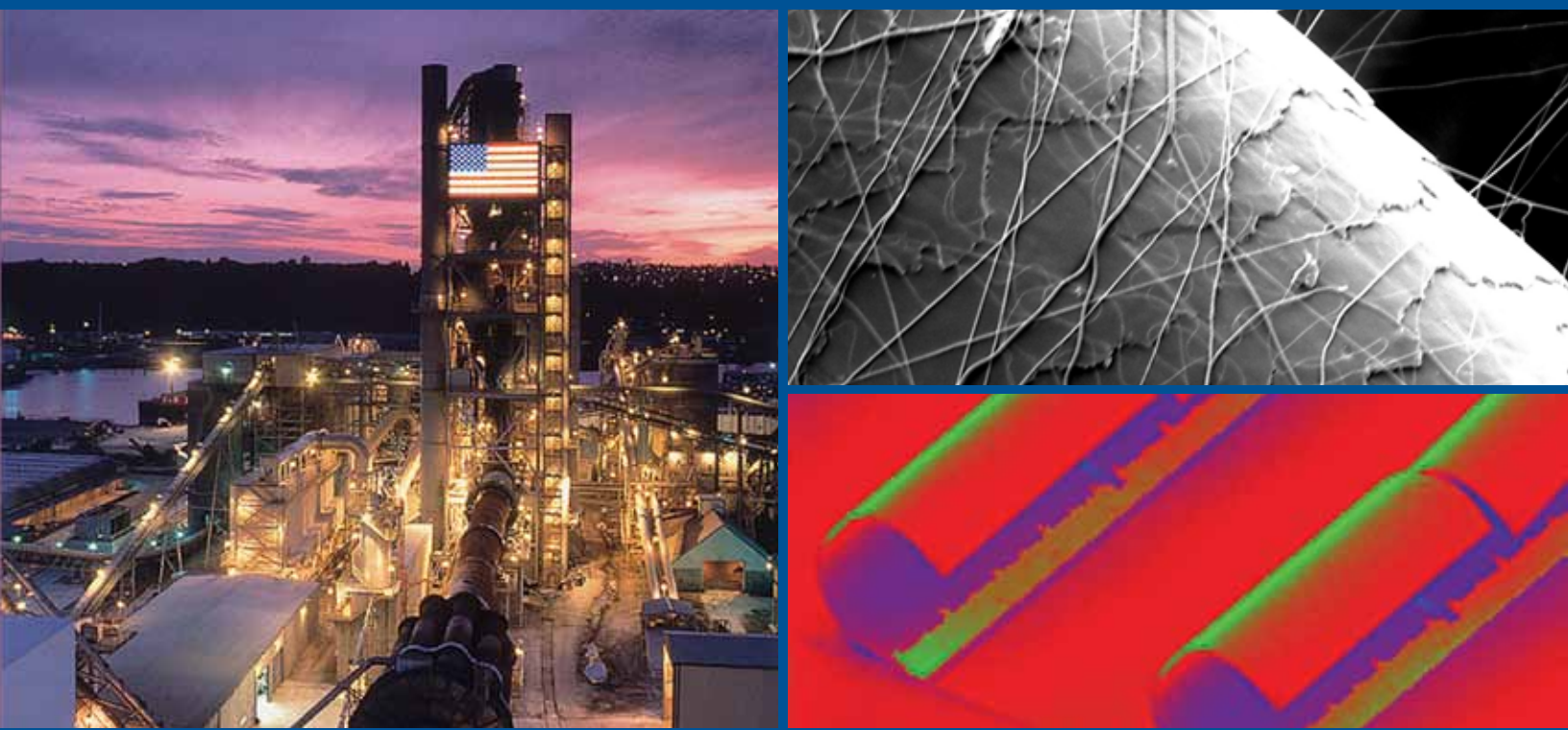


Engineering and Technology



At RTI International, our engineers help clients achieve their goals through the identification, development, application, and transfer of leading-edge technologies. Our expertise spans the energy, health, environment, electronics, and advanced materials markets. We have proven capabilities to successfully execute early- and late-stage R&D programs, and to lead programs from initial R&D to prototyping to commercialization.

R&D efforts at RTI are driven by multifunctional teams, drawing on the diverse backgrounds of our staff of experienced professionals, as well as our close working relationships with federal, industrial, and academic laboratories.

