FIA-100/FCA

Ignition and combustion properties of Heavy Fuel Oil

HFO or residual fuels may consist of different oil fractions which are blended to meet fuel specifications. As refinery processes has become more efficient through the years, more light components are extracted from the crude oil. The use of catalytic cracking processes are increasing the aromatic content of residual fuels, and as a result, ignition and combustion properties have great variation and are difficult to predict by use of empirical methods.

In engines, poor ignition and combustion properties may cause operational disturbances and in some cases this may lead to engine damage.

The FIA-100/FCA uses a small sample of fuel which is injected into a constant volume combustion chamber at high pressure and temperature. The fuel auto-ignites and the pressure increase during combustion is monitored. Ignition delay, and other combustion parameters are derived from the combustion pressure data.

Test method IP541/06

As the only instrument available, FIA-100/FCA is compliant with test method IP541/06 "Determination of ignition and combustion characteristics of residual fuel oils". When operated according to IP541/06 the Estimated Cetane Number (ECN) is calculated. ECN ranges from 5 to 40, where a high ECN value means good ignition properties.

The complete test method is available from Energy Institute. www.energyinst.org

Engines have different sensitivity to fuels ignition and combustion properties, and measured ECN values should be considered in relation to engine type, load case etc. CIMAC WG07 has published a fuel quality guide where operational reference ranges for the ECN parameter are suggested.

More information can be found at the CIMAC webpage: www.cimac.com

Instrument Specifications

Size (BxHxD):	70x70x40 cm
Weight:	Approx 60 kg
Air supply:	Compressed air – dry and clean
Electrical:	220-240V, 50Hz -1600W
Injector cooling	External circulation bath
Computer con.	Ethernet
Fuel consumption	50 ml pr. test

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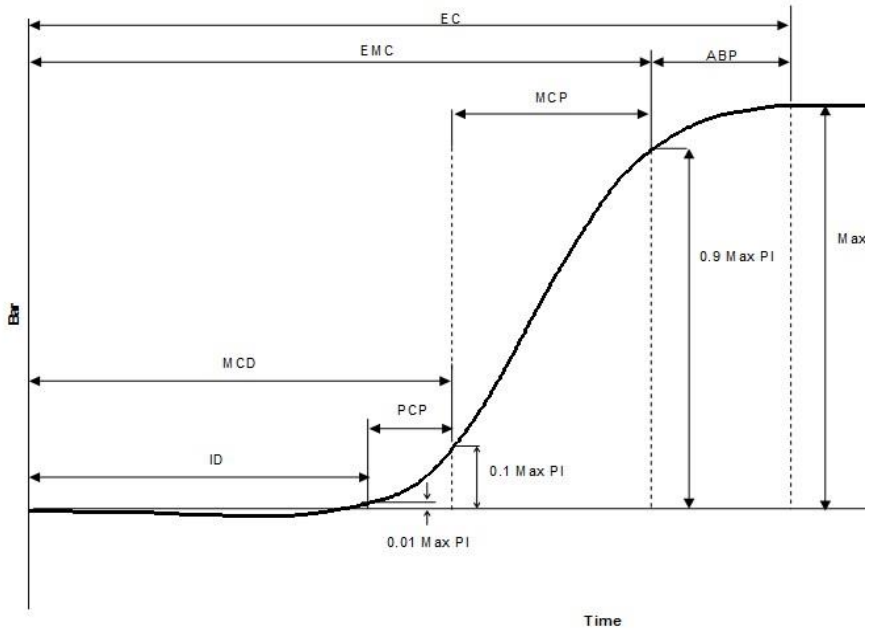
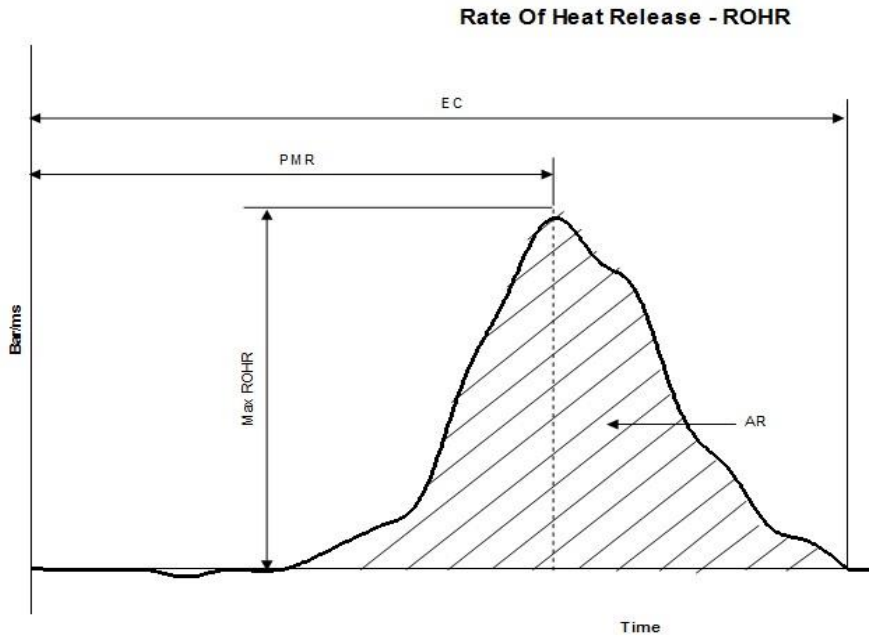
Contact us: mail@fueltechsolutions.com
Call us: +47 73534100

FIA-100/FCA

Test output





- Combustion Pressure trace
- Rate of Heat Release RoHR
- ECN - Estimated Cetane Number, range 5-40 CN, according to IP541/06
- Calculated parameters

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