

Senior Engineer

Leading Edge Crystal Technologies, Inc.
Boston Area

Contact: Alison Greenlee, greenlee@lectechnologies.com

Company Overview

Leading Edge Crystal Technologies (LECT) is revolutionizing semiconductor wafer manufacturing. We are commercializing the first single crystal direct wafer manufacturing process with a dramatically lower-cost, high performance advantage over the 70-year-old incumbent technology. In the largest global wafer market of solar photovoltaics (solar PV), the LECT process can generate over \$15BN of annual value and eliminate over 1 GT/year of greenhouse gas (GHG) emissions in the manufacturing process. After a decade of technology development and over 100 patents, LECT is developing this technology for a commercial pilot and market entry in 2022.

LECT was formed in 2018 as a technology spin-out from Applied Materials. Development has been financed by federal grants (>\$4.7M) and private venture capital (DSM Venturing and Clean Energy Venture Fund). As a team of 10, we have operated out of the Gloucester Applied Materials campus and will be moving into a new facility nearby north metro Boston.

LECT is a fast-paced, agile environment. We are growing and plan to add 5 new team members by March 2020. Team members wear many hats and we expect them to take initiative and ownership from day one. Strong communication and disciplined organizational skills are critical in this collaborative environment, as well as a passion for commercializing next-gen, high impact technologies.

Scope of Role:

We are seeking an exceptionally talented, creative, energetic, and motivated Senior Mechanical Engineer with a combination of uncommonly-strong analytical skills as well as hands-on development skills to work on a variety of interesting and challenging high temperature semiconductor manufacturing projects. This position provides the opportunity to work with an interdisciplinary team of experts in the fields of physics, heat transfer, process engineering, material science, electrical engineering, as well as technicians and company executives. You will support the development and commercialization of a novel high temperature, high purity semiconductor furnace and related auxiliary systems by contributing to brainstorming efforts, problem definition, initial analysis, concept refining, detailed analysis, risk assessment, and finally to the generation of engineering drawings and the hands-on assembly of new components and systems.

The ideal applicant for this position has experience developing precision flow devices or microjets that generate tailored flow, pressure and/or thermal profiles on an impinging surface for enhanced heat transfer. A preferred applicant must have a combination of 1) deep knowledge in the fields of heat transfer, flow mechanics, electromechanical machine design, 2) expertise in CAD and PDM, as well as 3) a desire to remain hands-on, turning wrenches, and debugging new or legacy systems when necessary.

The Senior Engineer should be comfortable with on-the-spot 1-D heat transfer hand calculations, simple strength of materials hand calcs, as well as more sophisticated thermal and mechanical analytical techniques in Excel/MATLAB/ANSYS/SolidWorks, etc. The Senior Engineer should be able to creatively brainstorm with the interdisciplinary team to arrive at design concepts that simultaneously satisfy the requirements of all other disciplines (process, thermal, purity and cleanliness, DFM, cost, etc.), and then be able to take the concept to a first-pass CAD model, and after some refinement and team vetting, to a fully detailed CAD model/assembly with machining drawings that are in accordance with industry drafting standards and G&DT.

Essential Duties and Responsibilities:

- Lead the design and development of precision gas flow systems in our novel semiconductor furnace.

- Work within the technical team to brainstorm and develop novel design concepts or modifications to existing designs to achieve new, stricter, device performance requirements.
- Ability to conduct rudimentary “back of the envelope” engineering calculations on the white board during team brainstorm and design concept discussions to guide the process.
- Independently evaluate design options using greater fidelity analytical calculations or spreadsheet calculations for thermal and/or mechanical analysis. Communicate results in a clear and effective manner.
- Advance the selected design concepts into fully detailed SolidWorks CAD models/assemblies complete with industry standard drawings.
- Work with specialty material vendors to understand exotic material stock sizes, material properties, purity, thermal conductivity, porosity, trace contaminant content, as well as processing options, material availability and lead time.
- Research, document, and ultimately specify auxiliary equipment based on technical system requirements. Mass flow controllers, gas flow meters, liquid flow meters, rotameters, pumps, solenoids, gas regulators, and other similar systems.
- As the company grows and accelerates, the Senior Engineer will participate in the conceptual design of multiple simultaneous systems and will have opportunities to delegate some CAD modeling. At that time the Senior Mechanical Engineer will begin to share the CAD workload with, and provide mentoring to CAD Designers to help accelerate the design cycle. The Senior Mechanical Engineer will use effective communication techniques to collaborate with a CAD designer who will take on a portion of the CAD modeling effort.

Required Skills & Qualifications

- Masters or Ph.D in Mechanical Engineering or a related field, along with directly relevant experience;
- 3+ years of analysis, design, prototyping, fabrication and failure analysis experience (portfolio of projects is a plus);
- Strong experience with Solidworks, PDM software experience is not required but desirable;
- Strong experience with ANSYS or other CFD modeling software.
- Familiarity with electronic systems, power supplies, sensors and instruments, data acquisition systems;
- Ability to coordinate multiple simultaneous projects and the presentation of project status to the team;
- Strong written and oral communication skills are essential. The Senior Mechanical Engineer must report information professionally, effectively, in a structured and concise format;
- Must be able to thrive in a dynamic, fast-paced, team-oriented environment with the ability to remain organized, and communicate effectively;
- Quick learner, open and able to adapt to new tasks and processes;

Bonus Skills

- Familiarity with the design of gas jets, nozzles, inert gas shielding, flow control
- Familiarity with solar/semiconductor furnace hardware and systems;
- Familiarity with high-purity systems / cleanroom / FDA purity or other strict purity/cleanliness requirements;

Benefits

LECT offers highly competitive salaries, excellent benefits, and unparalleled growth and development opportunities -- all to create a compelling and rewarding work environment.

LECT is an Affirmative Action and Equal Opportunity Employer and all qualified applicants will receive consideration for employment without regard to race, color, religion, gender, sexual orientation, national origin, genetic information, age, disability, veteran status, or any other legally protected basis.

Agency

LECT does not accept unsolicited agency resumes and will not pay fees to any third-party agency or firm that does not have a signed agreement with LECT.

Seniority Level

Senior or Principal

Industry

Manufacturing Systems and Equipment

Employment Type

Full-time

Job Functions

Senior Mechanical Engineering Design & Modeling