



PROCESS EQUIPMENT
FOR SNACK FOOD PRODUCTION PLANTS



The construction of my machines I guarantee to be first class in every particular.
(As first promised in an 1887 brochure from our founder, Charles Cretors.)

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*How has C. Cretors and Company survived for over 130 years in business?
A commitment to Quality Fabrication, Innovation and Customer Service.*





Cretors

Since it was founded in **1885**, C. Cretors and Company has focused on building high quality machines for the snack food industry. For five generations and counting, the **Cretors Family** has been committed to technical innovation and to quality fabrication. Our main focus has always been **popcorn** and there is no other company in the **world** better prepared to service your needs with that healthy snack.

Cretors owns two manufacturing plants with the main facility located close to O'Hare Airport (Chicago, IL, USA). At this location, we have a pilot plant available to aid our customers in process and recipe development. All of the machines and production lines are custom-built to match our customer's production capacity needs, to best fit within their plant's space constraints and to work with their local electrical and gas services. We test all of our production lines before they leave the plant and customers can witness that testing. We do not just offer attractive and efficient machines, we also provide process know-how garnered from our decades of experience in the industry.



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CONTACT INFORMATION**





Popcorn is the perfect snack food. It is a whole grain, it offers a lot more fiber than most other fruits and vegetables and it is a good source of antioxidants. It is a low calorie snack and is minimally processed.

WHY DOES IT POP?



• • **It's all about the Moisture**
Learn about the Science of POP! • • • • •

Popcorn is scientifically known as *Zea Mays Everta*. It's a type of maize or corn and is a member of the grass family. Of the four common types of corn – sweet, dent (also known as field), flint (also known as Indian) and popcorn – only popcorn pops!

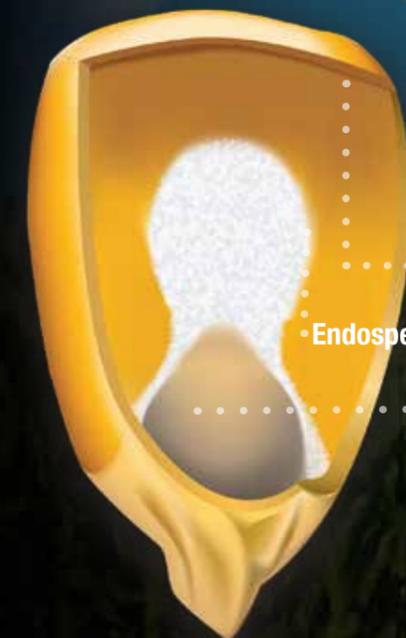
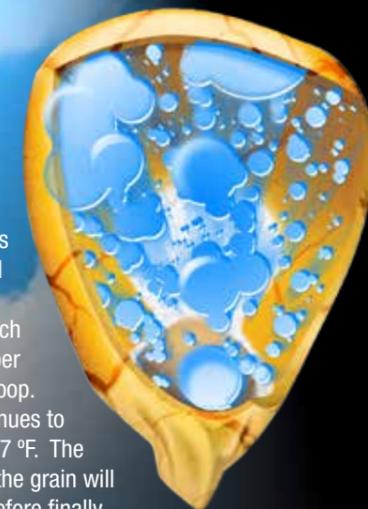
So why do popcorn kernels pop when heated? Popcorn kernels contain a special tissue called an endosperm. The center of the kernel contains a soft wet endosperm which is surrounded by a hard stony endosperm. When the kernel is heated, the water at the center expands to steam, cooking the starch, pressurizing the kernels until it eventually pops open and cools rapidly to maintain its new expanded form (popped corn!).

SCIENCE OF POP • • • • •

Each kernel of popcorn contains a small drop of **water** stored inside a circle of soft starch. Popcorn needs between 13.5-14% moisture to pop. The soft starch is surrounded by the kernel's hard outer surface. When heat is added, the water inside the kernel begins to expand and puts enormous pressure on the kernel's shell.



As the kernel heats up, the water begins to expand. Around 212°F the water turns into steam and changes the starch inside each kernel into a super hot gelatinous goop. The kernel continues to heat to about 347 °F. The pressure inside the grain will reach 135 PSI before finally bursting the hull open.



As it explodes, steam inside the kernel is released. The soft starch inside the popcorn becomes inflated and spills out, cooling immediately and forming into the odd shape we know and love. A kernel will swell to 40-50 times its original size!

WHERE IS IT GROWN AND HOW IS IT PRODUCED?



Seed Development

Popcorn is a non-GMO product. Seed varieties are developed through hybridization of inbred lines. Seeds are developed in test plots over many seasons to achieve the desired growing and popping characteristics.

Growing

Popcorn is grown throughout the world but the main areas are the USA, Argentina, France and South Africa. The growing season is around 100 days. 1"-2" of water a week is needed. Warm days followed by cool nights is the ideal environment (and is most easily achieved at higher altitudes).

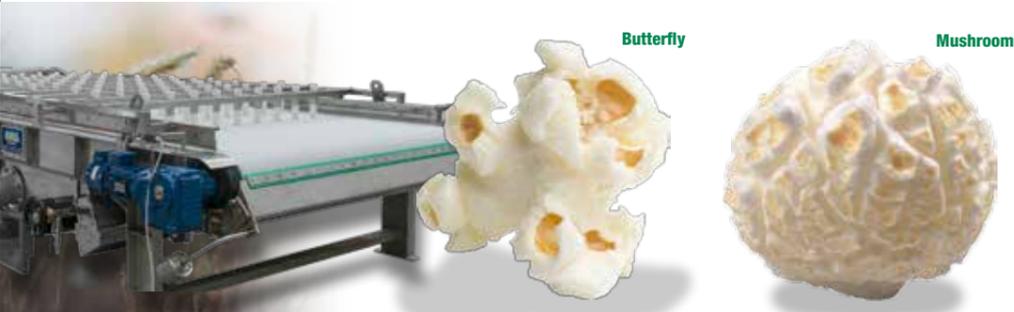
Harvesting

Popcorn is normally harvested when the kernels have a moisture content of 14-17%. Below 14%, the popcorn will not pop well. Above 17%, the corn may spoil when stored in grain bins.

Storage and Conditioning

In order to get the moisture content of popcorn to the ideal 14.5%, the corn stored in the bins is constantly monitored. Ambient air or heated air may be blown through the bins to achieve the optimum moisture level. There is also careful monitoring of insect and pests to ensure the integrity of the popcorn.

THERE ARE HUNDREDS OF POPCORN HYBRIDS AVAILABLE AND THEY CAN BE DIVIDED INTO TWO MAIN GROUPS:



Cleaning the Popcorn

Once the popcorn has the correct moisture, the kernels are then cleaned. Foreign materials and broken kernels are removed. There are four main steps in the cleaning process:

Screen Cleaner – using different size vibrating screens to sift out the kernels from the foreign material that may be found amongst the corn.



Gravity Table – An angled, vibrating screen to sort out impurities based on the density of the pieces

De-stoner – A small gravity table designed to remove very dense material (typically stones or rocks.)



Optical Sorter – A color sorter uses a high-resolution camera to visually inspect every kernel that flows through the machine. The machine can detect even the slightest visual defect. The machine then uses a burst of high speed air to knock that undesired material out of the product flow.

Packaging

After the corn is cleaned, it is then weighed and packaged. The most common bag sizes are 50 Lbs (22.67 Kg) and 2,200 Lbs (1 Metric Ton). The popcorn is then typically shipped on pallets in trucks or in dedicated shipping containers.



What's your flavor?

A Cornucopia of Flavors

Hundreds of different flavors are produced on Cretors' equipment worldwide. If you can imagine it, we can help you make it a reality.



Take a look a inside.

Cretors' Air-Popping Equipment is specially engineered to provide a fluidized bed of air around the popcorn. This patented method ensures that your production process maximizes your rate of efficiency.



Hot Air or Oil Popping?

Which came first? Air Popping (in a basket over an open flame). But then, our founder Charles Cretors patented the first oil popper in 1893.

Advantages to Air-Popping

1. Dry-Popping requires about 25% less oil than wet popping.
2. Air-Popping produces a more uniform popped corn than oil popping.
3. Less labor required – more automated process.
4. Dry-Popping makes a less expensive base on which you can add many savory or sweet flavors.
5. The oil applied to the popcorn after air popping is more stable and provides a longer shelf-life than the hot oil used in oil popping.
6. The sprayed oil is more evenly spread around the popped corn than the oil absorbed in an oil popper.
7. Air-Popping production lines are easier to clean.
8. Air-Popping lines are available for truly large scale production (over 5,000 Lbs/Hr).

Cretors offers many different lines of varying production capacities and levels of automation for both types of popping. Cretors will take the time to answer all of your questions when making this decision.

Advantages to Oil-Popping

1. Lower initial investment especially for low production capacity.
2. Small space requirements for the production.
3. A french-fried flavor different from dry popped corn that has had oil applied after popping.
4. The variation in texture and flavor between kernels from an oil popper are often viewed favorably by consumers.
5. While nutritional are not as favorable, most people prefer “fried” over “baked”.
6. Simplicity in operation with minimal labor skill requirements.
7. Product change-over times are generally shorter with oil popping lines.
8. Because oil popping lines typically involve multiple batch poppers, the full line does not have to shut down just because a single popper is off-line.

Every detail considered.

Cretors offers a variety of custom features on each machine. They are truly tailored for your business. Don't be afraid to ask, we'll gladly build something just for you.

Different stirrer blades on our oil popping kettles.





PILOT - SCALE EQUIPMENT

TO DEVELOP RECIPES AND TO DO SMALL PRODUCTION RUNS

THE PATH TO SUCCESS



WHETHER YOU'RE INTERESTED IN AIR OR OIL-POPPING, SWEET OR SAVORY PRODUCTS, CRETORS OFFERS MACHINES TO GET YOU STARTED ON THE PRODUCTION PATH.

EQUIPMENT TAILORED FOR YOUR BUSINESS

Cretors offers many different types and sizes of pilot equipment. The data can be scaled up to use on our full-scale production equipment. Long term, the pilot equipment is a good asset for Quality Control labs in production plants for on-going testing and development.



