Hoekstra Trading LLC

Fact and fantasy in catalyst selection

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The catalyst business is highly secretive. In a secretive culture, facts are obscured. That's why, from a refiner's perspective, it is hard to distinguish fact from fantasy when it comes to catalysts.

Today I will present 10 myths about catalysts, and will shine a light on the facts about those topics.

What I will say is based on hard data from experience with 300 independent pilot plant tests, direct participation in 200 catalyst decisions, and continuous market research done by our team of independent catalyst specialists.

Myth Number 1

The market leader has the best catalysts

Many people make the assumption that whoever sells the most catalyst has the best product. This seems a reasonable assumption when you have no better data; but it is a myth.

For example, our independent testing of conventional diesel hydrotreating catalysts shows that Haldor Topsoe has been offering industry-best catalysts for decades, during which time they were not the market share leader. In fact, for most of that time, Haldor Topsoe had less than 10 percent market share -- and they are only now approaching market share leadership.

Myth Number 2

You can rely on vendor data

We have proven that the vendor data you see out in public is generally not reliable.

For example, it is common for vendors to exaggerate the benefits of new catalysts. Often, a new catalyst is better by only a small amount that is hard to see except under special circumstances. Sometimes the claimed benefits are based on hair-splitting differences, and when we test the catalysts side by side under real-life conditions, we see no significant difference.

Myth Number 3

Catalyst performance has tripled in the last 15 years

This is an exaggeration.

For example, we have tested the different generations of diesel hydroprocessing catalysts alongside each other, for different vendors, with replicate tests, and we keep seeing about 75% improvement, not a tripling, of activity.

The claim of triple activity comes from compounding exaggerated claims. The benefit of a new generation catalyst is exaggerated; then the benefit of the next generation is exaggerated, compounding the benefit; then the next generation adds another layer of compounded exaggeration; and the exaggerations multiply, growing like Pinocchio's nose, greatly exaggerating the cumulative effect.

A pause . . .

It may seem like I am picking on the catalyst suppliers here – I have only covered three myths out of ten, and I'm already calling them Pinocchio. So I want to pause for a moment and say that even 75% improvement is a remarkable achievement that is worth $tens of billions to the refining industry. The catalyst companies are critical partners in our industry, they are great technical innovators, and we would be lost without them! I do not intend to pick on them or downplay their accomplishments.

I am only downplaying the *exaggeration* of their accomplishments.

Next we'll focus on three myths about refiners.

Myth Number 4

Engineers always resist change

The charge is that engineers cling stubbornly to their incumbent suppliers and are afraid to try anything new. But in fact we have been surprised to see how open most engineers are to using new catalysts to improve the performance of their units. So we call this "stubborn engineer" charge a myth.

What we have seen, though, is resistance to change coming from elsewhere in refining organizations.

For example, one refiner's engineering network recently did a good analysis of competitive options and came to a recommendation to change to a more profitable new catalyst from a different supplier. But then their recommendation was vetoed by higher management on the grounds that higher management had already made a commitment to stick with the incumbent supplier. In that case, it was higher management, not unit engineers, who resisted change. The engineers' correct *economic* answer was *politically* incorrect with the higher-ups.

Myth Number 5

Procurement guys are bean-counters

Bean counter is a derogatory term that is sometimes used by engineers and catalyst suppliers to downplay the role of procurement people. The charge is that the procurement guy just wants to buy whatever is cheapest without considering performance.

Is this fact or fiction?

We think it is true to a degree. But what we know for a fact is that when engineers and procurement people work together with a common goal, they can deliver big benefits.

For example, one of our clients last year saved over $500,000 in catalyst cost, and another saved $1,000,000, by changing the supplier of the pretreat catalysts in their hydrocrackers, and got much better performance. This was accomplished by teams of engineers and procurement people working together with the common goal of buying on performance and price; and those teams will pile up more benefits as they replicate their success.

Myth Number 6

Catalysts are chosen to maximize profitability

This is mostly fiction.

The *analysis* of catalyst options is always based on maximizing profitability. But the *final decision* is not.

For example, in the case I mentioned earlier, senior management vetoed a recommendation based on a verbal commitment made to an incumbent supplier. The veto was not based on profit analysis; it was based on a relationship. Things like this happen a lot. Our reports contain real-life case stories showing how layers of approval, personal relationships, and other non-economic factors have big impact on catalyst decisions made at refineries around the world.

Another pause . . .

It may seem impolite to talk so bluntly about things like politics that are usually not discussed out in the open. But this paper is about fact and fiction; and, ladies and gentlemen, the fact is the catalyst business is highly secretive and political.

It is also true that most people don’t like working in secretive, political environments. So when a refiner makes the decision to dismiss with all the secrecy and politics, and to focus on true economic benefits, things improve for everyone involved.

