10/31/05

ASTM-HDEOCP EXIT CRITERIA BALLOT:

To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot

Company	Name	Affirmative	Negativte
Afton Chemical	Charles Passut		X
BP	Mike Lynskey		X
Caterpillar Inc	Abdul Cassim		
Chevron Oronite LLC	Wm. Kleiser		X
ChevronTexaco	Jim Mc Geehan		X
Ciba Specialty Chemicals	Scott Harold		X
ConocoPhillips	David E. Taber	X	
Cummins	Warren Totten	X	
DDC	Mesfin Belay		
Dana Corporation	Howard Robins	X	
Deere & Co	Ken Chao	X	
EMA	Roger Gault	X	
ExxonMobil	Steven Kennedy		X
GM	Robert Stockwell	X	
Infineum	Pat Fetterman		X
Int'l Truck & Engine	Heather DeBaun	X	
Lubrizol	Lewis Williams		X
Mack Division-Volvo Powertrain	Greg Shank		
PerkinElmer	Thomas M. Franklin		
RohMax USA	Steven Herzog		X
Shell	Matthew Urbanak	X	
Valvoline	Wm. Runkle Jr.	X	
Volvo Power Train	Greg Shank	X	
	Totals	10	9

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO:
Pat Connelly via email (preferred):
patconnelly@chevrontexaco.com
or via Fax: 510-242-3758

Name: Scott Harold
Organization: Ciba Specialty Chemicals
Date: 10/25/05
Phone No.: 914 275-2711

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	☒

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

I have placed the data for the 95% confidence interval into this spreadsheet in the parameter worksheet.

ISMMeritRating1_rev 2.xls

Comments:

Need limits for other PC-10 tests to be established
Issue of redundancy still exists

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO:
Pat Connelly via email (preferred):
patconnelly@chevrontexaco.com
or via Fax: 510-242-3758

Name: Mike Lynskey
Organization: BP
Date: 25 October 2005
Phone No.: 443 799 6977

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	☒

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

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ISMMeritRating1_rev 2.xls

Comments:

We understood from the PC-10 needs statement that the ISM was a replacement for the M11 test from the API CI-4 category, as can be seen from the results on 830-2 these limits appear to move the test severity significantly. We would like the test sponsor to reconsider the proposed limits or provide field data to justify the increase in severity.

As far as we are aware no discrimination data has been presented for the top ring weight loss parameter. We would like to understand what discrimination data exists prior to accepting limits.

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO:
Pat Connelly via email (preferred):
patconnelly@chevrontexaco.com
or via Fax: 510-242-3758

Name: Jim McGeehan
Organization: Chevron
Date: October 21st 2005
Phone No.: 510-242-2268

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	X☐

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

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ISMMeritRating1_rev 2.xls

Comments:

This category is design to be back-ward compatible with performance equal to API CI-4 Plus oils using the reference oil 830-2. The limits propose is an up-grade beyond API CI-4 Plus. These limits should focus at the 830-2 performance and not the limits proposed. It is important in regard to category timing that these limits need to be changed to level of 830-2 level to ensure the category can be delivered on time.

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO:
Pat Connelly via email (preferred):
patconnelly@chevrontexaco.com
or via Fax: 510-242-3758

Name: Steven Kennedy
Organization: ExxonMobil
Date: 10/24/05
Phone No.: 856-224-2432

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	☒

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

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Comments:

The ISM was included in the PC-10 category as a backward compatibility test. Since the limits on this ballot are far more restrictive than those already accepted as the alternate limits for API CI-4, we can not support this proposal. In particular, the fact that these limits make TMC 830 a very borderline oil is a major concern. It indicates that PC-10 would have much more severe wear requirements in a test common to both categories. We believe that the more severe limits for the ISM parameters common to CI-4 and PC-10 have not been fully justified. Also, the parameters being added need to be discussed in more detail.