Metric Weight
Volume Tester



Pilot Oil Popping Plus Caramelizer
with Cooling Table

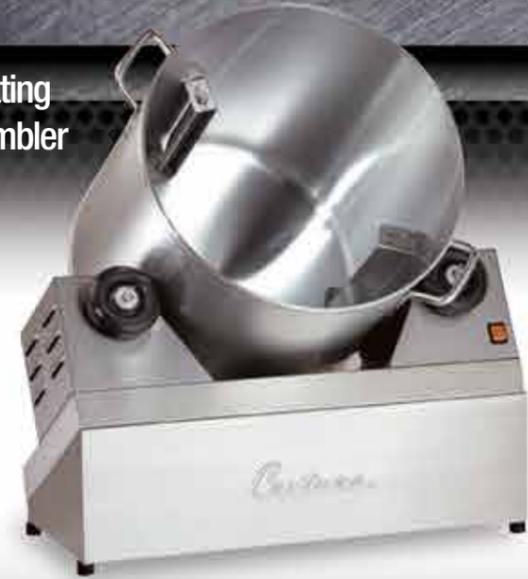


CMD100 Caramelizer on 6ft table



Pilot Air Popping plus Caramelizing
or Savory Coating

Batch Savory Coating
Counter Mixer Tumbler



FT 80 or 40 Continuous Popper



FT 80 Savory Coater



*PRODUCTS NOT SHOWN TO SCALE

OIL POPPING PRODUCTION SYSTEMS

OPTION 1

G60 WET POPPING PLANT



A batch line that allows an operator to run a number of our G60 poppers in parallel. Each G60 popper can produce up to 60 lbs/hr (27.2Kg) of salty or sweet popcorn.



OIL KETTLE
An all stainless steel, dished-bottom, jacketed-kettle for holding oil and heating oil. The kettle has a self contained thermostatically controlled heat system to heat the oil.



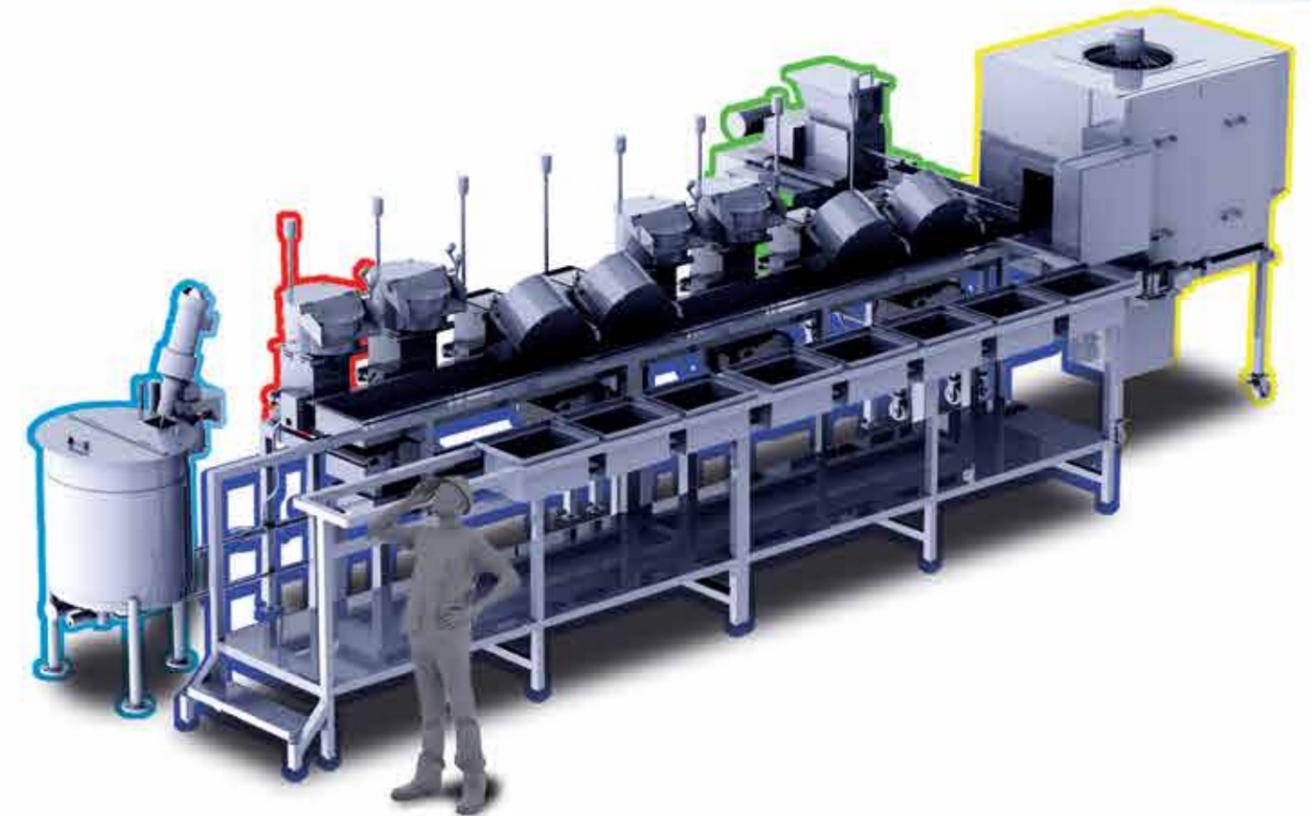
G60 OIL POPPERS
Giant 60 oz. Electric, Stainless Steel Kettle, with built-in oil pump and timer. Kettle comes with beacon light to notify operator when a batch is completed.



MOBILE SALTER
Hopper with variable speed discharge screw leading onto a vibratory scarf plate.



COOLING SIFTER
Constructed of a rotating stainless steel mesh wire cylinder with helical flights for conveying corn and a stainless steel tapered scrap chute. Includes cooling fan.



CORN / SUGAR BINS ON ACCESS PLATFORM
A stainless steel access stairway and platform to be placed in front of the collection conveyor. Allows the operator to easily pull/empty the popping kettles.

OIL POPPING PRODUCTION SYSTEMS

OPTION 2

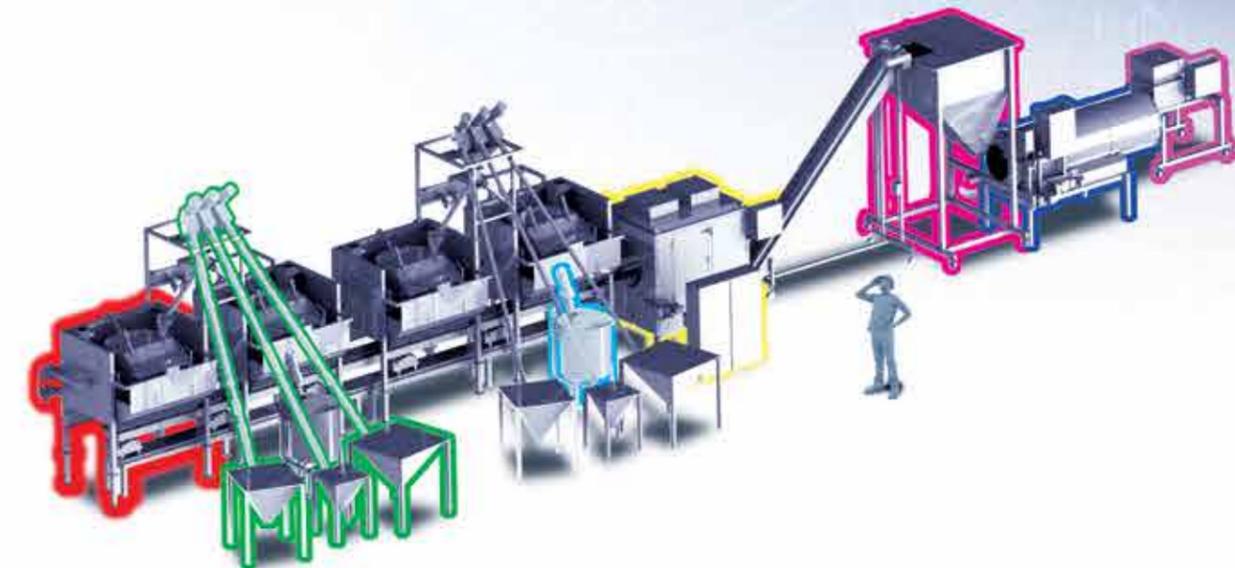
G-ZILLA POPPER



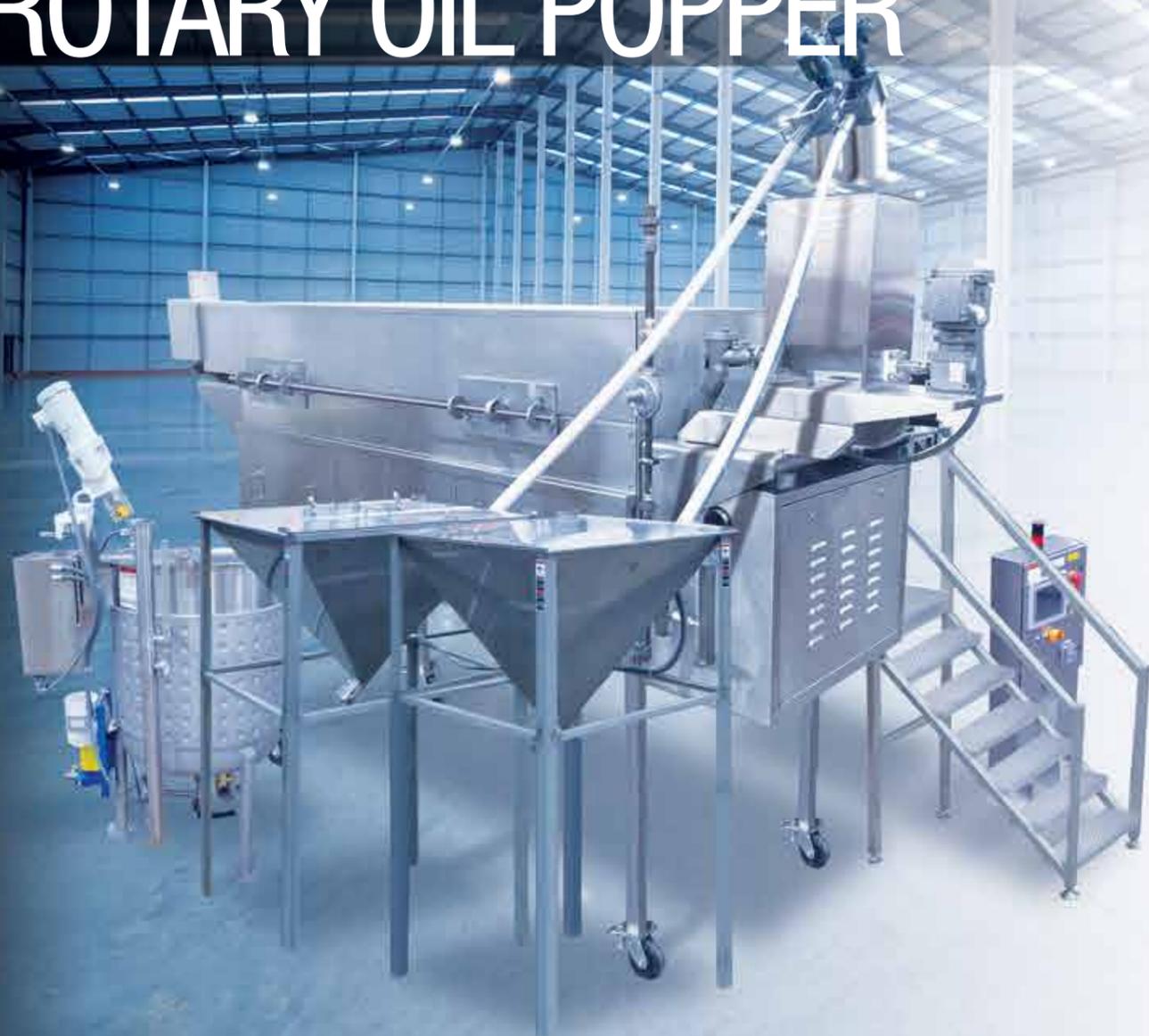
An automated batch system featuring our "G-zilla" Poppers. Each G-Zilla can produce up to 250lbs/(113Kg) of salty or sweet popcorn. Lines can feature one, two or four G-Zillas (1,000 lbs/hr out (453Kg/hr)). Down-stream coating and seasoning equipment can also be provided.

