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Update on European Biofuel Specifications and Test Methods

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Summary

- Since the last ICBS in 2009, a lot has changed in EU Directives and standards
- Big steps towards E10 and B10 were made
- The bio-palette has got more colour and so have our standards

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History…

- Until 1985 there were no European specifications
- Starting 1985, EU policies emerged:
  - 85/210/EEC: lead and benzene / 85/536/EEC: oxygenates
  - Fuel Emission Directives air pollution by motor vehicles
  - Fuel Quality Directives (e.g. 98/70/EC): sets environmental specifications and analytical methods for petrol and diesel that enter the European market
- In 1988, CEN received Mandate to create Standards for gasoline, diesel and LPG

EU Directives

- Prepared by the Commission after consultation with its own and national experts, using a process known as **Comitology**. The draft is presented to the Parliament and the Council.
- Political process, CEN is not involved!
- However, CEN/TC 19 has informal communications with European Commission

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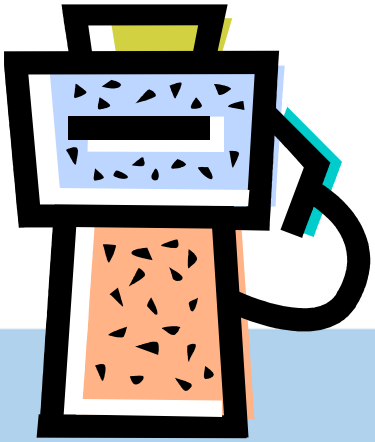
CEN standards in response

- Fuel specs, including test methods:
- EN 14274: Fuels Quality Monitoring System
- Followed by biofuel standards

Link CEN specs and FQD

- CEN implements the FQD only partly
- EN 228 and EN 590 are voluntary standards!
- Countries can implement FQD in different ways
  - Some countries refer to EN 228 and EN 590 in law
  - Some countries implement the FQD in law by Decrees



Link CEN specs and FQD

Example: EN 228

Property	Units	Min	Max	Method
RON		95,0		EN ISO 5164
MON		85,0		EN ISO 5163
Lead	mg/l		5,0	EN 237
Sulfur	mg/kg		10,0	EN ISO 20846 EN ISO 20884
Copper strip	Rating		Class 1	EN ISO 2160
Oxidation	Minutes	360		EN ISO 7536

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Mandates

Political request from the European Commission (EC), agreed upon by the Member States addressed to CEN, in support of an action from the EC. This can be in **support of legislative work** such as a Directive or in **support of an industrial policy** action from the EC.

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Mandates

- M/245: FAME quality specification
- M/344: Ethanol quality specification
- M/393: FAEE quality specification (2006)
- M/394: 10% FAME/FAEE in diesel fuel (2006
- M/413: PAH content analysis of extender oil (2008)
- M/430: Bio-based lubricants (2009)
- M/475: Biomethane (2010)
- M/…. on pyrolysis oil
- M/… on algal oil (production)

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Standards related to (bio)fuels

- EN 228 (E10)
- EN 15376: ethanol
- CEN/TS 15293: ethanol (E85) fuel
- EN 590 (B7)
- EN 14214: FAME
- CEN/TS 15940: paraffinic diesel fuel
- EN 589: LPG
- In progress: B10 and B30

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Unleaded petrol

- Manganese (as MMT):
  - FQD requires 6 mg/l now (and 2 mg/l in 2014)
  - EN 16135 (AAS) and EN 16136 (ICP-OES)
  - further developed for diesel and for Fe
- Vapour pressure waiver (as in FQD)
- CEN/TR 16145 on oxygenates blending
- Ethanol according to EN 15376:2011
  - to be revised for lower chloride and sulfate contents
- New octane panel allowed (awaiting ISO revision work)

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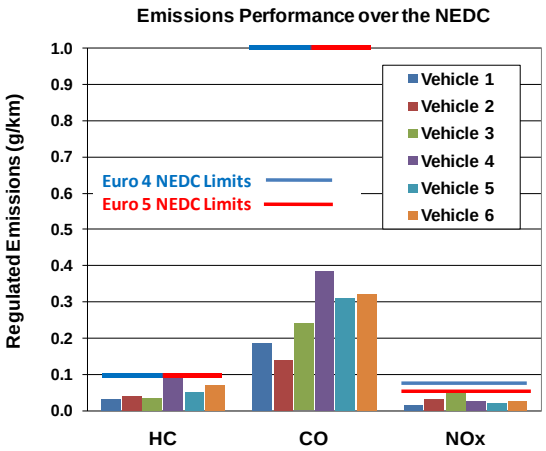
Unleaded petrol

