WENGER TECHNICAL CENTER

Your gateway to the future

For most companies, research and development represents a substantial investment and a large part of the cost of every marketable product. It's not an endeavor in which you can afford to make mistakes. So why go it alone? With 40 years of experience, the Wenger Technical Center is well-prepared to assist with extrusion and drying demonstrations, product development and process evaluation.

"The Wenger Technical Center was a tremendous asset to Iams during the whole 30 years I owned the company. Our challenge was getting the Iams products into the desired form while maintaining the nutritional characteristics of the original ingredients. Wenger helped us get that accomplished."

Clay Mathile
Former owner of The Iams Company

Inspiration you can see and touch

The Wenger Technical Center is an agrifood laboratory equipped with the latest in research and production scale extrusion and drying equipment for the exclusive use of our clients and customers. Yet, it has so much more to offer . . . like a doorway to your imagination. Step into the die room or browse the product sample collection and you'll see what we mean. We'll help you discover new ideas and concepts others have missed. Then, we'll help you turn them into reality.

Innovation that comes from experience

Backed by more than 60 years of manufacturing history, the Wenger Technical Center offers more knowledge and skill in all aspects of extrusion and drying technology than anyone in the industry. It's experience we offer in your quest to plan projects, develop product prototypes, perform laboratory analysis and develop processes to manufacture the product. Equally important, we can often help you weave your way through the process faster than you could do it alone – allowing you to get a concept on the market ahead of your competition.

"Test runs at the Wenger Technical Center dramatically increased our understanding of the extrusion process, and had a direct impact on our product quality and our factories' productivity."

Mads Speichert
EWOS Innovation

put feet to your ideas

A typical demonstration in the Wenger Technical Center will require one full day, including pre- and post-extrusion discussions and project review. Generally, the program consists of numerous runs, the scope of which will depend upon the materials processed and the equipment being evaluated.

Those factors, of course, are limited only by your wishes and imagination. Employing a long list of equipment and procedures, we're prepared to test and analyze anything and everything including breakfast cereal, pet food, aquatic feed, and textured vegetable protein products. Moreover, you have access to equipment including our C^2TX Conical Co-Rotating Twin Screw Extruder, Sanitary 2 Pass Dryer/Cooler, X-165 Optima Single Screw Extruder and Magnum ST Twin Screw Extruders.

Afterward, we'll assist with the interpretation of results and tracking of product quality. We can even help with process engineering, scaling up the process and transferring technology to your facility.

Imagination comes in many forms

While our clients have access to a wide variety of services and equipment in the Wenger Technical Center, imagination isn't limited to our on-site facilities. Wenger Technical Center staff often go beyond our walls to provide training and inspiration.

- **University Assistance**—Wenger maintains a cooperative extension relationship with a number of major universities that offer extrusion-related research on behalf of industry clients. Wenger will even provide technical assistance at these centers if the client desires.
- **Follow-Up Assurance**—Don't worry about having to remember everything when you go home. Data from Tech Center research is recorded and given to the client. Additionally, Wenger can provide a "help line" for process questions and troubleshooting problems.
- **Personalized Training**—We realize you can't always bring your whole staff to our facility for training. So, we're available to come to you with training tailored to your company's specific needs.
- **Specialized Training Seminars**—Each year, Wenger pushes innovation to the limits with specialized Processing Technology Seminars. These are typically three-day courses and provide a blend of classroom and hands-on training for review of extrusion system procedures and theory, while introducing new technologies for product quality and process improvement.

Accessible *from anywhere*

Adjacent to Wenger's manufacturing plant and corporate office in Sabetha, Kansas, the Wenger Technical Center is easily accessible by automobile or private aircraft. Just 95 miles northwest of the Kansas City International Airport, Sabetha is also within easy driving distance of major commercial airline service.

Why not give us a call today? We'll not only help set up accommodations, but open a whole new world of ideas and possibilities.

