



**ALL THINGS
BAKING**

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Standardizing Your Production Process



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Standardizing Your Production Process

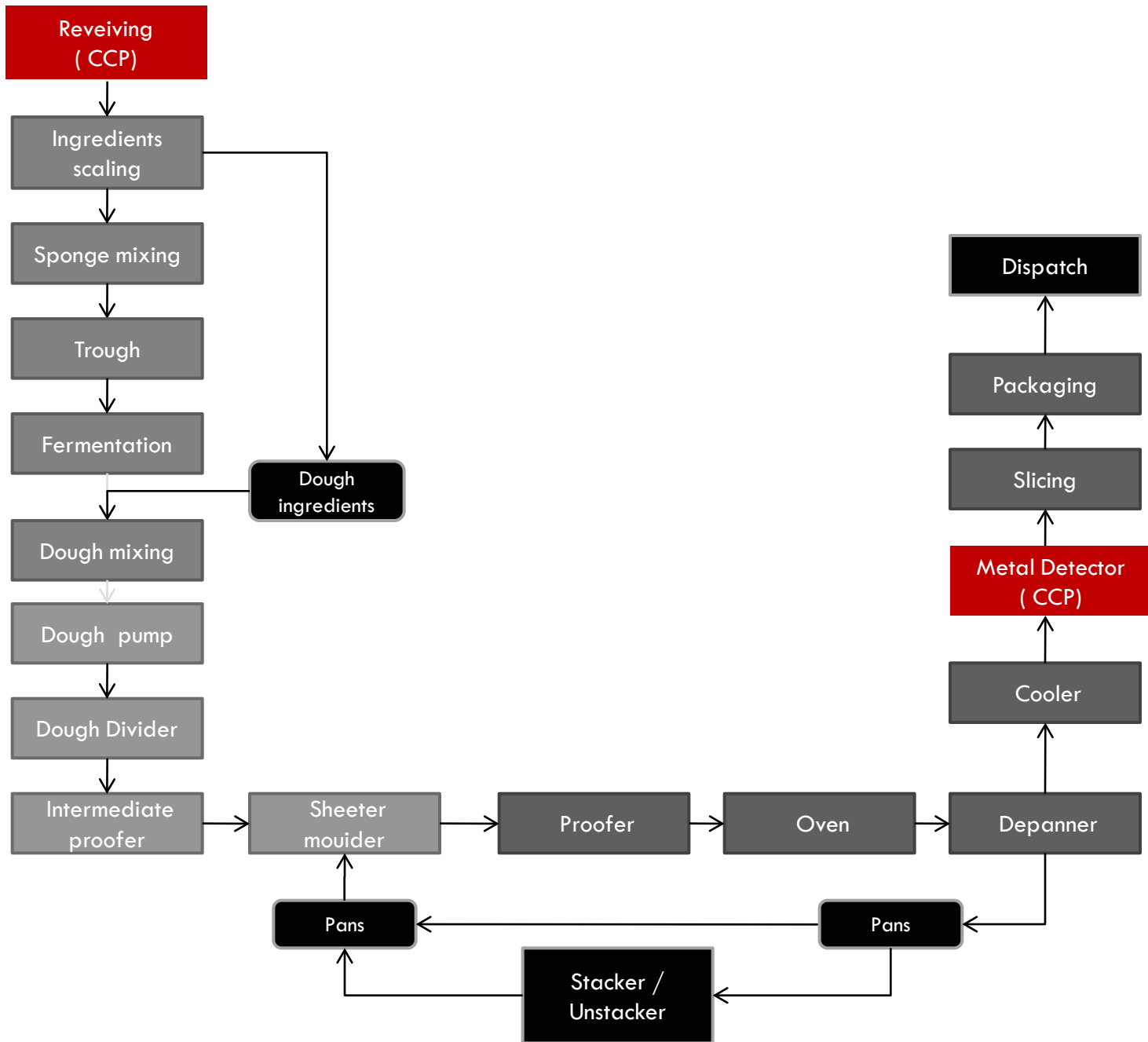
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Steps to Take

- Flow chart your process
- Take measures and benchmark
- Establish standards for finished products
- Identify key performance indicators (KPIs) that help you achieve consistent results
- Measure actual performance

Automatic Bun Line





KPI's

Sponge mixing

Variable	Ideal	Tolerance
Low speed mixing	2 min	± 1 min
High speed mixing	2 min	± 1 min
Dough out of mixer temperature	75° F	± 2° F
pH	5.20	± 0.1
TTA	3	± 0.5

