PAC

Herzog Cetane ID 510

Highest Precision in Determining Derived Cetane Number of Diesel Fuel Oils

- Significant savings on investment and maintenance
- Robust and fully automated technology for high ease of use
- **Approved standard methods:** ASTM D7668, EN 16715, IP 615 and GOST R 58440
- **Excellent correlation to:** ASTM D613, ISO 5165 and IP 41
- **Approved in diesel specifications:** ASTM D975, D6751 and D7467, EN 590 and GOST R 52368

WORLD-CLASS ANALYSIS OF DERIVED CETANE NUMBER FOR DIESEL FUELS

Accurate analysis of Derived Cetane Number (DCN) is crucial for diesel and biodiesel fuel blenders and refineries to maintain fuel consistency and quality. Existing technologies such as CFR Engine and CVCC methods do not meet current market requirements with their high investment and operational cost, difficult operation and poor system performance. Herzog's Cetane ID 510 has a unique technology that is proven to provide the best precision in the market for determining DCN of all types of Diesel Fuels, Biodiesel, FAME, HVO, BTL, B100, Jet Fuel and GTL.

It is a compact, easy to use, and fully automated analyzer, that offers excellent return on investment, and is in compliance with today's safety requirements. The CID 510 patented method is approved as standard ASTM D7668, EN 16715, IP 615 and GOST R 58440-2019. It's also officially approved in diesel specifications: ASTM D975, D6751, D7467, EN 590 and GOST R52368-2005.

WITH OPTIONAL ZYNTHAIR GAS MIXER

The ZyNthAir Gas Mixer is an accessory for existing CID Cetane Analyser that removes the need for synthetic air while producing constant, reliable and accurate combustion air. Benefit from the reduced cost of purchasing synthetic air and the need to perform a Cetane calibration between gas cylinder swaps. While experiencing better measurement performance across the complete Cetane measurement span.

KEY FEATURES

BEST PRECISION AND IN PERFECT CORRELATION TO ASTM D613

- Proven performance from ASTM/EI Inter Laboratory Study - included 20 samples*
- Precision exceeds CFR Engine and other CVCC instruments
- Cross Method Reproducibility (Rxy) is much better than other CVCC alternatives
- Excellent correlation to the mean value of the CFR Engine
- Calibration is based on the same Primary Reference Fuels than CFR Engine ASTM D613
- Long term calibration stability, no frequent calibration

*13 distillate fuels, 2 blends of biodiesel in distillate fuel (B2-B7 and B20), 4 B-100 biodiesels (Soy, Canola, Tallow, and a 30/70 blend of soy and rapeseed, respectively), and 1 aviation turbine fuel

HIGH STANDARDS FOR SAFE OPERATION

- Built-in fire monitoring and suppression system
- Fuel level sensor to avoid the injection system from running dry
- Over pressure protection for fuel injection system
- Over pressure protection for combustion chamber
- CVCC heaters guarded by thermal fuse
- Coolant flow detection to protect fuel injection system and chamber pressure sensor
- Automated diagnostic functions —Leak test for combustion chamber

SIGNIFICANT SAVINGS ON INVESTMENT AND MAINTENANCE

- Requires much less valuable space than CFR Engine (no separate room necessary)
- Automated calibration for long-term stability minimizes down-time risks
- No special user training required
- Lower investment cost than alternatives
- No cleaning of test chamber required: sootless combustion eliminates cleaning of Fuel Injection System, Combustion Chamber and Pressure Sensor

ROBUST AND FULLY AUTOMATED TECHNOLOGY FOR HIGH EASE OF USE

- Fully automated, one button operation allows minimal operator training
- Electronically controlled High Pressure Fuel Injection contributes to high accuracy
- Automatic Calibration with Primary Reference Fuels
- Automated diagnostic functions
- Flexible report formats for built-in printer and export to LIMS or Excel

BEST ROI AND PRECISION

The excellent precision and correlation of this technology allows refineries to run their process closer to the specification limit for the cetane number. In addition the costs associated with cetane improvers is reduced, which ultimately increases a refinery's profitability.

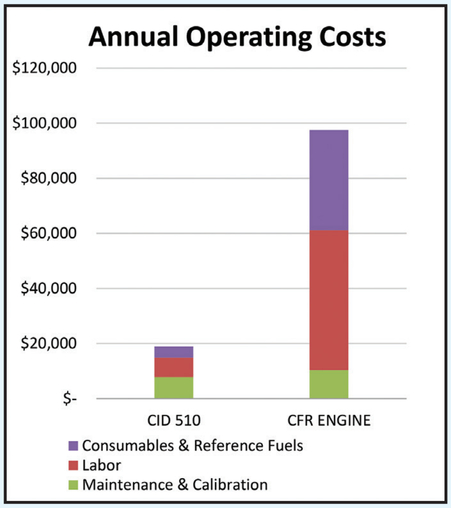
The initial investment cost is less than half than the competition. With the CID 510 the cost for reference fuels, and the operator and maintenance cost can be reduced by 80%.

