



Fried Instant Noodles and Air Dried Noodles Processing Technology

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Innovations for a better world.

 **BÜHLER**

From Grain to Noodles

Grain Logistics

Milling Process

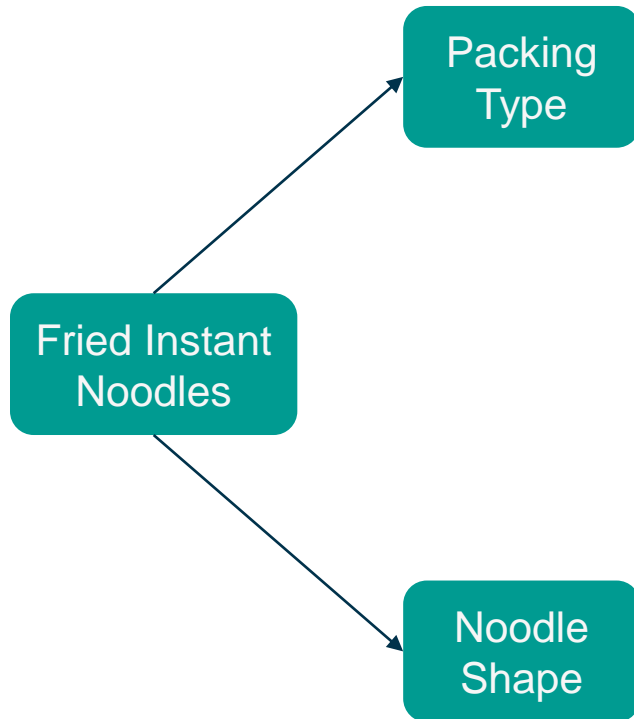
Noodle Process

Customer
Final
Products



