

T-4 Fuels – attributes, uses and trends of development

Introduction

1. Technology of PH production
2. Kinds of fuels and its attributes
3. Marking of PLO within NATO

Literature:

- ✿ BLAŽEK, RÁBL. Základy zpracování ropy a ropných frakcí. VŠCHT v Praze. Praha. 2002.
- ✿ MATĚJOVSKÝ. Automobilová paliva. Grada Publishing, a.s. Praha 2005.
- ✿ Zvláštnosti hospodaření s majetkem majetkového uskupení 3.0 v rezortu MO, Odborné pokyny. MO, Sekce podpory. Praha. 2008. 6127-60/2004/DP-3042.
- ✿ MO SP Č.j. 60146-22/2005/DP-3818-SMMU. V jenské jakostní specifikace pohonných hmot, maziv a provozních kapalin. *Pomůcka*. Praha. 2006
- ✿ MO SL. Č.j. 47275/19/2001-8918. Organizační nařízení k zavedení jednotného systému značení a identifikace jednotlivých druhů pohonných hmot, maziv a provozních kapalin v AČR. Praha. 2002.
- ✿ GŠ AČR. Č.j. 60146-20/2005-3818. Kontrolní systém a kontrola jakosti pohonných hmot, maziv a provozních kapalin v AČR. *Prozatímní směrnice*. Praha. 2002.
- ✿ <http://www.reflex.cz/Clanek30244.html>
- ✿ http://www.merocr.eu/files/ropa_ropa_ropa.pdf
- ✿ <http://www.eia.doe.gov/basics/quickoil.html>
- ✿ http://www.eeip.cz/cz/docs/070323_Vyvoj%20cen%20ropy%20a%20plynu_Konference_Brno.pdf

1. TECHNOLOGY OF PH PRODUCTION

It is a liquid mixture of hydrocarbons of fossil origin, representing the raw material in the petrochemical industry. Crude oil is light yellow to dark black.

Composition of Crude oil:

Carbon: 84–87 %

Hydrogen: 11–14 %

Oxygen: to 1 %

Sulfur: to 4 %

Nitrogen: to 1 %

compounds containing
heteroatoms(S, N, O).



gases methan, ethane, propane, butane and Carbon dioxide.