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO: Pat Connelly via email (preferred): patconnelly@chevrontexaco.com or via Fax: 510-242-3758	Name: Steven Herzog Organization: RohMax USA Date: October 24, 2005 Phone No.: 610-513-1865

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	X

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

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ISMMeritRating1_rev 2.xls

Comments:

Our understanding on the adopting of the ISM test was that it would be a replacement test for the Cummins M11 at the M11 limits. The proposed ISM limits appear to be an increase in severity versus the M11.

EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO: Pat Connelly via email (preferred): patconnelly@chevrontexaco.com or via Fax: 510-242-3758	Name: William M. Kleiser Organization: Chevron Oronite Company, LLC Date: October 24, 2005 Phone No.: 510 242 3027

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	☒

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

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ISMMeritRating1_rev 2.xls

Page 1

Comments:

Chevron Oronite feels that it is not possible to agree on PC10 tests individually. Additional testing on PC10 candidate oils is required in order to more clearly assess the relative appetites of all of the PC10 tests. Once that is complete it will be possible to evaluate the relative requirements of all tests as opposed to each individually.

In addition to the need to complete additional demonstration testing, the proposed limits are inappropriate in that they represent a significant performance upgrade versus both CI-4 and CI-4 Plus.

During all discussions regarding the conception and development of PC10, the clear intent has been a maintenance of current performance with a reduction in maximum allowable lubricant sulfated ash, sulfur, and phosphorus. All estimates of testing timelines has used performance levels equivalent to current lubricants as the target. An increase of performance will cause a lengthening of the timeline due to the impact on test pass/fail rates.

Finally, anchors and associated maximum and minimums must be based on available statistically sound data. Adjustments in ranges (i.e. maximum or minimum) which imply a test precision greater than demonstrated are not acceptable as it implies capability not demonstrated by the test method. The use less rigorous methods of evaluating data, such as engineering judgment, would be appropriate only if statistically sound data were not available. Past experience is that limits set arbitrarily beyond the capability of a test method can result in significant problems such as unexplained severity shifts.

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EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO: Pat Connelly via email (preferred): patconnelly@chevrontexaco.com or via Fax: 510-242-3758	Name: Lewis Williams Organization: Lubrizol Date: 10/24/05 Phone No.: 440-347-1111

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	X☐

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
Maximum	6.0	90	20	40	8.9
Anchor	5.0	65	12	30	9.0
Minimum	3.5	40	5	15	9.5

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ISMMeritRating1_rev 2.xls

Page 1

Comments:
See attachment.

Connelly, Patricia (patconnelly)

From: Williams, Lewis [LAWM@Lubrizol.com]

Sent: Monday, October 24, 2005 12:21 PM

To: Mc Geehan, James (JIAM); Connelly, Patricia (patconnelly)

Cc: Castanien, Chris; Scinto, Phil; Shah, Mayur; Galic, Mary; Duncan, David; Baumgartner, Daryl; Matasic, James; Griggs, Michael; Domonkos, Dan; Carlson, Jon; Mackney, Derek; Wilby, Ian; Rees, Mark; Nai, Paul; Okubo, Masakatsu; Dohner, Brent; Curtis, Thomas; Carroll, Dale; Joyce, Matthew; Ribeiro, Antonio; Fisher, Alison; Marn, Don

Subject: ISM Exit Criteria Ballot

Attachments: Cummis ISM-Exit Criteria Ballot PC-10 Parameters.doc

<<Cummis ISM-Exit Criteria Ballot PC-10 Parameters.doc>>

Lubrizol votes negative on the ISM exit ballot and offers the following alternative proposals.

Proposed PC-10 Parameters

Merit System Calculations are based on the Standard Deviation of RO 830 and the application of 2.5 standard deviations from the anchor to establish the max and the min. RO 830 is a borderline passing oil.

