

**OFFER NO-06-12/464467HM**

**Date: 03.04.2018**



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# **CONDIN CONSULTING**

## **ALGERIA**

**Long Cut Pasta Production Line with the Production Capacity  
of 1500 kg/h**

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03.04.2018**

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## **A – LONG CUT PASTA PRODUCTION LINE with the PRODUCTION CAPACITY of 1500 KG/H**

### **A.1 – PRESS UNIT – Model TAL 1.210 – 1980 L**

#### **A.1.1 – SEMOLINA FEEDING UNIT**

Consisting of a sensed cyclone which has alarm system if the level of flour/semolina decreases. System of the unit is specially equipped with openable covers for casual maintenance/cleaning operations.

#### **A.1.2 – FLOUR/SEMOLINA DOSING**

Semolina is the main raw material of pasta production.

- Can be adjusted to the desired capacity by spiral operated with an inverter (Yaskawa Control Technic)

#### **A.1.3 – WATER DOSING UNIT**

- 2-way pneumatic water circuit.
- Plastic pipes
- Thermometer and manometer.
- Sensitive water dosing by mono-pump.
- Magnetic shutting valve
- Sensitive water flow by flow-meter system

#### **A.1.4 – FAST MIXER-TLA – P**

Made of AISI 304 stainless steel material and has following characteristics;

- Front covers –easy-to-open
- Mixer with paddles
- Side-opening covers specially designed for mechanic safety.

- Electric motors supplied from Turkish brand “GAMAK / IMAK”
- ☐ Liquid inlet with double-entry
- ☐ Flour/semolina inlet from the flour/semolina dosing unit

#### **A.1.5 – MAINTROUGH**

- ☐ Adjustable kneading paddles, made of AISI 304 stainless steel material.
- ☐ Stainless steel shaft.
- ☐ Dough residues occurred on the inner surface of the trough always can be cleaned by stripping pallets located on the edge of the main shaft.
- ☐ Chrome made covers for kneading trough and safety switches.
- ☐ Special designed thrust-bearing lubrication system.
- ☐ Special receptacle which pours the dough to the vacuum lock.
- ☐ Dough touching surfaces are coated with AISI 304 stainless steel material.
- Reducers supplied from Turkish brand “YILMAZ / IMAK”
- Electric motors supplied from Turkish brand “GAMAK / VOLT”

#### **A.1.6 – VACUUM LOCK**

- Solid silk screen casting body
- 3 chamber vacuum capsule
- Direct coupled reducer
- Pure G20 structure, special bronze casting

#### **A.1.7 – VACUUM TROUGH**

- AISI 304 stainless steel vacuum mixer.
- Vacuum sealed mica covers with 30 mm thickness.
- Safety switches.
- Stainless steel shaft and adjustable mixing paddles.
- Dough touching surfaces are coated with AISI 304 stainless steel material.

**A.1.8 – MAIN HELIX (Ø 210 mm)**

- Highly resistant carbon steel pressure cylinders coated with stainless steel
- Stainless steel jacket to cool the cylinder
- Fixed angle and variable profile
- 3-leaved grinder for dough
- Chrome coated (CK45)
- Main helical gearbox with special extruder body
- Exchanger and pumping system mounted with plastic pipes
- Control and measuring of barrel temperature with PT 100
- Main spiral motor controlled by inverter

**A.1.9 – ALIGNED RECTANGULAR LONG CUT PASTA DIE – 1980 mm**

- Exchanger and pumping system mounted with plastic pipes
- Control and measuring of die slot temperature with PT 100
- Hydraulic system for die changing operations

**A.1.10 – SPREADER-TAL – S – 200**

Designed for automatic pasta spreading operation for long cut pasta – Length: 1850 mm

Machine equipment;

- Aeration fans for cutting chamber
- Moist product cutting by horizontal rotative knives
- Synchronous storage system on the forwarding device
- Automatic conveyor of sticks upon hooks-fitted chain, equipped with safety mechanical clutch and automatic re-phasing device.
- Mono-block structure
- Horizontal knives made of hardened metal material

- System of horizontal knives equipped with special height adjusting system to set appropriate height for products (4500 – 6000 mm)
- Drive motors with electric brake
- Ladders and accesspoints

#### A.1.11 – RECYCLING SYSTEM

- Recycle conveyor belts made of polyurethane material
- Aspirator and cutter to pneumatic transfer of recycled products, and a decompression cyclone to extraction
- ❖ *It is possible to control, monitoring and data recording while the line is running thanks to the electric switchboard which equipped with PLC, safety and control devices, mounted on the main control panel.*

## A.2 – DRYING UNIT

Pasta drying unit of us consists of 3 sections for increasing product quality by using 6 independent climatic zones. Each zone has its own temperature/humidity values and controlled independently to get the maximum quality. There is also a special designed nozzle system to inject steam inside the dryer cabins.

