



RTI Laboratories
Statement of Qualifications
2018

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Executive Summary

Established in 1986, RTI Laboratories, Inc. (RTI) is one of the largest, nationally-recognized small business testing laboratories in the United States. Operating out of more than 28,000 square feet in Livonia, Michigan, we combine a team of highly experienced analysts with advanced instrumentation to deliver “Service and Solutions for Your Success.” Our commitment is to consistently provide our clients with responsive project management while meeting the most stringent quality standards in the industry.



RTI maintains its Quality Assurance Program in strict adherence to the ISO/IEC 17025:2005 standard, per which the American Association of Laboratory Accreditation (A2LA) accredits our laboratory. Following these guidelines, RTI performs comprehensive testing in accordance with industry-recognized protocols. Our capabilities include mechanical testing, metallography, environmental exposure testing, metalworking fluids analysis, destructive testing, materials characterization, paints and coatings analysis, and cleanliness evaluation. Clients have included the U.S. Military, major automotive companies, and several tier one suppliers.

Executive Summary (cont'd)

Founded on our SQL based “Omega” Laboratory Information Management System (LIMS), the laboratory is able to follow the progress of each client’s project throughout the extraction and analytical process. Beginning with the customer submittal request, the LIMS seamlessly coordinates between project managers and laboratory analysts to automatically integrate each client’s specific requirements. Within the lab, professional analysts utilize computerized processes to import data from instrumentation to the LIMS, minimizing the risk of transcription error while optimizing efficiency.



Once analyses are completed, the LIMS allows for the automated generation reports. Finally, our online information web portal, “Flashpoint”, provides secure, real-time data resources that allow clients to access their results and EDDs at any time.

We participate in the most rigorous of accreditation and compliance programs. With our focus on quality and service, RTI strives to meet each client’s specific needs in a timely and cost-effective manner.

Project Management

It is RTI's intent to be a single-source of analytical support for our clients. Working toward that goal, RTI assigns each client with an experienced Project Manager to answer all questions during project set-up and coordinate the successful completion of their work order. In addition, a back-up Project Manager is assigned for any further assistance needed.



The process begins before samples are even shipped to the laboratory. Client projects are first set up in our Laboratory Information Management System (LIMS) to include specific requirements: analytical requests, specifications (including limits), project scope and turnaround times. Upon receiving samples, each work order is expeditiously processed into the LIMS by our Sample Coordinator. Samples are then ready for laboratory production.

Project Management (cont'd)



Laboratory analyses are managed by our highly-regarded professional analysts. Each analytical sequence is characterized by strict quality-control criteria, and undergoes an initial quality review by the

analytical professional prior to importation into the LIMS. Upon completion of all analytical and quality-control data, the work order is validated by a senior manager and electronically generated into a final PDF report and an Electronic Data Deliverable (EDD). An email automatically notifies the client when these files are available to download from Flashpoint, our secure online server.

Finally, the Project Management Department verifies the project scope and validates an invoice for the work order, typically within one business day of the report's completion. It, too, is available for download via Flashpoint.

Clients are always able to confirm sample receipt by our laboratory via Flashpoint, an integral component of RTI's mission to provide outstanding client service. Implemented in 2007, Flashpoint has been received enthusiastically by RTI's large client base as a means to access laboratory information. Through service-oriented features such as these, RTI continues to fulfill the expectations of a professionally-managed testing laboratory.

Senior Management



Jerry G. Singh
President
B.S. Chemistry and Microbiology

Mr. Singh has over thirty years of experience in environmental and industrial chemistry, laboratory operations, and management. His responsibilities include corporate development, enhancement of technical expertise and strategic planning. Mr. Singh is a member of several associations and committees, including the Michigan Minority Business Development Council, Michigan Association of Environmental Professionals and the Laboratory Practices Committee.



Lloyd Kaufman
Director of Materials Sciences
B.S. Applied Physics and Materials Science
M.B.A. Technology Management

Mr. Kaufman has been with RTI Laboratories for over twenty-three years and has served a variety of roles. With a strong foundation in analytical methods, he has served as Quality Assurance Manager, Technology Director and now as Director of the Materials Testing division. He is responsible for outlining and executing the division's growth strategy, managing human resources and validating technical output.

Current Certifications

Please see our current accreditations & certifications for Environmental, Mechanical and Chemical testing using the link below:

<http://www.rtilab.com/accreditations-certifications>

Quality Assurance Program

The management and staff of RTI Laboratories are dedicated to the effective implementation of our Quality Program policies and procedures. Our goal is to meet the highest data quality standards



and conformance with the ISO/IEC 17025:2005 guidelines to consistently produce defensible data that meets the designated analytical method and client-specified quality objectives.

This is accomplished by incorporating the components of our Quality System into every laboratory process as an essential basis of day-to-day operations. Continual improvements and conformance to our quality standards falls under the administration of our Director of Quality Management.

Quality Assurance Program (cont'd)

In addition to the Quality Assurance Plan, the Director of Quality Management is responsible to ensure the following areas are in compliance within the laboratory:

- SOPs – Review and Compliance
- Standards Preparation Traceability
- Instrument Maintenance
- Non-Conformance/Corrective Actions
- Document Control
- PE Audits Performance and Compliance
- Sample Receiving
- State and Agency Certifications and Validations
- Records Retention
- Waste Management
- Instrument and Equipment Calibrations
- Data Package Review and Peer Checking



RTI participates in various proficiency testing programs to obtain or maintain approval for analysis by a given method. The Quality Assurance Manager keeps results of these tests on file.