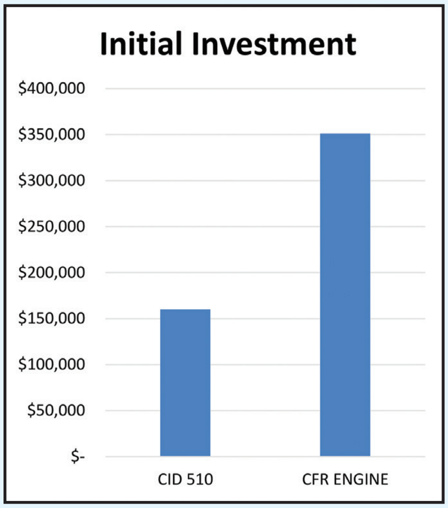
★★★★★

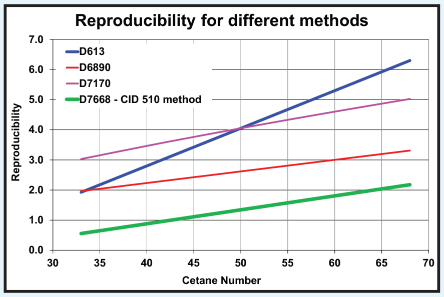
"We have made great use of our CID 510 in fuel studies varying from blending response of fuels, to validation of surrogate fuel mixtures that are intended to mimic the ignition behavior of full boiling range fuels, to characterizing the ignition delay response to diluents in the air charge. The strength of the CID 510 is that through the keypad interface you can vary injection pressure, injection duration, chamber pressure and chamber temperature, in addition to running the ASTM D7668. That means that the CID 510, as received from PAC, can serve in routine testing of DCN, but also as a research instrument. We obtain very reliable and repeatable results on ignition delay, and have studied diesel fuels, gasolines, jet fuels and many model compound mixtures."

André L. Boehman, Ph.D., P.E., FSAE
Professor of Mechanical Engineering
Department of Mechanical Engineering
University of Michigan

ANNUAL AND INITIAL INVESTMENT COSTS





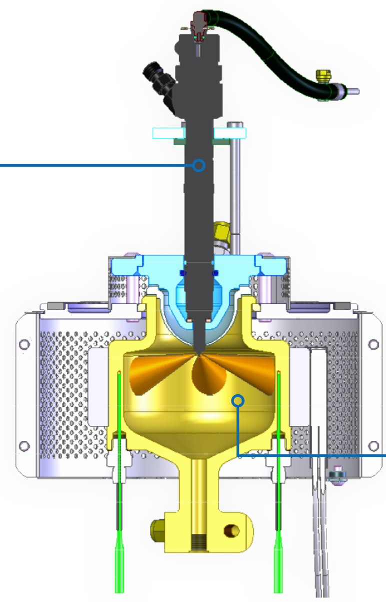


Costs for maintenance, calibration, labor and consumables for sample testing, plus the savings on the initial investment.

UNIQUE AND ADVANCED TECHNOLOGY

The fuel injection system is a modern high pressure common rail injection system which is electronically actuated offering ultimate precision. The common rail injector allows for much higher injection pressures (up to 1500 bar) yielding a completely volatilized test sample and therefore better, soot-free combustion than other Constant Volume Combustion Chamber (CVCC) instruments. The faster evaporation makes the pre-flame reactions observable.

The pre-flame clearly shows the effects of cetane improvers such as 2-ethylhyxylnitrate on the combustion process. The electronically controlled injector guarantees high precision in fuel injection volume making the results more repeatable.



ELECTRONICALLY CONTROLLED FUEL INJECTION SYSTEM

- Simulates real world Diesel engine systems
- Multiple nozzles
- Generates very fine droplet size
- Provides accurate injection volume

HEATED COMBUSTION CHAMBER

- Uniform fuel distribution
- Faster fuel evaporation
- Efficient mixing with air
- Sootless combustion

SERVICES, SUPPORT AND TRAINING

Our individualized instrument service programs help our customers ensure maximum quality and repeatability, while complying with standards and regulatory requirements. In addition to service programs, we also offer individual services for preventative maintenance, calibration, and relocation services. Our Service Repair Centers, located around the world, are ISO-9001 accredited. All work is performed by skilled certified service technicians.