	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	300	100	250	200	150
Maximum	7.0	125	55	122	8.7
Anchor	5.5	75	19	50	9.0
Minimum	4.0	25	7	21	9.3
Standard Deviation Used in Calculations	1.09	19	0.4245	0.3563	0.1354

1. We changed the weight on crosshead weight loss from 250 to 300 to reflect the importance and significance of this parameter in the ISM test.

2. We dropped the weight of the ASWL from 250 to 200.
3. Anchor points were set to make 830-2 a borderline passing oil.

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In general Lubrizol does not feel the ISM lends itself to using a merit system to evaluate oils. Crosshead weight loss is the true pass/fail parameters while TRWL, OFDP, ASWL and Sludge can be considered fail safe parameters. We alternatively propose conventional tiered limits based on the proposed merit system anchor point.

Tiered Limits are based upon the proposed anchors and the Standard Deviation of RO 830.

	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
1 Test Limit	5.5	75	19	50	9.0
2 Test Limit	6.0	84	23	59	8.9
3 Test Limit	6.3	88	26	64	8.9

The ISM was presented as a replacement test for the M11 EGR to assure backwards compatibility of CJ-4 oils to previous C categories. We have already agreed to ISM limits to replace the M11 EGR in previous categories. The proposed limits on the ballot are a substantial upgrade over CI-4 limits and we believe are not consistent with the intention of the ISM test development. The original goal of CJ-4 was to maintain engine durability at CI-4 PLUS levels but at reduced chemical limits to enable the use of DPFs to meet PM limits for 2007.

The limits offered in the tiered limit proposal set the pass/fail criteria such that 830-2 is borderline passing which is consistent with the objectives for the use of the ISM as a replacement test for the M11 EGR.

Lubrizol would prefer to wait until all pass/fail limits for the PC-10 category are proposed before we move forward with setting the limits on the ISM. The industry is currently in the technology demonstration period of category development where we are seeking to understand the appetites of the PC-10 category overall. Trying to set the limits on one major test before we have sufficient time to understand the performance requirements of all major tests makes setting realistic limits impossible.

Lew

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EXIT CRITERIA BALLOT

ASTM-HDEOCP	Issue Date: October 14, 2005
BALLOT FOR VOTING MEMBERS ONLY	Receipt Deadline:
Reference: Jim Mc Geehan, Chairman	October 25, 2005

RETURN BALLOT TO:	Name: Charles A. Passut
Pat Connelly via email (preferred):	Organization: Afton Chemical
patconnelly@chevrontexaco.com	Date: 10/24/05
or via Fax: 510-242-3758	Phone No.: 804-788-6372

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	X☐

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
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ISMMeritRating1_rev 2.xls

Page 1

Comments:

Afton Chemical votes negative on these proposed Cummins ISM PC-10 limits for the following reasons:

1) It was previously agreed not to set limits before January 23, 2006. Afton feels that as we are currently developing our PC-10 technology, setting ISM limits now is premature, since we do not yet know the proposed limits for the Cummins ISB, Mack T-12 and Caterpillar C13 tests.
2) Afton is also concerned that these proposed ISM PC-10 limits are an upgrade from those for API CI-4 Plus. We have not seen any data to justify an upgrade.

3) Afton needs more time to determine if the newly proposed weighting factors and max/min values improve or hurt the repeatability of the merit values. We would like more information on how these limits were derived and how they relate to the field. With all of the PC-10 matrix analyses currently being performed, Afton has not had adequate time to digest and understand the underlying statistics that were used to develop the limits. Afton is concerned that when using operationally valid TMC 830-2 data, it appears that the new merit maximums do not reflect the precision of the test. In particular, unless supported by a very high level of test and measurement precision, the sludge limits as defined are unacceptable. Currently, sludge ratings are reported to one decimal place. The difference between the proposed maximum and anchor values is only 0.1 units. Effectively, these two numbers are the same. They are less than one standard deviation of the reference oil (about 0.15 units) and are also less than one standard deviation of the rating workshop data. Yet one result is worth 0 merits, the other result is worth 150 merits, and nothing is available in between them.
4) Afton is concerned that TRWL is included as a pass/fail parameter, since this parameter has never been shown to discriminate in the ISM test. We presume that TRWL has been included in the proposed ISM PC-10 merit system as a fail-safe, to catch flyers, but the data suggests that these flyer results are due to operational and/or hardware problems, and are not oil related. Afton believes that it is impractical and unsupported to have TRWL as a pass/fail parameter.