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EQUIPMENT AVAILABLE FOR USE IN WENGER'S TECHNICAL CENTER

(equipment available will change as designs are upgraded)

	Model / Screw Diameter	Minimum Batch Size For R & D Run	Typical Production Capacity Range	Motor Size	Breakfast Cereals	Direct Expanded Snacks	Snack Pellets	Starch	Full Fat Soy	Textured Soy	Petfood	Aquatic Feed	Precooked Pasta	Breadings	Confectioneries	Fruit/Vegetables	Livestock Feeds	High Shear	Med-Shear Extrusion	Low-Shear Extrusion
					Typical Commercial Application													**Configurations Available For:**		
Twin Screw	C2TX-8.1 * Conical	4,000 lb 1,800 kg	4,400-18,000 lb/hr 1,000-8,000 kg/hr	300 hp 225 kw	●	●		●	●		●	●					●	●	●	
Twin Screw	TX-57 MAG II * 57mm	50 lb 20 kg	50-400 lb/hr 20-180 kg/hr	60 hp 45 kw	●	●	●	●		●	●	●	●	●	●		●	●	●	●
Twin Screw	TX-85 MAG ST * 85mm	150 lb 70 kg	300-3,500 lb/hr 140-1,600 kg/hr	250 hp 187 kw	●	●	●	●		●	●	●	●	●	●		●	●	●	●
Twin Screw	TX-760 * Thermal	150 lb 70 kg	300-3,500 lb/hr 140-1,600 kg/hr	150 hp 110 kw	●	●	●	●		●	●	●	●	●	●		●	●	●	●
Single Screw	X-85 Optima II 85mm	100 lb 50 kg	200-450 lb/hr 100-200 kg/hr	40 hp 30 kw				●	●		●	●					●	●	●	
Single Screw	X-165 Optima * 165mm	1,000 lb 450 kg	4,000-8,800 lb/hr 1,800-4,000 kg/hr	250 hp 187 kw				●	●		●	●					●	●		
Single Screw	E-525 Former			25 hp 19 kw			●				●	●	●		●				●	●
Single Screw	UP/C 1k® 85mm	1,000 lb 450 kg	1,100-2,200 lb/hr 500-1,000 kg/hr	50 hp 37 kw					●		●	●					●	N/A		
Dryers	Laboratory Dryer (Multi-Pass, Multi-Stage Configurations Available)				●	●	●	●		●	●	●	●	●	●	●	●	N/A		
Dryers	Wenger Model 4800 Dryer (Multi-Stage Configuration)				●	●				●				●						
Dryers	Wenger Model 15G3.51-2 Sanitary Two Pass Horizontal Dryer with attached Cooler					●				●	●	●				●	●			

*May be operated and demonstrated with the Wenger APM computer control system which automatically controls start-up, operation and shut-down of the extruder. It will regulate extruder throughput, process temperature, liquid addition and monitor any integrated post-extrusion process functions required to optimize product quality, process efficiency, personnel safety and machine loading.

Auxiliary Equipment

Post-Extrusion Cutters:
die-mounted or belt-mounted cutters available for a range of products.

Embossing Rolls:
give texture to the surface of sheeted extrudates.

Flaking Equipment:
state-of-the-art flaking rolls for production of cereal flakes from extruded beads.

Automated Vacuum Infusion Equipment:
infusion of lipid, liquids, flavor, etc. into extruded products.

Mixers:
batch mixers available for premixing your ingredients.

Shredding Mill:
granulates extruded breadings prior to drying/toasting.

Complete Die and Knife Warehouse

Gravimetric Dry Material Feeders

Comminuting Machines:
3 hp (2.25 kw) Fitzmill; 40 hp (30 kw) Fitzmill

High Pressure Pumps:
for injection of chemicals, additives (colors, flavors, fats, etc.) into process system flow.

Pneumatic Conveying Equipment

Data Management Systems

Vacuum Pumps:
removal of air and volatiles from extruder barrel; facilitates control of temperature as well as physical and organoleptic properties of extrudate.

Separators:
Sweco, 24 and 48 inch diameters.

Kek K-650 Centrifugal Sifter

Wenger Phase Transition Analyzer:
measures the "controlling" glass (T_g) and melt (T_m) transitions of a complex mixture of biopolymers that often comprise an extruded food or feed product.

