



Ag-tech and Food Processing

Sigma Design Company has extensive experience in designing, developing, optimizing and manufacturing equipment for clients in the demanding Ag-tech and Food Processing industries. Whether you are looking for a solution aimed at the fast-growing ag-tech indoor vertical farms sector, or developing a product for the food processing industry, Sigma will leverage our years of experience to take your concept from an idea to finished product – on time and on budget.

SERVICES

Sigma's 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 as well as build to print services.

We bring to our clients decades of collective design, engineering and manufacturing knowledge and experience that helps streamline the process. All work is done in our state-of-the-art 20,000 square foot Technology Commercialization and New Product Manufacturing Center in New Jersey.

Our experience includes developing analytical appliances, testing equipment and water filtration systems for such applications as:

- Design/build liquid nutrient dosing systems
- Structural analysis of racks and structures
- Food contact equipment to NSF
- Temperature analysis of food storage systems
- Water and wash down systems development
- Wastewater treatment for TSS reduction prior to discharge to WWTP

CASE STUDY – AG-TECH

Fluid Handling and Nutrient Injection System for Ag-tech Vertical Farming



Sigma Design collaborated with a multinational food and beverage giant to develop a nutrient dosing system for their newly developed indoor hydroponic agriculture farm. We used our extensive background in fluid handling systems across many industries to perfect a water and nutrient dosing system in a well-packaged and well-engineered skid to fit the final dimensional layout required at their facilities. Pumps were selected after Sigma Design reviewed components suggested by our customer; our background helped us optimize some components to better fit expected operating conditions.

Services Performed:

Fluid handling skid design, component selection and optimization, metal fabrication, hydrostatic pressure testing, design optimization



PROVEN RESULTS

Since 1999, Sigma Design Company has been trusted by hundreds of manufacturing firms to transform smart ideas into successful products and machinery. Since then, we have 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 employ advanced engineering, simulation and rapid prototyping technology to speed time to market while helping clients reduce risks and costs associated with product development. We have worked with scores of clients in the ag-tech and food processing industry including:

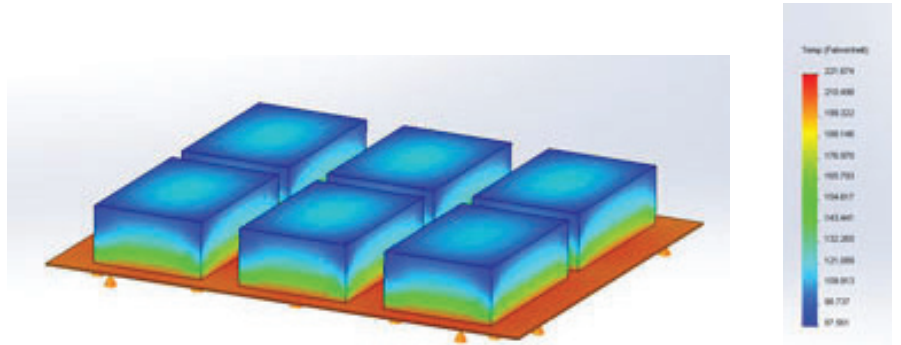
- * Crop One – Vertical Farming
- * Welch's Foods – Industrial Food Processing
- * Aqseptence Group – Dairy Farm Waste Reduction and Water Reuse

CASE STUDY – FOOD PROCESSING

Serving Safe Chicken: Meeting FDA Requirements for Safe Food Holding Temperatures

How much heat does it take to keep food safe for consumption? Sigma used its advanced engineering skills to answer this question. A New Jersey-based company asked Sigma to analyze their warming tray prototype by performing a heat power analysis and thermal FEA on the heater element and control circuit.

The tray is designed to keep rotisserie chickens at a safe internal temperature of 140°F and breakfast sandwiches at a slightly lower temperature, determined by a high and low setting that is set by an operator's switch.



Step one was to determine the steady state heat power requirements to keep the chicken at temperature by using hand calculations. Then a simplified FEA was run to verify that it matched the hand calculations.

Step two was to source heater elements that match the power requirements found in the hand and FEA calculations from the previous steps. The final step was to determine 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