



Culinary Appliances

Sigma Design Company is a leader in designing, testing, optimizing and manufacturing food-safe culinary systems and products for the food & beverage industry.

For more than 20 years, Sigma Design Company has provided new product development and process equipment design and manufacturing for clients in the food & beverage industry. Our extensive experience includes, but is not limited to, food processing machinery, water processing appliances, electrical housewares and portable appliances, commercial and household cooking appliances, analytical appliances, testing equipment and water filtration products.

All work takes place at our state-of-the-art 20,000 square foot Technology Commercialization and New Product Manufacturing Center in Middlesex, New Jersey, USA. Sigma Design Company maintains a Quality Management Program in accordance with ISO 13485 and ISO 9001.

SERVICES

Our comprehensive services encompass the entire product development cycle. They include design engineering, design and cost analysis, prototyping, photo-realistic simulation, electronics, low volume (100s) highly specialized manufacturing and testing, and larger manufacturing runs.

We employ advanced engineering, simulation and rapid prototyping technology to speed time to market while helping clients reduce risks and costs associated with product development. In addition to engineering new solutions, our team also evaluates products and systems under development, using advanced engineering analysis including Finite Element Analysis (FEA), Computational Fluid Dynamics (CFD), structural stress, deflection, fluid flow and heat transfer simulation. These computer-aided engineering (CAE) tools allow us to uncover and detect non-obvious, counter-intuitive design flaws early in the process.

We bring to our clients broad manufacturing knowledge and experience that helps streamline the process. Sigma Design also develops stringent test protocols and performs factory acceptance testing on all the electro-mechanical systems we build.

CASE STUDY

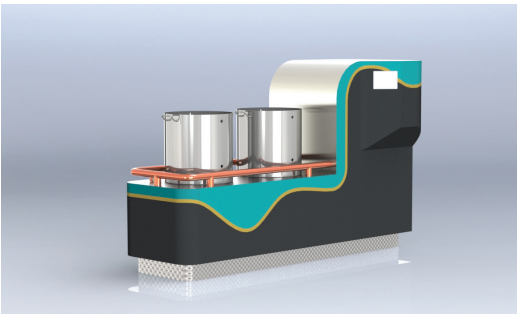
International Design Winning
Mechanical Butter Churn



Churncraft is recognized for products that revive cherished cultural traditions in a contemporary American context. Today the company's flagship product is a hand-powered, mechanical butter churn, inspired by the founder's memories of making butter as a child using her family's well-worn antique device. Sigma Design Company was hired to create a modern mechanical design that retained the charm of the original churn while translating it into a sleek design – skillfully engineered for superior functionality. Sigma Design Company took the new design through prototyping, matching the client's vision for an elegant product with the realities of manufacturing methods and food safety. The new butter churn received the coveted Red Dot Award, the prestigious international recognition for product design.

Services Performed:

Concept layouts, user interface and ergonomics, aesthetics, simulation, product development, material selection, detail part design, manufacturing review, manufacturing of prototypes



PROVEN RESULTS

Since our founding in 1999, Sigma Design Company has delivered more than 1,000 successful design and design/build projects, on time and on budget, and saving our clients hundreds of thousands of dollars in manufacturing. We have worked with scores of customers in the food & beverage industry including:

- Nutri Systems
- Frigidaire
- Food Network
- Whirlpool
- Bosch
- CUNO 3M

PROJECT EXPERIENCE

Industrial Design and Consumer Prototypes

- Coffee Grind Collection Device (*above right*)
- Tap water sterilizer
- Commercial food can opener
- UV + carbon water sterilizer
- Liquid juice dispenser

Commercial and Industrial Food

Process Equipment:

- Micro Brewing System (*above left*)
- 3D Printer for Sugar Structures - Food Contact Safety – (*above middle*)
- Milk homogenizer
- Liquid filling system with spin weld cap technology
- Liquid mixing device
- Process heaters

Full understanding and experience with:

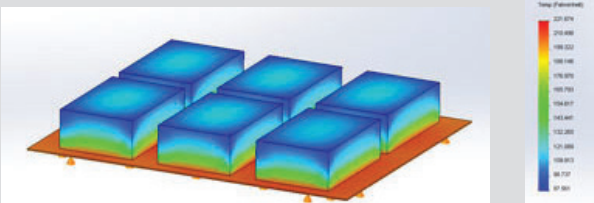
- FDA: 4.5 CFR 21 Section 110 (Current Good Manufacturing Practice)
- NSF 2: food equipment
- NSF 42, 53, 61: drinking water systems
- NSF 18: manual food and beverage dispensing equipment
- NSF 7: commercial refrigerators and freezers
- NSF 8: commercial powered food preparation equipment
- ServSafe® food safety training
- Hazard analysis & critical control points (HACCP) regulations and methods

We employ advanced engineering, simulation and rapid prototyping technology to speed time to market while helping clients reduce risks and costs associated with product development.

CASE STUDY

Meeting the FDA Requirements for Safe Food Holding Temperatures

A New Jersey-based company asked Sigma Design Company to analyze their warming tray prototype by performing a heat power analysis and thermal FEA on the heater element and control circuit. The tray was designed to keep rotisserie chickens at a safe internal temperature of 140°F and breakfast sandwiches at a slightly lower temperature, with high and low settings fixed by an operator's switch.



Steps included:

- Determining the steady state heat power requirements to keep the chicken at temperature, using hand calculations and then running a simplified FEA to verify that it matched the hand calculations.
- Sourcing heater elements that matched the power requirements found in the hand and FEA calculations.
- Determining a control circuit to keep the surface temperature of the plate as constant as possible, meeting the FDA requirements for safe holding temperatures.

Services Performed: Concepts, heat load FEA simulation, detail design, electronics, ServSafe food safety, product development and testing