Customer Final Noodle Products

Fried Instant Noodles



Customer Final Noodle Products

Air-Dried Noodles



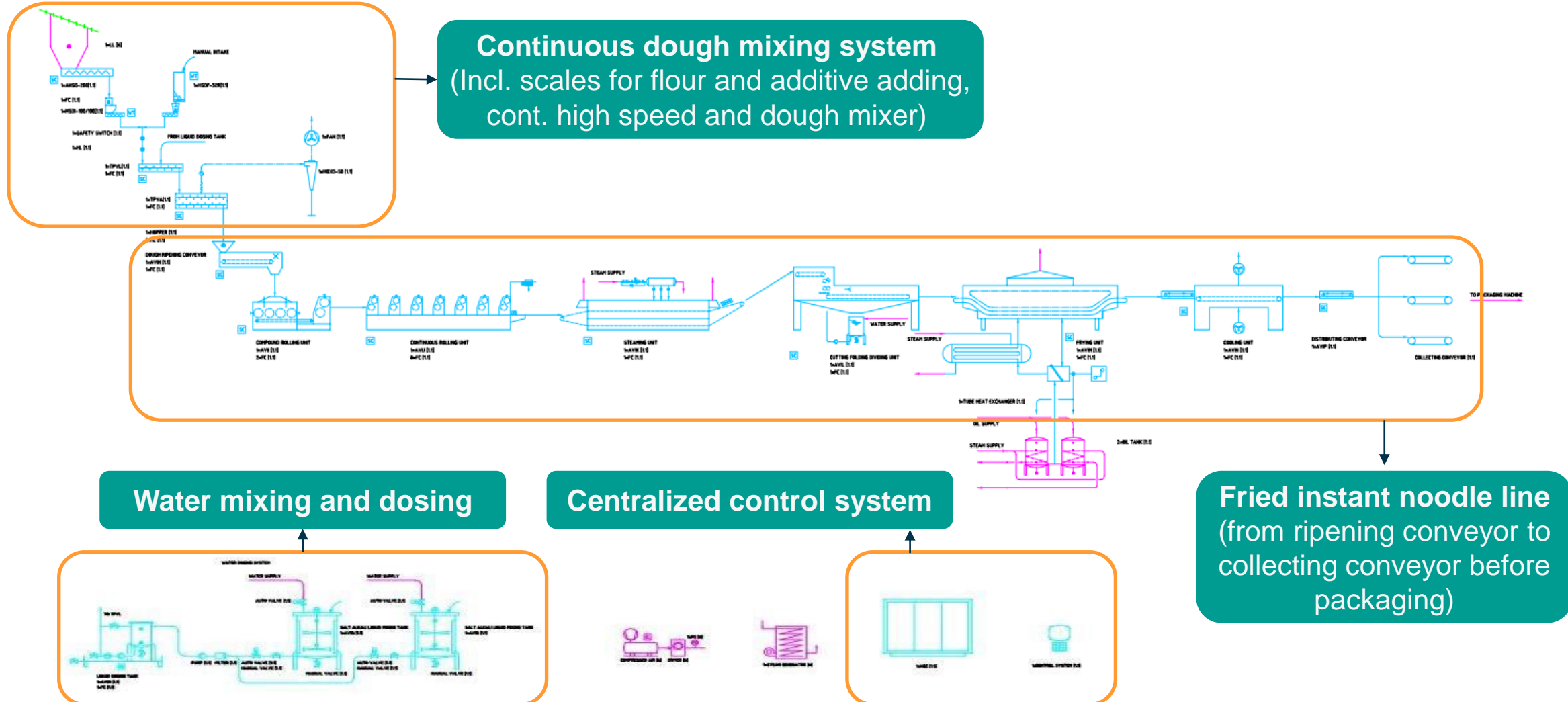
Customer Final Noodle Products

Air-Dried Noodles



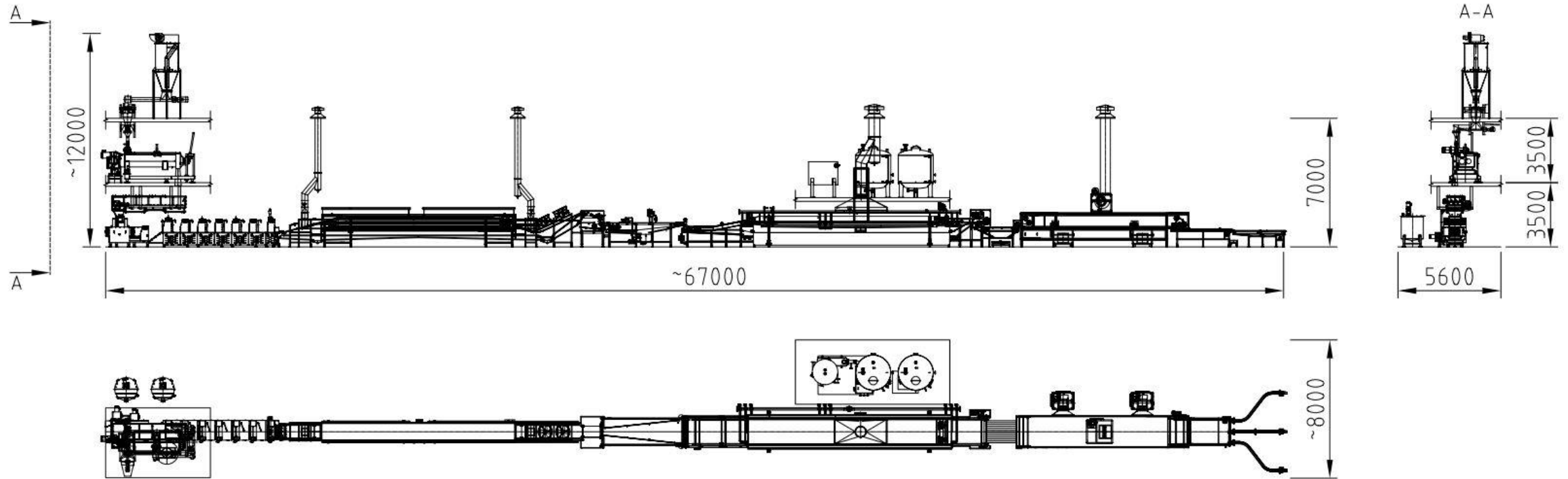
Fried Instant Noodle Technology

Flowsheet



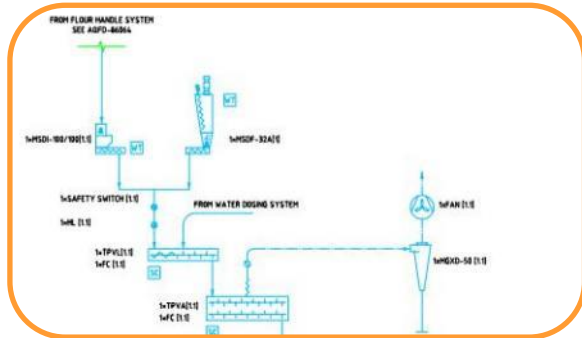
