IQT Ignition Quality Test (ASTM D6890; EN 15195; IP 498)
v
Cetane CFR Engine Test (ASTM D613)

Understanding the very significant benefits offered by IQT means appreciating the message that "conventional" refining cannot indefinitely continue to meet tightening product specifications with optimized costs using current test procedures. ‘Smarter’, more rapid and precise in-line and at-line measurement technologies are needed.

For Cetane measurement, IQT represents such ‘smarter’ technology and is now being adopted by many companies to support modern fuel blending operations. The IQT analyzer rapidly and precisely provides the Cetane Number of both feedstock materials and finished blends. Fast evaluation of CN supports efficient utilisation of the valuable cetane rich feedstock and helps to minimise giveaway.

ASTM D6890 is an approved alternative test method to D613 in US Diesel spec ASTM D975 and many fuel companies now use D6890 for all daily blending operations. The same method is included in the B100 specification, ASTM D6751.

EN15195, based on IP 498, is now available and has been included as an alternative method within EN 590. Specification BS2869 for Kerosene and Residual Fuel Oil already includes IP 498.

BENEFITS TO THE REFINER

IQT will provide the CN of a fuel sample in just 20 minutes and with excellent repeatability. It is the SPEED and PRECISION of operation that offers the greatest benefit to a Refiner and means that different dynamics can be introduced between Scheduler and Blender to ease ‘the desired recipe being delivered on specification’.

‘Smart’ blend procedures
Checking feed and blends QUICKLY to maximise flexibility and support the scheduler’s needs. IQT can be used to test “side cuts” from a TBP run due to the small volume of fuel needed for a spot-check. A more robust and classical approach than NIR modelling.

Precision
The accuracy of IQT data allows blending nearer to the specification point than can be achieved with the engine, thus saving on cetane giveaway. Where blended to typically 2.5 numbers, but with the IQT a value of 0.5 DCN.

Cetane Rich Feedstock can be optimised
Real-time CN measurement supports blend optimization of feedstock.

More efficient use of Hydrotreater Material
Improved blend specifics adds value to lower grade products and helps to raise the margins on low value product.

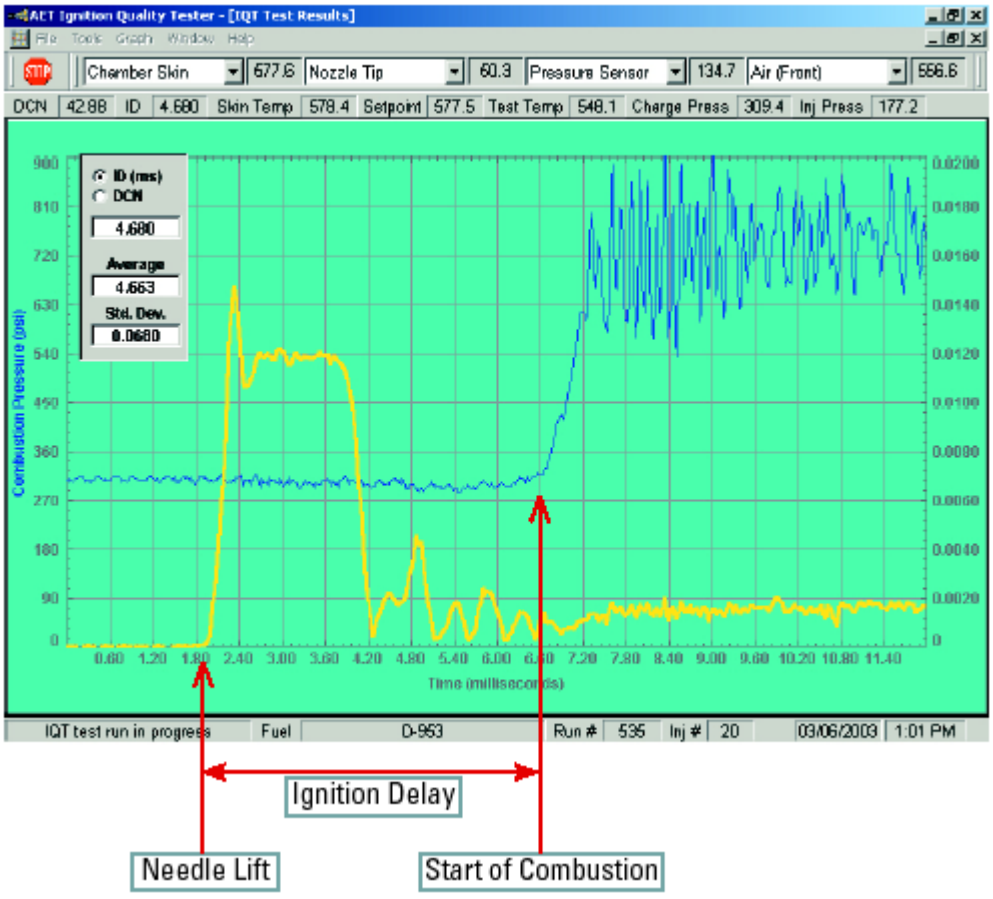
Optimize the use of aromatics
with low CN using higher CN hydrocarbons in the blend process

Avoiding giveaway
by adding high CN feeds to kerosene and other fuels that are not requiring highly specified CN

Transition to lower Sulphur Diesels
Helps the blend balance with more precise determination of CN level - balance volumes of paraffin's and aromatics to get the right CN mix to meet the specification, whilst allowing the refinery to meet demands on other products by utilising the refinery feed pool.