- G-Zilla**
Batch Oil-Popper fabricated from stainless steel. May be gas-fired or electrically heated. Each batch will typically take around 4 minutes before the kettle is automatically emptied forward.
- Oil Kettle**
An electrically heated water-jacketed kettle used to pre-heat oil before the oil is pumped to the G-Zilla Popper.
- Corn/Sugar/Salt Feed System**
Stainless steel Floor Hoppers fitted with Inclined Spiral Feeders to deliver the raw material up to the over-head Diverter System – leading down into the next available G-Zilla.
- Cooling Sifter**
An in-line stainless steel Sifting Tumbler that serves to remove un-popped kernels and under-sized popped kernels. In the case of sugared corn, it also separates and cools the product before it continues down-stream.

- Surge Bin**
An intermediate surge bin that is used to convert the irregular batch flow from the G-Zillas into a steady continuous outflow to the down-stream Coating Tumbler. A stainless steel hopper fitted with a vibratory discharge tray.
- Savory Coater**
An in-line stainless steel Coating Tumbler used to apply additional oil, oil slurries and salt (where needed).
- Dry Seasoner**
Used in conjunction with the Coating Tumbler to add additional dry ingredients onto the popped corn (where needed).



OIL POPPING PRODUCTION SYSTEMS OPTION 3 ROTARY OIL POPPER



An in-line continuous line featuring our model 250 Rotary Oil Popper. It Produces 250 lbs/hr (113Kig) of salty or sweet Popcorn.

Model 250 Rotary Oil Popper
A patented rotary popper specially designed for continuous in-line, oil-popping. A gas-fired unit with stainless steel construction. Tight control on the temperature of the different zones in the Popper.



Oil Kettle
An electrically heated water-jacketed kettle used to pre-heat oil before the oil is pumped to rotary popper.



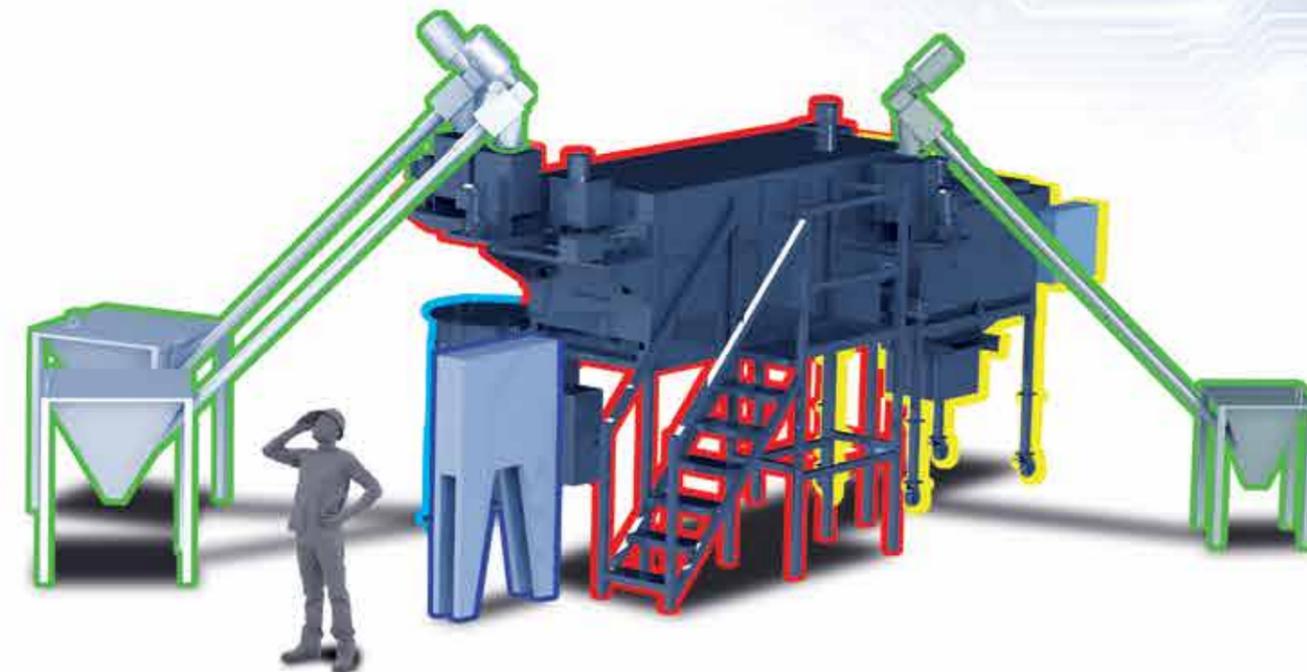
Corn/Sugar/Salt Feed System
Stainless steel Floor Hoppers fitted with Inclined Spiral Feeders to deliver the raw material up to the over-head Diverter System.



Cooling Sifter
An in-line stainless steel Sifting Tumbler that serves to remove un-popped kernels and under-sized popped kernels. In the case of sugared corn, it also separates and cools the product before it continues down-stream.



Control Panel
Control Panel available in either PLC or Relay logic.



POPPERS AND PUFFERS POPCORN OVENS



FLO-THRU ROTARY OVEN

The main component in our air-popping lines is our fluidized, rotary oven. They are used for popping popcorn ("Poppers") and for expanding snack pellets ("Puffers"). They are also used for toasting breakfast cereals and roasting nuts.

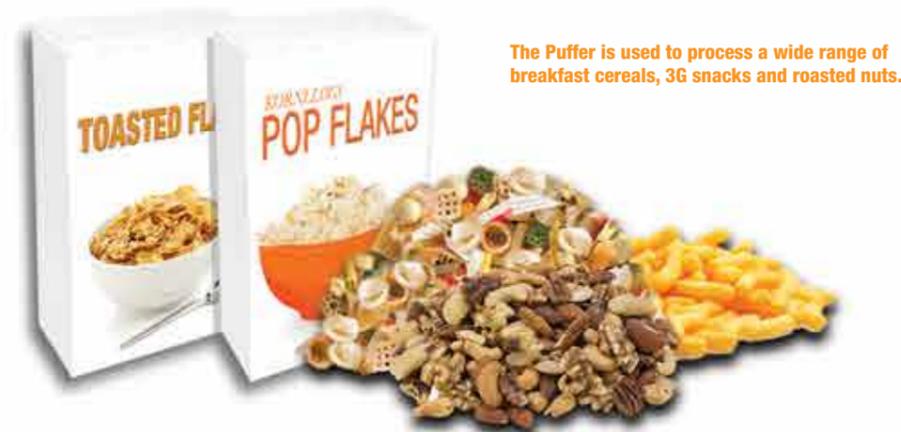
Features Include:

- 1 Reliable screw feeder (featured) or electromagnetic vibratory feeder.
- 2 Low maintenance drum drive with electronic speed control.
- 3 Advanced flame ignition and monitoring system.
- 4 Easily accessible clean-out door.
- 5 Auger (featured above) design that ensures uniform residence time.
- 6 State-of-the-art controls with safety interlocks.
- 7 Efficient blower with electronic speed control.
- 8 All stainless steel construction with 3 inches (80mm) of fiberglass insulation.

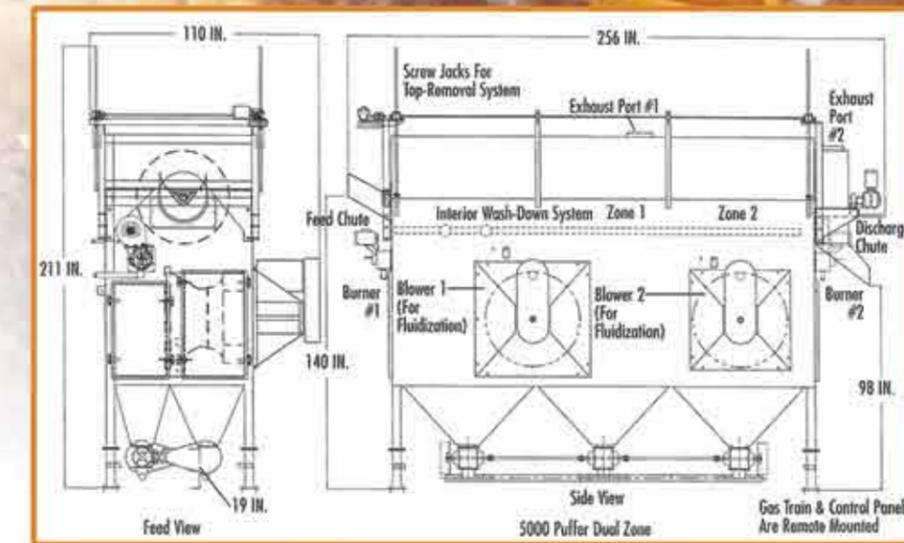
AVAILABLE SIZES

POPPER/PUFFER MODEL NUMBER	IN-FEED CAPACITY FOR POPCORN	
40	40 Lbs/Hr	18Kg/Hr
80	80 Lbs/Hr	36Kg/Hr
200	200 Lbs/Hr	91 Kg/Hr
650	650 Lbs/Hr	295 Kg/Hr
1000	1000 Lbs/Hr	453Kg/Hr
2500	2500 Lbs/Hr	1133Kg/Hr
5000	5000 Lbs/Hr	2267Kg/Hr

PRODUCTION VERSATILITY



The main difference between the design of a Puffer and a Popper is the greater number of control variables on a Puffer. A Puffer has a variable speed vibratory feeder, a variable speed drum drive (oven residence time) and a variable speed blower (degree of fluidization). Our Puffers also typically feature lighted sight-glasses that allow the operator to visually confirm the correct product fluidization inside the oven.



This drawing shows a typical Model 5000 Dual-Zone, Puffer/Toaster Oven.

