

Miniature Plant Trials

NOW COMPLIANT WITH NEW FSMA LEGISLATION! Our Miniature Plant Trial Services provide the benefits of our equipment without having them at your own facility. Processing is a persistent unknown, often restricting experimentation and impeding development. We offer three different programs to help eliminate this unknown and make processing a tool, not an impediment to R&D: Miniature Plant Trials, Overnight Plant Trials, and Scaling Services. Our programs accelerate your product development by providing accurate processing results, and by relieving the scheduling, disposal, and cost restrictions of conventional plant trials. Small batch sizes (minimum 1-3 liters depending upon product and process) allow many ingredient and process variables to be tested. Thus, you can learn how your product will perform during processing. This enables you to develop a functional formula quickly and easily; without the challenges of full-scale plant trial. Come and take advantage of our laboratory, process capabilities, and experience with continuous thermal processes to advance your research.

Miniature Plant Trials

Miniature Plant Trials are conducted at our facility where you can formulate and process products at conditions ranging from hot-filling to Ultra High Temperature (UHT) processes (for aseptic and extended shelf life products). During each test, processing conditions are recorded using computerized data acquisition, enabling you to review them for each batch separately. This data is extremely useful in fouling studies where burn-on of different process tests are compared so formulas can be modified to optimize their quality and run time. Processing conditions can be selected to represent general industrial conditions, or arranged confidentially to imitate your specific process. With our Miniature Plant Trial Services, you can arrive with a concept and leave with a tested and proven formula.

Available Heating Styles

- Tubular
- Steam Injection
- Plate in Frame
- Microwave

Available in-line unit operations:

- Homogenization
- Ultra Clean Filling
- Custom Processing
- Specialty Hold Tubes
- In line sampling
- Deaeration
- Starch Hydration

Minimum Batch: 1 to 10 liters depending on product and process

Maximum Batch: 378 liters or more depending on product and process

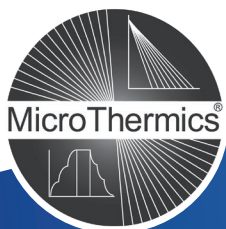
Tests per day: 5 to 20 depending on product and process

Overnight Plant Trials

Overnight Plant Trials are used as a follow-up to our Miniature Plant Trials. They are nearly the same, with one major exception. You do not need to attend these plant trials. Your samples are sent to us using appropriate services (i.e. overnight couriers, etc.). We assemble and process the product to your specifications. Processed samples are over-nighted on ice back to you, with a report containing process data, and our observations. This service has two advantages. First, it eliminates travel costs but more importantly, these Overnight Plant Trials eliminate travel schedules. They can be conducted on short notice, and turned around quickly.

Scaling Services

At MicroThermics, you don't scale up the product, we scale-down the process. We've combined the flexibility of our laboratory-scale processing systems with the latest techniques developed to measure the impact of continuous thermal processes. After satisfying the necessary confidentiality requirements, we evaluate your detailed process data, and select laboratory scale processing conditions to match them. With Scale-Down Services, you can use our laboratory scale processing systems, or the services discussed above, to accurately reproduce plant conditions and qualify developmental formulas before plant trial.



EASY, AFFORDABLE, PROCESS ACCURACY!

Miniature Plant Trial Process Capabilities

FDA Registered/FSMA Compliant

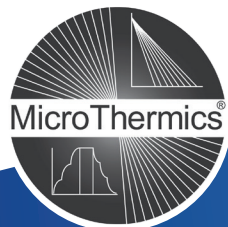
Processing Styles

Tubular Plate-in-Frame Steam Injection Microwave

Service	Notes	Process Capabilities
Miniature Plant Trial	Attended by client Up to 15 batches/day (depending on batch size) Customized processing	Process Temperatures - Heater 1: 140°-250°F - Heater 2: 170°-305°F
Mail-In Plant Trial	Follow up to attended Miniature Plant Trials Uses overnight carriers (i.e. Federal Express, DHL, UPS)	Hold Time Range - 2 to 180 Seconds
Steam Injection Plant Trial	Up to 15 batches/day (depending on batch size) Customized processing	Homogenization Conditions - 1 or 2 stage, 5400 PSI maximum
		Homogenization Location - Anywhere in-line

Process Descriptions

Process Name	Number	Physical Layout
One Heater Processes (High Acid Aseptic and Pasteurization)		
Hot-Fill	1	Heater 1(140°-250° F)
Hot-Fill with Hold (i.e. starch cook)	2	Heater 1(140°-250° F)-Hold
Hot-Fill with Hold and Trim Cool	3	Heater 1(140°-250° F)-Hold-Partial Cool
Starch Cook (1 step) with Cool	4	Heater 1(140°-250°)-Hold-Cool
Starch Cook (2 step) with Cool	5	Heater 1(140°-250° F)-Heater 2 (170°-305° F)-Hold-Cool
Aseptic (High Acid)	6	Heater 1(140°-250°)-Hold-Cool
Aseptic (High Acid) with Homogenization	7	Homo-Heater 1 (140°-250° F)-Hold-Cool
	8	Heater 1 (140°-250° F)-Homo-Hold-Cool
	9	Heater 1 (140°-250° F)-Hold-Homo-Cool
	10	Heater 1 (140°-250° F)-Hold-Cool-Homo
Pasteurization	11	Heater 1(140°-250°)-Hold-Cool
Pasteurization with Homogenization	12	Homo-Heater 1 (140°-250° F)-Hold-Cool
	13	Heater 1 (140°-250° F)-Homo-Hold-Cool
	14	Heater 1 (140°-250° F)-Hold-Homo-Cool
	15	Heater 1 (140°-250° F)-Hold-Cool-Homo
Two Heater Processes (Low Acid Aseptic and Pasteurization)		
Aseptic (Low Acid)	16	Heater 1 (140°-250° F)- Heater 2 (250°-305° F)-Hold-Cool
Aseptic (Low Acid) with homogenization	17	Homo-Heater 1 (140°-250° F)-Heater 2 (170°-300°)-Hold-Cool
	18	Heater 1 (140°-250° F)-Homo-Heater 2 (170°-300°)-Hold-Cool
	19	Heater 1 (140°-250° F)-Heater 2 (170°-300°)-Homo-Hold-Cool
	20	Heater 1 (140°-250° F)-Heater 2 (170°-300°)-Hold-Homo-Cool
	21	Heater 1 (140°-250° F)-Heater 2 (170°-300°)-Hold-Cool-Homo
	22	Heater 1 (140°-250° F)-Heater 2 (170°-300°)-Hold-Cool-Homo-Cool
Aseptic for high Starch Products	23	Heater 1 (140°-250° F)-Hydration Loop-Heater 2 (170°-300°)-Hold-Cool



EASY, AFFORDABLE, PROCESS ACCURACY!



MicroThermics, Inc.
3216-B Wellington Ct.
Raleigh, NC 27615 USA
1 919 878 8045
info@microthermics.com
www.microthermics.com