Fried Instant Noodle Technology

Layout - Capacity of 200'000pcs/8h as Reference

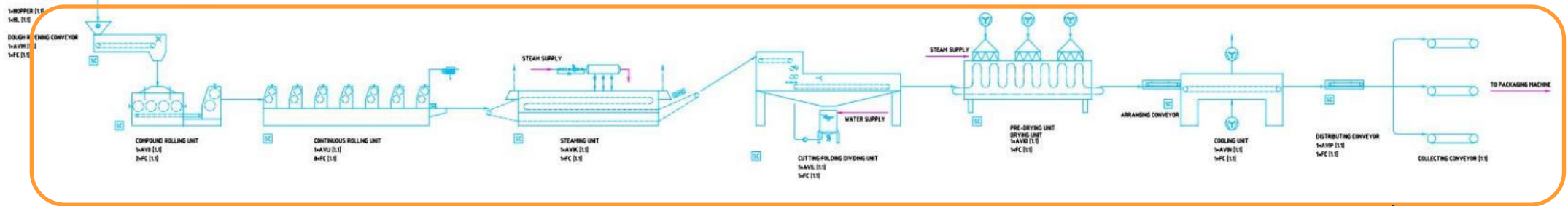


Air-Dried Noodle Technology

Flowsheet



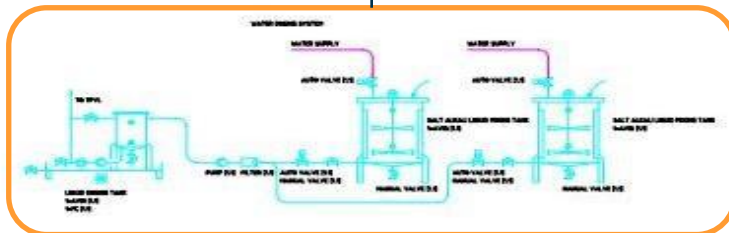
Continuous dough mixing system
(Incl. scales for flour and additive adding,
cont. high speed and dough mixer)