Energy and Process Engineering

Our scientists and engineers conduct applied R&D to solve energy-related problems faced by the power, chemical, and petroleum refining industries, as well as the transportation sector. We work with process licensors, gas processing companies, oil refiners, chemical manufacturers, clean fuels developers, catalyst manufacturers, and other commercial clients, as well as the U.S. Department of Energy and other government agencies.

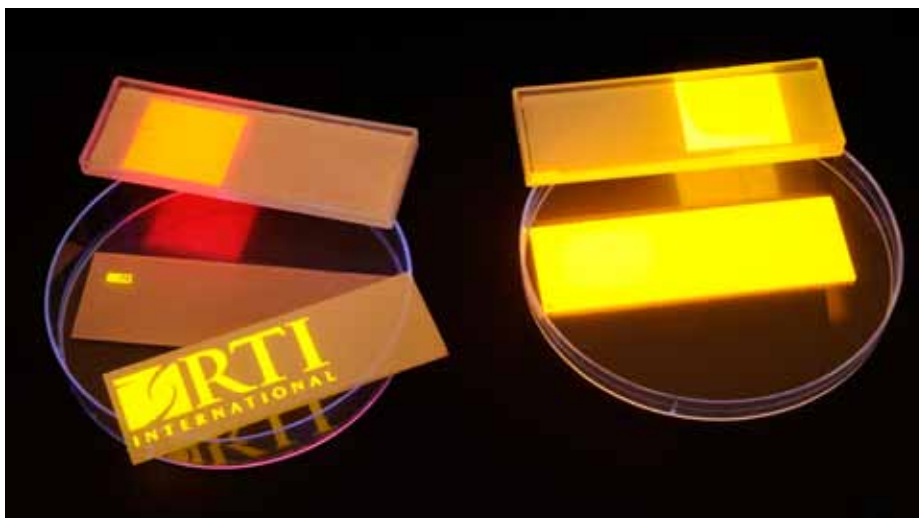
Energy and Process Engineering Capabilities

- Catalyst/sorbent synthesis
- Advanced gasification
- Biomass conversion
- Carbon capture
- Membrane separations
- Process development and scale-up

Application Areas

- Clean coal and fuels
- Solar derived fuels
- Oil/gas drilling
- Hydrogen production/purification

RTI is a founding member of the Research Triangle Energy Consortium (RTEC), an energy-sector alliance with Duke University, North Carolina State University, and the University of North Carolina. Under the leadership



of Dr. Vikram Rao, RTEC works to solve high-impact energy problems by combining science, technology development, environmental sciences, and policy.

Advanced Materials

RTI conducts basic and applied research in materials science, offering expertise in synthesis, characterization, and modeling to design new materials or improve the performance of existing materials.

For example, we have developed in-house capabilities in colloidal and aerosol science to synthesize, modify, and integrate customized nanoparticles and quantum dots using state-of-the-art techniques. We are using quantum dots (image above) to increase the efficiency of solar cells, and we are developing large-area arrays of infrared photodetectors fabricated by inkjet printing. We are also combining quantum dots and nanofibers to create photoluminescent nanofibers that can be tailored for specific end-use applications such as solid-state lighting.

Materials Science Capabilities

- Materials characterization
- Nanotechnology
- Polymer processing
- Aerosol physics
- Cement and concrete technology

Application Areas

- Nano-enabled materials
- Energy-efficient lighting
- Metamaterials
- Solid-state nucleonics
- Infrastructure and construction

Health and the Environment

Our scientists and engineers routinely bring their expertise to bear on a host of technical challenges that directly affect health and the environment—from exposure monitoring to innovative new medical devices.

For example, RTI is home to internationally recognized experts in aerosol science who study environmental implications of aerosols. Our extensive test facilities include wind tunnels, test

ducts, and cleanrooms, and our suite of aerosol measurement and generation enable us to synthesize and characterize broad aerosol chemistries and determine their effects on human health.

Health and Environmental Capabilities

- Environmental modeling
- Exposure analysis and monitoring devices
- Biomedical engineering

RTI conducts research on behalf of the U.S. Environmental Protection Agency, National Institutes of Health, National Institute of Environmental Health Sciences, and other agencies.

