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Naftni proizvodi – Dizelsko gorivo – Vodilo za dobro gospodinjstvo

Petroleum products - Automotive diesel fuels - Guide for good housekeeping

Mineralölerzeugnisse - Dieselkraftstoff für Kraftfahrzeuge - Leitfaden für eine gute Systemwartung

Produits pétroliers - Carburants diesels pour automobiles (Gazoles) - Guide pour une bonne maîtrise de la qualité du produit

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Foreword

This document (CEN/TR 15367:2006) 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.

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Introduction

During its meeting held in Cannes on 27 June 2003, WG 24 "Automotive diesel" decided that a guidance document on good housekeeping could be instrumental in prevention of potential motoring problems caused by contamination in the supply chain. This was endorsed by CEN/TC 19 resolution 24.5. The work 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, 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 it's 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. The advice in this document outlines the 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 should be defined using a Total Quality Assurance methodology.

1 Scope

This document provides general guidance on diesel fuel housekeeping. It does not pre-empt national or local regulations. It only addresses the issues of contamination by water or sediment that may occur in the supply chain, during manufacturing, storage and/or transportation. It does not address contamination by other products nor does it address the possible contamination by water or sediment that may occur on board of vehicles.

NOTE Informative guidance on vehicle factors is presented in Annex A.

2 Background documentation

The documents referenced below are useful for the application of this document. These are undated references, the latest edition of the referenced document (including any amendments) applies.

Quality requirements for diesel are described in the following European standard:

EN 590, *Automotive fuels – Diesel – Requirements and test methods.*

Sampling and testing are critical steps in assessing fuel quality, in particular with regard to free-water and/or sediment contamination issues. Information on sampling can be found in the following standards:

EN 14275, *Automotive fuels — Assessment of petrol and diesel quality — Sampling from retail site pumps and commercial site fuel dispensers*

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

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

UST Rules: EU member states requirements for Underground Storage Tanks differ. In most countries, specifications exist for tank construction, corrosion protection and leak detection. These regulations have been set mainly from a safety and environmental protection point of view but also serve to avoid product contamination.

3 Supply chain definition

For the purpose of this document the supply chain is considered to consist 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.

Information on useful additives beyond the supply chain is given in Annex B.

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 and biological contamination. 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 longer period of time.

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 for guaranteeing product quality. There should therefore 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 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 or biological disinfection) 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 is however 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 maintained properly, equipment faults will develop over time which may eventually affect the ability of the operator to maintain product quality at the required level.

5.2 Detailed recommendations

NOTE Recommendations are split into four sections for refineries, terminals, filling stations and transportation, each covering various elements. They represent current industry experience and are therefore based on handling of predominantly hydrocarbon **diesel** fuels.

5.2.1 Refineries

5.2.1.1 Testing

All batches of diesel 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 water content and total contamination requirements of EN 590.

Where a sample is not found to be visually acceptable, it should be analysed to quantify the problem. Analysis at this point would help 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.

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

5.2.1.2 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.

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

5.2.1.3 Operations

Although some storage tanks have floating off-take points, most have fixed off-takes so procedures to avoid build-up of water bottoms are essential. 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 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.

Diesel tanks should also be checked periodically for the presence of bacteriological 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 cure, and is best achieved by good water management.

5.2.1.4 Hardware requirements

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

They should also have convenient facilities for taking three samples.

— An upper sample at one-sixth of the depth of liquid below the maximum level;

— A middle sample halfway down the depth of the liquid;