Reduces the usage of Cetane improvers
IQT's precision allows more exacting use of costly cetane additives and helps reduce overdose, by being more discriminative when the engine masks the effect. Some IQT users have literally halved the use of cetane improvers.

Limits operation overload
Better CN data contributes to a reduction in problems associated with running refinery operations over and above specified limits to meet output needs. Optimizing the refinery units minimises issues of early maintenance and/or the need to bring forward expensive shutdowns and upgrades.



BENEFITS TO THE LABORATORY

Capital & Running cost economy
The cost of 'owning' an IQT is far less than an engine. IQT has lower operating costs, lower service support costs and far less 'down time' for maintenance.

Operator efficiency
The IQT test requires much less time than the CFR engine, making personnel available for other work. Typically an operator is 'tied' to the engine for at least an hour, whilst the IQT test sequence takes less than 20 minutes in total. IQT is simple to use and suitable for shift work operation as well as for 'spot check' requirements.

Reliability
The repeatability of IQT results is independent of the skill of the operator whereas the engine is VERY operator dependent.

Consistency of results
IQT results are not affected by atmospheric conditions. The engine is greatly affected by this (example: on some days it may not be possible to obtain a result from the engine due to instability of atmospheric pressure and humidity).

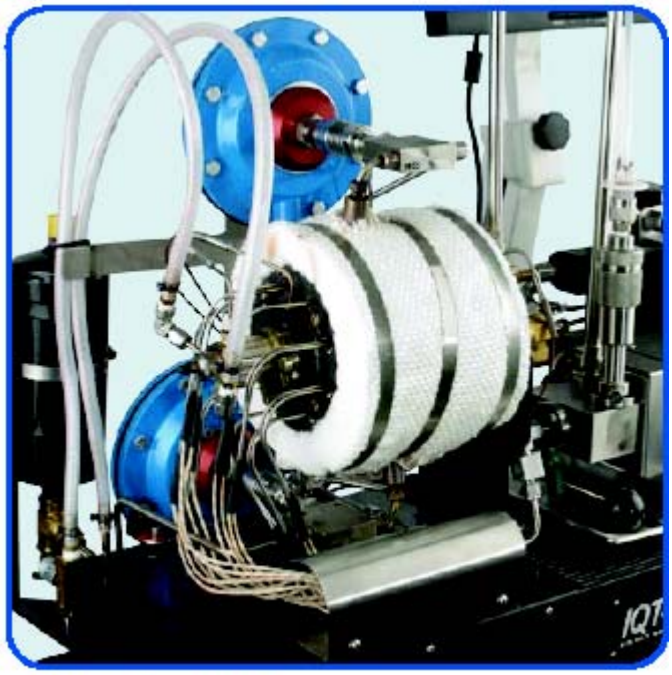
Supporting R&D Operations
IQT allows precise CN data to be quickly and efficiently determined 'on demand' improving R&D information flow and techniques.

Space saving
IQT requires no specialised 'Engine room'; the analyzer is significantly quieter in operation and can be situated within a normal laboratory. It has a small footprint and takes much less space than an engine.

Methods & Specifications

ASTM D6890	Standard Test Method for Determination of Ignition Delay and Derived Cetane Number (DCN) of Diesel Fuel Oils by Combustion in a Constant Volume Chamber
IP 498	Standard Test Method for Determination of Ignition Delay and Derived Cetane Number (DCN) of middle distillate fuels by Combustion in a Constant Volume Chamber
ASTM D975	Standard Specification for Diesel Fuel Oils , biodiesel, biodiesel blend, diesel, fuel oil, petroleum and petroleum products
EN 15195	Determination of ignition delay and derived cetane number
EN 590	Diesel fuel specification
BS 2869	Kerosene and Residual Fuel Oil

IP Derived Cetane Number Correlation Scheme
Run in parallel to and using the same specially blended diesel fuels as the Diesel Fuel Engine Correlation Scheme. This scheme allows users to compare results against those determined by other users and to compare the DCN directly to a mean Cetane Number as determined by IP 41/ASTM D613. IQT participation is growing, now 18 instruments and more than 20 engines.



Combustion Chamber detail

WHO IS USING THE IQT?

Globally there are 150+ IQT users in all five continents. Within Europe a total of 53 units are operational and 30 of these are located at Refineries, mostly working 24/7 on a 3 shift basis. A further 10 instruments are sited at third party test laboratories.

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