- E10 specification (as by amended FQD):
  - major dispute on volatility vs. driveability requirements
  - extensive vehicle test programmes executed
  - “Leap day compromise”:
    E70 range +2% / E100 max + 1%
    VLI adapted accordingly
    local follow-up procedures in case of incidents



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Unleaded petrol open issues

- octane of high oxygenate fuels:
  - above 25%vol
  - measure or derived from other test results
- methanol content of E85
- applicability checks on many tests for E85
- water content of ethanol and petrol (impact on corrosion prevention)

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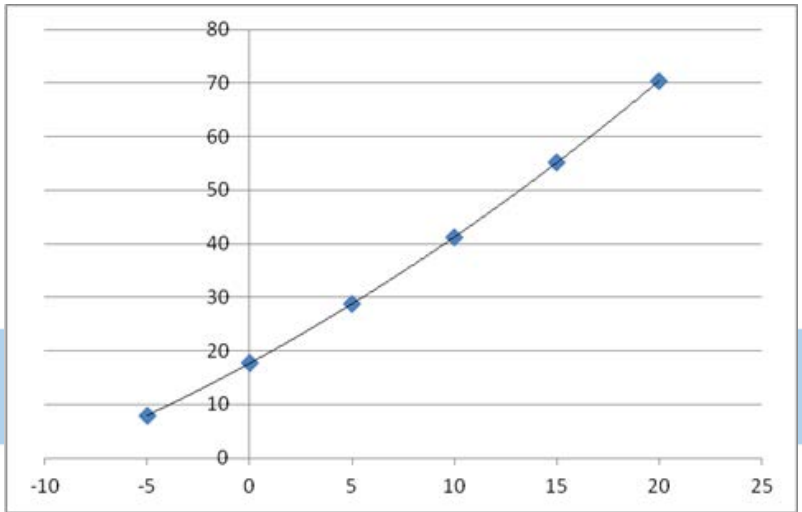
Biodiesel

- EN 14214 for automotive and heating B100
- up to B10 and B30 requirements
- oxidation stability to 8 hours Rancimat
- specific table for cold operability:
  - CP/CFPP and MG combination to be chosen by countries
  - correlation predicts SMG level
  - further explanation in Annex



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(Bio) diesel questions

- PetroOxy oxidation stability test (EN 16091) limit related to field performance
- acid number pass test for stability (FAME)
- steryl-glycosides (by GC-FID and GC-MS)
- saturated mono-glycerides
- cetane and DCN measurement (paraffinic diesel)
- total aromatics of paraffinic diesel
- seizure protection guarantee of paraffinic diesel

Diesel discussions

- sodium contribution to injector deposits
- filter plugging tests vs. field issues
- ash-forming metals in diesel
- B10 specification as separate specification:
  - mandated by EC, indirect FQD relationship
  - discussion within EC why part of EN 590?
  - majority agreement during enquiry ballot to split

Biomethane

- CEN/TC 408 works on it
- Both for vehicle application as for gas grid introduction
- Will use many natural gas methodologies
- Bio-questions: siloxanes, microbes, methane number, sulfur, reference materials

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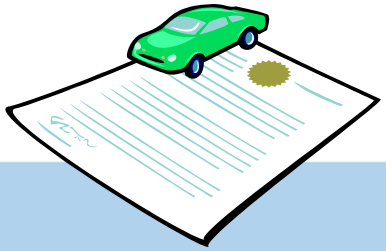

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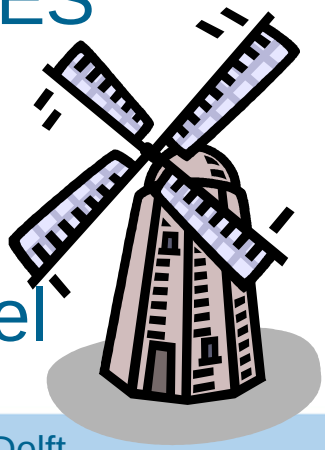
Thank you for the attention

- EN 15944, Ni+Va in fuels by ICP-OES
- EN 16091, Petroxytest
- EN 16135/16136, Mn in petrol
- EN 16144: FIT (2nd derived cetane test)
- EN 16270, high boilers in petrol
- EN 16294, phosphorus in FAME by ICP-OES
- EN 16300, iodine value of FAME
- EN 16329, CFPP by linear bath method
- prEN 16476, ash forming elements in diesel



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