PAC offers a wide selection of training and educational programs to support our customers throughout the range of industries that our instruments serve. Our training programs may take place in one of our PAC facilities worldwide or right at the customer's facility. We also offer webinars of some of our key technologies online.

TECHNICAL SPECIFICATIONS

Operation		
Measurement Principle	Constant Volume Combustion Chamber (CVCC) with electronically controlled high pressure injector and patented Multi Point ID measurement	
Standard Test Methods	**ASTM** D7668, **EN** 16715, **IP** 615. **Correlates** to **ASTM** D613, **ISO** 5165, **IP** 41, **GOST R** 58440	
Fuel Specifications	**ASTM** D975, D7467, D6751, **EN** 590, **GOST R** 52368	
Precision	Published precision of the **CID** 510 **ASTM** D7668 is much better than the CFR Engine and other CVCC instruments. r = 0.6, R = 1.44 @ 52CN	
Operation		
User Interface	LC Display with solvent-proof numeric keypad with alpha numeric capabilities	
Combustion Chamber	6 mm stainless steel	
Injector	Modern high pressure common rail injector	
Sample Introduction	Sample is directly poured into the sample vessel	
Sample Volume	60 to 160 ml for testing (depending on number of tests) approx. 100 ml more for cleaning if done with next sample	
Timmings	Test Duration: Approx. 30 minutes	Warming up Time: Approx. 40 minutes
Measuring Range	15 - 100 DCN	
Cleaning	With next sample or appropiate solvent	
Unit Protection	Built in fire suppressing system with 2 fire sensors	
Software Functions	Result data base for the last 100 results. Print-out with built in printer. 10 Operator Names. Memory for Test Parameters. Automatic Calibration. Diagnostic Test.	
Computer interface	3 * USB for memory stick. RS232C serial port for LIMS and service. Ethernet RJ45 port for PC connection.	
Measurements		
Chamber	Temperature: Approx.600°C (adjustable 535°C to 650°C)	Pressure: 20 bar (adjustable 0 to 25 bar)
Injection	Time: 2500 μs (adjustable 400μs to 3000 μs)	Pressure: 1000 bar (adjustable 600 to 1400bar)
External Connections		
Combustion Air	Compressed Synthetic Air, 19.5% to 20.5% O2; balance is N2 <0.003 Vol.% hydrocarbons and <0.025 vol.% water; Delivery Pressure 22 to 25 bar; Fitting 1/4A Swagelok for tube ID 6.4mm. This requirement can be also met using the ZyNthAir gas mixer.	
Nitrogen	Compressed Nitrogen, 99.9% purity; Delivery Pressure 8 to 10 bar; Fitting 1/4A Swagelok for tube ID 6.4mm	
External Cooling System	Liquid circulating bath: cooling power 260 W @ +50°C. Pump pressure 500mbar. Flow rate of 22 l/min. No-flow monitor locks the instrument if cooling system is off.	
Other Specifications		
Electrical Connection	Dual Voltage 115 or 230V with automatic selection. Power 1800W.	
Operating Requirements	Temperature 10 to 35°C (50 to 95°F). Relative humidity up to 80% at 35°C (95°F).	
Size and Weight	W x H x D: 60 x 66x 66 cm (23.6x 26.0x 26.0 in.) 80 kg (177 lbs)	
Options & Accesories	External Cooler. Regulators for Nitrogen and Synthetic Air.	

Continuing research and development may result in specifications or appearance changes at any time.

PAC

ABOUT PAC

PAC develops advanced instrumentation for lab and process applications based on strong Analytical Expertise that ensures Optimal Performance for our customers. Our analyzers help our customers meet complex industry challenges by providing a low cost of ownership, safe operation, high performance with fast, accurate, and actionable results, high uptime through reliable instrumentation, and compliance with standard methods.

Our solutions are from industry-leading brands: AC Analytical Controls, Advanced Sensors, Alcor, Antek, Herzog, ISL, Cambridge Viscosity, Phase Technology, PSPI, and PetroSpec. We are committed to delivering superior and local customer service worldwide with 16 office locations and a network of over 50 distributors. PAC operates as a unit of Roper Technologies, Inc., a diversified technology company and a constituent of S&P 500, Fortune 1000, and Russell 1000 indices.

HEADQUARTERS

PAC LP | 8824 Fallbrook Drive | Houston, Texas 77064 | USA
T: +1 800.444.8378 | F: +1 281.580.0719

Contact us for more details.
Visit our website to find the
PAC representative closest to you.