Next we’ll look at some technical myths**.**

Myth Number 7

Catalyst loads must be customized for each unit

Suppliers like to differentiate their products. One way to do this is by offering customized loading strategies for each unit. But it is not necessary to customize every catalyst load, and it makes catalyst selection unnecessarily complex for the refiner.

For example, in hydroprocessing, you already have 200 different catalysts out there to choose from. That's already too many options. It's not possible to make good decisions when considering so many different customized solutions for every unit.

The fact is you don't need to custom-design and micro-tune every catalyst load. We help our clients simplify their project, standardize their catalyst specifications, and reduce their choices to a few of the best competitive options. In the real world, this simpler approach brings better results.

Myth Number 8

Anything that goes wrong on a unit is the catalyst's fault.

As a rule, catalysts are assumed guilty until proven innocent. But history has shown that, in fact, it is usually not the catalyst's fault.

For example, in BP, we kept a list of "short cycles" for hydroprocessing units. In almost every case, the catalyst was initially fingered as the most likely cause of the short cycle. But six months later, after more complete problem analysis, it was agreed the root cause was something else, like feed changes, exchanger leaks, or unit upsets. This conclusion is supported by dozens of other case stories in the industry.

I commend the catalyst suppliers for keeping a positive attitude when their catalysts are blamed for problems that are not their fault. After one meeting, I complimented the supplier's technical service person on his positive response to being blamed for a short cycle, in an difficult atmosphere of finger pointing. His reply was, "this happens a lot, it's part of our job, we know how to deal with it".

Catalyst suppliers need thick skin. Really good technical service people treat false accusations as opportunities to help their customer and increase their value to the refinery.

Myths 9 and 10 relate to the economics of catalyst selection.

Myth Number 9

Catalyst supplier profits are razor thin

This myth is often heard in price negotiations, and in idle talk at industry conferences, and I have seen it in several (expensive!) consultant studies on the catalyst industry. But we have done the research to prove it is a myth. In fact, catalyst supplier profits are *off-the-charts high*. – And the charts are in our reports.

We do not criticize the catalyst suppliers for being profitable; in fact, it is a great thing and it is very healthy for our industry.

But I am just saying that, when you hear this “razor-thin” myth, you shouldn’t believe it.

Myth Number 10

Switching catalyst suppliers is risky business

Here are three important points about this myth:

1. All the major suppliers sell good catalysts.
2. There is a lot of benefit to having more than one catalyst supplier.
3. You can greatly reduce the risk of switching suppliers by having accurate independent data to help see through the veils of secrecy and politics.

When you work with good information, the risk is low. Our clients switch suppliers much more often than the industry norm, and they have been delighted with the results.

Independent Catalyst Test Report

These topics, and more like them, are covered in our five annual reports. Our business was formed six years ago on the belief that the industry can benefit from more open access to more accurate information about catalysts. That is what we deliver, to help you see the facts more clearly.

We have issued five annual reports called *Independent Catalyst Test Report*, and the sixth will be issued later this year. Each report contains independent pilot plant test data on eight hydroprocessing catalysts and one year of market research on the catalyst industry. This is an open-market, multi-client program, and the reports are available to anyone.

There is an easy way for your company to begin using our reports, for an investment of $50,000 (see Table I for details). When you buy just one report, you will begin realizing benefits with your next catalyst purchase.

Here is what I want to leave you with today: Don’t rely on myths and idle talk about catalysts. *Independent Catalyst Test Report* will help you

- Separate fact from fiction
- Buy the right catalysts with confidence
- Save $hundreds of thousands on each purchase

Thanks a lot for your attention.

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Table I. Independent Catalyst Test Report

Hoekstra Trading has completed a 5-year, $1.5 million pilot plant test program- on ultra-low sulfur diesel (ulsd) catalysts.

We produced a database of 40 pilot plant tests- 8 tests per year for 5 years, on ulsd catalyst from all major suppliers

Plus 5 years of market research- on the catalyst industry.

The program was funded by 19 companies- 12 refiners, 4 catalyst suppliers, and 3 investors interested in the catalyst business

Results are available to anyone- in 5 reports, Independent Catalyst Test Report 2010, 2011, 2012, 2013, and 2014:

- Refiners under 1 million barrels per day: $50,000 per year
- Anyone else: $100,000 per year

Step One- buy our 2012 report

- It is the third year, and most popular of our five reports as an initial purchase
- It gives what you need to get big benefits with your next catalyst purchase

For refiners under 1 million barrels per day- that's $50,000 to tap into this $1.5 million industry study

Start getting $300,000 - $5,000,000 benefit per unit

Our clients have already shifted over $100 million of catalyst market share- to new products, better products, overlooked products, and new suppliers

Our clients say-

- *"This is great work"*
- *"A wealth of information"*
- *"Sheds a whole new light on catalysts"*
- *"We've not seen anything like this before"*

Take step one today

http://hoekstratrading.com

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