Spaghetti products transmitted to one cabin from another by means of special heat-treated conveyor chains in drying unit consisted of 5 drying cabins in a single row. There are control windows to take product samples on main panels in 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> zones. Total drying operation time is calculated approximately 5 – 5,5 hours depending on pasta shape. Stages of drying process described in detail below;

### A.2.1 – PRE-DRYING SECTION

Pre-drying section consists of 3 climatic zones. Technical details:

- There are aspirators in first zone to provide clean and required moisture
- Air circulation aspirators located at the top of the cabin specially designed by Codin's supplier Makina in the second climate zone.
- The third zone equipped with aeration aspirators, additionally there is a nozzle system to inject steam inside the cabin.
- Polyester cabin combined with lateral and top panels with 40 mm thickness
- Lateral panels can be fully opened
- Whole structure made of AISI 37 steel
- Operated by aluminium fans and axial fans with electric motors
- Hot water controlled by proportional 4-20 mA control system and 3-way valve (Siemens/Germany). Hot water the machine needs provided by a hot water pump (KSB/Turkey)
- Hot air the machine needs provided by hot water serpentines
- Fresh air into the drying cabin heated by a serpentine mounted in front of the aspirator. This system controlled proportionally by 4-20 mA.
- Temperature and humidity control provided by a probe located inside the dryer. This device transfers the data to PLC, thus all settings and values can be controlled.

### A.2.2 – MAIN DRYING SECTION

This section consists of only 1 climatic zone (4<sup>th</sup> zone). Process of this section is the same as described above. The only difference is a nozzle system in this section to inject steam into the cabin.

- Polyester cabin combined with lateral and top panels with 40 mm thickness
- Lateral panels can be fully opened
- Whole structure made of AISI 37 steel
- Operated by aluminium fans and axial fans with electric motors

- Hot water controlled by proportional 4-20 mA control system and 3-way valve (Siemens/Germany). Hot water the machine needs provided by a hot water pump (KSB/Turkey)
- Hot air the machine needs provided by hot water serpentine
- Fresh air into the drying cabin heated by a serpentine mounted in front of the aspirator. This system controlled proportionally by 4-20 mA.
- Temperature and humidity control provided by a probe located inside the dryer. This device transfers the data to PLC, thus all settings and values can be controlled.
- A special nozzle system to inject steam into the drying cabin.

### **A.2.3 – COOLING SECTION**

This section consists single and the last drying cabin of drying process. It has 2 climatic zones (5<sup>th</sup> and 6<sup>th</sup> zones). Temperature and humidity measuring for each zone are conducted independently by measuring probes.

- Polyester cabin combined with lateral and top panels with 40 mm thickness
- Lateral panels can be fully opened
- Whole structure made of AISI 37 steel
- Operated by aluminium fans and axial fans with electric motors
- Cold water controlled proportionally with 4-20 mA and provided by a circulation pump and 3-way valves.
- Temperature and humidity control provided by a probe located inside the dryer. This device transfers the data to PLC, thus all settings and values can be controlled.

### **A.3 – STRIPPER-TAL – 1850**

- Mono-block structure
- Triangle feeding units with automatic product distribution system
- Low type cutting units, cutting disks, sticks and necessary equipment to cut product with 250 – 260 mm length.