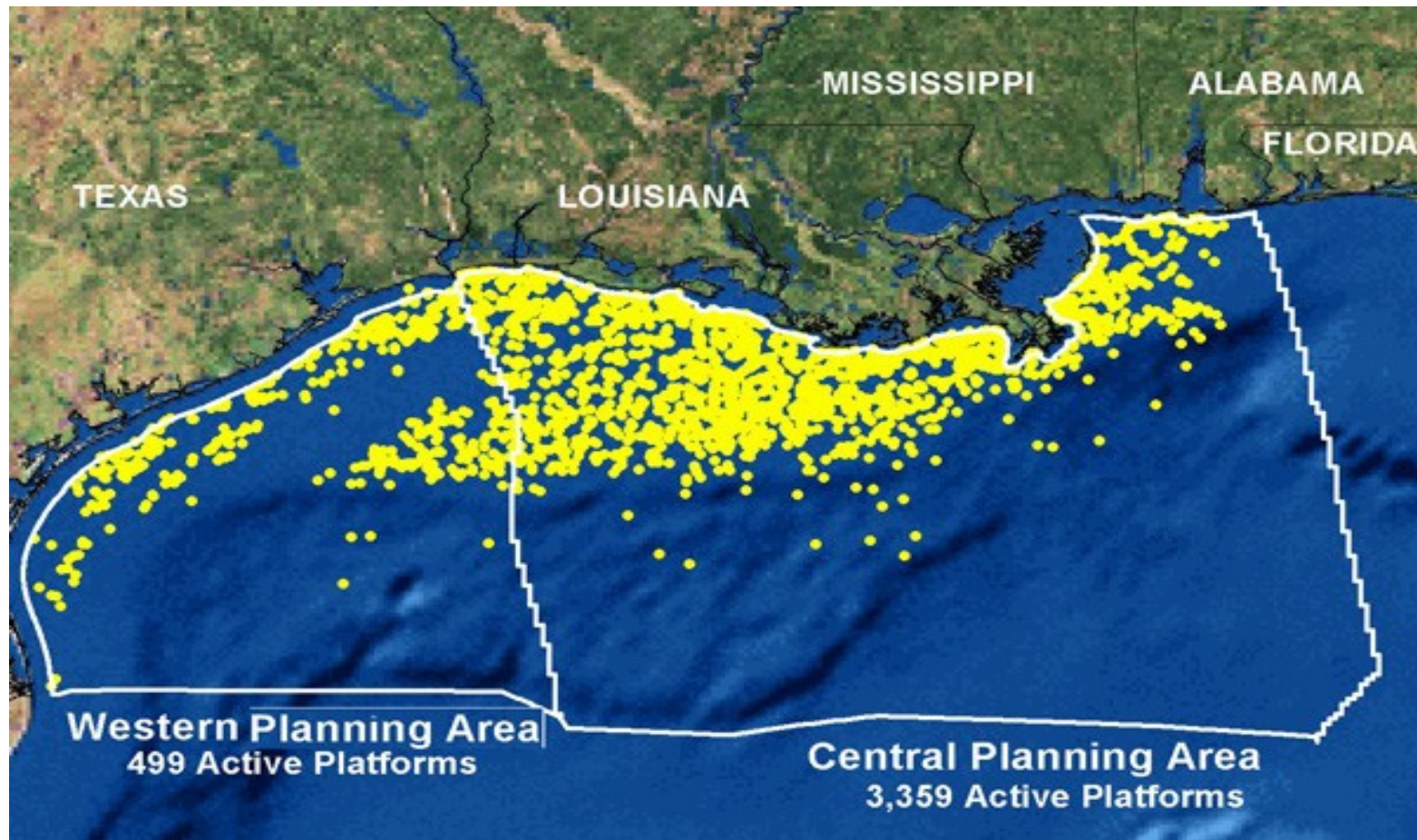
Crude oil sites

Brent – 15 kinds of crude oil from sites in North Sea

- WTI (West Texas Intermediate)
- Dubai, for its prize is sold Middle Eastern oil designated for asian-pacific area.
- Tapis (from Malaysia), for its prize is sold light oil from Far East.
- Minas (from Indonesia), for its prize is sold heavy oil from Far East.