Extruder Accessories:
Back Pressure Valve
Retention Time Control
Density Control Systems
Stand Alone DDC's
TX Mix Head Die
SX Mix Head Die

Laboratory Equipment and Test Procedures

Clients and customers are invited to take advantage of the many services offered by the Wenger Technical Center to attain maximum resource utilization of their own processing facilities. The services offered by the Technical Center include:

Test Procedures
Moisture Determination
Starch Pasting Properties
Glass Transition Temperature
Melt Transition Temperature
pH Determination
Oxidation Reduction Potential
% Total Starch
% Gelatinized Starch
Total Amylose
Amylose Leaching
Dextrose Equivalent
Starch Gel Strength
Sieve Analysis
Fish Meal Flow Number
Oil Leaching
Piece Density
Maximum Fat Uptake
Pellet Durability Index
Urease Activity
Water Absorption Index
Water Solubility Index
Acidity
Viscosity
Water Activity

Test Equipment
Arizona Instrument, Computrac
Denver Instrument, IR 200
Forced Air Convection Oven
Rapid Visco Analyzer™, RVA 4
Brookfield Viscometer
Phase Transition Analyzer™
Temperature Compensated pH meter, Accumet AB15
Dextrose Analyzer, YSI 2700
Spectrophotometer – range 330 – 1000 nm
Hobart Blender (5 qt capacity)
Centrifuge – range 0 – 7000 x g
Temperature Controlled Water Bath
Temperature Controlled Magnetic Stirrers
Electronic Balances ± 0.001 g accuracy
UDY Cyclone Sample Mill
Jet Stream Air Oven
Water Activity Meter, AquaLab
Perten NIR-DA7200

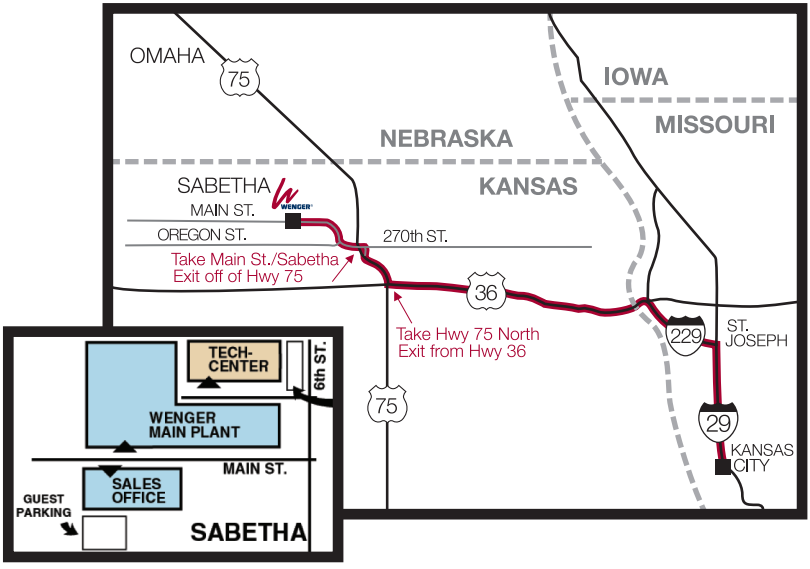
Test Kitchen Facilities
Deep Fat Frying
Baking
Pressure Cooking
Air Puffing
Product Enrobing

Accommodations

If possible, you should plan to arrive in Sabetha the evening prior to the demonstration so that work can begin promptly at 8:00 A.M. on the day of your scheduled run.

The most convenient motel for visitors will be the Country Inn Motel, Sabetha, telephone 785-284-2300, located a few minutes from Wenger's plant. Wenger will be happy to make your reservations; however, you will be responsible for all lodging charges or cancellation charges.

We suggest you plan your departure from Sabetha no earlier than 4:00 P.M. on the demonstration date to assure sufficient time to complete a full day's scheduled demonstration. It is advisable to allow two hours, with normal road conditions, to Kansas City International (MCI) airport. A number of hotels are available near the airport to facilitate next-day departure.



WENGER®

Inventing the new original since 1935.

WENGER PLANT AND CORPORATE OFFICES
714 MAIN STREET, SABETHA, KANSAS 66534-0130 USA
TEL 785 284 2133 **FAX** 785 284 3771 **EMAIL** INFO@WENGER.COM

BELGIUM +32 3 232 7005 **TAIWAN** +886 4 2322 3302 **BRASIL** +55 19 3871 5006
CHINA +86 10 6641 5979 **TURKEY** +44 1502 675 780

WWW.WENGER.COM

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