Water mixing and dosing

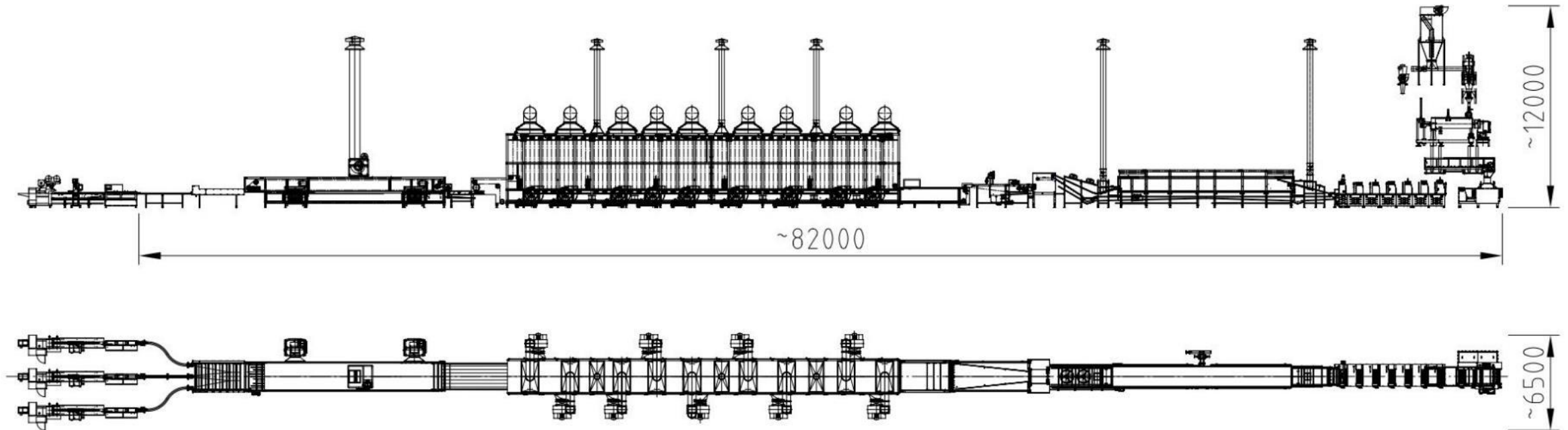
Centralized control system

Air-dried noodle line
(from ripening conveyor to
collecting conveyor before
packaging)



Air-Dried Noodle Technology

Layout - Capacity of 170'000pcs/8h as Reference



Raw Materials and Technical Functionality - Wheat Flour

Characteristics that favor the gelatinization of starch and the gluten network in noodles

Gluten Network:

- High protein content
- Quality of gluten
- Low coagulation temperature of the proteins
- Presence of thermally unstable soluble proteins
- Uniform distributions of the proteins
- High gelatinization temperature of the starch

Gelatinization of Starch:

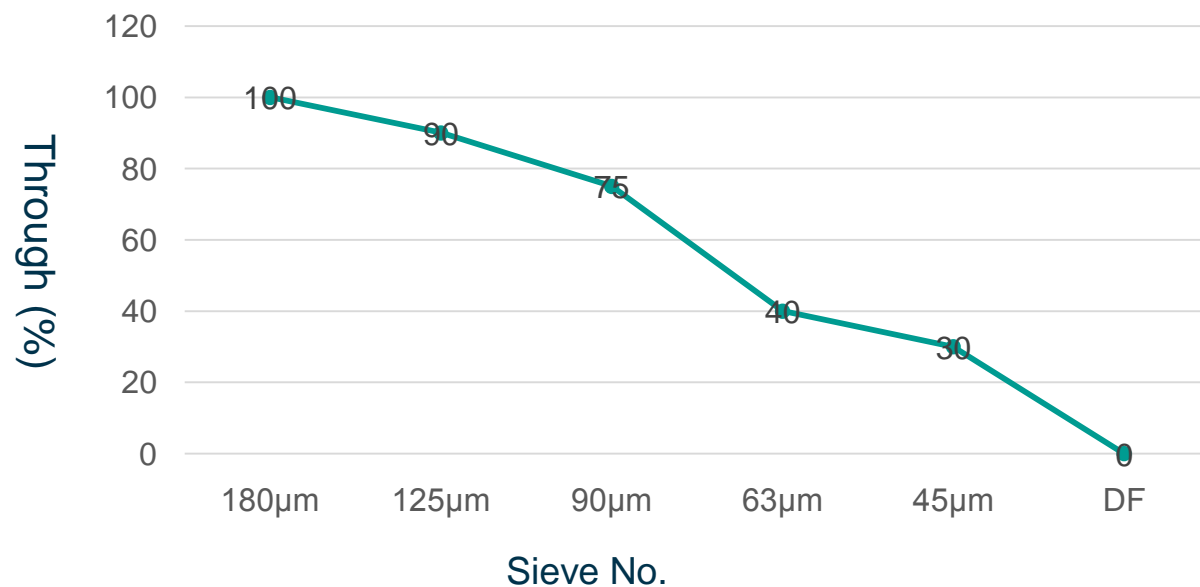
- Quality of the starch
- Low starches damages
- Larger diameters of the starch granules
- Lack of preventative polymerization of the gluten
- Unequal distribution of the proteins
- Presence of coagulated mass proteins