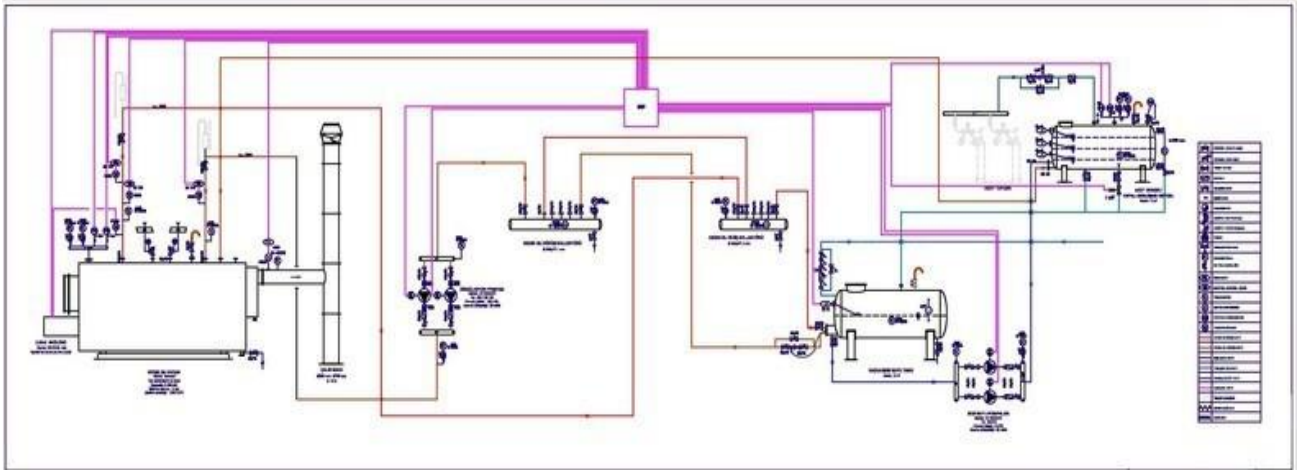


- Section type conveyors
- Drive motors with electric brake
- Ladder and access points
- Appropriate discharge system to the structure of facility building
- Residue recycling system
- Movement of empty sticks provided by special designed transport system with chains

#### A.4 –SUPERHEATED WATER SYSTEM

**Unit consists;**

- 1 boiler to heat the water (superheated water). Thermal power – 550.000 kcal/h
- 1 gas burner (there are several variables (diesel, natural-gas, charcoral, fuel-oil etc.)
- 1 chimney, made of steel sheet. Maximum height - 10 m from the ground
- 1 hot water circulation pump
- On/off valves, non-return valves, filters, thermometers and manometers, automatic air extraction devices
- Sealing pipes for connection made of carbon steel and other related connection parts
- Hot water distribution system through the whole line
- 1 electric switchboard and thermal unit
- **Operating temperature:** 130°C.
- **Pressure:** Maximum 4bars.
- **Buyer is obliged to supply the fuel up to the boiler room.**



❖ **HEATING INFRASTRUCTURE of the LINE WILL BE DESIGNED in ACCORDANCE WITH the CUSTOMER PREFERENCE of FUEL USAGE**

#### A.4.1 – STEAM GENERATOR

This unit meets the steam necessity of the line.

##### **Technical features;**

- Industrial type, works with 380 V electricity
- 100% safety with voice alarm system and safety valves
- Water feeding operated automatically by means of pumping system
- Steam capacity: 10kg/h.
- 100 l condenser tank, made of Cr-Ni stainless steel
- Ready to work at full capacity in 20 minutes
- Working pressure: 4 bars
- Resistance power: 2x10kw
- Depending on the usage capacity resistances can be switched gradually. Manufactured in accordance with CE norms.

#### A.4.2 – SET of INTERNAL FITTING MATERIALS

Set of material to apply the following connections (pipes and accessories)

- Thermal station, cooling system and internal connections of vacuum system
- Superheated water distribution
- Connections of the hot water for dough
- Connections of vacuum pump

## **B – GENERAL CONDITIONS for MAIN CONTROL PANEL, ELECTRIC SWITCH BOARD and AUTOMATION SYSTEM**

All functions controlled by a PLC computer assembled inside the control panel and an operator interface to manage the electric panel and the whole production of the line by a desktop computer which has the graphic software.

Button console mounted on press platform controls dosage/measurement system of raw material by means of its alpha-numeric interface, besides provides to control product extrusion and forming.

#### **B.1 – INSPECTION and CONTROL**

Can be conducted by graphic control system besides automation equipment.

##### **Items of control system:**

- High-performance PC
- 22" colour widescreen
- Scada system
- Operating system: WINDOWS 7 Sp1.

