

Michael S. Metcalfe

Objective

To obtain contract employment as a Design Engineer, utilizing my creativity while expanding my skill set and sharing my knowledge with others.

Qualifications

Engineering Expertise

- Skilled in fluid and gas delivery system design for high technology applications such as semiconductor, photovoltaic, fiber optic and PVD/CVD.
- Involved in all phases of process equipment / product design, including conceptual design, budgetary estimates, component selection, integration with subcontractors, and product documentation.
- Proficient in the layout and use of electrical / pneumatic schematics and process diagrams.
- Well-versed in safety and equipment design standards including NFPA codes, the Uniform Fire Code, ASME codes and other industry specific guidelines. Able to understand model codes and design for compliance. Experienced with CE and UL marking.
- Skilled in producing accurate three-dimensional solid models using three-dimensional CAD including mechanical and electrical component layout, fluid delivery, machined part design and sheet metal design.
- Experienced in renewable energy design and technologies, including solar thermal, hydrogen, and photovoltaic system design and application sizing.
- Competent in the design and diagnostics of electrical circuits, circuit boards and component selection. Experienced with embedded Microchip PIC microcontroller integration and assembly language programming.
- Experienced with planning and deployment of PLC, HMI, and SCADA software for control and data acquisition.

Tools:

- Microsoft Operating Systems Windows 95-10, MS Office, MS Project, Adobe, Macromedia, and various other utilities and software packages.
- Autodesk Inventor 2020, Autodesk Vault, AutoCAD, Autodesk Mechanical Desktop 2-9, Dassault SolidWorks 2018.
- National Instruments LabVIEW Development Suite for test, measurement and control applications.
- Lilly Software Visual Manufacturing / Other MRP Systems.
- Rockwell and Koyo (Automation Direct) PLC Programming Software.
- Electronic Test equipment, Helium leak detectors and analytical equipment, machine tools.
- Microchip MPLAB ICD2 In-Circuit Debugger for microcontroller programming applications.

Employment

2017 – Present Purist, LLC

Kennebunkport, ME

Owner

- Developed a line of Simulated Moving Bed Chromatography Systems for separation of chiral compounds or other binary separations.
- Worked with customers to develop chemical separation and isolation technologies, including centrifugal ethanol extraction, filtration, and Thin Film Evaporation.
- Developing a low cost, high efficiency Thin Film Evaporator for separation of botanical oil from solvent solution.

1998 – 2019 Dakota Systems, Inc. South Portland, ME / Dracut, MA
Chief Technology Officer / Lead Systems Design Engineer

- Managed a staff of 3 highly skilled technologists, in PLC programming, 3D and 2D electrical and mechanical CAD, and Information Technology to bring process equipment design concepts to reality.
- Managed IT infrastructure at \$30m corporation, utilizing 3rd parties as required, including conversion to virtual servers, complete site workstation upgrades, and multiple MRP database upgrades and improvements.
- Overall responsibility for the transformation of capital – monetary and intellectual – into technology to further the company's objectives
- Prepare and manage annual department budget
- Ensure the company is up-to-date with regulatory (e.g. U.S. FDA, ASME, SEMI, as applicable) and intellectual property (IP) issues (e.g. patents, trade secrets, license contracts)
- Review potential automation of existing activities or optimizing equipment or Information Technology infrastructure for increased productivity or other purposes
- Manage and advise senior management on desirable operational adjustments
- Responsible for identification, exploitation and integration of new technologies into company products and services
- Support Sales group as a technology leader, and enhance client relationships through consultation regarding best practices or engineering
- Developed a product line of high-purity, toxic and specialty gas delivery control equipment and facility monitoring devices. Created design packages and Bills of Material. Programmed PLCs and worked with outside controls programmers to develop Operator Interfaces. Developed procedures for manufacturing and quality control of the product. Managed Assessment of product for SEMI S2-93 with SEMI F15 tracer gas analysis. Produced Technical Manuals and provided customer support.
- Worked from P&ID to finished product on various fluid delivery systems for semiconductor, biotech, pharmaceutical and fiber optic applications involving Field I/O, PLC systems, pneumatic devices, gas and fluid heating and delivery systems. Specified components and documented design packages.
- Integrated subsystems together in Fabrication facilities for monitoring of safety and process interlocks. Designed wiring systems, managed implementation and equipment startup.

2004 – 2010 Purist Energy, LLC Kennebunkport, ME
Owner / Engineering Manager

- Developed a product line of renewable energy appliances including solar hot water pumping stations and associated controls. Prototype development includes mechanical, electrical and component sourcing activities as well as website development, production of marketing materials and public speaking.

1994 – 1998 Field and Support Technologies, Inc. Poughkeepsie, NY
Electro-Mechanical Designer

- Developed a product line of high-purity purge panels, gas regulation enclosures and control equipment. Created all drawing packages and Bills of Material. Programmed PLCs. Sourced vendors and optimized costs. Managed assembly and quality control of the product.
- Developed and managed the assembly of toxic gas area-monitoring systems for use in semiconductor manufacturing facilities.
- Designed large bulk gas purification and filtration skids from customer supplied P&ID's. Selected valves, instruments and materials per specifications. Maintained project management Gantt charts and files. Verified quality assurance documentation.
- Designed piping installations for semiconductor process equipment and process skids.

Education

1999 –2004 **Southern Maine Technical College** **South Portland, ME**

Associate in Applied Science – Microelectronics Technology

- Completed a variety of Semiconductor-related courses include Microelectronic Manufacturing Equipment, Vacuum, RF and Hot Processes, Properties of Engineering Materials. GPA 4.0.
- In years since graduation I have completed various additional courses of interest including Web Design (HTML), Calculus, and C++ Programming.

1992 – 1993 **Lincoln Technical Institute** **Allentown, PA**

Mechanical Drafting and CAD Certificate

- Courses included 1200 hours mechanical and CAD design. GPA 3.9.

1990 - 1992 **Kutztown University** **Kutztown, PA**

1989 - 1990 **Rochester Institute of Technology** **Rochester, NY**

Personal

I am mechanically inclined, hardworking, and a creative problem solver. I learn quickly and am able to work effectively as a team player or independently. I continue to find great satisfaction in learning a variety of subjects.

I have many interests, and try to make time to research them with books and the Internet. One of my favorite subjects is renewable energy, including photovoltaics and the processes used to develop PV cells. Working in the semiconductor industry has given me unique insight into the technology. I also enjoy many outdoor activities such as boat building, sailing, hiking, camping and snowboarding.

References

Available upon request.