Optimal Flour for Noodle production

Chemical and physical data

Moisture (%)	Protein content (%db)	Wet Gluten (%)	Gluten Index (%)	Ash (%db)	Falling number (sec)	Starch damage (%)	Farinogram stability time (min.)	Wet gluten extensibility (cm)
13~14	>10	30~32	60~90	<0.6	>300	<10	>4	>10

Granulation:



Raw Materials and Technical Functionality

Refined, Bleached and Deodorised Palm Oil in noodles

RBDO's Fouctionality in frying

- Remove the moisture
- Make noodle strands microporous
- Fix product gelatinization degree
- Promote the flavour

Benefit

- Extended product shelf life
- Fast rehydration time, easy to cook
- Easy to cook
- Increase the oily and fine taste

Physicochemical data

Colors	Smells	Moisture (%)	Acid value (mgKOH/g)	Peroxide value (meq/kg)	Iodine value	Free fatty acid (%)	Rancidity test	Melting point (°C)
Light yellow	Nomally and no unpleasent	≤0.05	≤0.2	≤2	51-55	<0.4	Negative	24-39

Raw Materials and Technical Functionality

Food additives - Examples

Additives	Functionality
Edible salts	<ul style="list-style-type: none"> ● Promote the protein absorbing more water and expanding to enhance dough viscoelasticity and extensibility
Blended alkali(K_2CO_3 , Na_2CO_3 , $NaHCO_3$)	<ul style="list-style-type: none"> ● Enhance dough elasticity and extensibility ● Promote the starch gelatinization to enhance rehydration ● Decrease noodle gelatinization viscosity to make the noodle smoother ● Biosyntheses makes the noodle better appearance and flavor ● Reduce the cooking loss
Thickener (Guar gum, Na Carboxyl Methyl Cellulose, Locust bean gum, etc.)	<ul style="list-style-type: none"> ● High viscosity makes noodle taste smooth, reduce the cooking loss, improve the cooking tolerance ● High water binding capacity improve the dough absorbing water and good for network forming, increase the gelatinization