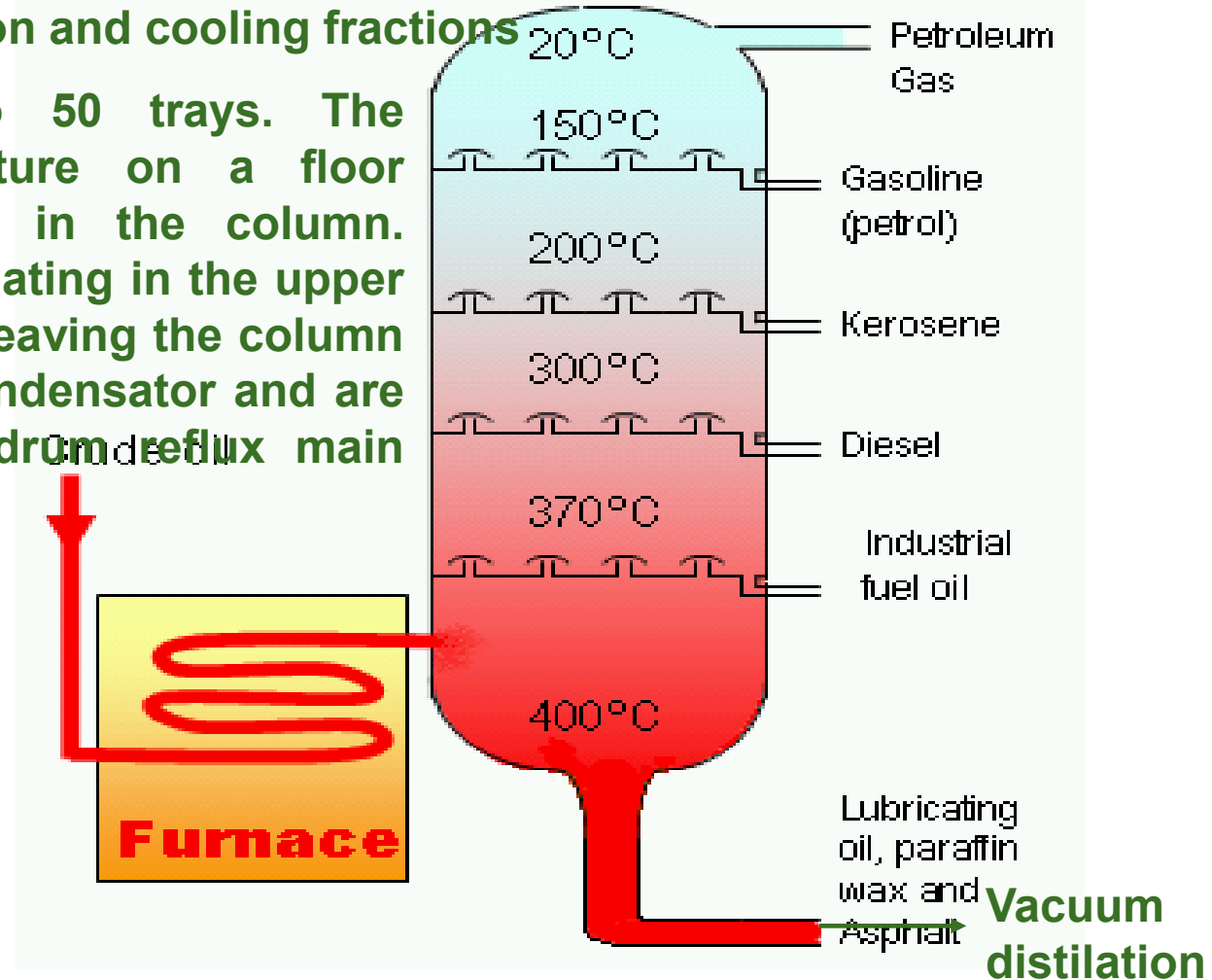
1. TECHNOLOGY OF PH PRODUCTION



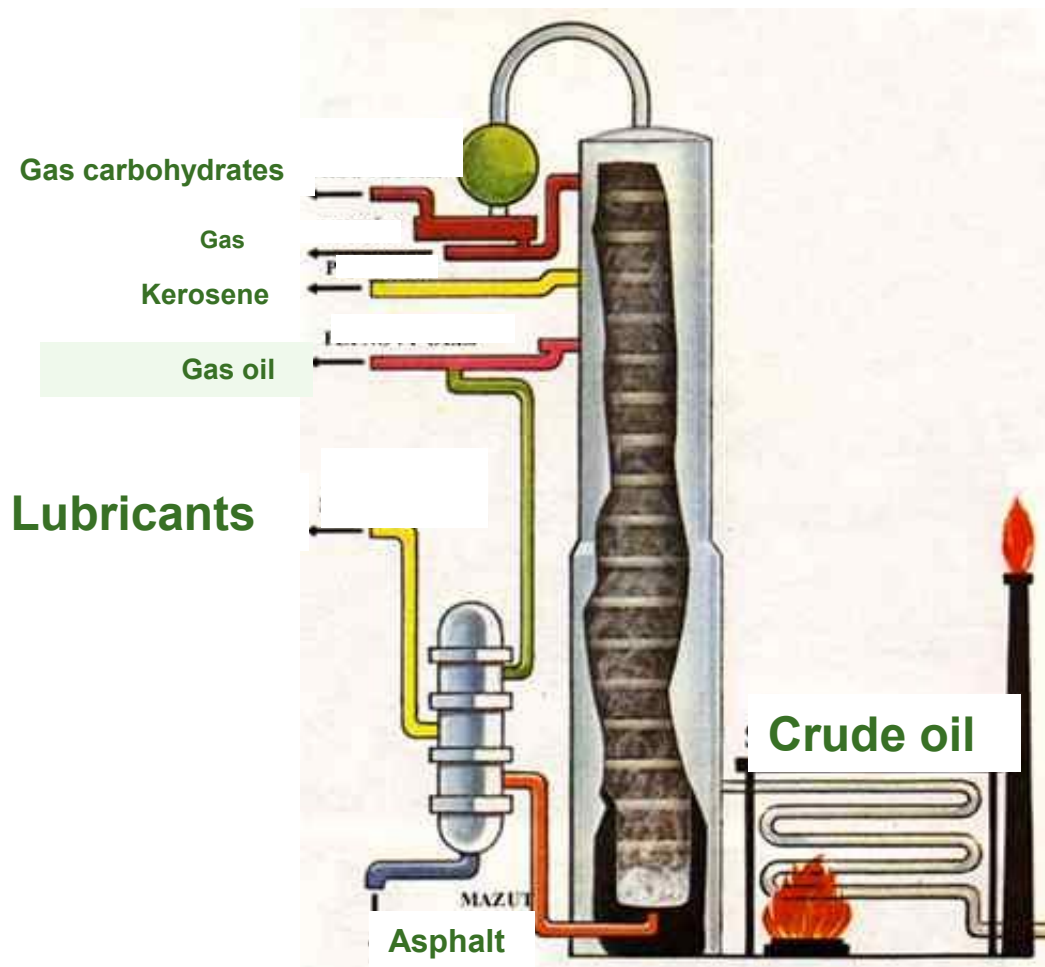
1. TECHNOLOGY OF PH PRODUCTION

The base of distillation is the heating of raw material, its evaporation, fractionation, condensation and cooling fractions