## B.2 – ELECTRIC PANEL

### Components of the panel:

- Electrostatic painted special made electric cabins from “EAE” brand
- Cabin and terminal box, local paint of the cabin “RAL 7032” and protection class IP 55. External terminal box and other junction boxes. All internal panels are galvanised
- Schneider and/or Siemens brands are used in the whole electric system
- Brands used in electro-mechanical equipment of command/control system (magneto-thermic, circuit breakers, etc.) chosen from the worldwide brands like Schneider, Vipa Siemens, Pheneix, etc.
- Inverters for motor speed management from Yaskawa Control Technic or equivalent brand
- Flour/Semolina dosing motor; Press helix motors, electro-pump motors
- Vipa or Siemens brands used in PLC for automation management
- Alpha-numeric colour operator interface mounted on the shutter

## B.3 – AUTO-CONTROL SYSTEM / RAW MATERIAL DOSAGE MANAGEMENT

- Dosage system works automatically depending on planned recipe. Liquid entries managed by an appropriate PID with auto regulation, another PID algorithm measures the flour/semolina dose. Flour/semolina and water rates memorized by the system automatically.
- System sets the appropriate capacity of flour/semolina automatically. Thus, adjusted mixture rate can be stabilized.
- Mixture level in the vacuum mixer affects perception of values without probes
- Except the automatic adjustment of dosing rates between water and flour/semolina, system also stabilise pressure of the extrusion spiral on the adjusted level.
- Values of operating variables can be monitored on the screen of operator panel. Every functioning above mentioned can be dosed by manually.

## B.4 – MANAGEMENT of PRESS

### B.4.1 – PRESS

Automatic cycle of the press which can be adjusted by the operator consists of 2 phases;

**Filling:** Start of all kneaders with screws at a standstill until max level set is reached in the vacuum kneader.

**Discharge:** Discharging of the dough comes from kneading trough while kneaders are working actively.

- In the event of drier standstill, the press will come to a stop during the cutting stage and re-starting of the machine will go into phase automatically.

Press completely controlled automatically by PLC. Some of functions controlled by PLC;

- Tank fillings
- Initial dough discharging
- Cylinder thermostation, diffuser pipes and water mixtures
- Speed settings of helix extrusion which can be varied depending on the chosen recipe
- Vacuum pressure
- Dough pressure

### B.4.2 – DOSING

- Volumetric flour/semolina doser operated automatically and controlled by inverters (Yaskawa Control Technic)
- Flow-meter system for water dosing

## B.5 – MANAGEMENT of DRYING UNIT

### B.5.1 – DRYING

- System provides to control drying process by making temperature and delta adjustments in some transition areas within the whole line.
- System controlled by a control programme installed in PLC. There is also an operator interface with functions can be used by personnel in inception and/or alarm case.
- Temperature levels in variable water batteries and heating radiators monitored by PT 100 probes while variable temperature and humidity values in different climatic zones transmitted to the PLC by GENTEK brand probes.
- Delta T values are calculated depending on temperature and humidity values which gained by the probes.

Activities in production and drying sections managed automatically. Particularly;

- Required settings, fan motors, driving motor and automatic start of the line by activation of all functions related to presence of the product in different control areas
- Maintenance management in case of stopping the production
- Automatic adjustment of parameters in case of format changing during operation.
- Automatic management of the uses stop (Motor, fans, regulators) in emptying line phase for end production.

All functions and mechanic drivers of components related to automatic management of operation parameters of drying unit controlled by means of PLC.

- Start of the line by activation of the aeration fan motors and climatic control system
- Management of the line in alarm mode
- Management of discharge operation for ending production

System automatically makes adjustment of parameter settings for above mentioned functions to provide the maximum product quality.

## **B.5.2 – CLIMATIC CONTROL**

All climatic zones controlled by PID in accordance with parameters set by operator.

The following functions are restricted;

- Modifications on transfer stages are restricted to protect the product quality
- Maximum mA value of hot water valve
- Settings and regulations of PID parameters of regulators

## **B.6 – AUTOMATIC MANAGEMENT of the PRODUCTION PROCESS**

### **B.6.1 – FUNCTIONING**

All the following functions managed by the PC located in the control room. Besides mentioned above, the automation system functionalizes following features;

- Generating, pre-setting and modifying operations for each recipe
- Format change function allows the operator to make adjustments on PID and limit values depending on the position of the product inside the line
- Management of product lots
- Automatic start of the line
- Visualization of the geographical position of the product in the line.
- Shutting down of the line
- Modifying and setting the processing parameters of the line manually. Data recording of the shapes produced
- File management of the dies with automatic calculation of the hours of use for every die
- Recordings all values of production process (temperature, humidity, amount of production, etc.) to a special database which displays instantaneous and past trends
- Recording of the processing value histograms
- Possibility of analysing all processing data from a PC
- Password protection to the changes of data