Application Areas

- Life sciences and diagnostics
- Medical technologies and devices
- Air filtration
- Water purification
- Personal exposure monitoring devices
- First responder monitoring devices
- Development and testing of protective clothing
- Biomaterials
- Biomedical devices



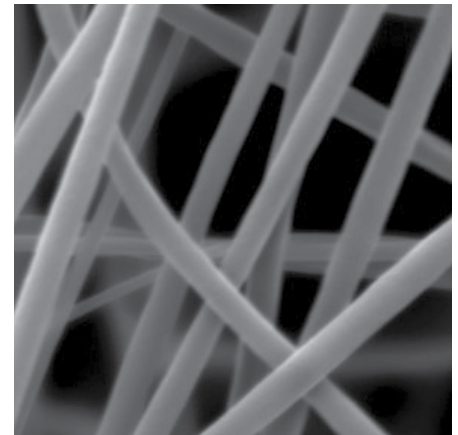
Electronics

RTI is a leader in the research, development, and prototyping of innovative materials, microstructures, and devices. We specialize in solving difficult technical problems and partnering with clients to further develop their technologies. Our cleanrooms and laboratories are professionally staffed with experienced chemists, metallurgists, material scientists, physicists, and biophysicists.

Our work supports the U.S. Department of Defense, National Institutes of Health, and other agencies.

Microfabrication Capabilities

- Photolithography
- Wet and dry etching
- Thin-film deposition
- Thermal processing
- Ultra-fine-pitch flip-chip bumping
- Fine-pitch flip-chip assembly
- Fluxless soldering and assembly using plasma-assisted dry soldering
- Packaging and assembly
- Electrical and optical testing
- Reliability testing
- Materials characterization through surface and bulk-film analysis



Application Areas

- Thermoelectric devices
- Sensors and actuators
- 3-D interconnect technologies
- MEMS devices
- Flexible displays and electronics
- Advanced electronic packaging solutions
- RF sensors
- Digital signal processing
- Power and thermal management
- Ultra-low power devices
- Thin film devices

Technology Applications and Commercialization

By combining technical and business expertise, proven processes, and unparalleled resources, we help clients commercialize technologies through a comprehensive suite of services. Clients include a diverse set of private-sector companies, NASA, the National Institute of Standards and Technology, and other agencies, as well as universities.

We also help communities in the U.S. and other countries transform their economies by designing, implementing, and evaluating policies and practices to encourage economic development, workforce development, and entrepreneurship.



Commercialization Capabilities

- Open innovation—innovation management, market intelligence, landscape analysis, technology scouting, and partnership development
- Innovation-led economic development—strategic planning and policy development, industry and market assessments, and program evaluation and benchmarking
- Technology commercialization support—opportunity assessment, licensing support, and strategic advising

Application Areas

- Advanced materials
- Aerospace
- Chemistry
- Communication
- Energy and power
- Environmental sciences
- Image and signal processing
- Life sciences
- Manufacturing processes
- Mechanical systems
- Medical devices
- Microelectronics
- Optics and optical systems
- Sensors and instrumentation
- Transportation
- Policy

Every day, our scientists and technicians conduct leading-edge research in emerging markets and technologies. Our history includes several successful commercial ventures with roots in funded research programs, including

- Spin-offs—Ziptronix, Nextreme Thermal Solutions, and siXis, Inc.
- Technology licensing—We are working with Eastman Chemical Company to develop and commercialize a jointly developed synthetic gas (syngas) clean-up technology. We have combined the intellectual property resulting from the collaboration and are offering the technology package for further scale-up and commercialization.

RTI has a pipeline of new technologies and actively seeks to partner with industry to develop these technologies into valuable assets.

More Information

Debbie Retzlaff
Engineering and Technology Unit
919.541.6072
dar@rti.org

RTI International
PO Box 12194, 3040 Cornwallis Road
Research Triangle Park, NC 27709-2194 USA

RTI 7660 0711



RTI International is one of the world's leading research institutes, dedicated to improving the human condition by turning knowledge into practice. Our staff of more than 2,800 provides research and technical services to governments and businesses in more than 40 countries in the areas of health and pharmaceuticals, education and training, surveys and statistics, advanced technology, international development, economic and social policy, energy and the environment, and laboratory testing and chemical analysis. For more information, visit www.rti.org.

RTI International is a trade name of Research Triangle Institute.