Dough mixing

Variable	Ideal	Tolerance
Low speed mixing	2 min	± 1 min
High speed mixing	10 min	± 1 min
Dough out of mixer temperature	78° F	± 2° F
pH	5.20	± 0.1
TTA	4	± 0.5

Divider

Variable	Ideal	Tolerance
Dividing weight	62g	± 1g
Dough Temperature	78° F	± 2° F

Proof box

Variable	Ideal	Tolerance
Temperature	105° F	± 2° F
RH%	90%	± 2%
Dough temp. out of proofer	98° C	± 2° F
Proof time	60 min	± 1 min

Oven

Variable	Ideal	Tolerance
Temperature	430° F	± 10° F
Baking time	8 min	± 0.5 min
Bun Internal temperature	205° F	± 2° F

Cooler		
Variable	Ideal	Tolerance
Cooling time	30 min	± 0.5 min
Bun Internal temperature	95° C	± 2° F

Metal detector (CCP)		
Variable	Ideal	Tolerance
Ferrous	2.0 mm	Detection
Non Ferrous	2.5 mm	
Stainless Steel	3.0 mm	

Baggers		
UBE		
Variable	Ideal	Tolerance
Units per package	4	
Packages per tray	15	
Pill-o-pack		
Units per package	30	
Packages per tray	2	

Limiting piece of equipment



Steps in Making Cake Donuts

Scaling and Mixing

Depositing

Frying

Cooling

Icing

Packaging

Mixing Spiral Mixer



Batter Specifications	
Batter kg Per hour	740 kg
Batter Capacity (Needed)	240 kg
Batter Capacity (Available)	201 kg
Batter per hour	3.50 batters
Time per Batter	17 mins

Key Performance Indicators

Line: Donuts Area: Batter

Product	Powdered Sugar
Egg Yolk Temperature	4 – 7 °C
Water Temperature	6 – 7 °C
Time (Low speed)	0.5 – 1.5 min
Time (High speed)	2.0 – 8.0 min
Final Batter Temperature	18 – 24 °C
Specific Gravity	0.95 – 1.25

Depositor



Number of Cutters : 6 cutters

Key Performance Indicators

Line: Donuts Area: Depositor

Product	Powdered Sugar Donut
Weight of dough piece	21 – 25 g
Cutter height	1 ½ - 2 inch

Fryer



Fryer Specifications

Pieces Per hour (Needed)	2340 pieces
Pieces per hour (Available)	2350 pieces
Occupancy	100 %

Key Performance Indicators

Line: **Donuts** Area: **Fryer**

Product	Powdered Sugar
Weight of divided dough piece	21 – 25 g
Frying time	85 – 95 sec
Temperature Zone 1	355 – 365 °F
Temperature Zone 2	355 – 365 °F
Air Pressure	1.5- 4.5 PSI
Rate	39 rpm
No. of Cutters	6 cutters
Final Temperature	86 – 94 °C
Weight of the product after frying	25 – 30 g

Finish Line Conveyor



Cooling

Product	Powdered Sugar
Donut temperature (before cooling)	90 – 95 °C
Donut temperature (After cooling)	24 °C

Powdering Sugar



Powdering Sugar

Powdering Specifications	
Topping per package per kg	0.016
Dozen per hour capacity (Needed)	2300 pieces
Dozen per hour capacity (Available)	2430 pieces

Packaging



After getting separated, going for packaging



Wrapping Area

Packaging

Packaging Specifications	
Packaging per min Capacity (needed)	117
Packaging per min capacity (Available)	240
Machines available	2

Key Performance Indicators

Line: **Donuts** Area: **Packaging**

Product	Powdered Sugar
Temperature before powdering	28 ± 4 °C
Rate	57 – 70 rpm
Sealing temperature of the tube	120 – 130 °C
Sealing temperature (outside)	145 – 165 °C
Sealing temperature (inside)	145 – 165 °C
Cooling time after sealing	17 ± 3
Final Product temp. after packaging	28 ± 4 °C
Wt. of decoration Donuts	3.5g – 4.5 g
Wt. of donuts packaged	128 – 144 g

Metal Detector Critical Control Points



Metal Detector Patterns	
Ferrous	1 mm
Non Ferrous	1.5 mm
Stainless Steel	2 mm

Dimensions of Equipment

Fryer	
Frying Length	4.27m
Frying Width	61 cm
Standard donuts per pocket	6 donuts
Production	7416 donuts/hr (123 donuts/min)

