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Naftni proizvodi – Vodilo za dobro gospodinjstvo - 2. del: Goriva za motorna vozila

Petroleum products - Guide for good housekeeping - Part 2: Automotive petrol fuels

Mineralölerzeugnisse - Leitfaden für eine gute Systemwartung - Teil 2 : Ottokraftstoffe für Kraftfahrzeuge

Produits pétroliers - Guide pour une bonne maîtrise de la qualité du produit - Partie 2: Carburants essences pour automobiles

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English Version

**Petroleum products - Guide for good housekeeping - Part 2:
Automotive petrol fuels**

Produits pétroliers - Guide pour une bonne maîtrise de la
qualité du produit - Partie 2: Carburants essences pour
automobiles

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Systemwartung - Teil 2 : Ottokraftstoffe für Kraftfahrzeuge

This Technical Report was approved by CEN on 13 February 2007. It has been drawn up by the Technical Committee CEN/TC 19.

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Foreword

This document (CEN/TR 15367-2:2007) 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.

CEN/TR 15367 consists of the following parts, under the general title *Petroleum products - Guidelines for good housekeeping*:

— *Part 1: Automotive diesel fuels*

— *Part 2: Automotive petrol fuels*

This part of this standard describes the distribution of automotive fuels in general and petrol in specific detail. For guidance concerning diesel distribution, part 1 is published to specifically address biodiesel or FAME.

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Introduction

During a meeting held in Oslo on June 1 2005 through June 3 2005, CEN/TC 19 decided to adopt the Preliminary Work Item "Fuels supply chain - Housekeeping guide for gasoline" on its Work Programme with the intention to start an enquiry on this CEN Technical Report in 2006. It was later decided to link this work directly with the already existing housekeeping guidelines for diesel fuel. The best option was to publish them as separate parts of the same CEN document, which is achieved by revising the original CEN/TR 15367:2006 "Petroleum products — Automotive Diesel Fuels — Guide for good housekeeping" as Part 1.

The work on both documents has been carried-out with support from Concawe.

Automotive fuel specifications generally apply at the point of delivery to the customer. To ensure the quality at this point, the best practice is to make sure that the product meets specification when it is dispatched from the refinery and to have systems in place to ensure that it cannot go off-specification on its way to the customer. There will be more than one method or procedure to handle many of the potential contamination issues throughout the distribution chain, thus the advice in this document outlines principles to apply but does not specify the precise detail of the methods to be adopted in all cases. Nevertheless, it is strongly recommended that all the procedures or measures to be applied along the distribution chain be defined using a Total Quality Assurance methodology.

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1 Scope

This document provides general guidance on petrol fuel housekeeping. It does not pre-empt national or local regulations. It addresses the issues of contamination by water or sediment that may occur in the supply chain during manufacture, storage and/or transportation. It does not address contamination by other products, nor does it address possible contamination by water or sediment that may occur on board vehicles, however, an informative note on vehicle factors is presented in Annex A.

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 228, *Automotive fuels – Petrol – Requirements and test methods*

prEN 15376, *Automotive fuels - Ethanol as a blending component for petrol - Requirements and test methods*

3 Supply chain definition

For the purposes of this document the supply chain consists of the following four parts:

- refineries,
- terminals,
- filling stations (including retail and industrial customer sites); and
- transportation from refineries to terminals and from terminals to filling stations.

4 Potential sources of water and sediment in the supply chain

4.1 Water

Water may enter the product at various stages of the supply chain but only becomes an issue if it is present as free water, which can be a contributory cause of corrosion. Entry points include:

- a) **as dissolved water** during manufacturing; this may become free water further down the supply chain depending on ambient conditions if the product is cooled so much that it reaches saturation point;
- b) **as free water** due to ingress as a result of e.g. heavy rainfall or through cracks in equipment;
- c) **as water vapour** (moist air) through vents followed by cooling/condensation on tank walls, including the vehicle tanks;

As it is virtually impossible to stop water from entering the supply chain, proper water management is essential.

4.2 Sediment

Sediment may consist of rust, dirt, dust, oxidation products and biological growth. These may form over a long period of time.