The column has 30 to 50 trays. The temperature of the mixture on a floor depends on its position in the column. Lighter fractions are cumulating in the upper part of the column. Vapor leaving the column head, pass through the condenser and are collected in a separator drum, reflux main rectification column.



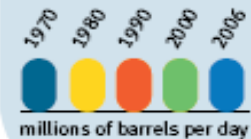
1. TECHNOLOGY OF PH PRODUCTION



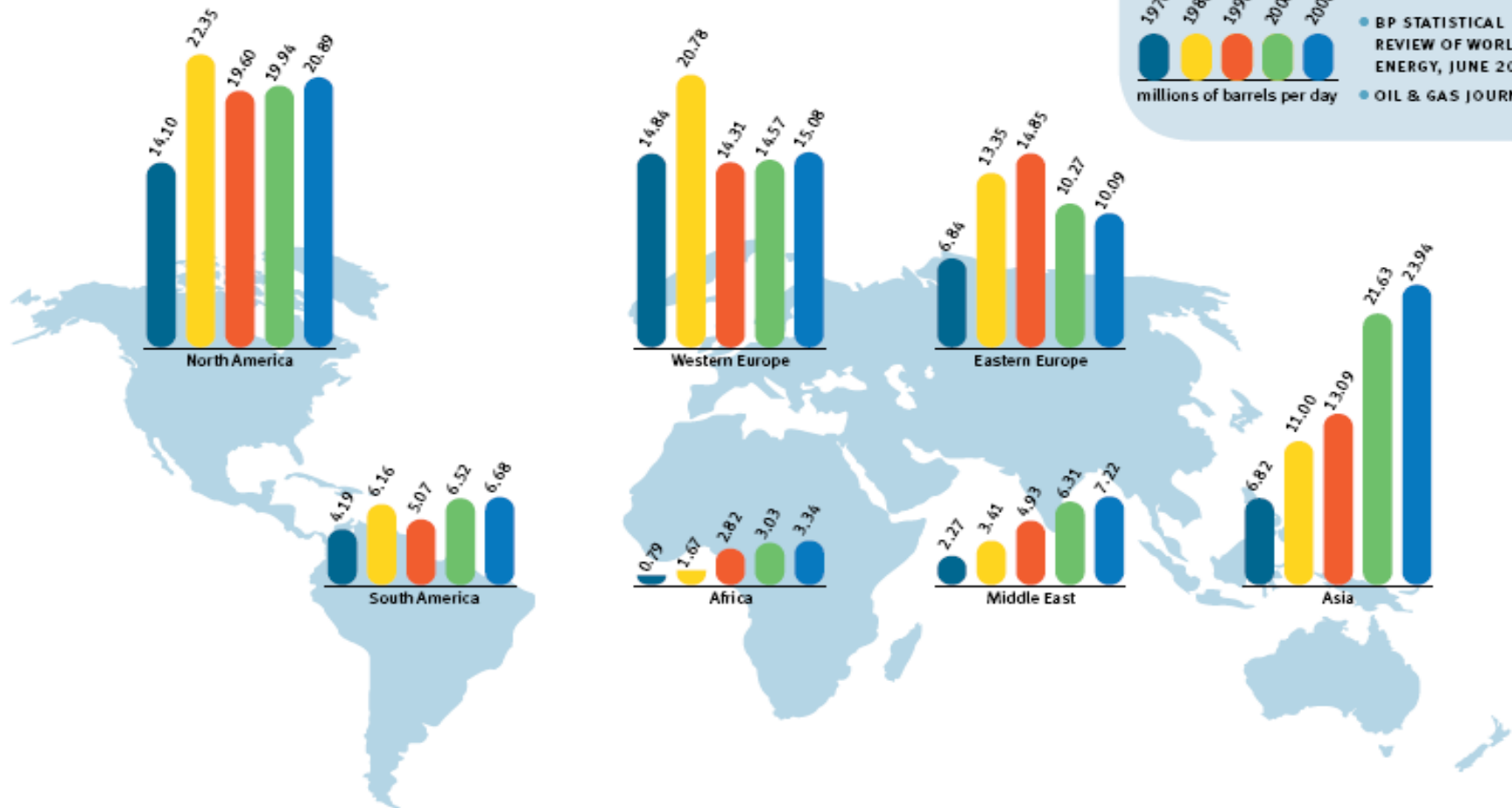
1. TECHNOLOGY OF PH PRODUCTION

World refining capacity

Key



SOURCES:
 • BP STATISTICAL REVIEW OF WORLD ENERGY, JUNE 2007
 • OIL & GAS JOURNAL



2. Kinds of fuels and its attributes

Kinds of fuels:

- ✿ Automobile petrols;
- ✿ Diesel oil;
- ✿ Kerosen;
- ✿ Liquefied petroleum gases— LPG;
- ✿ Natural gas— compressed (CNG) or liquid (LNG);
- ✿ Alcohols — Methanol, Ethanol (líh), higher alcohols;
- ✿ Fatty acids (rapeseed oil acid) and their mixtures with diesel fuel, so called mixed fuels (know under incorrectly name biodiesel);
- ✿ Hydrogen;
- ✿ exotic fuels - ammonia, nitromethane, dimethyl ether, acetone - butanol mixture.

2. Kinds of fuels and its attributes

Diesel fuel

Requirements:

- Matching motor output;
- Quiet;
- Adequate lubricity;
- Fine combustion;
- Useful in different climatic conditions;
- Keeping quality during storage(diesel stability);
- Low emissions.

2. Kinds of fuels and its attributes

Additives in diesel fuel:

- ✱ antioxidants and additives improving the stability of oil;
- ✱ antistatic additives;
- ✱ bactericidal and bacteriostatic additives;
- ✱ Deemulgators;
- ✱ detergent additives to diesel fuel;
- ✱ lubricity additives;
- ✱ anti-corrosion additives to diesel fuel;
- ✱ anti-foaming additives;
- ✱ additives to increase cetane number;
- ✱ additives to improve the low temperature attributes;
- ✱ dyes and markers.

2. Kinds of fuels and its attributes

Antioxidants and additives improving the stability of oil

Petroleum diesel fuel is not necessary to stabilize (adity by antioxidant), if it doesn't contains olefins, or if it hasn't be long time stored. During long time storage, but also in vehicle tank and in fuel systém of the engine, where is during circulation oil exposed to high temperature, leads to chemical reactions, during which are forming dissulable materials in oil. There can being resins, if there are olefins. Resins can be created during long time storage at higher temperatures too.

2. Kinds of fuels and its attributes

Antistatic additives

A discharge of static electricity can cause an explosion of fuel vapor mixtures with air if its composition ranges in values between the lower and upper explosion limits. This danger arises during pumping and transporting of fuel, during refueling and any other manipulations. Static electricity is generated by the movement of the product (pumping, stirring), which has low electrical conductivity, which is typical for deep refined products

2. Kinds of fuels and its attributes

Deemulgators

Diesel oil has sometimes light opacity, caused by amused droplets of water, which is very stable. It happens usually at the end of the distribution networks, when it got through several tanks and drainings.