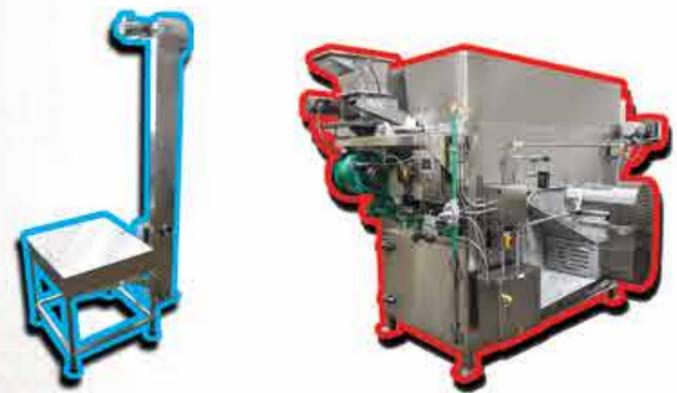
The temperature in the oven is tightly controlled by a digital temperature controller. The burner utilizes a state-of-the-art burner system with all of the required safety features. With the use of the modulating burner valve and auto-tuning capabilities of the controller, it is possible to run the oven at +/- 1°F.



Each oven is custom designed and built to best meet *your* needs.



SAVORY POPCORN LINE (AIR POPPING) CONTINUOUS

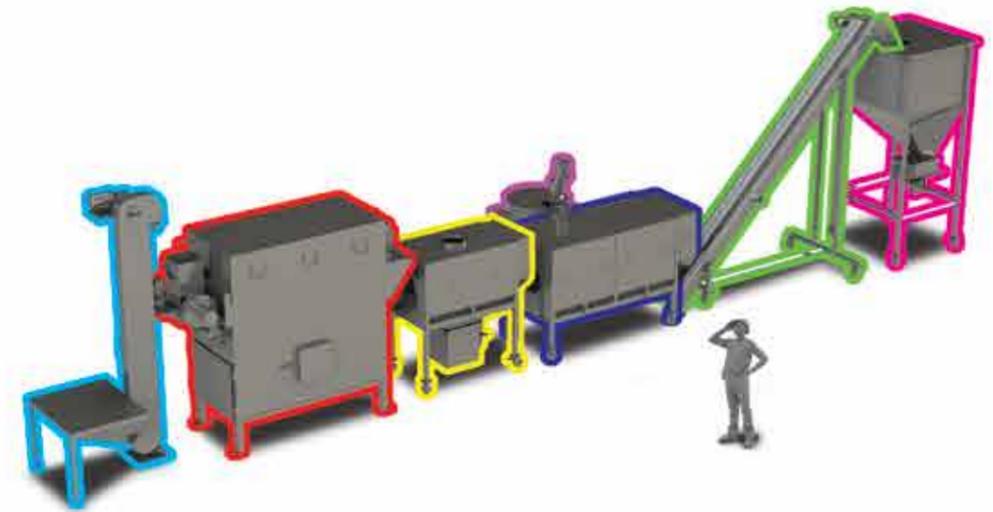


- **Raw Corn Elevator**
 Stainless steel floor hopper with bucket elevator to deliver popcorn kernels to the Popper on demand.
- **Air Popper**
 An in-line, rotary, fluidized oven. Stainless steel construction. May be gas-fired or electrically heated. Tight control on feed rate, oven temperature, blower speed (fluidization) and drum speed (residence time). Produces uniform popped corn.
- **Sifter**
 An in-line stainless steel Sifting Tumbler that serves to remove un-popped kernels and under-sized popped kernels.
- **Savory Coater**
 An in-line stainless steel Coating Tumbler used to apply additional oil, oil slurries and salt (where needed).
- **Heated Kettle**
 A water jacketed Kettle used for mixing slurry recipes. Different sizes available depending on recipe.
- **Inclined Conveyor**
 An inclined, cleated-belt conveyor to deliver the coated popcorn to an intermediate storage bin or to a packaging system.
- **Surge Bin/Storage Bin**
 An intermediate surge bin on a Savory line typically feeds next to the Weighing and Packaging System. The stainless steel hopper is fitted with a vibratory discharge tray.

We offer in-line Continuous Savory Popcorn production lines featuring our air poppers. We offer a range of models and sizes and there are many optional features available.

MODEL NUMBER	IN-FEED CAPACITY		FLOW RATE AFTER SIFTING		OUTPUT RATE AFTER COATING AND SEASONING*	
			Lbs/Hr	Kg/Hr	Lbs/Hr	Kg/Hr
80	80 Lbs/Hr	36 Kg/Hr	68 Lbs/Hr	31 Kg/Hr	>95 Lbs/Hr	>43 Kg/Hr
200	200 Lbs/Hr	80 Kg/Hr	170 Lbs/Hr	77 Kg/Hr	>238 Lbs/Hr	>108 Kg/Hr
650	650 Lbs/Hr	295 Kg/Hr	552 Lbs/Hr	250 Kg/Hr	>773 Lbs/Hr	>351 Kg/Hr
1000	1000 Lbs/Hr	453 Kg/Hr	850 Lbs/Hr	385 Kg/Hr	>1190 Lbs/Hr	>540 Kg/Hr
2500	2500 Lbs/Hr	2267 Kg/Hr	2125 Lbs/Hr	963 Kg/Hr	>2975 Lbs/Hr	>1350 Kg/Hr

* RECIPE DEPENDENT



CARAMEL / SWEET POPPING LINE OPTION 1 KETTLE / COATER



A single Kettle /Coater line that will typically produce 350lbs/hr (160Kg/hr) of Caramel Corn. A twin Kettle/Coater line will produce double that.

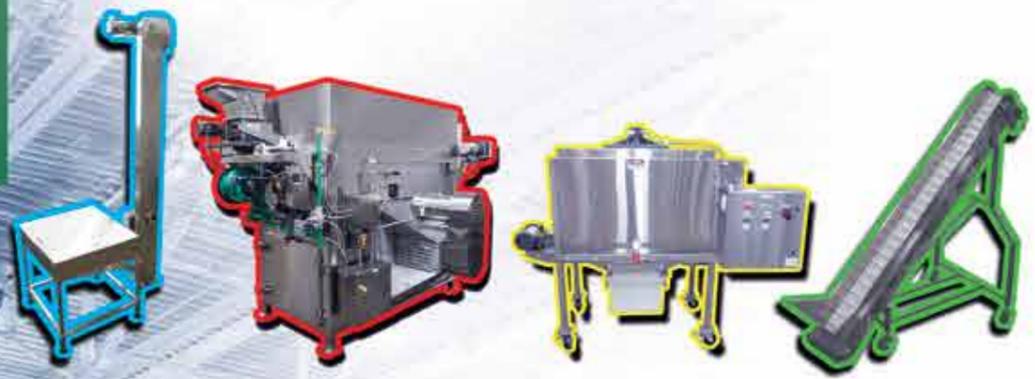
- **Raw Corn Elevator**
Stainless steel floor hopper with bucket elevator to deliver popcorn kernels to the Popper on demand.
- **Air Popper**
An in-line, rotary, fluidized oven. Stainless steel construction. May be gas-fired or electrically heated. Tight control on feed rate, oven temperature, blower speed (fluidization) and drum speed (residence time). Produces uniform popped corn.
- **Sifter**
An in-line stainless steel Sifting Tumbler that serves to remove un-popped kernels and under-sized popped kernels.
- **Inclined Conveyor**
An inclined, cleated-belt conveyor to deliver the coated popcorn to an intermediate storage bin or to a packaging system.
- **Heated Hopper with Inclined Conveyor**
Used to store the next batch of popped corn for use in the Kettle coater. Heated air is passed through the popcorn while in storage to prevent the popcorn corn from absorbing ambient moisture.



- **Syrup Kettles**
Jacketed, stainless steel kettles used to dissolve and heat the caramel syrup to 180 degrees F. May be gas-fired, electrically heated or steam heated.
- **Lecithin Tank**
Electrically heated, water-jacketed stainless steel tank that is fitted with a mixer. Used to heat and mix oil and lecithin that is then pumped to the Kettle/Coater. The lecithin is as an emulsifier that aids in the separation of hot caramel corn.
- **Kettle/Coater**
Large cooking kettle to cook the syrup up to 300 degrees F. Stainless steel construction. Features a bottom scraper mixer and a top-mounted auger mixer. Once the syrup is cooked, popped corn is added and the batch mixes. Lecithin is then sprayed onto the batch. Next the batch is emptied forward using the automated, pneumatic dumping system.
- **Take-away Hopper /Conveyor**
Serves to meter the batch of hot caramel corn up and into the down-stream Cooling Tumbler.
- **Cooling Tumbler**
In-line, continuous rotating Cooling Tumbler designed to separate caramel corn and to then cool the product. Stainless steel construction. Large blowers deliver ambient air through the product in the tumbler.



CARAMEL / SWEET POPPING LINE OPTION 2 CONTINUOUS

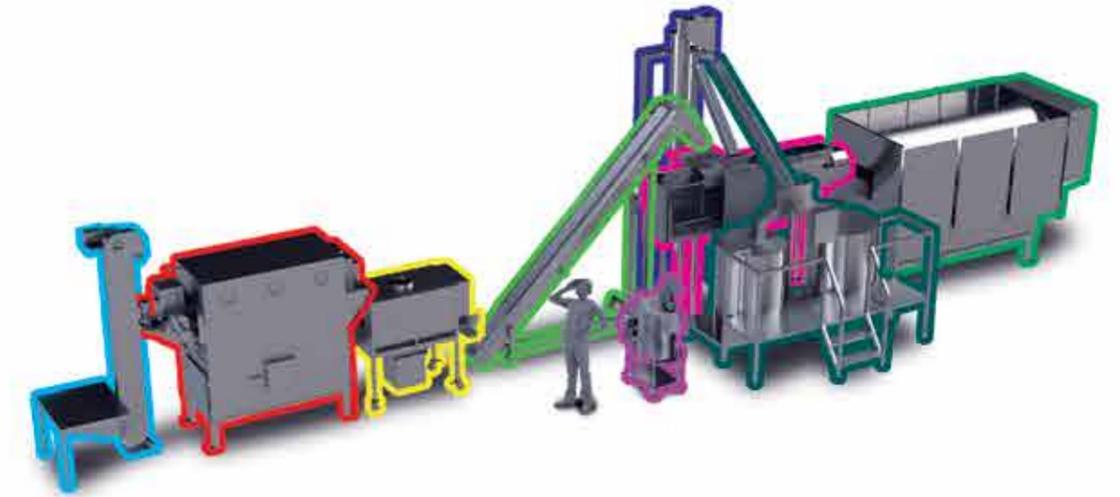


- **Raw Corn Elevator**
 Stainless steel floor hopper with bucket elevator to deliver popcorn kernels to the Popper on demand.
- **Air Popper**
 An in-line, rotary, fluidized oven. Stainless steel construction. May be gas-fired or electrically heated. Tight control on feed rate, oven temperature, blower speed (fluidization) and drum speed (residence time). Produces uniform popped corn.
- **Cooling Sifter**
 An in-line stainless steel Sifting Tumbler that serves to remove un-popped kernels and under-sized popped kernels. In the case of sugared corn, it also separates and cools the product before it continues down-stream.
- **Inclined Conveyor**
 An inclined, cleated-belt conveyor to deliver the coated popcorn to an intermediate storage bin or to a packaging system.
- **Syrup Kettles**
 Jacketed, stainless steel kettles used to dissolve and heat the caramel syrup to 180 degrees F. May be gas-fired, electrically heated or steam heated.

