

Global Lubricant Developments An Additive Company Perspective

ATIEL Seminar, Royal Windsor Hotel, Brussels
December 7th 2011

Dr Chris Locke
Global Automotive Lubricants Business Manager

- Share additive company perspectives on a rapidly changing world
- Demonstrate what drives additive company thinking
- Illustrate some key challenges, consequences and responses
- Stimulate thoughts for debate and challenge

What Drives Additive Company Thinking?

Additives provide essential performance to a modern finished lubricant

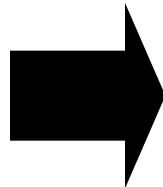
Additive Package

- Cleanliness
- Dispersancy
- Antioxidancy
- Antiwear
- Friction modification
- Viscometrics

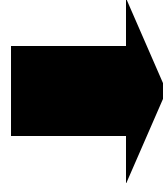
Basestock

- Cooling
- Viscometrics
- Hydrodynamic lubrication
- Volatility
- Carrier Fluid

5-20%w

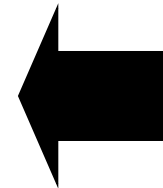


80-95%w



OEM/Customer/Consumer Wants and Needs

- Compliance
- Performance Features
- Marketable Features
- Availability
- Supply Security
- Cost Competitiveness



No single stakeholder (OEM, oil marketer, additive company) can deliver all needs. In a changing world, stakeholder collaboration will become increasingly important

Socio-political pressure and legislation

- Societal wants and needs drive politicians and legislators
- Emissions (eg. CO₂) predominant driver on lubricants industry
- Defines overall OEM objectives and timelines
- Also impacts via REACH, GHS, regulatory issues

What are the 'Megatrends' influencing lube and additive development ?

Vehicle/engine builders (OEMs)

- Respond to legislative and consumer needs
- Primary objective: Compliance at lowest practical cost
- Hardware solutions
- Key stakeholders in lubricant specification development, enabling required performance

What are the hardware consequences and implications on lubricant?

Lubricant and additive suppliers

- Phys/Chemical solutions
- Respond to specification and/or customer needs
- Commercial development timelines and delivery are aligned with hardware launch
- Lubricants and additives becoming an integral part of hardware design

How do we ensure timely delivery of practical commercial solutions ?

Hardware/OEMs

- Fuel economy, downsizing, boosting, higher power density, new materials, globalisation, aftertreatment durability, hybridization
- Moving East – with all global builders represented

Specifications

- API and ACEA as global majors, but with notable regional or local specifications (JASO, GOST, GB – developing markets)

Geographical Move East (and South)

- Overwhelming majority of future OEM and lubricant growth is in emerging economies – BRIC, but also SE Asia, E Europe, L America
- Local but large national oil companies, OEMs and specifications

Technology

- Fuels – still wide variations in sulphur level, even within markets
- Basestock – inexorable move from Gp I to II / III (IV/V)
- Additives - continued drive to reduced Sulphated Ash, Phosphorus and Sulphur (SAPS) for aftertreatment compatibility

Hardware/OEMs

- Fuel economy, extended drain, global deployment of the most advanced technologies
- Conflicting performance trade offs are addressed (e.g. fuel economy vs durability; 'SAPS' vs emissions systems compatibility)
- Fluid becoming an integral design component

Specifications

- Specifications naturally follow OEM market position (e.g. in a market dominated by US engine designs, API pre-eminent)
- Demands for regional specifications to follow global OEMs into developing markets

Geographical Move East (and South)

- Rapid deployment of new hardware drives rapid quality upgrade
- Emerging economies no longer low quality, low tier markets
- International marketers deploying global prestige brands

Additive Technology

- High level of investment in innovative new technology
- Tailored technologies to meet unique market needs
- Supply security – eg. flexibility in basestock. Can be trade offs

Fuel Economy

- Future may require mandatory delivery of FE over vehicle lifetime
- Fluids delivering FE will become an integral part of the delivery system

How do we ensure the correct fluids are used over the vehicle lifetime ?

Emission System Compatibility

- Need to formulate for
 - Long oil life
 - High fuel economy
 - Hardware durability
 - Emissions system compatibility
- Requires compromise

How do we deliver the best compromise for stakeholders ?

Co-development & value recognition

- Formulating for advanced hardware is expensive
- Increasing requirement for co-development by fluid & hardware developers
- Early engagement for best system development

How do we obtain recognition by all of the high system value of these fluids

- Additives provide essential performance to modern finished lubricants
- The world is changing fast, for all stakeholders
 - Hardware
 - Lubricant specifications
 - Additives technology
 - Geography
- The rate and pace of change continues to escalate, alongside the consequent cost of keeping up,
 - All stakeholders have a major role to play
 - The winning solutions of the future will require greater collaboration across traditional interfaces

Technology collaboration amongst stakeholders in all parts of the value chain will become increasingly important

Reproduction of any material whether by photocopying or storing in any medium by electronic means or otherwise is prohibited without prior written consent of Infineum International Limited.

© Copyright INFINEUM INTERNATIONAL LIMITED 2011.
All rights reserved

See the legal disclaimer notice on www.infineum.com

"INFINEUM", "DOBANAX", "PARATAC", "SYNACTO", "VEKTRON", "VISTONE" and the corporate mark comprising the interlocking ripple device are trademarks of Infineum International Ltd.