

PETROLEUM PRODUCTS
Fuels (Class F)
Distillate and Residual Fuels
Specification of Estonian Shale Oil

Naftasaadused ja samaväärsed tooted
Kütused (klass F)
Destillaat- ja jääkkütused
Eesti põlevkiviõli spetsifikatsioon

NATIONAL FOREWORD

This Estonian standard is

- the identical English version of the Estonian Standard EVS 943:2021 and it has the same status as the original Estonian version. In case of interpretation disputes the original version applies;
- endorsed with a notification published in the September 2022 issue of the official bulletin of the Estonian Centre for Standardisation and Accreditation.

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INTRODUCTION

Estonian shale oil is a liquid product produced from kukersite oil shale through pyrolysis. Estonian shale oil is primarily used as liquid fuel or its blending component.

The need to establish specification of Estonian shale oil is to define respective product based on its characteristic properties. Liquid fuels are often blended together from different components. Standardised motor fuels as final products have to meet certain quality requirements. However, blending components do not have to meet quality requirements set for final products, but would affect certain property of final product. If one would identify non-compliant final product then it would be useful to know all blending components and their characteristics. As Estonian shale oil is used as a blending component in fuel oils and bunker fuels the need has arisen to define characteristic properties of shale oil fractions.

The specification presented in this standard is based on the current data and knowledge of existing shale oil production technologies in Estonia.

1 SCOPE

This Estonian standard applies on liquid fuels produced from kukerite oil shale through pyrolysis. In this standard Estonian shale oil is considered as two different fractions depending on boiling point (boiling point is determined by test method EVS-EN ISO 3405):

- light fraction (normal boiling point range between 30 °C and 210 °C);
- middle-heavy fraction (normal boiling point over 150 °C).

This Estonian standard defines ranges (density, viscosity, elemental composition, ash content, etc.) and test methods of the main characteristics of different shale oil fractions.

2 NORMATIVE REFERENCES

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements 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.

EVS 652. Shale oils — Method for determination of sediment content and ash

EVS-EN 15553. Petroleum products and related materials — Determination of hydrocarbon types — Fluorescent indicator adsorption method

EVS-EN ISO 2719. Determination of flash point — Pensky-Martens closed cup method

EVS-EN ISO 3016. Petroleum and related products from natural or synthetic sources — Determination of pour point

EVS-EN ISO 3104. Petroleum products — Transparent and opaque liquids — Determination of kinematic viscosity and calculation of dynamic viscosity

EVS-EN ISO 3170. Petroleum liquids — Manual sampling

EVS-EN ISO 3171. Petroleum liquids — Automatic pipeline sampling

EVS-EN ISO 3405. Petroleum and related products from natural or synthetic sources — Determination of distillation characteristics at atmospheric pressure

EVS-EN ISO 3675. Crude petroleum and liquid petroleum products — Laboratory determination of density — Hydrometer method

EVS-EN ISO 6245. Petroleum products — Determination of ash

EVS-EN ISO 8754. Petroleum products — Determination of sulphur content — Energydispersive X-ray fluorescence spectrometry

EVS-EN ISO 12185. Crude petroleum and petroleum products — Determination of density — Oscillating U-tube method

EVS-EN ISO 20846. Petroleum products — Determination of sulphur content of automotive fuels — Ultraviolet fluorescence method

ISO 91. Petroleum and related products — Temperature and pressure volume correction factors (petroleum measurement tables) and standard reference conditions

ISO 10307-1. Petroleum products — Total sediment in residual fuel oils — Part 1: Determination by hot filtration

ASTM D97. Standard Test Method for Pour Point of Petroleum Products

ASTM D1159. Standard Test Method for Bromine Numbers of Petroleum Distillates and Commercial Aliphatic Olefins by Electrometric Titration

ASTM D4052. Standard Test Method for Density, Relative Density, and API Gravity of Liquids by Digital Density Meter

ASTM D4294. Standard Test Method for Sulphur in Petroleum and Petroleum Products by Energy Dispersive X-ray Fluorescence Spectrometry

ASTM D5291. Standard Test Methods for Instrumental Determination of Carbon, Hydrogen, and Nitrogen in Petroleum Products and Lubricants

ASTM D5622. Standard Test Methods for Determination of Total Oxygen in Gasoline and Methanol Fuels by Reductive Pyrolysis

ASTM D5762. Standard Test Method for Nitrogen in Liquid Hydrocarbons, Petroleum and Petroleum Products by Boat-Inlet Chemiluminescence

UOP 304-08. Bromine Number and Bromine Index of Hydrocarbons by Potentiometric Titration

UOP 649. Total Oxygen in Solid, Semi-solid, and High Boiling Point Liquid Hydrocarbons by Pyrolysis

Method of determining the content of aromatic constituents in products with a distillation end point exceeding 315 °C. European Commission. Explanatory notes to the Combined Nomenclature of the European Union. Official Journal of the European Union, C 119, 29 March 2019 (OJ 2019/C 119/146)

3 TERMS AND DEFINITIONS

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

3.1

shale oil

shale oil is oil produced from kukersite oil shale through pyrolysis. Shale oil is a complex mixture of organic compounds. Shale oil is mainly utilised as fuel oil or blending component of bunker fuel. Shale oil has to be distinguished from oil-bearing shale, which is often designated with the same term in English „shale oil“

3.2

kukersite oil shale

kukersite oil shale is a marine-type sedimentary rock, which contains light-brown kerogen and is found in Estonia and North-West Russia

3.3

shale oil fraction

shale oil fraction is a part of shale oil with certain boiling point range

4 SAMPLING

Sampling of shale oil for determination of properties can happen in a location agreed between the supplier and buyer. Samples have to be taken according to the standard EVS-EN ISO 3170 or EVS-EN ISO 3171 and/or according to the national standards or according to the national regulations for sample taking.