	(m/m) %	≤ 0,01	≤ 0,01	≤ 0,02	≤ 0,05	≤ 0,90	EN ISO 6245
Liquidity (sediment test)	°C h	3 24	0 24	-	-	-	annex A (normative)
Crystallization temperature	°C	-	-	≤ 15	≤ 15	≤ 60	prEN 13991

[a] EN ISO 14596 is a suitable alternative.

[b] ISO 3733 is a suitable alternative. For the determination of very low water levels in fuel oils, a 2 ml receiver in conjunction with a 1000 ml flask and 500 g of sample shall be used.

[c] DIN 51900-1 is comparable to ISO 1928 and covers solid and liquid fuels whereas ISO 1928 is restricted to solid fuels.

Annex A
(normative)

Determination of the liquidity[1)]

To test the liquidity, (100 ± 2) ml of fuel oil, while stirring, is heated until all crystalline deposits have disappeared.

Following, the oil is cooled to the required temperature (accuracy ± 1 °C) and kept for the required time (see Table 1).

The oil is sucked through a paper filter[2)] .

No visible crystalline deposits may remain on the filter surface.

1) This test is derived from DIN 51603–2:1992 ; Sub-clause 4.1 “Detection of sediments on a paper filter”.

2) Characteristics of the paper filter: diameter: 90 mm; average pore diameter : 10 µm to 15 µm.

Bibliography

[1] ISO 1928, *Solid mineral fuels – Determination of gross calorific value by the bomb calorimetric method, and calculation of net calorific value*.

[2] DIN 51603-2, *Types L,T and M - Requirements, testing*.

[3] DIN 51603-4, *Liquid fuels - Fuel oil - Part 4 : Fuel oils ZT, C and R;requirements, testing*.

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