- Major parameters can be protected by setting password to the access page of those parameters.
- Time of alarm
- Number of alarm
- Efficiency of the line

### **B.6.2 – DISPLAY and MONITORING**

- Whole line and ancillary equipment can be displayed on colour screen pages
- The top-quality graphics utilized are of easy intuition by any user
- Several climatic zone pages are also displayed which show the current status of the valves and trend charts

### **B.6.3 – HISTORICAL ARCHIVE MEMORY**

Thanks to this system, process records can be stored, all main variables can be displayed and printed, and necessary interventions to the historical archive can be done.

- If you set the period you interest in, you can retrieve a list of all alarms or a list of alarms per category.
- If you click on the graphic archives, you can visualise saved trends and you can zoom in on the different areas of the graphs in order to identify the slightest of variations.



## B.7 – FUNCTIONALITY of PRODUCT QUALITY MANAGEMENT

- System of the supervision programme provides support for product quality control
- The present product in the line is divided in lotteries identified by their position inside the same line
- With reference to determined events is possible to effect automatically a selection of that product that, having suffered a different process drying from the standard, could result not conforming
- Each preselected pasta shape inside the line has its own unique colour
- When the selected product reaches the packing unit, is possible to produce a signalling to recall the attention of the operators employed to the control of the quality for the opportune device to be adopted
- Preselected products might be affected by operator interventions

## B.8 – REMOTE ASSISTANCE

- Thanks to the automation system which includes telephone, modem and a PC, remote assistance can be made urgently
- Internet connection must be provided by the buyer
- The connection must always to be activated by the present operators on the plant
- The service is free furnished (excluded the cost of the telephone connection) during the guarantee period

**C – POWER CONSUMPTION DETAILS of the PRODUCTION LINE**

REQUIRED THERMAL POWER	412500	kcal/h
HOT WATER INLET TEMPERATURE	130	°C
REQUIRED ELECTRIC POWER	223	kw
WATER for DOUGH	450	l/h

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## D – PRICE LIST

Quantity	LONG CUT PASTA PRODUCTION LINE with the PRODUCTION CAPACITY of 1500KG/H	EXW (Exwork) GAZIANTEP PRICE (EURO)
1	Automatic Press with Vacuum Unit – TAL 1.210 – 1980 L	
1	Rectangular Long Cut Pasta Die	
1	Pre-drying	
1	Drying	
1	Cooling Unit	
1	Stripper – TAL – 1850 (Rear Cutting Unit)	
1	Thermal Control Centre (Boiler & Superheated Water System)	
1	Steam Generator	
1	Set of Internal Fitting Materials	
1	Main Control Panel (PLC – Automation System)	
1	Installation and Inspection Services	
		<b>TOTAL: 1.177.000 €</b>

## E – MANUFACTURE and INSTALLATION

### E.1 – MANUFACTURE and INSTALLATION PERIOD

- Period of manufacture is 180 working days after receiving the advance payment.
- Installation and start up period is 60 working days.
- The electrical connections of systems' equipment must be covered at the inside of the building only.
- Except the outer lightning of the equipment, all converters, low tension transformers, underground cables must be inside of the building (inner plant and outer lightning are excluded).
- The potable water installation which is required for the plant is at the responsibility on customer.
- Codin's supplier Makina will not have responsibility for delay which might affect negatively the installation period because of the delay of supply of the necessities and equipment which must be provided by the customer.
- Lifts, forklifts etc. and other necessary equipment for unloading off the trucks and transfer to the site will be provided by the customer.
- The necessary workmanship support to the Codin's supplier Makina's technicians will be held by the customer.
- Main control panel is controlled by touch screen automation system.
- Air conditioned control panel is controlled by touch screen PID automation system.
- The offer is valid for 60 days

## E.2 – TRAINING of LOCAL STAFF

All mentioned equipment, devices, tools, etc. included in this proposal will be installed by our technicians.