CEN/TR 15367-2:2007 (E)**5 Housekeeping guidelines****5.1 Elements of good housekeeping****5.1.1 Operations**

Proper attention to detail during all operating activities from product manufacturing to final delivery is essential to guarantee product quality. There should be operating procedures in place covering receipt, delivery, sampling, inspection, testing, and tank draining. These procedures should be reviewed and updated as required, when product quality changes are taking place as a result of new regulations or the introduction of new fuel types.

It is essential that personnel involved at each link in the chain, both company employees and contractors, are properly trained so that they are aware of and understand the importance of applying existing operating procedures.

If the use of chemicals is considered anywhere in the supply chain for housekeeping purposes (e.g. corrosion protection) the potential impact on fuel quality and performance should be investigated thoroughly. Non-chemical solutions are generally preferred.

5.1.2 Hardware

Age and design of existing hardware along the supply chain vary widely and it is possible to control product quality properly with differently engineered installations. Quality control, however, is much easier if hardware is designed to facilitate good housekeeping as described in the following sections.

5.1.3 Maintenance

No matter how well designed an installation may be, if it is not inspected and properly maintained, equipment faults will develop which may affect the ability of the operator to maintain product quality at the required level.

5.2 Detailed recommendations**5.2.1 General**

Recommendations are split into four sections, each covering various elements for refineries, terminals, filling stations and transportation. They represent current industry experience and are based on predominantly handling hydrocarbon petrol fuels. Special requirements may be necessary for bio-fuels later described in this document.

5.2.2 Refineries**5.2.2.1 Testing**

All batches of petrol fuel should be visually assessed, should not contain free water and should be free from visible sediment. When testing for visual appearance, the prevailing ambient temperature should be considered. Alternative methods such as on-line haze meters may be used. The product must meet the appearance requirements of EN 228.

When a sample is not visually acceptable, it should be analysed to quantify the problem. Analysis at this point enables any issues to be resolved at the refinery and avoid the problem becoming more widespread.

Test records should be kept for a sufficient period to cover market needs and regulatory requirements.

Product imports should be tested using the same approach as recommended for terminals (see 5.2.3).

5.2.2.2 Sampling

Upper, middle and lower samples should be taken from fixed off-take storage tanks for visual assessment and analysis. All three samples should be examined for visual appearance, including confirmation that the blend is not layered. Composite samples may be used for the other routine specification tests unless otherwise specified in their respective test methods.

No special requirements are specified with respect to settling time, after blending and before sampling. If product samples do not satisfy the visual appearance requirements, allowing time for settling is one measure that can be employed to bring the product on specification.

5.2.2.3 Operations

Most petrol storage tanks have external floating roofs and fixed off-takes, so it is not unusual for small volumes of water to leak into the stored petrol as a result of rainfall. Procedures to avoid build-up of water bottoms are essential. The floating roof drain pipe typically passes through the main tank volume and it is important to ensure that it does not leak into the petrol. Most storage tanks are flat bottom, though they can be cone-up or cone-down. Procedures to control water build-up (regular water bottoms checks and use of a facility to drain off water as required) should be established based on local experience with the particular tank configuration, fuel production process and local climate. These procedures should ensure that water is not carried forward to the next stage of the supply chain. Dome covers on floating roof tanks are effective at reducing water ingress.

Tanks should also be checked periodically for biological infection and there should be a procedure to deal with such contamination in case it is detected. Once established, biological growth can be difficult to rectify – prevention is better than a cure and is best achieved by good water management.

5.2.2.4 Hardware requirements

New tanks should be designed to minimise water ingress, optimise water draw-off capability and be fitted with anti-swirl systems to minimise mixing of tank bottoms during filling.

They should also have a convenient facility for taking three samples:

- upper sample at one-sixth of the depth of liquid below the maximum level;
- middle sample halfway down the depth of the liquid; and
- lower sample at approximately one-sixth up from the bottom level, representing the product which will be drawn out of the off take system. The precise height for the lower sample should be based on details of tank configuration including the height of the off-take point.

Filtration of the final product is not generally necessary to control water and sediment. Filters may be installed as an additional safeguard in some situations. If filters are used, precautions should be taken to avoid static electricity build-up and potential ignitions.

5.2.2.5 Maintenance

Tank cleaning is a major operation which requires completely draining the tank. It is only carried out periodically, normally on a schedule of several years, possibly coinciding with (statutory) inspection and maintenance requirements. Good housekeeping can help to extend the periods between tank cleaning.