2. Kinds of fuels and its attributes

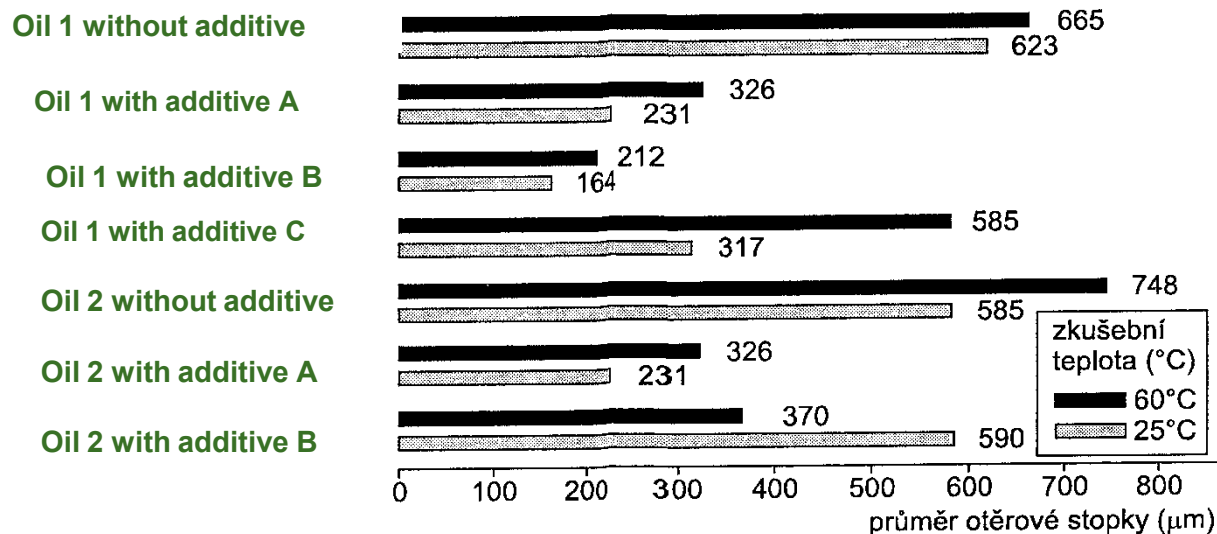
Detergent additives to the diesel oil

Additives for fuel stability improve, are suppressing formation of sediments mainly during long time storage, and it can positively change the speed of engine fuel filter sedimentation. Detergents, both type dispersants and surfactants, are not changing inner stability of fuel, but they are lowering risks, that there will be problems with engine operation caused by clogging of nozzles.

2. KINDS OF FUELS AND ITS ATTRIBUTES

Lubricity additives

Deep desulfurization of diesel, reducing end of distillation great content kerosene fraction has resulted in worse lubricity. It concerns mainly so called ecological diesel oil for winter or arctic clima. Therefore, there was included requirement for minimal level of lubricity in EN590.



Pic 10.4 Results of Swedish oil lubricity tests (HFFR)

2. KINDS OF FUELS AND ITS ATTRIBUTES

The dates for the sale of seasonal types of diesel

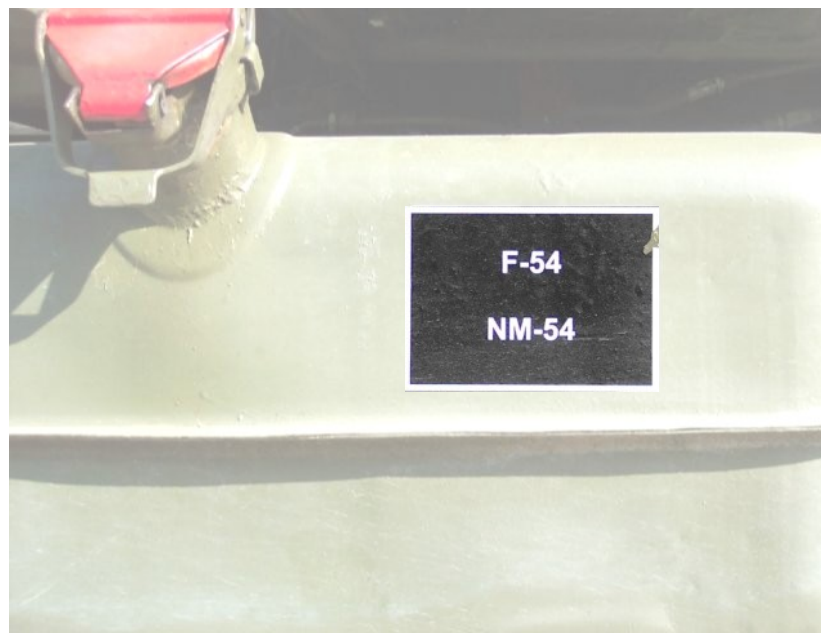
Quality	summer	crossing	winter	
Type	B	D	F	Class 2 arctic
Period for supply of petrol stations	4/15 – 9/30	10/1 – 11/15 3/1 – 4/15	11/16 – 2/28	Not specified
Prolonged periods for dispensing at petrol stations	Until 10/15	Until 11/30		
CFPP, maximum	0°C	-10°C	-20°C	-32°C
Cloud point, maximum	-	-	-8°C	-22°C

3. MARKING OF PLO WITHIN NATO

Marking of PLO by NATO

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CONCLUSION

Important role for keeping quality during manipulation with PLO are playing PLO warehouses, where trained personnel responsibly handle with mentioned material. As part of its activities in this area fulfills a broad spectrum of actions that may significantly affect the quality in case of non-compliance with established procedures for the receipt, storage and dispensing of fuel.