### **Mechanical Installation;**

Mechanical installation of the line will be conducted by our technicians with the help of following numbers of local staff who must be provided by the buyer;

- 5 local staff

### **Electronic installation;**

Electronic installation of the line will be conducted by our technicians with the help of following numbers of local staff who must be provided by the buyer;

- 2 electricians (with their own tools and equipment)

### **Hydraulic Installation;**

Hydraulic installation of the line will be conducted by our technicians with the help of following numbers of local staff who must be provided by the buyer;

- 3 local plumber (with their own tools and equipment)

### **Functioning test;**

This test is not a production but only to see that the mechanical, electronical and hydraulic components of the line works perfectly as planned, and this will be conducted by our technicians.

### **Test of Technological Components;**

This test will be conducted by our technicians to see that all the technological components of the line work perfectly as planned.

- ❖ **Our technicians will test the line during 10 days only with one pasta die (one of the dies given within the line).**

## F – WARRANTY

### F.1 – TERMS of WARRANTY

In all pasta lines can be used both semolina flour from durum wheat or white flour from soft wheat.

- The guarantee of machines and equipment is 24 months from the beginning till start-up of the system.
- Customer should conform instructions and obligations to operate the line within warranty. Seller will not be responsible for any material wear that cause defects, negligence and professional faults within maintenance and operation in case of improper use.
- The necessary maintenance and lubrication instructions during the warranty will be given by a chart and customer has to strictly comply these instructions.
- The warranty will be invalid in case of any modifications which might be made without confirmation of Codin's supplier Makina.
- The long cut macaroni line works as continuous system.
- The control panel and electrical motors will be chosen from CE certificated brands and suppliers.
- The offer is valid for 60 days.**
- Without explicit applications, how much described in offer will be built according to the Normative of European Union.**

## F.2 – PAYMENT TERMS

Payment cash or 100% confirmed irrevocable "L/C" with a first-class bank account and must be confirmed by letter which covers the whole period of manufacture, partial shipments, etc.

- 50 % in advance beginning with the sign of the contract
- 40 % before shipment
- 10 % in when the installations start, before test production
- Delivery is based on EXW(Exwork) / TURKEY

### **EXCEPTIONS (BELONG to the BUYER);**

- The flight tickets and in-country transfers from/to airport, hotel, industry zone, etc.
- Accommodation (hotel and food) and telephone calls.

## F.3 – USE Of raw material

**Production Capacity:** Max. 1500 kg/h of dry pasta

**Thickness:** Maximum 1.6mm

**Guaranteed shape:** Thickness; 1,2 – 1,6 mm. Output 1500 kg/hour.

❖ **The final running test of the line will be performed with reference to the pasta shape agreed between the Supplier and the Customer having the over mentioned characteristics.**

- 100% durum wheat semolina
- 100% soft wheat flour
- Mixtures of durum and soft wheat

<b>DURUM WHEAT SEMOLINA</b>	<b>SOFT WHEAT FLOUR</b>
Humidity 14,5 % max.	Humidity (%) 14,5 max.
Ash content 0,9 % max.	Ash content (%) 0,7 max.
Proteins 11-14 % the rate of quality protein	Proteins 9-11 % the rate of quality protein

<b>GRANULOMETRY</b>	<b>GRANULOMETRY</b>
>500 µm 0%	>500 µm 0%
>425 µm 0-2%	>425 µm 0%
>300 µm 20-35%	>300 µm 0-10%
>212 µm 35-45%	>150 µm 50-70%
>150 µm 18-25%	<150 µm 20-40%
<150 µm 10-18%	

The production capacity of the line is to be conventionally referred to;

- Dry product, with final humidity not superior to 12,5%.
- Continuous and uninterrupted production of the guaranteed shape for 24 hours.

*The guaranteed production capacity depends also on the following conditions;*

- Semolina or Soft Wheat, used as raw material, obtained from grinding of durum wheat or soft wheat or mixing, cleared from foreign substances and impurities, conforming to the norms concerning well-preserved products allowed for the pasta process and for the preparation of foodstuff for human beings, having the following characteristics:

Furthermore;

- Minimum protein (dry substance) content: 11.5 %
- High protein rate
- Absence of grains with size above 500 microns
- Product humidity 14,5%

In case of flour percentages superior to 60%, the Chopin alveo-graphic analysis must have the following values:



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W = 180-200

P/L = 0,5 – 0,6

The raw materials temperature shall not to be superior to room temperature.