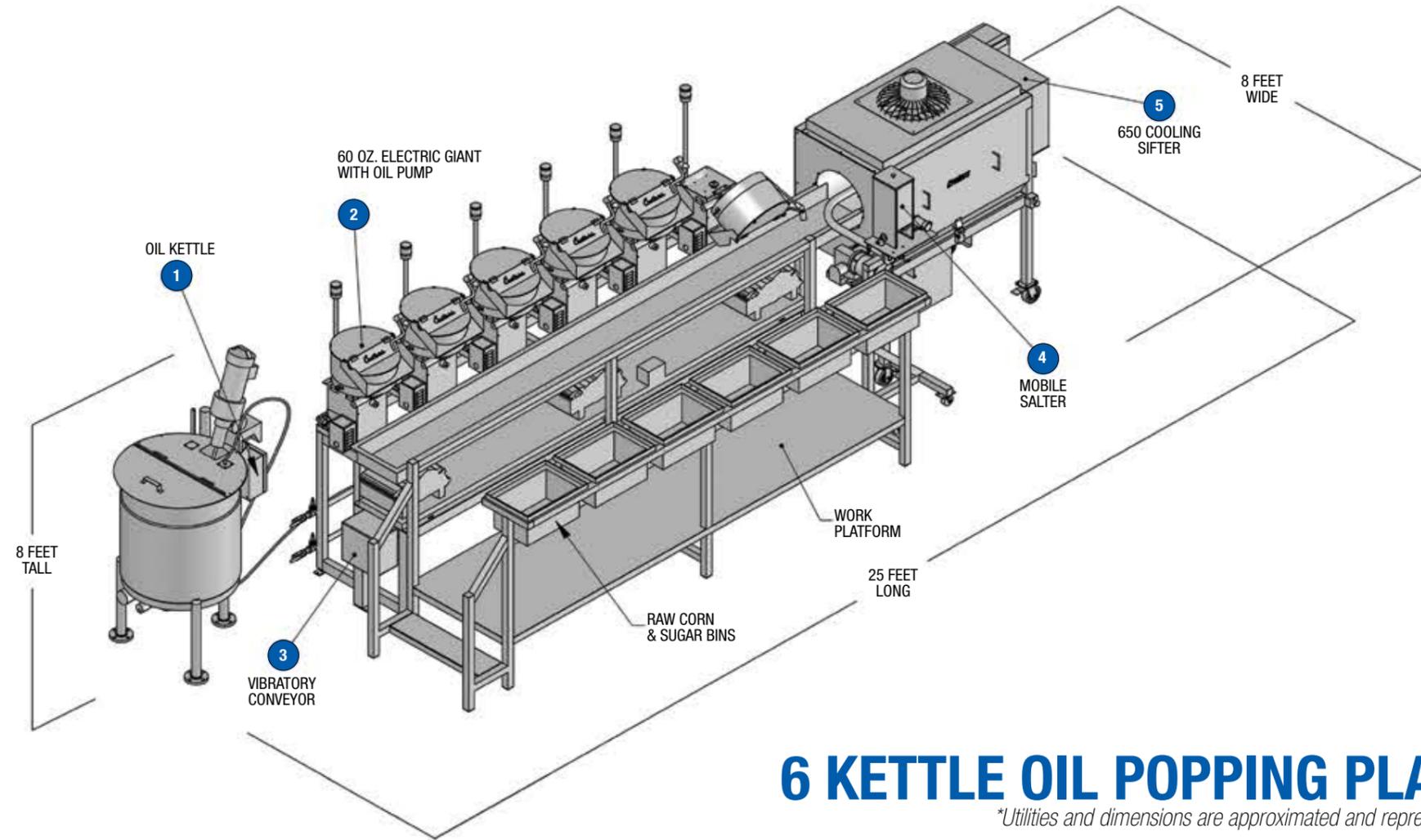
- **Lecithin Tank**
 Electrically heated, water-jacketed stainless steel tank that is fitted with a mixer. Used to heat and mix oil and lecithin that is then pumped to the Caramel Coater. The lecithin is as an emulsifier that aids in the separation of hot caramel corn.
- **Evaporator**
 A steam heated, heat-exchanger designed to continuously cook the syrup to the final hard-crack temperature. May be a Rising-Film Evaporator or a Scraped-Surface Evaporator. Stainless steel construction. Tight control on syrup temperature and steam flow.
- **Caramel Coater**
 An in-line, screw-coater. Steam is passed through the jacket on the trough and through the hollow shaft of the auger. Stainless steel construction. The Coater is fitted with spray nozzles for the application of the lecithin. Nut feeders are available to accommodate the addition of nuts/fruits/seeds to the caramel corn inside the Coater.
- **Cooling Tumbler**
 In-line, continuous rotating Cooling Tumbler designed to separate caramel corn and to then cool the product. Stainless steel construction. Large blowers deliver ambient air through the product in the tumbler.

Our Continuous Caramel Corn Lines feature steam jacketed Kettles, Evaporator and in-line Coater. Many different sized lines are available and they can be customized to match your proposed recipe.

POPPER	POPCORN RATE	WEIGHT RATIO OF CARAMEL: POPCORN (RECIPE)			
		2:1	3:1	4:1	5:1
MODEL	available for coating	FINAL OUTPUT RATE	FINAL OUTPUT RATE	FINAL OUTPUT RATE	FINAL OUTPUT RATE
200	170 Lbs/Hr 77Kg/Hr	510 Lbs/Hr 231 Kg/Hr	680 Lbs/Hr 308 Kg/Hr	850 Lbs/Hr 385 Kg/Hr	1020 Lbs/Hr 463 Kg/Hr
650	552 Lbs/Hr 250 Kg/Hr	1656 Lbs/Hr 751 Kg/Hr	2208 Lbs/Hr 1001 Kg/Hr	2760 Lbs/Hr 1252 Kg/Hr	3312 Lbs/Hr 1502 Kg/Hr
1000	860 Lbs/Hr 385 Kg/Hr	2580 Lbs/Hr 1170 Kg/Hr	3440 Lbs/Hr 1560 Kg/Hr	4300 Lbs/Hr 1950 Kg/Hr	5160 Lbs/Hr 2340 Kg/Hr
2500	2125 Lbs/Hr 936 Kg/Hr	6375 Lbs/Hr 2891 Kg/Hr	8500 Lbs/Hr 3855 Kg/Hr	10,625 Lbs/Hr 4819 Kg/Hr	12,750 Lbs/Hr 5782 Kg/Hr



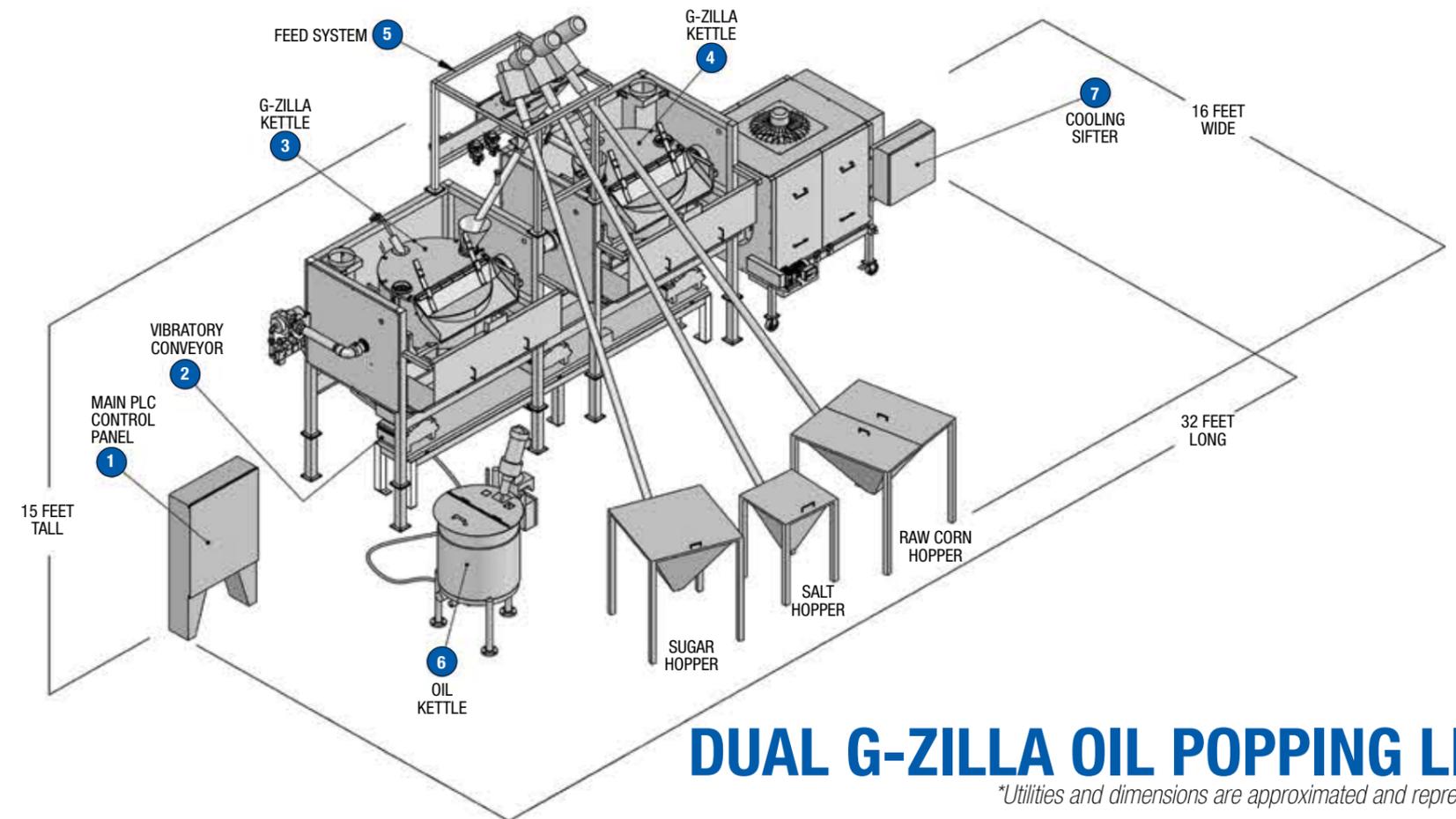
ITEM#	DESCRIPTION	POWER	WATER	DRAIN	GAS	STEAM
1	OIL KETTLE	3 PH 4 kW	NO	NO	NO	NO
2	60 OZ. ELECTRIC GIANT POPPER WITH OIL PUMP	3 PH 7 kW (EACH)	NO	NO	NO	NO
3	VIBRATORY CONVEYOR	3 PH 3 kW	NO	NO	NO	NO
4	MOBILE SALTER	3 PH 1 kW	NO	NO	NO	NO
5	650 COOLING SIFTER	3 PH 2 kW	NO	NO	NO	NO



