Claim Consolidation: Maximizing Performance, Minimizing Shelf Space

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Infineum
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Overview

- European PCMO specifications – past and present
- The European PCMO market today
- Delivering value to oil marketers
- Challenges in claim consolidation
- Meeting the challenge
- Conclusion
PCMO Specifications – “the alphabet soup”
Spec evolution – the history

• 10-15 years ago: not much difference between different engine technologies, used by different OEMs, in Europe

• Today, engine technology varies greatly in:
  • Engine design and operating conditions
  • Surface coatings used
  • After treatment devices

Proliferation of specifications
## European PCMO Market Tiers

<table>
<thead>
<tr>
<th>Full SAPS Mainline</th>
<th>Full SAPS Premium</th>
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<tbody>
<tr>
<td>All Grp I or Grp I / Grp III (10W-40)</td>
<td>All Grp III, XW-40 &amp; XW-30</td>
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<tr>
<td>VW TDI = RL204-4</td>
<td>VW TDI = RL204</td>
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<tr>
<td>ACEA A3/B3, MB p229.1, VW 501.01/505.00</td>
<td>ACEA A3/B4, BMW LL-01, RN 0710</td>
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<tr>
<th>Mid SAPS</th>
<th>Low SAPS</th>
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<tr>
<td>All Grp III / PAO</td>
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<td>VW TDI = RL204</td>
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<td>Chemical limits</td>
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<tr>
<td>ACEA C3, MB p229.31, GM Dexos 2</td>
<td>ACEA C1/C4, RN 0720</td>
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Fuel Economy oils

Fuel economy will only increase in importance in the future. Within each performance tier there are Fuel Economy specifications:

- **Mainline:** ACEA A1/B1-08
- **Full SAPS Top-tier:** ACEA A5/B5-08
  - BMW LL-01 FE
  - Ford 913-C: 3% FE in M111FE
- **Mid SAPS:** ACEA C2-08
- **Low SAPS:** ACEA C1-08: 3% FE in M111FE
4 market tiers + FE oils = many specifications!

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<thead>
<tr>
<th>High HTHS</th>
<th>Low HTHS - FE</th>
<th>Full SAPS Mainline</th>
<th>Full SAPS Premium</th>
<th>Mid SAPS</th>
<th>Low SAPS</th>
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<td></td>
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<td>Ford 913B</td>
<td>BMW LL-01 FE</td>
<td>GM Dexos 1</td>
<td>Ford 934A</td>
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<td>A1/B1</td>
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<td>C2</td>
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<td>PSA B71 2296</td>
<td>A3/B4</td>
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Many oil marketers have a portfolio of top tier oils…….

Example of a portfolio of Top-tier Full SAPS oils:

<table>
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<tr>
<th>0W-30</th>
<th>5W-30</th>
<th>5W-30</th>
<th>5W-40</th>
<th>5W-40</th>
</tr>
</thead>
<tbody>
<tr>
<td>MB p229.5 BMW LL-01 VW 502.00/505.00 GM LL A/B025 Porsche PSA Renault 0700/0710</td>
<td></td>
<td>FORD 913-C</td>
<td>MB p229.3 BMW LL-01 Porsche VW 502.00/505.00 PSA B71 2296 Renault 0700/0710</td>
<td>MB p229.5 BMW LL-01 VW 502.00/505.00 PSA B71 2296 Porsche</td>
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Ideally oil marketers would like to be able to blend these oils with a minimum number of additive packages for logistical reasons.
Challenges in claim consolidation

• Conflicting performance requirements:
  • Fuel economy VS Wear protection
  • Fuel economy VS Sludge/Soot Dispersancy

• Conflicting engine test appetites: Components used to pass one test may be a debit in another test
  Eg. Anti-oxidant boosters needed to pass severe bench oxidation tests

• Chemical limits restrict the formulation space in highly challenging specs
  Eg. ACEA C1-08, C4-08

• TBN limits make it difficult to meet Full SAPS & Mid SAPS specs on the same oil

• Engine tests which assess several performance parameters simultaneously
  Eg. BMW N52 measures: Piston cleanliness, Ring sticking, Sludge, Oil Viscosity Increase, TBN reduction & EOT Iron content
Keys to successful claim consolidation

Components
varied, robust, advantaged

Delivering Customer Value

Formulation expertise
codes, spec. understanding

Future vision
understanding future needs

OEM relationships
Formulation expertise – balancing the additives for the application

Performance Targets

- Detergent
  - SAPS contribution
  - TBN vs Ash
- Dispersant
  - High vs Low mw.
  - Performance vs FE debits
- Anti-oxidant
  - Which AO mix?
  - Performance debits?

Viscometric Targets

- VM
  - CCS contribution
  - FE credits
- Base oil mix
  - Performance vs cost

Chemical limits

- Anti-wear
  - Multi-functional AW additives
- FM
  - FE credits vs wear potential

Performance you can rely on.
Claim Consolidation: It can be done

There is a Premium Mid-SAPS Technology which meets all of these specifications, and provides claim coverage in these basestocks:

**Specifications**
- ACEA C2/C3-08
- API SM/CF
- MB p 229.31/229.51
- VW 502.00/505.00/505.01
- BMW LL-04
- Porsche
- GM Dexos 2
- RN 0700/0710
- PSA B71 2290

**Basestocks**
- Nexbase
- Yubase
- S-Oil Ultra S
- Etro

But it does not meet the requirements of VW 504.00/507.00 nor RN 0720
Limits to Claim Consolidation

• Additive companies can help on consolidating some OEM claims but “One product fits all” is not possible

• Diesel engines fitted with DPFs need Mid and Low SAPS oils, whereas Gasoline engines don’t have this requirement

• OEM specs are based on specific engine requirements and what matters most is that the right oil is developed for the application

• There will always be specifications which meet very specific OEM needs – leads to opportunities for differentiation
Anticipating the future

• We’re part of a dynamic industry
• Additive and lubricant companies need to anticipate the challenges of tomorrow
• Partnerships between lubricant suppliers, OEMs and Adcos will be necessary to meet the lubricant needs of the future
• Deep understanding of OEM needs
• New component development must be targeted at future needs and challenges
  • Future engine designs
  • New materials of construction
  • Increasing importance of fuel economy
  • After-treatment solutions
Conclusion

• Successful Claim Consolidation *can be* possible with the right additive technology and a high level of formulation expertise. Key ingredients for success:
  • A varied, robust and advantaged component portfolio
  • The formulation expertise required to formulate against very demanding and often conflicting requirements
  • Good understanding of OEM needs
  • Understanding and anticipation of future market and customer requirements

• What matters most is that we develop the right oil for the vehicle. There will always be very specific OEM needs which need specific oil formulations. “One product fits all” is not possible.
• The successful additive company needs to meet both of these challenges