

# Pushing and Pulling API Group II Basestocks

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The lubricants business in the US is moving through a period of rapid change, and despite the high profile of mergers and acquisitions in the industry, basestocks represent one of the most significant areas of changes and challenges. Independent lubricant manufacturers are seeking insights into how they can safely navigate the challenging waters of change ahead, and groups like ILMA are investigating activities that might help independents mitigate the disruptive force of change and embrace the inherent opportunities.

## A Sea Change

Basestock manufacturing is shifting from processing schemes based on solvent-refining and solvent-dewaxing to hydrocracking and wax isomerization. Many know this shift as a move from Group I to Group II basestocks. Group II basestocks are generally considered superior to Group I because they have a lower aromatic content. Aromatic fractions tend to be more unstable than saturated hydrocarbons, and as a result, Group II basestocks have superior thermal stability and resistance to oxidation over Group I. In addition, moving up the continuum from Group II to II+ and III, there is a range of basestocks with a minimum viscosity index (VI) of 95 to Group III basestocks with inherent VIs of over 120. This together with other issues makes them an ideal blend stock to meet the more stringent volatility requirements in passenger car motor oil (PCMO). This also gives them an advantage in heavy-duty motor oil (HDMO), and automatic transmission fluids.

Although Group II basestocks have been in the North American market for close to 15 years and demonstrate superior performance capabilities, they didn't receive much airtime until about the last five years. The primary reason was limited supply: there were only two producers in North America, Chevron and Petro-Canada. This changed, however, when Excel Paralubes came on stream in 1997. The Excel plant

increased supply of Group II by close to 20 TBD. The additional supply gave Group II the critical mass necessary to convince automotive OEMs that it was now time to write more stringent specifications around volatility that represent a step change in PCMO performance. This specification would clearly favor the use of Group II. In fact, for some grades, it mandates the use of Group II.

In addition to significantly bolstering supply, the Excel plant sent a clear signal to all finished lubricant producers that Pennzoil — one of the leading marketers of PCMO — was committed to Group II basestocks and this could give them a competitive advantage.

Within three years many of the majors announced that they too would have Group II capacity. With majors moving to install Group II capacity and the amount of ink Group II/II+/III and GF-3 was receiving, it would be easy for independents to get caught up in the excitement and conclude that Group II was an issue of purchase or perish, but this could be a significant overreaction for some independent lubricant manufacturers.

## The Push and Pull of Performance Requirements

Although independent lubricant manufacturers and major oil companies are both in the business of blending and marketing finished lubricants, they face different basestock challenges and needs. In fact, even within the ranks of independents, the need for Group II basestocks varies significantly. Some manufacturers need Group II now, some can wait. The primary reason for the difference is tied to technical performance needs and product slates. Total formulation cost, tankage and other issues also come into play.

Understanding performance requirements provides the key to separating marketing hype from real need, or "marketing push" from "pull demand." Marketing push is a function of the basestock marketer's need to sell its partic-

ular product in the merchant market and/or consume it captively to produce finished lubricants. Some basestock manufacturers only produce Group II, therefore the supplier may say that this is what you "need." Demand stemming from marketing push is typically indicative of what types of basestocks are produced, and/or perceived as required, and not necessarily what types are required.

Conversely, pull demand is a function of a true technical need for a basestock to meet specific performance requirements. The distinction between "marketing push" and "pull demand" is particularly important in an emerging market like Group II since a capacity build must reach a critical mass in the lubricants industry before its use is required by OEM performance specification and adopted by formulators. Interestingly, a relatively small percentage of the current demand for Group II/II+ and III basestock is driven by true technical need, or "pull demand." Instead, most is driven by "marketing push."

## PCMO Specifications Drive Demand

There are currently only two product categories that technically require the use of Group II/II+ to meet performance specifications. The most significant in terms of volume and value is in the PCMO arena. Even within this product category, however, it is primarily for 10W-30 and 5W-30 oils, because it is not economically feasible to formulate these grades of PCMO with a Group I basestock. Group II and II+ basestocks are required in order to strike the fine balance dictated by GF-3 for volatility and low temperature performance.

