



## *Short Summary of Crude Assays*

Crude oil can be refined into a variety of products we use every day, such as gasoline, diesel, jet fuel, heating oil, and pitch (used to make asphalt that's on the road). A crude assay is essentially a detailed evaluation of a crude oil feedstock conducted by a petroleum testing laboratory.

A full crude assay takes the guess work out of the equation by simulating refinery distillation conditions (using ASTM D2892 and ASTM D5236) to determine the yields and the quality of the distillates (using a variety of ASTM and proprietary methods). This helps refiners and traders make informed decisions regarding a specific crude oil or a blend of crude oils prior to purchase and before it enters the refinery. This information will also help maximize profits and optimize processes.

It is a service that requires the most sophisticated technology and instrumentation coupled with experienced and knowledgeable personnel.

Our industry uses Crude Assay information in a number of different ways:

- To predict crude oil product yields, quality, and production specification.
- To establish the compatibility of a crude oil to a particular refinery configuration or to development "cocktail" blends of various crude oils as a solution
- To help optimize existing refinery operations or evaluate future ventures.
- To determine if the crude oil distillates meet regional or foreign market quality standards.
- To set the price of a newly discovered crude oil reservoir or determine the currently price and quality of older ones.

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- To supply engineering companies with detailed crude oil analyses to help them design their refinery processes.
- To identify economic opportunities in the crude oil spot market.

### *How do you start a Crude Assay?*

First, a Crude Assay Template is established, and it depends on the end user of the data, the source of the crude and known issues, a refiner and their constraints, and the specific end market and their concerns. It will include all of the desired cut points (fractions) and the testing for each fraction. A cut or fraction is a generic name for all compounds that boil between any two temperatures. Many templates are provided by the clients, while others are developed through collaboration.

Once the template is finalized, the laboratory requires at least 2 x 5 gallons of the crude oil for the assay. The fractional distillation, the testing of each fraction, and the generation of the final report usually takes approximately one to four weeks to complete, depending on the template of the assay. *AmSpec can complete an average crude assay within one to two weeks.*

The quality of the assay data is dependent on the attention paid to sampling and handling of the crude oil. Sample integrity must be maintained throughout the process, from sampling, to shipment, to the testing in the laboratory. ASTM D4057 and D5854 provide information on the sampling and mixing of petroleum products, respectively. Selections of appropriate test methods to use for which fraction is also critical.

Once the testing is complete, the task of performing a mass balance and analytical data review is undertaken. A crude assay generates vast amount of data that is compiled into the final report. AmSpec utilizes Haverly's iCDM software to manage this. AmSpec can create various data formats which can be imported directly to users' LP models, a significant time savings with no data entry error.

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Our professionals can collaborate with you through the entire process to ensure the final crude assay report meets your needs. If you would like to discuss further or require more detailed information, please contact our Crude Assay Team at AmSpec's Houston Technical Center:

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This is an example of an assay distillation tower (ASTM D2892) semi-automatic Crude Assay still, the same type used by AmSpec. (Photo courtesy of DC Scientific)

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