Facilities and Resources



RTI Laboratories is located in Livonia, Michigan and employs a staff of over 60 professionals. The facility encompasses two buildings totaling 28,000 square feet of laboratory, private offices, and administrative

area. All entrances to the facility are locked. Visitors are escorted at all times while in the facility by members of the staff only after the visitor has signed a permanent logbook.



The laboratory has a full complement of support equipment and instrumentation, such as hoods, refrigerators, freezers, ovens, auto analyzers, a Type II water filtration system, multiple air handling units, etc. The

facility also includes a full machine shop to cut and prepare samples for testing. All instruments are maintained by either trained employees or manufacturer service personnel.

Facilities and Resources (cont'd)



In an effort to reduce unexpected instrument failure, ensure reliable and accurate data, while controlling the costs associated with non-routine maintenance and down time, the laboratory has implemented a preventative maintenance system. When

discovering that non-routine maintenance is required, RTI has on-site instrument service available usually within 24 hours.

A summary of major instrumentation is detailed as follows:

Materials Testing

- EDS detector and digital acquisition system
- Atomic emission spectrometer
- Gas chromatography-mass spectrometry (GC/MS)
- Gas chromatography-flame ionization detector (GC/FID)
- High performance liquid chromatography (HPLC)
- Inductively coupled plasma (ICP)
- Ion chromatography (IC)
- Thermogravimetric analyzer (TGA)
- Differential scanning calorimetry (DSC)
- Metallograph
- Spectrophotometer
- Digital Microhardness tester
- Rockwell Hardness Tester

Facilities and Resources (cont'd)

- Scanning Electron Microscope
- Epifluorescence microscope
- Polarized light microscope
- Charpy Impact Tester
- Brinell Hardness Tester
- Ductility Tester
- Cyclic Corrosion chamber
- Thermal chamber

Case Studies

Materials Testing



General Motors Powertrain Division
Location: Warren, Michigan. GM Technical Center
Fuels & Lubricant contract research and
development

Beginning in 2000, engineers in the General Motors fuels and lubricants research laboratory identified the need to contract warranty related fuels issues to outside research centers. RTI has been an integral part of this outsourcing initiative by providing residue identification on several engine components directly removed from test stands in a timely manner. This relationship and testing has led to numerous changes in fuel blends throughout the country.



Quaker Chemical
Location: Chemical Management at GM
Willow Run Assembly
General Motors LS-2 support

Case Studies (cont'd)

Due to pressures and initiatives at General Motors, an extensive program for validation of incoming lubricants was established (LS-2). RTI was approached for providing the first round of product validations in the GM Willow Run assembly plant, which included suppliers such as Quaker, Castrol, DA Stuart, Cincinnati Millicron, Chrsyan, Nalco and 2V. The blind evaluations were complete in 2001, and RTI remains an integral partner with GM in evaluation of new testing requirements and new products under the LS-2 program. RTI is the sole commercial testing provider of all of the testing requirements specified under LS-2.



Ford Motor Company
Vehicle Development Headquarters
Location: Dearborn, Michigan
Onsite Metallurgical Laboratory Staffing &
Operations

For nearly a decade, RTI was responsible for staffing, supervision, and operating control of the metallurgical laboratory at vehicle development headquarters in Dearborn, Michigan. The arrangement allowed Ford Motor Company to outsource routine metallurgical evaluations and process troubleshooting issues while maintaining immediate response to dynamic issues relating to vehicle development. Up to eight technicians were managed through this arrangement with significant cost savings to Ford Motor Company. In addition, RTI headquarters provided additional expertise in surface analysis, failure analysis, industrial chemistry relating to fuels and lubricants, and other non-routine issues encountered on a daily basis.

Testing Services

The following is a list of materials testing offered by RTI Laboratories.

Mechanical Testing

- Tensile Testing
- Proof load
- Rockwell hardness
- Brinnel hardness
- Microhardness
- Charpy v-notch
- Hydrogen embrittlement
- Jominy (hardenability)

Metalworking Fluids Analysis

- Tramp oil percent
- Total acid number
- Viscosity
- Four ball wear
- Seal compatability
- Wear/additive metals
- Percent water (Karl Fischer)
- ISO cleanliness

Environmental Exposure Testing

- Humidity
- Salt spray
- Chemical exposure
- Cyclic corrosion
- Thermal shock/exposure

Testing Services (cont'd)

Metallography

- Microhardness
- Microstructure
- Fractography
- Case depth
- Inclusions
- Decarburization
- Plating/coating thickness
- Heat treating
- Grain size
- Scanning electron microscopy (SEM)
- Energy dispersive spectroscopy (EDS)
- Microetching
- Failure analysis
- Electronic component solder evaluation

Destructive Testing

- Tensile testing
- Gears and springs
- Weld evaluation
- Casting

Materials Characterization

- Microhardness (Knoop, Vickers)
- RPAS (Chrysler)
- RoHS— metals
- LS2 lubricant testing (GM)

Testing Services (cont'd)

- FTIR
- TGA DSC (high resolution & modulated)
- GC/MS
- GC/MS pyro

Paints & Coatings Analysis

- Failure analysis
- EPA 24 VOC
- Deformulation
- Thermal analysis
- Contaminant identification
- Batch/batch comparative analysis

Cleanliness Evaluation

- Parts cleaning and gravimetric analysis (Millipore)
- Particle size and distribution (SEM, laser scatter)
- Particle composition and distribution

Awards & Recognitions

Along with its numerous accreditations and certifications, RTI Laboratories has been honored with several recognitions for consistent growth, quality of service to clients and its positive impact in the community. A handful of these awards are given below:



Inc. 500/5000 Fastest Growing Private Companies in America



Michigan 50 Companies to Watch (Edward Lowe Foundation)



Best Small Business in Southeast Michigan (SBDC Region 9)



Seal of Excellence - American Council of Independent Laboratories