With this formulation reality as a backdrop, and the high visibility of PCMO, it is easy to understand why GF-3 receives so much attention, and why such companies as Pennzoil-Quaker State, Equilon, Castrol, Valvoline and other marketers with relatively large shares of the PCMO mar-

ket are in need of Group II and II+ basestocks. All significant marketers of PCMO in the US will be impacted by GF-3 and are expected to require some use of Group II/II+ basestocks in 2001.

In addition to PCMO, the performance requirements for automatic transmission fluids (ATF) have also reached a level where most require the use of Group II and III basestocks to meet OEM specifications. This again underscores why marketers with a large footprint in the consumer automotive segment of the lubricants business are very interested in Group II products.

## Enter PC-9, and More Pull

The next major product category with a technical requirement for the use of Group II basestocks is in the formulation of HDMO products. Although the use of Group II basestocks in current HDMO products can be leveraged to position products as having premium performance as well as lower total formulation cost, it is not required to meet today's performance specifications. But this is expected to change when PC-9 hits the market.

One of the issues PC-9 will face is the U.S. EPA's more stringent requirement on NO<sub>x</sub> emissions. Due to an agreement between the EPA and diesel engine OEMs in 1998, the timetable for the introduction of low NO<sub>x</sub> emission engines was accelerated from the initial target date of 2004 to October 2002. There is general agreement that cooled high-pressure loop exhaust gas recirculation (EGR) will be the solution of choice for OEMs to use in meeting the new NO<sub>x</sub> emission requirements.

Although EGR is a very effective means to reduce NO<sub>x</sub>, its use tends to form significantly more strong acids in the air intake system and subsequently more acid in the blow-by gases than engines without EGR. In addition, EGR also tends to contribute significantly more soot to the crankcase. Improved additive chemistries and higher performance basestocks will be required to counter the corrosive effect of

the acids, increases in viscosity, wear from soot, and other oil related stresses associated with EGR.

Group II basestocks are expected to be the product of choice in formulating HDMO to meet PC-9 performance requirements. In addition to superior oxidation stability, the lower aromatic content of Group II basestocks gives it superior soot loading capabilities. By definition, Group I basestocks have an aromatic content greater than 10% and Group II less than 10%. In practice, Group II basestocks typically have less than 1% aromatic content. According to research recently published by Lubrizol, aromatics are believed to be a leading factor in soot related oil thickening.

Assuming the PC-9 development and approval process proceeds as scheduled, API licensing is expected to commence in July of 2002. A corresponding uptick in the "pull" demand for Group II is expected to follow.

Beyond the PCMO, ATF, HDMO product categories there is the specification morass of industrial lubricants, process oils, and metalworking fluids. The drumbeat for Group II/II+ basestocks in these market segments is, however, relatively soft in comparison to the highly specification-driven and concentrated automotive market segments. Use of Group II in industrial lubricants, process oils, and metalworking fluids is now primarily driven by marketers working to create demand and meet end user needs for improved oxidation stability. There is little question higher performance basestocks will penetrate these markets. Much of the demand will, however, be more a function of marketing push than demand pull over the next few years, and market penetration will take time.

## Independents and Majors Don't Share Slates

As is readily apparent from the performance requirements summarized above, lubricant marketers with product slates heavily weighted on PCMO likely have already secured a supply of Group II bases-

stocks. They need Group II now and have few economically feasible alternatives to consider. Marketers with a significant share of business in HDMO are right behind the big players in PCMO. They are feeling the heat and the need to use Group II to remain competitive and meet upcoming PC-9 specifications. These players have some breathing room, but not much.

Assessing the need for Group II basestocks requires an understanding of what products must have in order to meet specifications, where it might give a competitive advantage, and how important those products are to an independent's lubricants business.

The lubricant product slates of major oil companies and independents are significantly different. Basing an independent's need for Group II on what majors do is risky business. In aggregate, PCMO represents close to 35 percent of the product slate sold by major oil companies, while PCMO accounts for roughly 10 percent of the slate sold by independents. Thus most majors are

PCMO accounts for roughly 10 percent of the slate sold by independents. Thus most majors are currently more motivated to secure Group II/II+ basestocks than independents, simply because they must, in order to meet GF-3 requirements. An independent could elect to not produce GF-3 approved products if PCMO accounts for only a small percentage of its total sales and tankage is limited. For some independents, walking away from the GF-3 PCMO market may not be a significant point of pain.

