

PAUL BRAUN
Providence, RI

(401) 263-0849

pbraunsix@gmail.com

Creative problem solver and materials engineer experienced in manufacturing, R&D, and entrepreneurial environments.

SUMMARY

- Extensive hands-on experience in engineering materials ranging from ceramics and metals to polymers and composites, with a proven track record in new product development, design, process development and troubleshooting.
- Managed early-stage innovation program designed to mitigate financial risk in new-product development; strong reputation as a cross-pollinator of ideas.
- Recognized by senior management for versatility, strong work ethic, and the ability to resolve highly technical product issues and customer concerns.
- Highly experienced in design, fabrication, and manufacturing processes. Work seamlessly between lab, machine shop, and on the manufacturing floor.
- Experience in developing, testing, and manufacturing **syntactic foam composites** for energy-absorption components in automobiles. After sales to Ford and BMW, led marketing push to English automotive component suppliers.
- Strong customer focus.

PROFESSIONAL EXPERIENCE

Remtec, Inc. *Norwood MA*

2016 through present

Senior Process Development Engineer

- Redesigned an aerospace-related component mothballed in 2017. Worked with the original customer to address performance issues in the original product. Presented new design concepts and performance data to the customer, which led to a prototype order. Overwhelming success of the prototype led to a follow-up order of \$125k.
- Revived a microfabrication facility, restoring a mask aligner and developing process parameters for producing fine-scale circuits suitable for operation at microwave frequencies.
- Developed product process parameters, validated performance, and documented procedures for an unused second-hand belt furnace critical to numerous products.

Saint-Gobain Ceramics and Plastics R&D, *Northborough, MA*

2008 to 2016

Research Engineer

Skunkworks innovation program: new product development

- Transformed a blue-sky research program into an early-stage product development program supporting business groups within the corporation.
- Redesigned the program to mitigate the financial risk of new product development.
- Co-managed \$250k annual budget to fund projects in image analysis, abrasives, novel ceramic and polymer processes, and building materials.
- Vetted technical and business merit of proposals, reviewed customer needs, assembled multidisciplinary development teams, and provided technical guidance and brainstorming as needed.

Ceramic Engineering

- Developed a new method of producing shaped, ceramic abrasive grains. Designed, fabricated, and validated performance of prototype process equipment, resulting in seven US patents related to abrasive grain.
- Characterized sources of variability to justify redesign of an existing abrasive grain pilot line. Collaborated with process technician to institute hardware changes and validate system performance in a single week, resulting in minimal manufacturing downtime.
- Developed methods of producing lightweight porous ceramic structures.

Product troubleshooting

- Determined the mechanism of an aging defect formed in a commercial polypropylene injection-molded building product. The defect had been under intensive study and was responsible for >\$1MM in warranty liability.
- Collaborated with injection-molding manufacturing team to model manufacturing practices and likely sources of variability for each of six molding machines: melt and mold temperature, ejection temperatures, cooling times, part handling, raw materials (including reground plastic), and plant atmospheric conditions.
- Ran manufacturing designed experiments, analyzed DOE response, used optical microscopy, mechanical testing, and differential scanning calorimetry (DSC) as main tools to determine the mechanism of defect formation.

Technic Inc., Woonsocket, RI

2003 - 2008

Manager, Specialty Materials

- Managed inventory and production of precipitated precious metal powders and flake used in microelectronics, medical, dental, and military applications.
- Trained as an internal auditor, ISO 9001:2000. Trained in Lean Six Sigma methodology.

Ferro Electronic Materials (formerly Degussa), South Plainfield, NJ

1999 - 2003

Applied Technologist

Primary dielectric materials technical representative to the multilayer ceramic capacitor (MLCC) industry.

- Developed process parameters for new dielectric compositions. Worked with US, Asian, and European customers to qualify new products.
- Accompanied sales staff as technical specialist to address customer concerns with existing products, introduce new products.
- Analyzed customer processes and material interactions to determine root cause of device failures, presented findings and provided product and process solutions to customers.
- Provided Ferro Netherlands R&D with a solution to problems with pilot-scale tape casting. Proposed materials and process parameters to allow automatic production of MLCCs.

SRI International (formerly David Sarnoff Research Center), Princeton, NJ 1995 - 1999

Associate Member of Technical Staff

Key member of a multidisciplinary program to develop a multilayer microfluidic device for combinatorial chemistry drug discovery. Technical contributions led to the award of Orchid Biosciences spinoff company stock options, and two Sarnoff Technical Achievement Awards.