Afton does, however, favor the use of a merit system for this test.

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EXIT CRITERIA BALLOT

ASTM-HDEOCP BALLOT FOR VOTING MEMBERS ONLY Reference: Jim Mc Geehan, Chairman	Issue Date: October 14, 2005 Receipt Deadline: October 25, 2005

RETURN BALLOT TO:
Pat Connelly via email (preferred):
patconnelly@chevrontexaco.com
or via Fax: 510-242-3758

Name: Pat Fetterman
Organization: Infineum
Date: 10/19/05
Phone No.: (908) 474-3099

Motion	Affirmative	Negative
To accept the Cummins ISM limits for PC-10 and to move forward with an "Exit Criteria Ballot."	☐	X☐

Proposed PC-10 Parameters

Criterion	Crosshead Weight Loss	Top Ring Weight Loss	Oil Filter Delta P	Adjusting Screw Weight Loss	Sludge
Weight	250	100	250	250	150
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Page 1

Comments:

Infineum votes negative on these limits for several reasons –

1) As we noted in our original response to including the ISM into PC-10, we are concerned that three separate tests addressing valve train wear are included in this category. We have shared data with both the Valve Train Wear Task Force and the HDEOCP showing that the ISM and ISB give the same ranking of passing and failing oils with a much better separation in the ISB than the ISM. No data has been shared with either the VTWTF or the HDEOCP to contradict these observations, and this makes one of these tests redundant. Given the better separation in

the test, Infineum believes the ISB test should be the only Cummins Valve Train Wear Test selected for PC-10.

2) The ISM was put forward by Cummins as a necessary replacement test for the M11-EGR, and as such it was accepted with very minimal testing. In fact, the only testing run under final conditions and soot loading was a mini-matrix consisting of limited tests with TMC 830-2 as the M11-EGR benchmark oil and TMC 1004 as the discriminating oil. The extent of this testing was significantly less than would be required to develop a meaningful precision statement for the ISM, but it was sufficient to show statistical separation between TMC 830-2 and TMC 1004.
   If the ISM had been presented to industry as a "new test" with significantly revised pass/fail parameters and tighter limits, it is unlikely it would have been accepted without more data to develop a precision statement.
3) The ISM was described to industry as the EMA's "backward compatibility" test to insure no loss of performance versus API CI-4. Since we have already agreed to limits which describe the CI-4 performance of oils in this test, those already agreed limits should suffice for PC-10.
4) Top Ring Weight Loss in the M11-EGR has already been agreed as redundant to Top Ring Weight Loss in the Mack T-10 based on an extensive review of candidate date showing that oils passing the parameter in the T-10 always pass the M11-EGR parameter. Since the T-12 also measures TRWL, and since the Matrix data show both PC-10 Matrix candidates out performing the T-10 reference oil, TMC 820-2, Top Ring Weight Loss in the T-12 should cover the needs of the ISM.
5) Additional ISM reference data is now available which show the above limits would fail TMC 830-2 on wear 40% of the time. TMC-830-2 average Crosshead Weight Loss averages two standard deviations below the pass/fail limit in the M11-EGR, and it has never failed the wear parameter using batch A crossheads. In addition, during the ISM development period, Cummins put forward an oil identified as ISMA which was described as "the best M11-EGR performing oil Cummins had ever seen". The above proposed limits would fail that oil 100% of the time on Injector Adjusting Screw Weight Loss. For a test described to be a "placeholder" to insure there is no loss in valve train wear protection in PC-10, this level of performance is totally unwarranted.

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