The playing field shifts, however, when HDMO joins the game. This product category represents roughly 30% of the independents' slate, while it comprises less than 15 percent of the majors' line. Generally speaking, both majors and independents are taking the same path to get Group II for use in HDMO. Those independents heavily reliant on HDMO sales, however, may have to move a little faster since most of the majors with significant market share in HDMO already have Group II in their formulations.

Although some independents with rock solid commercial fleet accounts that are slow to buy new engines could delay a decision to produce PC-9 engine oil, most will find it necessary to move ahead with Group II.

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## The Push and Pull of Base Oils

The industrial side of the business is where it gets very interesting for independents. Industrial lubricants (excluding process oils) represent close to 25 percent of the aggregated product slate of majors, while they account for over 50 percent of the aggregated independents' product slate. Majors tend to move more of the higher volume, lower margin general industrial lubricants than independents. Independents tend to load their product slates with more of the higher margin general industrial lubricants than the majors.

Even more striking is the differences between majors and independents in the metalworking fluid markets — in fact, some would say the independents are the majors when it comes to metalworking fluids. Metalworking fluids represent close to 15 percent of the aggregated product slate of independents, and for some independents, metalworking fluids are the primary product and account for virtually 100% of their product slate. The participation of majors in the metalworking fluids market, on the other hand, is relatively soft. In aggregate, metalworking fluids account for less than 2 percent of their product slate. Although there appear to be some theoretical

advantages that could favor the use of Group II in metalworking fluids and other industrial lubricants, it will take some time and pushing for this market to develop.

The fact that there is no loud cry for Group II basestocks in the industrial segment of the lubricants market and that this segment represents close to 50% of the US total may prove to be a real challenge and opportunity for both independents and majors. Majors boxed out of serious play in the automotive segments because they lack Group II/III+ refining capacity may look to the industrial markets as a home for their products. Although there may be limited technical need (or "pull demand") for Group II basestocks in this segment at this time, independents may find it necessary to incorporate Group II as a defensive move to counter migration of displaced majors into their market space.

Such a push marketing strategy by the independents could, however, potentially result in the pendulum swinging back at them in the future when they find that Group II is the workhorse in the industrial segment of the business and the lack of real technical need for the product does not allow them to capture value. This is a situation

some Group II producers are finding themselves in with HDMO in the current market.

Independents, however, have proven to be very successful in communicating the value of their products to customers and getting the value back. Although independents may not lead the charge to promote the use of Group II in the industrial market segment, they will likely benefit by moving in that direction. This will be particularly true for those independents already required to inventory Group II for use in HDMO.

### Supply Logistics and Formulation Costs

In addition to specification and product slates, supply logistics and total formulation costs also play an important role in the decision to use Group II/III+ basestocks. Obviously, formulating with Group II is not as simple as putting previously used additives into new basestocks. Additive solubility is different in Group II due to its lower aromatic content. Oxidation stability, viscosity index and other physical and chemical differences also exist, and as a result, Group II basestocks require the use of additive packages optimized for these basestocks. Although the basestocks may cost

fractionally more to procure, total formulation cost could actually favor the use of Group II basestocks over that of Group I, depending on additive cost.

Independent lubricant manufacturers must also consider basestock storage in their decision to use Group II. Few independents and even few majors are eager to add additional tanks to their facilities. For many, the decision to use Group II is an all or nothing proposition: if Group II is used, it will likely end up being the workhorse occupying the stall previously occupied by Group I.

Independent lubricant manufacturers must each take an "independent" look at their specific basestock needs. Moving with the herd, getting caught up in market hype, running scared, or jumping in too soon are easy traps to get caught in. Independent manufacturers must carefully assess the types of basestocks they actually need (representing pull demand).

If technical need is not carefully taken into consideration along with other cost and logistical factors, "push marketing" dynamics could have a strong impact on setting the pace and the price of change. ▫

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