

Cummins ISM Ballot for Advancement Into PC-10 Category

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Chairman

ASTM Heavy-Duty Engine Oil Classification Panel

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Ballot Returns

- **22 Returns in Total**
- **3 Negatives**
- **19 Affirmatives**
 - **Six Affirmatives Included Comments**

- We are encouraged by the progress that has been made with the ISM test, and believe that it may be viable for use in the PC-10 category. Our negative is based on a concern with the number of high-soot valve train wear tests currently proposed for PC-10. Since one of the key objectives in HD category development is to avoid redundant performance parameters, we propose a thorough evaluation of the 3 high-soot VTW tests (ISM, ISB, and RFWT) to determine if one or more of these tests could be eliminated without compromising the integrity of the category. If this activity demonstrates that each test can be justified on its own merits, and the full range of 2007 engines would not be adequately protected by using fewer than 3 VTW tests, ExxonMobil will support the use of the ISM, as well as the 2 other high-soot VTW tests, in the PC-10 category.

Afton Chemical

Negative



- Afton Chemical supports the Cummins ISM test and the work done by the Cummins Surveillance panel. We believe the test should be included in PC-10 and we encourage the development of correlation data to provide a replacement test for the Cummins M-11 EGR. At this time we have voted negative on the acceptability of the test for inclusion in PC-10 because:
 1. An outlier screening method for cross-heads, adjusting screws and top rings has not yet been developed. This method should be consistent with the current M-11 EGR test which uses the 95% confidence level. This will facilitate data analysis.
 2. A soot correction should be finalized to allow a better estimate of precision. The soot correction should normalize to a value that prevents extrapolation to higher soot values.
 3. The precision of the adjusting screw weight lost parameter needs to be improved if it is to be included in PC-10.
 4. The overall acceptability of the test will be enhanced with the addition of the 4 additional reference tests. These tests will also assist in defining the Sludge and Filter plugging parameters.
- Afton realizes that the surveillance panel is in the process of addressing these issues. When our comments have been addressed we will change our vote to affirmative for inclusion of the ISM in PC-10 .

BP

Negative



- It is accepted that the data presented to the HDEOCP shows the ability of the ISM to differentiate oils with adequate precision on wear, however, we do not feel that there is sufficient discrimination or repeatability shown in the oil filter plugging at this time to include this parameter.

Chevron Oronite Company

Affirmative



- Chevron Oronite approves with some reservations. The ISM taskforce state the following: *It is the opinion of the ISM Development Task Force and the Cummins Surveillance Panel that the ISM test does show the ability to differentiate oils with acceptable precision on wear and filter plugging, however items such as soot correction, outlier screening, correlation to M11 EGR, and the actual OFDP calculation still need to be finalized.*
- A number of details must be resolved before this test will be fully acceptable.
 1. While discrimination between TMC830 and TMC1004 has been demonstrated, the scale is very compressed. We believe that the task force needs to focus efforts on minimizing any impact of operational and hardware variability.
 2. The details on assessment of the OFDP need to be finalized.
 3. The ISM test does not show discrimination on sludge . An alternative measurement should be considered .
 4. The ISM does not discriminate on TRWL. This factor may be assessed in other tests, such as T12. Given the inability of the ISM to discriminate on this measure, we recommend focusing efforts elsewhere.

ChevronTexaco

Affirmative



- Based on the work to date we vote affirmative on advancing the ISM to PC-10 category.
- However, we are concerned that there is insufficient separation on filter delta P and lack of sludge data reported in presentation. In addition, wear data is required at 6% soot where the limits are to be set. Nevertheless, our understanding is four more tests are in progress which we hope will resolve these issues before matrix testing.

Infineum

Affirmative



- Infineum is voting positive on the ISM status as being ready to move forward for consideration as one of the possible tests for PC-10. However, we have not yet seen sufficient data in either the ISM or the ISB to convince us that both tests will be required to protect against valve train wear. We reserve the right to accept only one of the two proposed valve train wear tests into PC-10, should later data show that both the ISM and the ISB rank oil performance in the same way. In addition, although the ISM does seem to separate oils 830-2 and 1004-3 with statistical significance on some parameters, we are concerned that the absolute levels of separation are very small and that additional testing may degrade the test statistics to the point that these oils no longer separate. Finally, we are concerned that the ISM reverses the M11-EGR ratings of oils 830-2 and ISMA – especially with respect to injector screw weight loss where ISMA looks very much like 1004. The data currently in hand do not seem to show the test can discriminate between a “good” ISMA and a “bad” 1004.

Lubrizol

Affirmative



- Lubrizol votes affirmative on advancing the ISM for possible inclusion in the PC-10 category. Lubrizol agrees with the recommendations of the ISM Development Task Force that items such as soot correction, outlier screening, correlation to the M11 EGR, and OFDP calculations still need to be finalized. We are committed to work with the ISM Development Task Force to resolve these issues.
- Some of the wear parameters in the ISM may be highly correlated to one another. We would anticipate that redundant wear parameters within the test would be dropped.
- We recommend that consideration be given to inclusion of one of the low SAPS PC-10 matrix oils into the ISM referencing system. A goal of our referencing process is to use current technology. A low SAPS oil with less than 0.12 % wt phos would be appropriate for a test that includes wear parameters.

Citgo Petroleum Corporation

Affirmative



- **Based on the information presented, we CITGO support advancing the ISM test for inclusion in the PC-10 category.**

Shell

Affirmative



- **Shell votes affirmative to advance the ISM test for inclusion into PC-10, subject to successful completion of the “Next Steps” by mid-January in the attached ISM report.**

Affirmative

- **Volvo Powertrain/Mack Division**
- **International Truck & Engine Co**
- **Cummins Inc.**
- **DDC**
- **Deere & Company**
- **GM**

Affirmative-No Comments

- **Ciba Speciality Chemicals**
- **ConocoPhillips**
- **Metro Tech Systems LTD**
- **PerkinElmer**
- **RohMax USA Inc.**
- **Valvoline Company.**
- **Safety -Kleen**