

CEN/TC19 2011 Conference



EN 228
Unleaded Petrol
A brief history

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Prologue

Before 1985



Before 1985

- Fuel quality and specifications are not a European concern
- Fuel quality is defined at national level or inter-company exchange specifications



1st Chapter

1985 – 1998



The first steps towards European standards

- Few parameters are regulated
- For environmental/Health reasons
 - Sulphur
 - Lead
 - Benzene
- Security of supply
 - Introduction of oxygenates



Introduction of unleaded petrol

- To meet exhaust emission regulations, exhaust catalysts need to be implemented
- Due to their sensitivity to lead, acting as a poison, need to introduce unleaded petrol
- A mandate is given, by European Commission and ETFA, to CEN to develop a European Unleaded petrol specification in support of:
 - Air quality
 - Free trade
 - Customer protection
- The first EN228 standard is published in 1987



EN228:1987

→ Some key parameters

- Harmonization of octane numbers (95-85)
- Simplification of volatility classes
 - E70, E100, E180 and Vapour Lock Index
- No constraint on hydrocarbon composition except benzene

→ Further revisions took place in 1993 and 1998, mainly related to test methods updates



2nd Chapter

1998 – 2005

1993 → 1998



→ EU strategy develops in CAFE

- Clean Air For Europe
- Actions needed to reduce emissions from the transport sector
- → Launch of Auto Oil programme
 - EPEFE (European Programme on Emissions, Fuels and Engines)
 - Base of the 1st fully formed directive on fuel quality (98/70)



Directive 98/70/EC

- Establish environmental characteristics of fuels based on their impacts on exhaust/evaporative emissions
 - Vapour pressure (summer): 60 kPa max
 - Volatility: E100min (46%v/v), E150min (75%v/v)
 - Composition:
 - Benzene: 1% v/v max
 - Aromatics: 42% v/v max
 - Olefins: 18% v/v max (21% for regular unleaded)
 - Oxygen content: 2,7% m/m
 - Sulphur: 150 mg/kg (50 mg/kg in 2005)

EN228:1999 revision



→ To include:

- Environmental parameters set in the directive
- Assess the impact of vapour pressure limitations (summer) and constraints on composition
 - → Adaptation of volatility classes (E70, VLI)
- In parallel, discussion on impact of changes in reference fuels on octane number determination

EN228:2004



- Publication of revision of 98/70/EC: 2003/17/EC
 - Confirms most of the parameters set in 98/70
 - Further sulphur reduction to 10 mg/kg in 2009
 - Further aromatics reduction to 35% v/v in 2005
- EN228 revision:
 - Inclusion of the revised parameters from the directive
 - Inclusion of a correction factor for octane numbers
- In parallel, the directive on the promotion of biofuels is published
- EC gives mandate to CEN to establish European specification for Ethanol as a blending component



3rd Chapter

2005 – 2012



From 2005 until today

- 2008: Update of EN228:2004
 - Test methods
 - Clarification of octane reporting and correction factor

- 2009: Publication of Directive 2003/30/EC
 - Introduction of E10
 - Maintenance of E5 as protection grade (until 2003)
 - Limit on MMT (as Mn)
 - Conditional ethanol waiver for vapour pressure (summer)

