

Overview of Intertek Automotive Research

Intertek Automotive Research is a fully independent testing facility that has been in business since 1953. Based in San Antonio, TX, Intertek-AR provides a vast array of services to the Automotive and Heavy Duty Engine OEM's, tier 1 suppliers, and the fuels and lubricants industry.

Intertek Automotive Research has over 50 engine dynamometer based test stands to support a variety of test needs. Testing is conducted 24 hours per day, seven days per week. Thousands of hours of dynamometer testing are conducted annually in facilities that cover 18 acres. One primary area of testing includes engine and engine component development and durability testing.



Engine component development and durability testing performed at Intertek-AR primarily encompasses performance and validation testing on engines and engine components. Customers include all of the automotive and heavy duty engine manufacturers and their suppliers. Intertek-AR has a variety of test stand configurations to suit this need. Precision data acquisition and control systems are used that provide flexible and repeatable engine control. Data acquisition rates vary depending on customer requirements. Typical rates are once/minute and once/stage. Intertek-AR also employs "flight recorder" data acquisition which gathers data at a high rate (such as 100 Hz) to aid in determining root cause due to engine or engine component failure. Gaseous emissions measurement equipment and control of intake air humidity and temperature is also available.

Intertek-AR has expertise in testing a variety of engine configurations ranging from single cylinder to multi-cylinder research, prototype, and production engines. A variety of fuels are used including gasoline/gasoline blends, diesel, and alternative fuels. Engine and engine components are constantly evolving. They are becoming more sophisticated, and are being developed at a more rapid pace and at less cost than ever before. Our facilities allow our customers to meet these challenges.

Engine Test Facilities

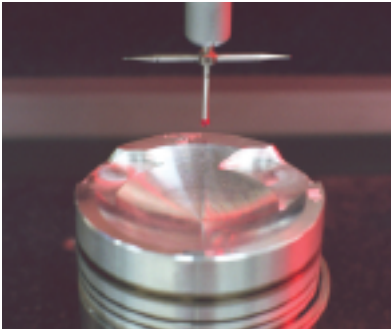
- Engine performance and validation testing
- Engine development testing
- Individual test cells
- Eddy current dynamometers up to 600 HP
- Engine speed control up to 8000 RPM
- Combustion air control (temp and humidity)
- Exhaust back pressure control
- Emissions
- Oil consumption measurement (manual and auto)
- Engine fluids (fuel, coolant and oil) temperature control
- Cooling water is available in each cell at a mean temperature of 80 degrees F
- Chilled water is available in each cell at 50 degrees F
- Automated data acquisition and control (various systems and speeds)



- Multiple data acquisition channels - dependent upon program
- Flight recorder monitoring
- OEM diagnostic equipment utilized
- Various test fuels utilized (examples: gasoline/gasoline blends, diesel, and alternative fuels)

Customers

- Heavy duty OEMs
- Passenger car OEMs
- Off road/industrial equipment manufacturers
- Military
- Tiered suppliers



Testing Experience

- Complete engine durability
- Component durability
- Throttle sticking
- EGR
- O2 sensors
- Turbochargers
- Power checks, curves
- Performance
- Blowby monitoring
- Compression/leakdown evaluations
- Engine blueprinting
- Engine deposit evaluations
- Fuel, lubricant evaluations
- Octane requirement increase evaluations
- Crankcase ventilation evaluations
- Oil consumption evaluations
- Emissions
- Failure analysis
- Test development
- OEM specific tests
- Industry standard tests



Test Cycles

- Industry specified cycles
- Proprietary cycles
- Custom designed cycles

Off Site Portal Presence

- Intertek-AR offers off site portal presence: the ability to view testing anywhere & real time via web link

Test Personnel

- Test engineer assigned to each program
- Continuous (24/7/365) operation with operators staffed on each shift

Test Support Personnel

- Lab support- engine diagnostic tools and emission measurement equipment are used in the lab
- Rating department - visual rating of any engine part via CRC methods
- Metrology lab - performs measurements for engine blueprinting. Equipment includes dimensional gauges, roundness, flatness, surface finish, hardness, cam profiles, coordinate measurement machine, ring tension, and weight
- Analytical lab - performs fuel and lubricant analytical tests per ASTM and customer specific tests. Over 25,000 samples/month are tested
- Calibration lab - performs all instrument calibrations for all labs. NIST traceable
- Project engineering - performs engineering for new stand installations, stand conversion and design of test rigs
- Instrumentation shop - engineering and technician support for all cell and engine electrical/electronic controls
- Electric, welding, machine, plumbing and construction shops - performs test cell conversion, installation, repair and maintenance
- Information systems - provides support for test cell automation, database operations, test process automation and customer data communication

- Photographic services - complete digital imaging with Kodak DCS® Technology. Photo booths, in-lab shooting and borescope photography
- Client services - performs data retrieval, test report generation and transmission to customer
- Parts stock - maintains an inventory of spare parts for engines and test cells
- Inspection and tear down - an area for tear down, cleaning, inspection, and photography
- Storage - ample room for secure storage of engines and engine parts
- Engine build - engine block and cylinder head assembly and disassembly
- Fuel handling - over 300,000 gallons of fuel tank storage. Special fuels can be blended and run from 400-gallon stainless steel tanks

Quality

- ISO 9001-2000
- Ford Q1



What Sets Us Apart

- Invitations to reside on customer internal task forces and staff meetings
- Participation in industry activities and committees
- Customer interaction - test development activity
- Providing consistent, reliable, quality service
- Customers seeking advice to field related issues
- Proficient with diagnostic/PCM manipulation equipment
- Participation in customer sponsored training
- Deliver results in accordance with customer requirements
- Use solid engineering judgment to resolve problems
- Daily engineering review
- Control charting of critical parameters to identify changes
- Alarming to avoid catastrophic failures
- Data recording that facilitates quick analysis

For more information, please feel free to visit our website at www.ar.intertek-cb.com, contact us via email at testingservices@intertek.com.