6 KETTLE OIL POPPING PLANT

**Utilities and dimensions are approximated and representative.*

ITEM#	DESCRIPTION	POWER	COMPRESSED AIR	WATER	DRAIN	GAS	STEAM
1	MAIN PLC CONTROL PANEL	1 PH .5 kW	NO	NO	NO	NO	NO
2	VIBRATORY CONVEYOR	1 PH 3 kW (EACH)	NO	NO	NO	NO	NO
3	G-ZILLA KETTLE	3 PH 3 kW	17 CFM @ 80 PSI	NO	NO	230,000 BTUH @ 5 PSI MAX	NO
4	G-ZILLA KETTLE	3 PH 3 kW	17 CFM @ 80 PSI	NO	NO	230,000 BTUH @ 5 PSI MAX	NO
5	G-ZILLA FEED SYSTEM	3 PH 8kW	17 CFM @ 80 PSI	NO	NO	NO	NO
6	OIL KETTLE	INCLUDED IN FEED SYSTEM	NO	NO	NO	NO	NO
7	FT 1000 COOLING SIFTER	3 PH 2 kW	NO	NO	NO	NO	NO

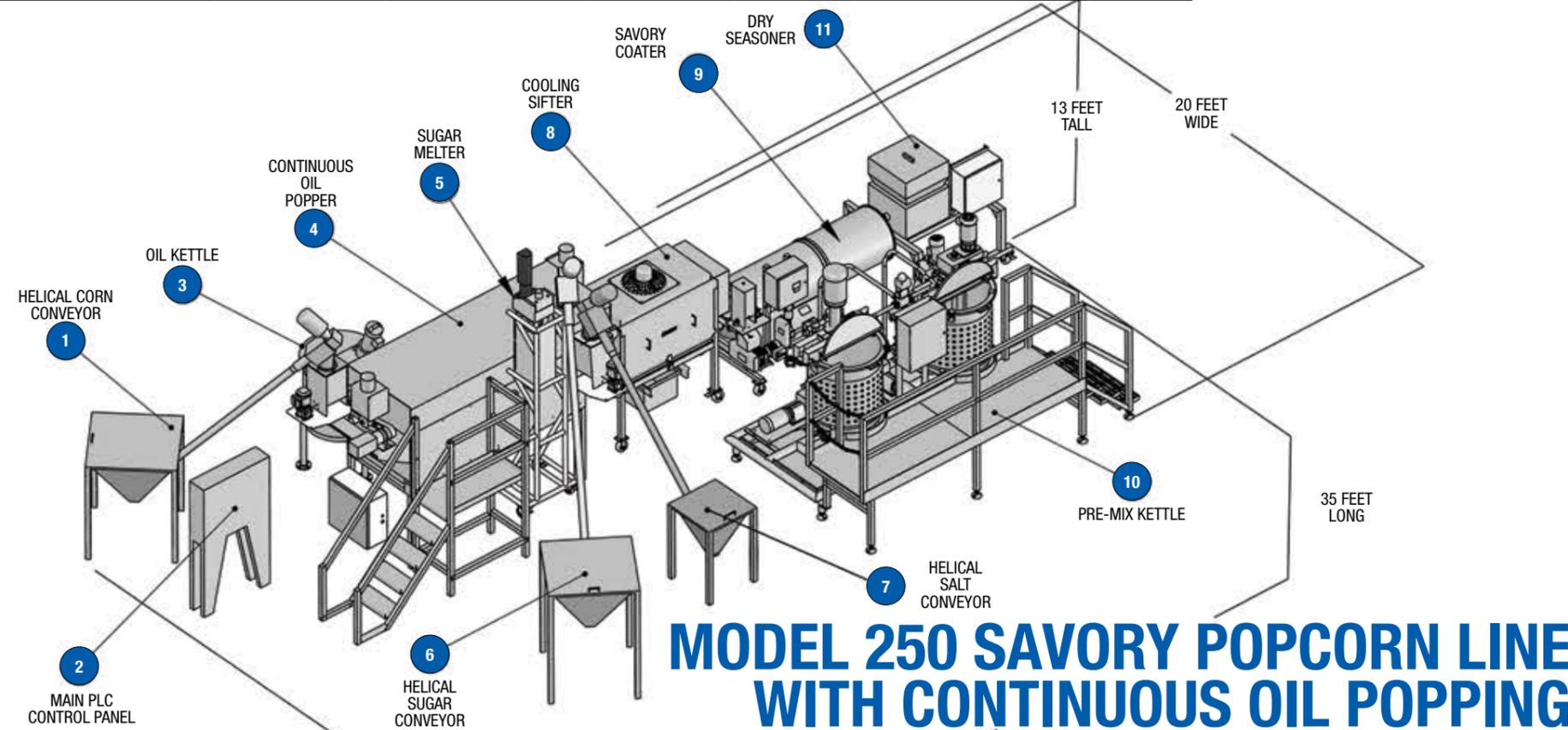


DUAL G-ZILLA OIL POPPING LINE

**Utilities and dimensions are approximated and representative.*

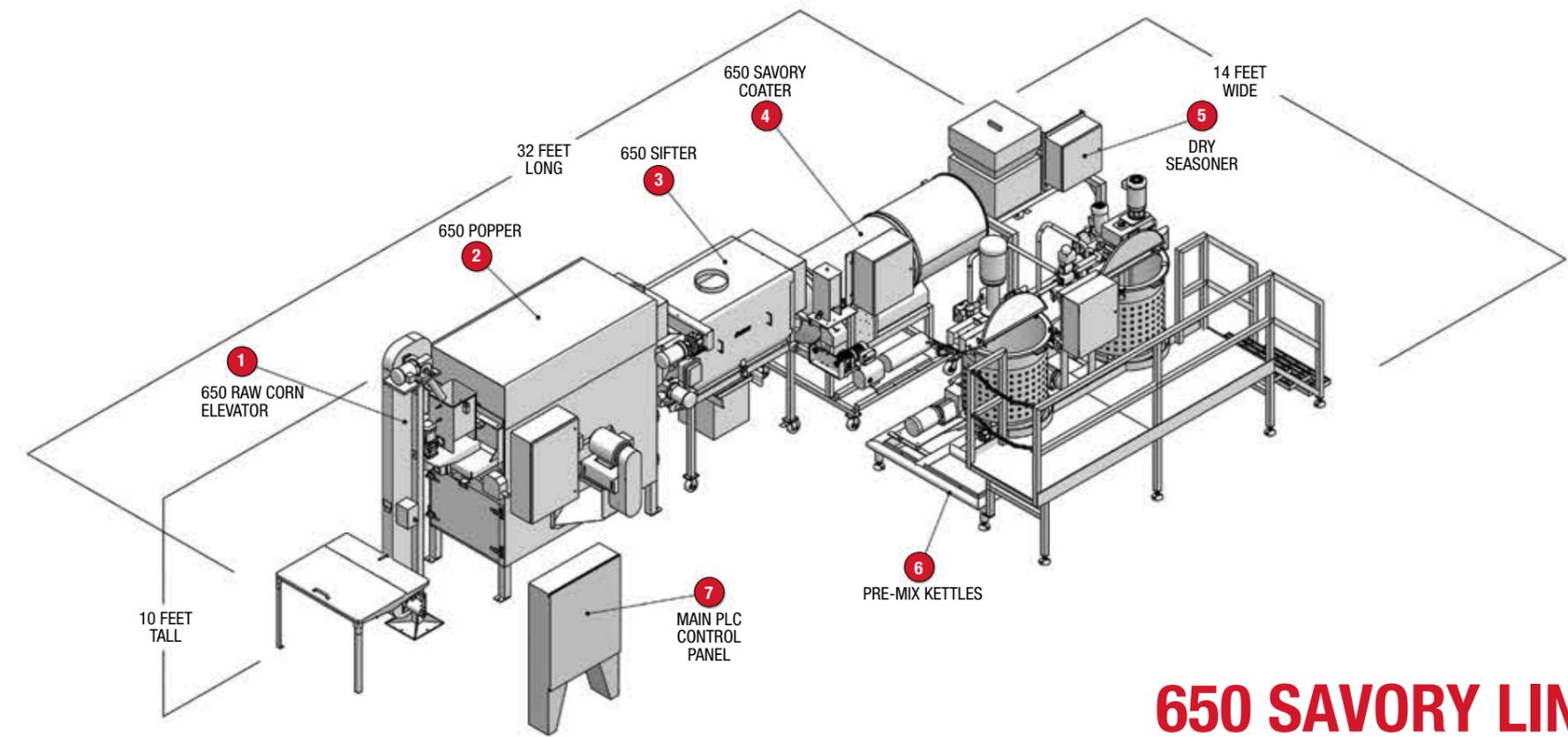
ITEM#	DESCRIPTION	POWER	COMPRESSED AIR	WATER	DRAIN	GAS	STEAM
1	HELICAL CORN CONVEYOR	3 PH 2 kW	NO	NO	NO	NO	NO
2	MAIN PLC CONTROL PANEL	3 PH 0.5 kW	NO	NO	NO	NO	NO
3	OIL KETTLE	3 PH 3 kW	NO	NO	NO	NO	NO
4	CONTINUOUS OIL POPPER	3 PH 2 kW	NO	NO	NO	500,000 BTU/HR @ 0.5 PSI MAX.	NO
5	SUGAR MELTER	3 PH 40 kW	NO	NO	NO	NO	NO
6	HELICAL SUGAR CONVEYOR	3 PH 2 kW	NO	NO	NO	NO	NO
7	HELICAL SALT CONVEYOR	3 PH 2 kW	NO	NO	NO	NO	NO
8	200 COOLING SIFTER	3 PH 2 kW	NO	NO	NO	NO	NO
9	200 SAVORY COATER	3 PH 2 kW	40 CFM @ 40 PSI	NO	NO	NO	NO
10	PRE MIX KETTLES	3 PH 18 kW	100 PSI / 1/4" NPTF	45 PSI / 12 NPTF	1" NPTF	NO	NO
11	DRY SEASONER	3 PH 1kW	NO	NO	NO	NO	NO