Microfluidic device development

Played a key role in microfluidic device development and prototyping. Developed procedures to yield defect-free glass substrates for 3-D microfluidic structures. Developed process procedures which decreased raw material costs, decreased scrap, and significantly decreased process time in multi-step device fabrication process.

Elan Technology, Belleville NJ (now in Midway GA) 1993 - 1995

Ceramic Engineer

Developed Elan's ceramic materials manufacturing capability. Position required extensive knowledge of ceramic compositions, process methods, and testing.

- Provided customer technical support in glass-to-metal and ceramic-to-metal sealing.
- Developed compositions and procedures to produce standard ceramic compositions and worked with customers to develop custom ceramic compositions.

Microcel Technology Edison, NJ

1990 - 1993

Senior Development Engineer

Key member of a startup venture to commercialize hollow ceramic spheres with applications in **syntactic foam energy-absorbing composites, composite tooling**, and non-fibrous refractories.

- Evaluated ceramic sphere production systems and established safety guidelines for new manufacturing prototype plant.
- Led marketing program to introduce energy-absorbing composites to major suppliers in the US and English automotive industry, composed promotional literature.
- Energy absorbing composite foam was qualified and selected for use in select models by Ford and BMW.

General Electric, Astro-Space Division Valley Forge, PA

1987 - 1989

Ceramic Engineer

Key member in the development of high-power thermoelectric devices for space power applications (SP-100 program). Position required knowledge of high temperature chemistry, thin film deposition; and ceramic, metal, and semiconductor process methods.

- Analyzed process-related failures of complex thermoelectric devices. Recommended process changes based on failure analysis.
- Designed mechanical test fixtures and procedures to determine device integrity.
- Presented project updates to GE and Government management.

EDUCATION

- Polymer Science/Plastics Engineering Program – University of Massachusetts, Lowell (certificate program designed for Saint-Gobain, 2012)
- M.S. Ceramic Science & B.S. Ceramic Engineering- Rutgers University

PATENTS

- US 8764863 B2: “Composite Shaped Abrasive Particles and Method of Forming Same” 2017
- US 9765249 B2: “Shaped Abrasive Particles and Method of Forming Same” 2017
- US 9771507 B2: “Shaped Abrasive Particle Including Dopant Material and Method of Forming Same” 2017
- US 10280350 B2: “Composite Shaped Abrasive Particles and Method of Forming Same” 2019
- US 10286523 B2: “Abrasive Particles Having Particular Shapes and Method of Forming Such Particles” 2019
- US 10365178 B2 “Leak Detection System” 2019
- US 10428255 B2 “Shaped Abrasive Particles and Method of Forming Same” 2019
- US 10597568 B2 “Shaped Abrasive Particle Including Dopant Material and Method of Forming Same” 2020
- US10759024B2 “Abrasive Article Including Shaped Abrasive Particles” 2020

AWARDS

- Sarnoff Technical Achievement Award, (1996)
- Sarnoff Team Award (1997)

ADDITIONAL SKILLS & EXPERIENCE

Manufacturing processes

- Design and fabrication of prototypes, fixtures, and laboratory-scale process equipment
- Plastic processing: injection molding, compounding, and extrusion
- Scanning electron microscopy (SEM) and optical microscopy
- Differential scanning calorimetry (DSC)
- Electrostatic deposition, high-voltage safety
- Plasma treatment of polymer surfaces
- Screen printing- setup and optimization
- Setup, use, and maintenance of furnaces and ovens (vacuum, controlled atmosphere, and air) batch and continuous
- Brazing of metals and ceramic-metal systems
- Mechanical testing
 - Bond integrity testing
 - Design of mechanical test fixtures
 - Behavior under load
 - Failure analysis

Manufacturing and troubleshooting methods

- Process mapping
- PDCA
- FMEA and root cause analysis, fishbone methodology
- 5 whys
- Six Sigma
- Lean manufacturing

Software tools

- Fluent in all Microsoft Office products
- JMP and Minitab statistical software
- Previous experience with SolidWorks used to design machine framework, nozzles, and secondary processes
- Currently use AutoCad

Training:

- Six Sigma and lean principles
- ISO 9001:2000 internal auditing
- Behavior-based safety and plant safety
- Project management- MS Project
- Sustainable product development
- 5S methodology