Raw Materials and Technical Functionality

Food additives - Examples

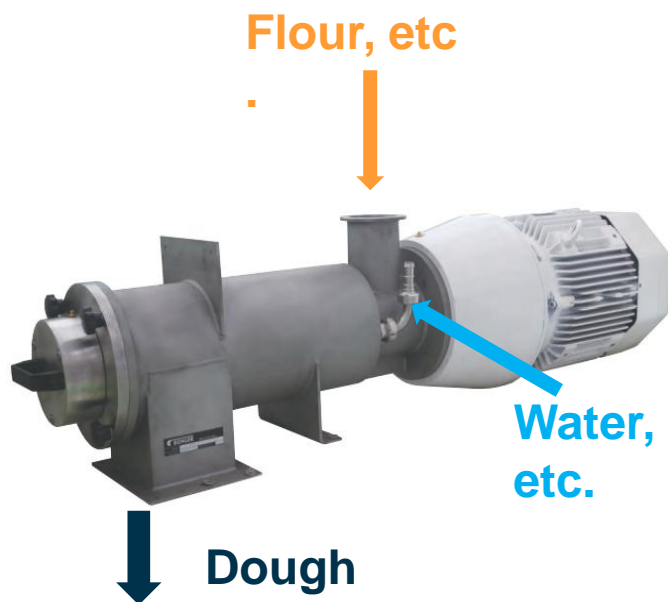
Additives	Functionality
Emulsifiers (LC-soy lecithin, GMS-Mono stearin)	<ul style="list-style-type: none"> ● Improve gluten quality ● Prevent starch aging ● Spread oil and fat evenly
Blended phosphate group (NaPO_3 , $\text{Na}_5\text{P}_3\text{O}_{10}$, $\text{Na}_4\text{P}_2\text{O}_7$, $\text{K}_4\text{P}_2\text{O}_7$)	<ul style="list-style-type: none"> ● Retention of water ● Improve starch gelatinization and gluten quality ● Improve noodle elasticity and surface smoothness ● Reduce cooking loss
Antioxidants (Vitamin E)	<ul style="list-style-type: none"> ● Prevent oxidation of oil ● Prevent the fat contained in noodles
Fortifier dietary supplements (Vitamin B ₁ , B ₂ , Calcium, etc.)	<ul style="list-style-type: none"> ● Nutrient enrichment
Colors (Gardenia yellow, Carotene etc.)	<ul style="list-style-type: none"> ● Improve the noodle appearance

