

Innovative oil process increases API, removes sulfur and other contaminants from crude oil.

FlexDS™ is a novel, catalytic process that offers the disruptive ability to upgrade heavy-sour crude oil, providing an increase in value as high as 10% -20%. FlexDS™ is an innovative leap in upgrading technology that operates at only \$1.50 - \$2.00/bbl - much lower than existing upgrading processes. Because FlexDS™ has a small footprint, oil producers can field upgrade heavy-sour oil while drastically improving their economics. FlexDS™ has been proven on many heavy-sour crude oils as well as bitumen and coal liquefaction product.

Increase API gravity Increasing API gravity can increase the value of a crude from 5% to 20%. For example, raising oil sands bitumen API from 10 to 20 eliminates the need for diluent and can provide a revenue boost of \$10-\$20/bbl. Other heavy crudes will see benefits closer to the 5%-10% range.

Sulfur Reduction Sulfur levels above 1% get discounted 2%-5% depending on the sulfur level. FlexDS™ can target and achieve specific sulfur levels depending on the desired quality of crude oil, increasing the overall value of the oil.

TAN Reduction For heavy-sour feeds that have TAN levels in the 3%-4% range, producers are forced to sell their crude at a discounted rate. Removing TAN, while increasing value, also allows crudes to be sold to a larger portion of the refinery market, not just complex refineries that are able to process high TAN.

Metals and nitrogen reduction Crude with high metals and nitrogen content is discounted along with other entrained contaminants. While the life of the FlexDS™ catalyst is not reduced by contact with these contaminants, metals and nitrogen have an adverse effect on other catalytic processes downstream. FlexDS™ treated crude oil will allow the refiners to achieve longer catalyst life, thus increasing the value of the crude oil.

Auterra is working internationally with strategic energy companies looking to increase the value of their crude oil. FlexDS™ is currently in the pilot plant stage, and Auterra expects to have first commercial FlexDS™ commitments in place by early 2011. Please contact Auterra for more information about the FlexDS™ process.

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FlexDS™ Highlights

- Increases API
- Removes sulfur, nitrogen, trace metals and lowers TAN
- Increases the value of crude up to 5%-20%
- Operating cost approx. \$1.50/bbl
- Effective on heavy-sour crudes, bitumen and coal liquefaction product
- Small footprint, low capital cost