Additionally;

- Free from suspended solid substances having dimensions bigger than 5 microns.
- Presence of chlorides: less than 30 p.p.m.
- Potable, colourless.
- Minimum pressure 1,5 bar, maximum 2 bar.

Water to be used, having chemical and physical characteristics conforming to the norms of the World Health Organization

**Hot water;** no lower than 110°C, for feeding of all technologic heating control systems present in the line.

**Cold water;** no higher than 18°C for feeding of all technologic heating control systems present in the line.

**Vacuum:** 600 mm Hg.

- Vacuum pressure of the line may vary depending of the altitude of the city where the line will be installed
- The line is able to produce different pasta formats, also when additives are added during kneading.
- The line nominal productive capacity could undergo some changes in operation depending of additive type and quantity.
- Any equipment of additives is not included in the offer

Environmental conditions in the pasta factory;

- ❖ **Temperature must not be lower than 28°C and a relative humidity must be at a value between 50 and 65%. The buyer must provide this environment inside the factory.**

## H-BRAND DETAILS of MECHANIC/ELECTRONIC COMPONENTS

### H.1 – MECHANICS

1 <sup>st</sup> BRAND	2 <sup>nd</sup> BRAND	AREA of USE	ORIGIN of MANUFACTURER
ERANSAN	ÖZMAKSAN	Boiler and the other equipment for the boiler room	TURKEY
UNIGAS	BALTUR	Burner	ITALY
MALKAN		Steam systems (steam generator, steam injectors etc.)	TURKEY
YILMAZ REDÜKTÖR	İMAK	Reducers for dryer	TURKEY
GAMAK MOTOR	VOLT	Fan motors of dryer	TURKEY
HCH FAN	POLİMAK	Aspirators of dryer	TURKEY
KSB	NORM	Hot water pump	TURKEY
PANKENS	PANKENS	Thermometer of vacuum lock	TURKEY
YILMAZ REDÜKTÖR	İMİK	Main helix of press unit	TURKEY
TALİA	TALİA	Flour/semolina conveying system	TURKEY
SIEMENS	SAMSON	Hot water control valves	GERMANY
SIEMENS	BELIMO	Aeration control valves	GERMANY
STANDART PUMP	NORM	Pump for the boiler room	TURKEY
ELİMKO	GENTEK	Temperature and humidity measuring sensors	
HASER PUMP	DEKO PUMPS	Water mono-pump	TURKEY
GAZİ COOLER		Chiller	TURKEY
TERMO	UNIVAL	Dryer valves	TURKEY
EKOMAK	AYDIN TRFO	Compressor	TURKEY
KROHNE	SMETER	Flow-meter	GERMANY/TURKEY

## H.2 – ELECTRONICS

1 <sup>st</sup> BRAND	2 <sup>nd</sup> BRAND	AREA of USE	ORIGIN of MANUFACTURER
VIPA	SIEMENS	PLC and SCADA systems	FRANCE/GERMANY
YASKAWA	CONTROL TECHNIQUES	Inverters	FRANCE/JAPAN
SICK	OMRON	Sensors	GERMANY/JAPAN
SICK	OMRON	Pressure transmitters	GERMANY/JAPAN
SCHNEIDER	WEIDMULLER	Ethernet switch	FRANCE/GERMANY
FIYAMA		Relays and probes for water level	ITALY
SIEMENS	SCHNEIDER	Control transformers	FRANCE/GERMANY
SIEMENS	SCHNEIDER	Circuit breakers	FRANCE/GERMANY
SIEMENS	SCHNEIDER	Contactors and termic	FRANCE/GERMANY
SIEMENS	SCHNEIDER	Selector switch	FRANCE/GERMANY
SIEMENS	SCHNEIDER	Motor protection relays	FRANCE/GERMANY
SIEMENS	SCHNEIDER	Timers	GERMANY
SIEMENS	SCHNEIDER	Keyboard	FRANCE
WEIDMULLER		Relay plates and lugs	GERMANY
EAE	PAMAKS	Cabins	TURKEY / TURKEY
WEIDMULLER		Power sockets	GERMANY
SCHNEIDER	SIEMENS	Main switch	FRANCE/GERMANY
PHANNENBERG		Aeration fans of electric panel	GERMANY
WEIDMULLER	ENTES	Terminal connectors	GERMANY/TURKEY
HES	SEVAL	Electric cables	TURKEY/ TURKEY