Depositor	
Depositor length	4.27m
Depositor width	61 cm
Cutters	6
Hopper Capacity	120 lbs

Dimensions of Equipment

Conveyor

Conveyor Length	122 inch
Conveyor Width	70 inch

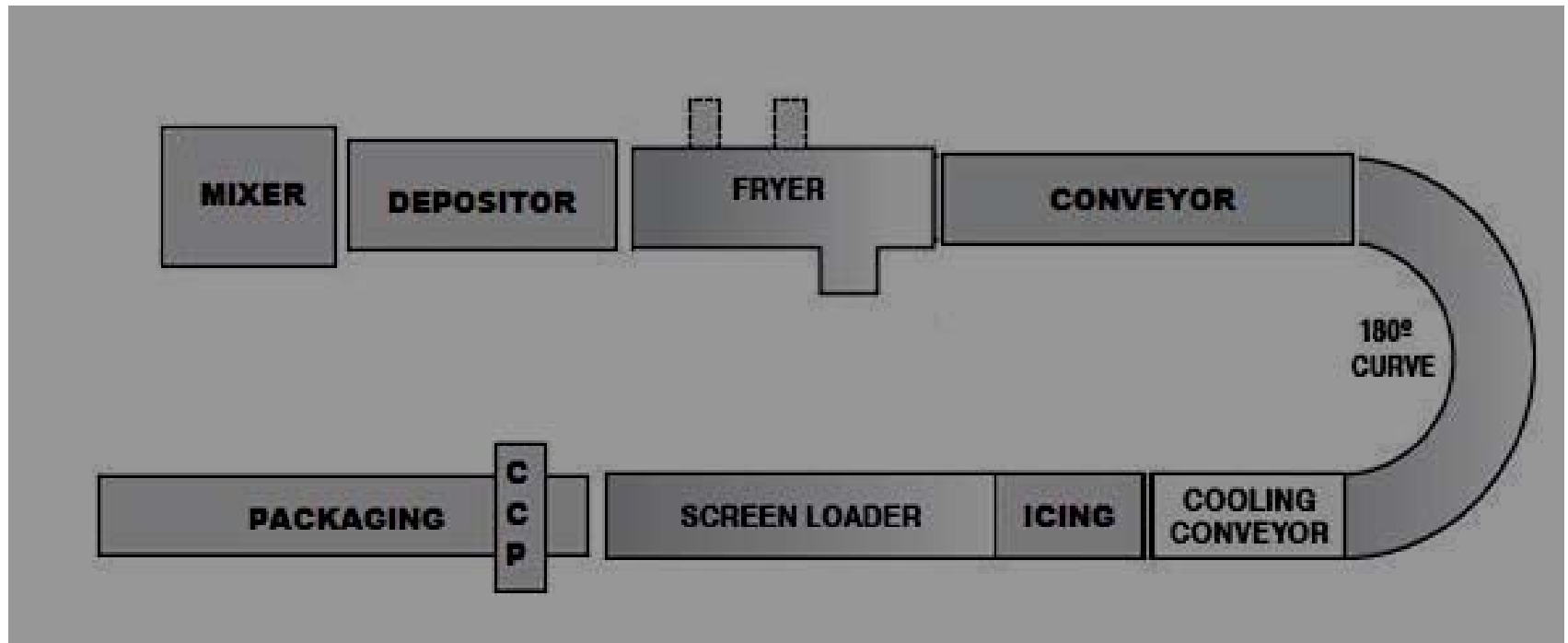
Powdering Sugar Machine

Length	2.13 m
Width	76 cm

Cooling Conveyor

Conveyor Length	2027 ft
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Donut Line Layout



KPIs for Other Products

- Cakes- batter specific gravity and temperature, deposit weight, oven temps., cake temp. after baking, temp. at decorating, icing temp. at application/viscosity of icing, packaging temp., storage temp.
- Cookies- spread, height, spread/height ratio, raw weight vs. finished weight.
- Pizza- dough temp., fermentation time and temp., proofing time, baking time/temp.

Differences for Smaller Bakeries

- No dedicated lines (more flexibility needed)
- No dedicated operators (need same people to do different parts of the process on different products)
- Not machine-paced
- Sales floor vs. Production floor concerns

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