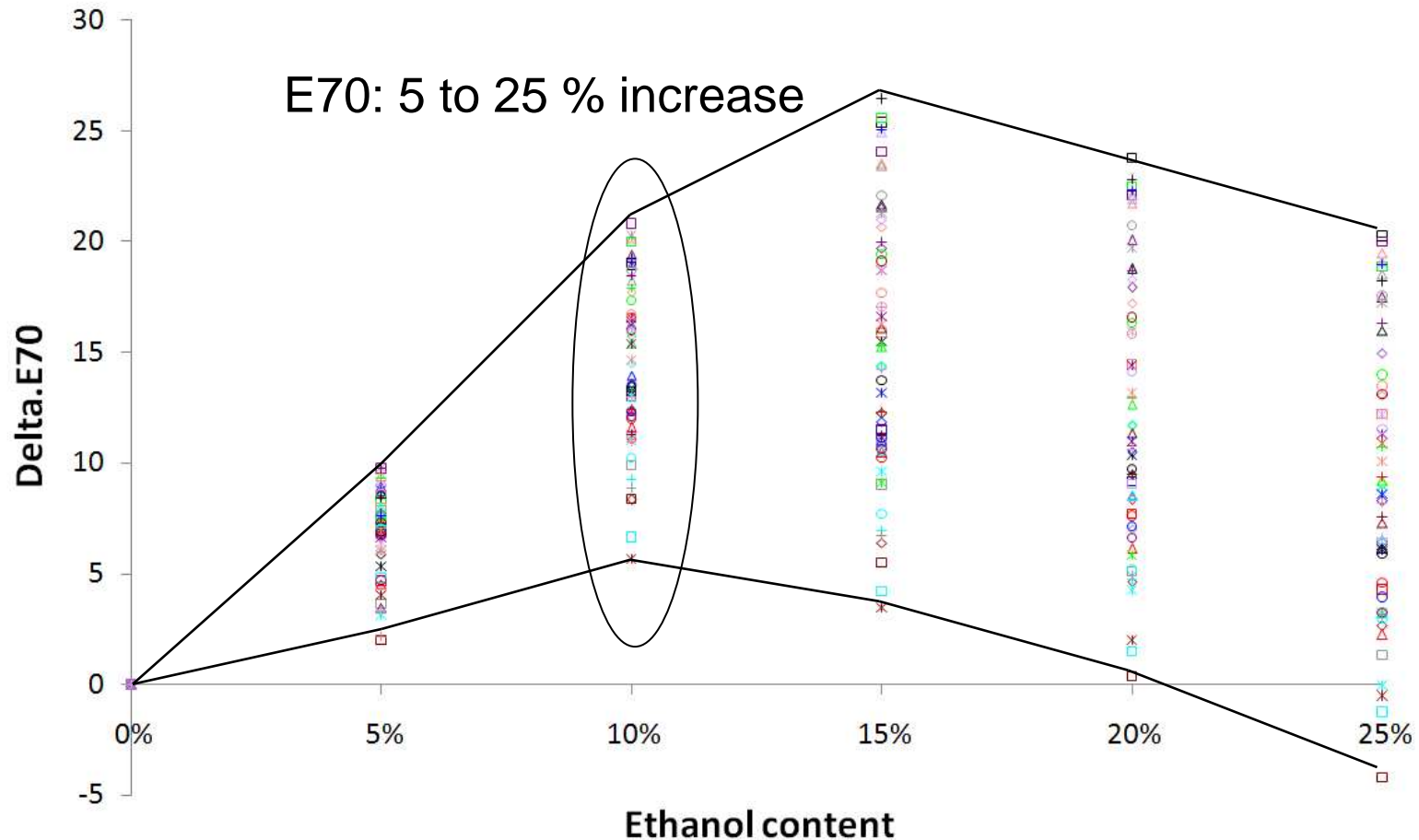


Proposed EN228:20XX

- Includes all revised parameters from the directive
- Includes a separate table for E5 (protection grade)
 - Equivalent to EN228:2008
- Includes a table for E10

- Key point of discussion: Volatility
 - Impact of 10% ethanol blending on E70/E100

BEP525 Results: Delta.E70 vs. Ethanol content



- Proposed Step 1: E70_{max}: + 4%v/v – E100_{max}: + 1%v/v
- Proposed Step 2: E70_{max}: + 7%v/v – E100_{max}: + 3%v/v

Source: Concawe



Potential consequences

- Changes in volatility may potentially affect:
 - Cold and hot driveability
 - Exhaust emissions – in particular at cold starts
 - Evaporative emissions

- Of current and future vehicle fleet

- Impact assessment on vehicles is currently under evaluation through test programmes on selected vehicles
 - Conclusion of the programmes, for step 1, are expected by May 2011

Volatility discussion



- To be completed in May 2011 following CEN TC 19 meetings in Krakow

Ethanol and E85



- Following EC mandate, CEN TC 19 has published the first standard for ethanol as a blending component (up to 5% v/v) in 2007 (EN15376)
- It was later revised and updated to accommodate ethanol blending up to 10% v/v
- In parallel, CEN TC 19 has developed a Technical Specification for E85 (CEN/TS 15293)
- It will be further revised and upgraded to a full EN norm



To be continued.....

2012 -



What will happen next?

- Beside the maintenance of the standards for test methods and follow-up of (potential) field problems
 - Method update
 - Potential alternative methods
 - High boiling components

- Long term perspective on E10+?
 - Guidance is requested, from EC and OEM's
 - Impact assessment of 10+ ethanol blending on unleaded petrol characteristics



Challenges

- To accommodate the political agenda (European Directives) and CEN process
- Anticipation of EC expectations is essential