
Diesel Engine Oil Category Development: Considerations for the Next Category

HDEOCP Working Groups

Phoenix

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EMA/API/ACC Concerns

- **Availability of new oils on the market**
 - To meet immediate needs
 - To meet 2007 emission standards
- **Flexibility to accommodate change / refinement**
- **Funding**
 - Test development
 - Matrix testing for BOI / VGRA
 - Structure
- **Worldwide acceptance of categories**
- **Value to, and consensus among, stakeholders**

EMA Observations

- **Great value in API system**
- **Time and resources are major concern for all**
- **Engine manufacturers committed to make new lower emitting engines available for 2007**
 - EPA standards take effect
 - Aftertreatment deployment will begin
 - Engine oils are critical to manufacturers' meeting those standards
- **Flexibility and innovation needed in process development**
 - Combine features of all proposals
 - Adjust to hardware development and still meet timeline
 - Deadlines have been met before, they'll be met again by all stakeholders working together

EMA Observations

- **OEM specifications**
 - Require less process to develop but lack universal API “CX” reference
 - May force fleet owners to purchase multiple oils
This is not acceptable
- **Chemical limits offer an efficient alternative to engine/aftertreatment performance testing for the short term**

2007 On Highway Emission Stds Aftertreatment Category – PC10

- **Requires vital new tests including**
 - Cummins ISB cam wear
 - Mack T12 ring and liner wear, bearing corrosion
 - Caterpillar C13 deposit control, oil consumption, (CCV?)
 - GM Sequence III G oxidation stability
- **Aftertreatment deployment will begin**
- **Chemical limits**
 - Efficient alternative to engine/aftertreatment performance tests
 - Balance hardware and aftertreatment needs
- **Backward compatibility / suitability needs to be defined**
 - ExxonMobil proposal regarding chemical limits and 500 ppm sulfur fuel presents an interesting concept to explore
 - Other test consolidation may be appropriate

A Way Forward

- **OEMs**
 - **Introduce new tests**
 - Cummins ISB to protect overhead valve train with low P oils
 - Caterpillar C13 for deposit control, oil consumption, and possibly CCV
 - Mack T12 for ring and liner wear, bearing corrosion
 - GM Sequence III G for oxidation stability
 - **Develop tests**
 - Demonstrate test discrimination
 - Propose limits

A Way Forward (cont.)

- **ASTM**

- **Develops chemical limits for 2006**

- Expect minimal changes to existing mechanical elements-bearing, valves, cams, etc.
 - Chemical limits that balance aftertreatment device protection and engine requirements

- **Addresses test robustness**

- Assures precision through HDEOCP and surveillance panels
 - Develops matrix to quantify test discrimination and lab repeatability
 - BOI / VGRA carried forward and improved over time with data collected

(early approved formulations remain valid until reformulated)

- **No “B” ballot required**

A Way Forward (cont.)

- **DEOAP**
 - **Determines timing for new category introduction**
 - **Establishes funding structure**
 - **Affirms consensus of test limits**
 - **Defines backward compatibility**
 - **Obsoletes old categories**

Timeline

	2003				2004				2005				2006				2007				2008				2009			2010		
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1	Q2
Upgrade of CI4 (CJ-4)	Upgrade of CI4																													
Tests Available																														
Initial Licenses																														
15 ppm S Fuel	15 ppm S Fuel																													
Initial Retail Req. 80 / 20 Phase in 100% Available																														
Engine / Aftertreatment Dev.	Engine / Aftertreatment Dev.																													
Hardware Development 2007 Pre-Launch 2007 Engine Launch Phase in to 2010																														
PC10	PC10 Development																													
Test Development																														
ISB Hardware Avail																														
ISB Development finished																														
ISB Limits																														
C 13 Hardware Avail																														
C 13 Development finished																														
C 13 Limits																														
T 12 Hardware Avail																														
T 12 Development finished																														
T 12 Limits																														
Oil Availability	Oil Availability																													
Chemical Limit Development	Chemical Limit Development																													
Data Gathering																														
Draft Limits																														
Testing of Low SAPS oils																														
Limits in Force																														