Ward's AutoWorld

Gold Key Ingredient in New Diesel Catalyst Tech

By David E. Zoia WardsAuto.com, Apr 17, 2007 1:04 PM Special Coverage

DETROIT – There's a new kid on the block in the automotive catalyst field, and it is bringing a new concept it says is as good – and inexpensive – as gold.

Nanostellar Inc., an October 2003 startup, reveals here at the SAE International World Congress it has developed new oxidation-catalyst technology that mixes gold with platinum and palladium to improve efficiency, reducing the amount of costly precious metals needed.

Platinum currently sells for about $1,240 per ounce (28 g), so substituting the cheaper gold – about half the price at $660 – can represent serious savings. The auto industry used more than $4 billion in platinum in 2006, Nanostellar says, and that is projected to grow 50% by 2010.

Nanostellar's NS Gold technology is aimed at light- and heavy-duty diesel engines and can cut noxious emissions 15%-20% from the levels the company says it achieves with its platinum/palladium catalyst. Nanostellar claims its platinum/palladium catalyst already is 25%-30% more efficient than similar products currently on the market.

With the NS Gold catalyst, platinum savings range from 25%-40%, depending on the application, says Nanostellar's David Aslin, a member of the board and investor in the firm since 2004. "Compared with a pure platinum catalyst, the savings would be 40%," he tells Ward's.

The use of gold as a catalyst isn't new, Aslin points out. But the Nanostellar technology marks the first successful application for automotive diesel engines, he says.

"Gold is difficult to apply," Aslin says. "It's the nanotechnology that allows us to do that."
The key, he says, is in controlling the growth of the nano-scale particles so that they remain within their defined size range even in harsh environments. That allows Nanostellar either to match the performance of other catalysts while using lower amounts of precious metals or boost the performance of the catalyst to meet tougher emissions requirements, Aslin says.

The mix of gold, platinum and palladium depends on the application. "We can tune it to fit the engine or platform," he says.

Although Nanostellar also markets to the stationary-power industry, most of its focus is automotive, where it currently derives its revenues from the aftermarket while awaiting its first OE contract.

It currently is on the verge of landing two such supply deals, Aslin says. One program, which Aslin expects to be finalized later this year, would involve a running change on a European light-duty vehicle for 2008. Nanostellar also is zeroing in on a 2009-2010 vehicle program with a U.S. auto maker.

Both of those projects involve Nanostellar's existing platinum-palladium catalysts, not the new NS Gold technology.

Nanostellar's revenues currently are projected at $3 million for 2007, with forecasts calling for the company to hit $40 million by 2010.

"But that's a conservative figure," Aslin admits. "If just one of those (OE) contracts comes in, it will dwarf that."

Nanostellar was founded in late 2003 by scientists from Stanford University and NASA's AMES Research Center. Its first products didn't hit the market until October 2006.

The supplier now employs about 50 people, mostly at its headquarters in Redwood City, CA. Manufacturing is outsourced to a company in New Jersey. Nanostellar also has partnerships with companies in Asia, Aslin says, and will add operations in Europe as it secures OE contracts there.

Winning over automakers with new technology typically isn't easy. But Aslin says the feedback from OEs so far is positive. "Most are saying we're at least as good performance-wise as anything they've seen, and we're using less precious metals," he says.

"Some are more skeptical than others, but we've had a good reception, particularly with one of the (U.S.) Big Three that appears pretty enamored with our approach.

"The Asian OEs (also have been) receptive," he adds. "We could see some business there in a relatively near term."

Nanostellar is focusing on diesel catalysts because there is less room for improvement with gasoline engine catalysts.

"The gain is maybe 5%-10%," Aslin says. "So, as a startup company, there's not as compelling a market opportunity. But I wouldn't rule out doing something eventually."

Fuel cells also might be an opportunity for the coating technology, but the company is only beginning to look in that direction, he says.