ITEM#	DESCRIPTION	POWER	COMPRESSED AIR	WATER	DRAIN	GAS	STEAM
1	650 RAW CORN ELEVATOR	3 PH 1 kW	NO	NO	NO	NO	NO
2	650 POPPER	3 PH 8 kW	NO	NO	NO	300,000 BTU-HR @ 5 PSI MAX	NO
3	650 SIFTER	3 PH 1 kW	NO	NO	NO	NO	NO
4	650 SAVORY COATER	3 PH 2 kW	1/4" NPTF, 80 SCFM @ 40 PSI	NO	NO	NO	NO
5	DRY SEASONER	3 PH 1 kW	NO	NO	NO	NO	NO
6	PRE-MIX KETTLES	3 PH 18 kW	100 PSI @ 1/4" NPTF	1" NPTF, CITY WATER, 45 PSI MAX	NO	NO	NO
7	MAIN PLC CONTROL PANEL	3 PH 0.5 kW	NO	NO	NO	NO	NO



MODEL 250 SAVORY POPCORN LINE WITH CONTINUOUS OIL POPPING

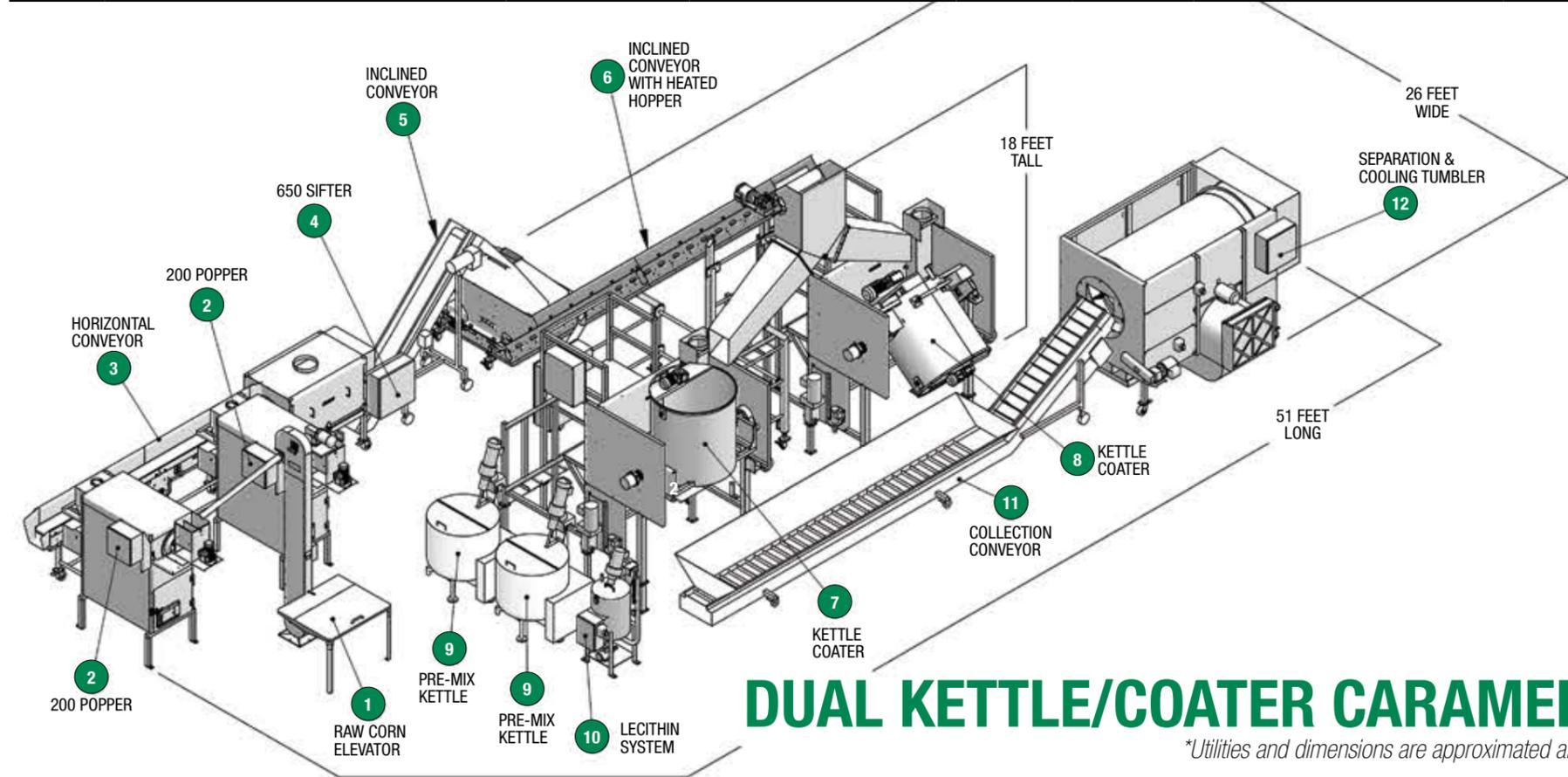
*Utilities and dimensions are approximated and representative.



650 SAVORY LINE

*Utilities and dimensions are approximated and representative.

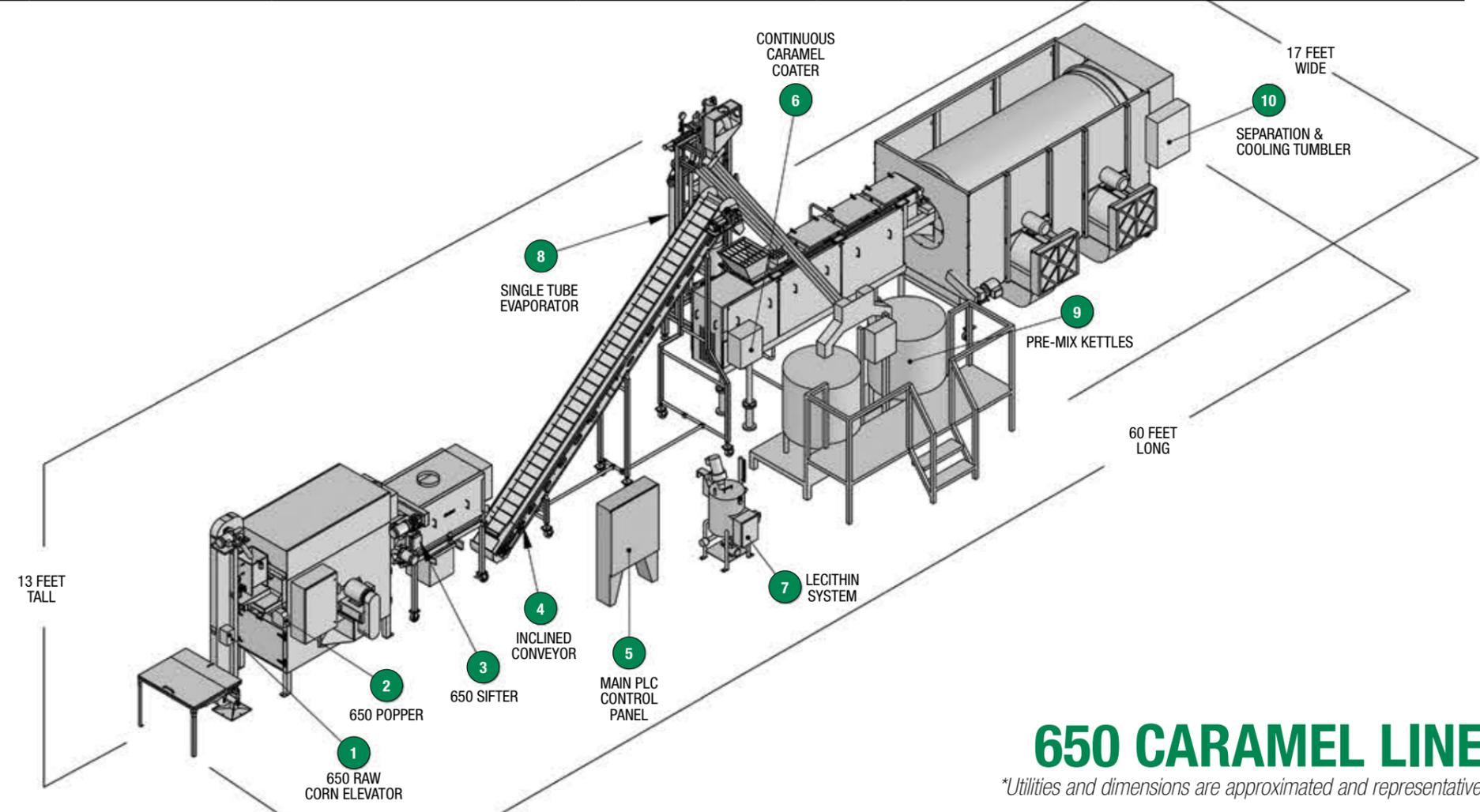
ITEM#	DESCRIPTION	POWER	COMPRESSED AIR	WATER	DRAIN	GAS	STEAM
1	650 RAW CORN ELEVATOR	3 PH 1 kW	NO	NO	NO	NO	NO
2	200 POPPER	3 PH 8.7 kW	NO	NO	NO	120,000 BTU-HR @ 0.5 PSI MAX	NO
3	HORIZONTAL CONVEYOR	3 PH 1 kW	NO	NO	NO	NO	NO
4	650 SIFTER	3 PH 1 kW	NO	NO	NO	NO	NO
5	INCLINED CONVEYOR	3 PH 1 kW	NO	NO	NO	NO	NO
6	INCLINED CONVEYOR WITH HEATED HOPPER	3 PH 4 kW	NO	NO	NO	NO	NO
7-8	KETTLE /COATER (EACH)	3 PH 4 kW	13 CFM @100 PSI	NO	NO	230,000 BTUH @ 5 PSI MAX	NO
9	PRE-MIX KETTLES	3 PH (EA) 1 kW (EA)	NO	NO	1" NPT (EA)	190,00 BTUH @ 0.5 PSI MAX (EA)	NO
10	LECITHIN SYSTEM	3 PH 3 kW	NO	NO	NO	NO	NO
11	COLLECTION CONVEYOR	3 PH 3 kW	NO	NO	NO	NO	NO
12	SEPARATION & COOLING TUMBLER	3 PH 5 kW	NO	NO	NO	NO	NO



DUAL KETTLE/COATER CARAMEL LINE

*Utilities and dimensions are approximated and representative.