Main Equipment

Continuous Dough Mixing System



Differential Dosing Scale



High-speed Mixer



Double-shaft Continuous Dough Mixer



Water Dosing System

Main Equipment

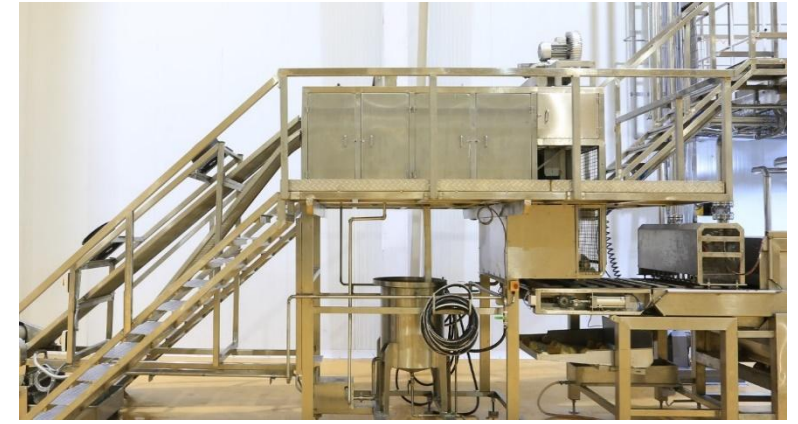
Noodle Production Line



Compound + Continuous Rolling Unit



Steaming Unit



Cutting Folding / Dropping Unit

Main Equipment

Noodle Production Line



Main Equipment

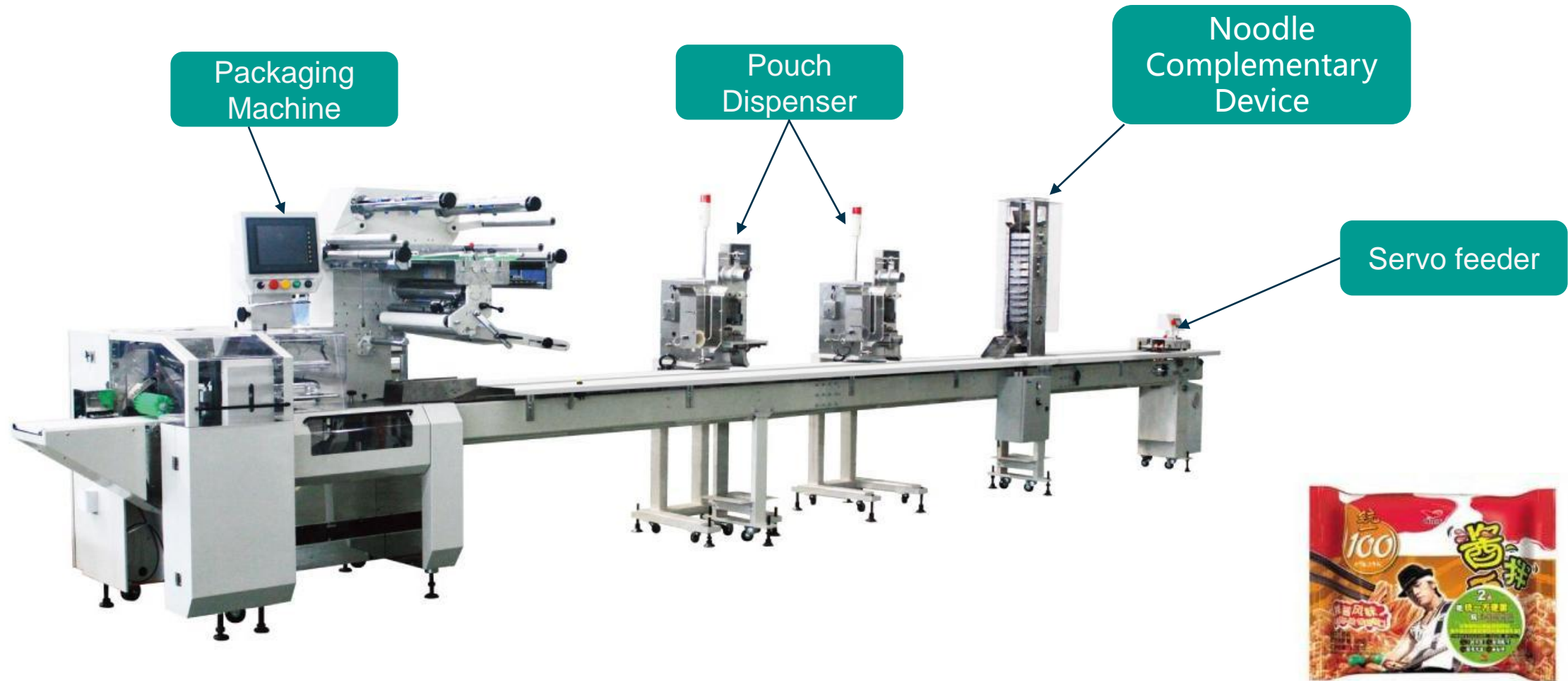
Noodle Production Line



Drying Unit

Main Equipment

Auto-Packaging Line



Main Equipment

WinCos Control System

Powerful
database



Management level
for recipes, jobs,
products etc.

Graphical processes
with actual values

Ethernet Latest communication
technology: **OPC**

Process
interlocking, equipment-
and process
control



Profibus



Quality Control

Items	Critical Control Point
Raw Materials quality control	<ul style="list-style-type: none">● Residual agriculture chemicals and veterinary drugs● Food allergy testing● Carcinogens● Food poisoning bacteria groups● Radioactive substances● Heavy metals● Irradiation verification
Processing Control	<ul style="list-style-type: none">● Quality Management system● Manufacturing practices● On-site inspection● Food safety and Hygiene management● Maintenance● Cleaning activities

Quality Control

Finished Goods Analysis

Physicochemical data

	Fried Instant Noodle	Air Dried Noodle
Colors	Milk white/Faint yellow	
Smells	Odorless	
Impurities	No visible	
Moisture (%) ≤	8	14
Fat (%) ≤	22	
NaCl (%) ≤	2.5	
Acid value (in fat) (mgKOH/g) ≤	1.8	
Peroxide value (in fat) (meq/kg) ≤	20	
IOD value ≥	1	
Rehydration time(min.) ≤	4	6

Thank you!

Engineering Customer Success