ITEM#	DESCRIPTION	POWER	COMPRESSED AIR	WATER	DRAIN	GAS	STEAM
1	650 RAW CORN ELEVATOR	3 PH 1 kW	NO	NO	NO	NO	NO
2	650 POPPER	3 PH 8 kW	NO	NO	NO	300,000 BTU-HR @ 5 PSI MAX	NO
3	650 SIFTER	3 PH 1 kW	NO	NO	NO	NO	NO
4	INCLINED CONVEYOR	3 PH 1 kW	NO	NO	NO	NO	NO
5	MAIN PLC CONTROL PANEL	1 PH 0.5 kW	NO	NO	NO	NO	NO
6	CONTINUOUS CARAMEL COATER	3 PH 5 kW	NO	HOT CITY WATER @ 45 PSI 1/2" NPT	1" NPTF	NO	11 LBS/HR @ PSI MAX
7	LECITHIN SYSTEM	3 PH 4 kW	NO	NO	3/4" NPTF	NO	NO
8	SINGLE TUBE EVAPORATOR	1PH 0.5 kW	100 PSI FOR VALVE ACTUATION	HOT CITY WATER @ 45 PSI 1" NPT	1-1/4" NPTF	NO	400 LBS/HR @ 120 PSI MIN - 150 PSI MAX. 1-1/4" NPTF
9	PRE-MIX KETTLES	3 PH 2 kW	100 PSI FOR VALVE ACTUATION	NO	NO	NO	NO
10	SEPARATION & COOLING TUMBLER	3 PH 6 kW	NO	NO	NO	NO	NO



650 CARAMEL LINE

*Utilities and dimensions are approximated and representative.

Customization of Production Lines

Savory Line Options

In addition to customizing the size of the production line, Cretors offers many specific components to best match your needs. We will look closer at some elements here.

Some of the options available on our Savory lines:

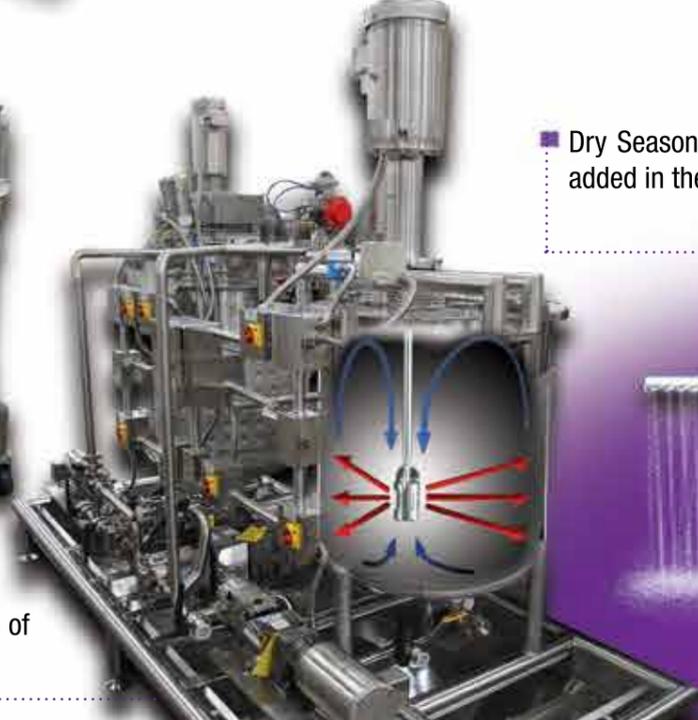
- The use of Load Cells.



- Many different types of pumps for the oil/slurries (Gear, Centrifugal or Lobe Pumps).



- Various styles of mixer in the Oil Slurry Kettles (High-speed impeller mixer, High-Shear Mixer or Wall-scraper Mixer).



- The type of heating system for the Holding Kettles.

- The use of individual kettles on casters or pairs of kettles on skids.

- Various arrangements for Air-Atomized Spray Nozzles used inside the Savory Coating Tumbler.



- Customizing of the control system (Relay Logic or PLC).

- Dry Seasoners to add dry ingredients in addition to those added in the oil slurries.



Caramel Line Options

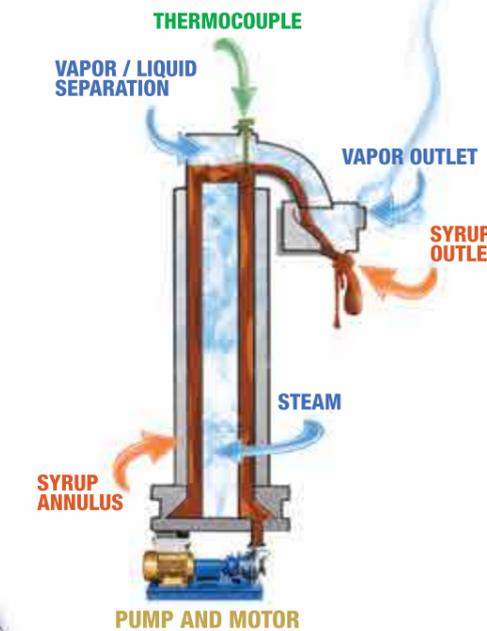
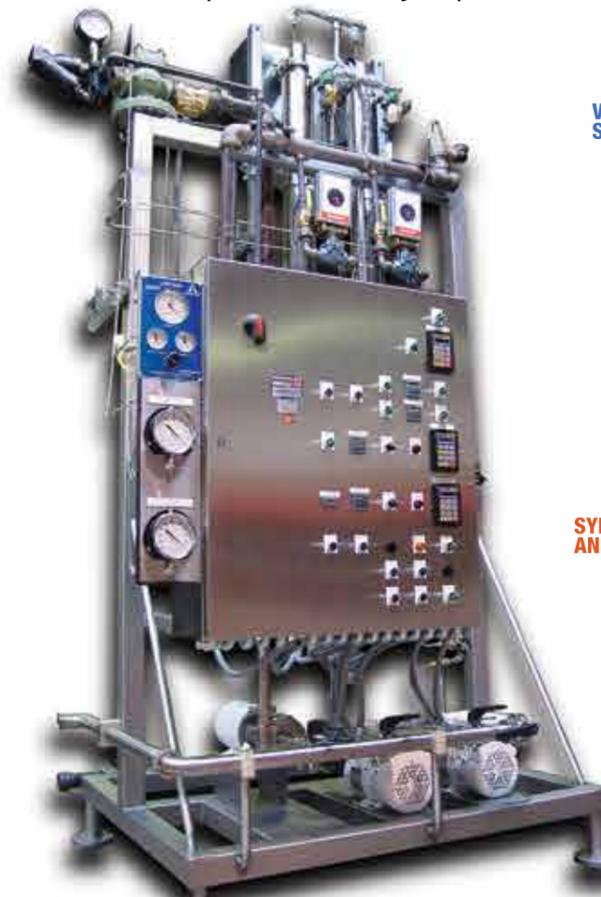
The main customization of our Automated Caramel lines are in regards to the Evaporator used. The Evaporator is used to cook the candy syrup to 300 °F (149 °C). We offer two types of Evaporator, the Thin Film Evaporator and the Scraped-Surface Evaporator.

The Thin Film Heat Exchanger consists of one or more parallel tube concentrator elements. Each element is dual jacketed to provide a heat transfer surface on both the inner and outer walls of the narrow product annulus. An extremely high heat transfer rate can be achieved since the product is fed in a turbulent, thin film between the two heat transfer surfaces.

In applications where it is necessary to concentrate highly viscous liquids, solutions with a high protein content or heat sensitive liquids (such as with some recipes of caramel), it is necessary to use a Scraped surface Heat exchanger. This style of exchanger achieves extremely high heat transfer rates by incorporating jackets on both the inner and outer walls of a narrow product annulus. During operation, the inner walls of the product annulus are continuously scraped by the spring-loaded scraper blades, which prevents product scorching and fouling. The mixing action provided by the scraper blades also provides even heat transfer and product homogeneity.

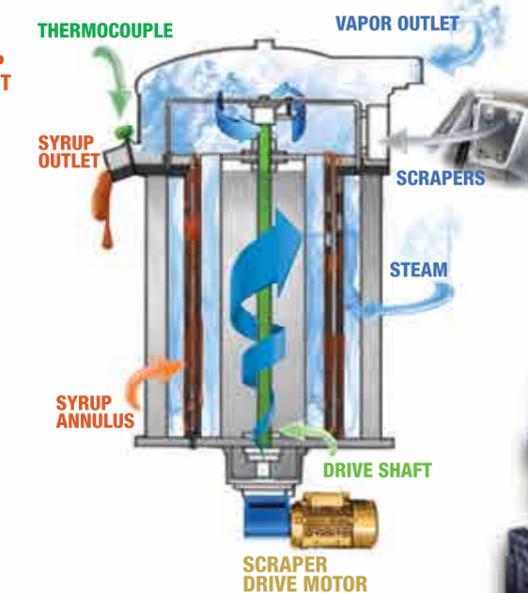
Thin Film Heat Exchanger

Various tube diameters and lengths are available. Tubes can also be mounted in parallel to match your production requirement.



Scraped Surface Heat Exchanger

Different diameters and lengths are available



INNOVATION ROOM



INNOVATING TECHNOLOGY - THE FUTURE OF POPCORN

With over 130 years of experience Cretors has the knowledge to tailor a system for your processing application.

Cretors offers a pilot plant for snack development and production. It is conveniently located within a 20 minute drive from O'Hare International Airport (Chicago, IL, USA). It can be used to produce savory and sweet popcorn. It can also be used for processing snack pellets and some cereals. We can process from raw ingredients through to sealing cartons of bagged snacks.

Small batch processes are available for initial tests and for recipe development. Scale-up can then be done onto the Pilot Lines. While the larger-scale, pilot lines use air-popping, our smaller test machines include oil-popping options.

The Room is air conditioned to ensure product stability and to limit moisture absorption. The packaging machine is also fitted with a nitrogen flushing system to displace any humid air in the snack package before sealing.

Customers can ship us their own ingredients or provide us with a list of required ingredients. Cretors can source ingredients locally and then invoice afterwards at cost.

A modern Vertical Form and Fill packaging machine with multi-head weighing system is provided. Products can be packaged at over 60 bags/minute. The output product can be boxed and shipped out for further evaluation at the customers' own facility.

2 Line Options Available

Two separate Pilot Lines are offered: one for in-line, continuous production of savory coated popcorn/snacks and one for caramel or candy coated popcorn/snacks. The savory popcorn Pilot Line has a capacity of over 200 Lbs/Hr (90 Kg/Hr). Both Oil Slurry (Spray) and Dry Seasoning applicators are available. The caramel popcorn production line has a capacity of over 400 Lbs/Hr.

State of the Art Instrumentation

Test instruments are provided. For example, the moisture contents of the raw material and the finished product can be accurately measured.

Dickey-John Moisture Analyzer

Accurate temperature-sensing capabilities allow you to measure frozen and hot grain.



FLO - THRU



C. CRETORS AND COMPANY

176 Mittel Drive | Wood Dale, Illinois 60191

Main: +1 847.616.6900 | Fax: +1 847.616.6970 | +1 800.228.1885

www.Flo-Thru.com