

ORDER CONFIRMATION

Xolg Master Kft

Tema ref.: T245402&T245403

Chicken litter Dryer/Cooler



TEMA  **PROCESS**

CHANGE OF CONTRACT
T223291-3

Xolg Master Kft
Att. Mr. Bárány
Nefelejcs street N:4
4400 Nyíregyháza
HUNGARY

Our ref.: T245402&T245403**Your ref.:****Date:** 4-9-2024

Dear Mr. Bárány,

Following the meeting on the 8th of August 2024 we herewith send you our order confirmation for the following scope of supply:

- T245403 - Upgrade of existing dryer
- T245402 - Delivery of new dryer

T245303 Upgrade of existing dryer

A summary of the task we will perform to upgrade the first line to handle more capacity to produce 40.000t/year instead of 30.000t/year:

- Increase the size of the fluid bed from 16,5m² to 21m²:
 - Increase the size of the wind-box by installing an extension part to increase the width to 2.150 mm
 - Install a new bedplate of 21m²
 - Widen the suction hood by cutting it in half through the length and installing a new section in between it.
- Increase the size of the exhaust hood by cutting it in half and installing an extension part.
- Elongating the height of the pulsejet filter with 0,5 meter, and install new cages and filter bags.
- Filter cages are bought back by TEMA (part of price), transport from Baromfi back to Tema included.
- Updating the software to increase the production capacity from 30.000 T/y to 40.000 T/y
- The scope of works includes, engineering and manufacturing of the required parts to increase the capacity of the dryer/cooler and exhaust air system. Supervision of installation commissioning and start-up are on a lump sum base and actual expenses for lodging.

T245402 - Delivery of new dryer**A summary of the new line to be installed:**

- Shaking fluid bed dryer/cooler with an evaporation capacity of ~4,5t/h (depending on throughput, initial moisture content and the drying air temperature).
- The shaking fluid bed drying/cooling system has a total area of 32,25 m², divided in a 28,7m² drying section and a 3,6 m² cooling section. The re-circulated drying air with 75-85 °C temperature will be heated to 150-180°
- The fluid bed size is designed for drying of chicken litter with a high straw content and low air load. Filter outlet provided with a rotary air lock.
- The maximum moisture content for the input is 50%. According your experience on the existing dryer line up to 50% mc input material can be dried without back-mix system.
- The scope of work includes engineering, and manufacturing of a fluid bed dryer/cooler, air supply system, exhaust air system and product crushing/conveying. Supervision of installation, commissioning and start-up are on a lump sum base and actual expenses for lodging.
- The complete system: contact parts of the fluid bed, the exhaust air system and air recycle as well as product conveying system are manufactured in stainless steel AISI 304L. Insulation: where required because of the high temperatures, the process (to avoid condensation) or for safety issues insulation is installed. The filter installation limits dust emissions (<10 mg/Nm³) to ambient or to the ammonia/odour scrubber(s). The scrubber(s) will not clog up with dust. The ammonia and odour is reduced using a double scrubbing system (acidic + base/oxidizing scrubber).

Section 1. The scope of supply and pricing of the equipment:**1. T245403 Increase Capacity Existing line**

- Item 1.1 Increasing size of Shaking Fluid Bed Dryer Cooler
 - Item 1.2 The installed gas burner remains
 - Item 1.3 Increasing size of exhaust gas system, new recycle air fan
 - Item 1.4 Documentation and engineering
- Upgrade burner to 3000kW with new recycle fan.

2. T245402 New Drying Line

- Item 2.1 Continuous shaking fluid bed unit 32,25 m²
 - Item 2.2 Air supply system with heat pump system, electrical heater and direct gas fired air heater
 - Item 2.3 Exhaust air system with filter, exhaust fan and ducting
 - Item 2.4 Product paddle lump breaker/conveyor + outlet conveyor in AISI-304L
 - Item 2.5 Acidic and oxidizing scrubber units and associated ducting
 - Item 2.6 Spark detection and extinguishing system
 - Item 2.7 Instrumentation and control cabinet (MCC/PLC)
field cabling is excluded (by customer)
Instrumentation and local panel scrubbers
 - Item 2.8 Documentation and engineering in the above prices
- Set of spares for 2 years of Operation
Dual Fuel burner (EB) suitable for propane and natural gas

3. Site-works for both lines.

- Item 3.1: Price for installation supervisor 12 weeks
excluding costs for hotel and lodging
- Item 3.2: Price for start-up 4 man weeks (process, and electrical),
excluding costs for hotel and lodging

Transport to site included.

Contract Price (DDP Nyírákó) € 2.830.000,--

Details see Appendix 3 with negotiated price on August 8, 2024

All prices are in EURO's (€) excluding taxes, levies or duties.

Section 2. Terms and Conditions

| | |
|-----------------------|---|
| Mechanical Guarantee: | 12 months after commissioning but 18 months after delivery at the latest, whichever is earlier. Normal wear and tear is excluded. |
| Limited Liability: | The liability for defects is limited to the agreed price of the supply of the product. Normal wear and tear and improper use are excluded. The liability for loss of or damage to the Product due to fire and/or explosion is excluded, regardless of the cause. If any limitation of liability is restricted by law or otherwise the liability of supplier is limited to the amount which shall be paid on the liability insurance policies of supplier. |
| Commercial Terms: | As far as they do not deviate from the aforesaid, the General Conditions of Delivery for the Mechanical, Electrical and Associated Electronic Products (Orgalime SI-14) will govern our supply. |
| Terms of Delivery: | DDP Nyírákó , Hungary, according to Incoterms 2010, including packing |
| Terms of Payment: | 30% down payment against invoice after signing of this order confirmation 60% after FAT before delivery against invoice but no later than 3 months after notice of equipment ready if delay is not caused by Tema Process. 10% 15 days after installation against invoice but no later than 3 months after delivery if delay is not caused by Tema Process. |
| Delivery time: | Equipment FCA Wapenveld , 11 months after receipt of down payment and approval of lay-out plan. |

Upon signature of this change of contract , the previous order confirmation with TEMA project number T222291 will expire automatically.

Agreed by the parties :

The supplier:

The buyer :

TEMA Process BV

Xolg Master Kft

Mr. Ben Knuppe

Mr. László Bárány

Date and place :

Date and place:

Section 3. Process specifications for updating existing line and delivery of the new line

General Process Specifications (valid for both lines)

Product

| | |
|--------------------|--|
| Name | Chicken manure (free of foreign materials) High straw content |
| Particle size | 1 – 100 mm before de-lumping 0,1-15 mm after de-lumping |
| Bulk density wet | 400 – 500 kg/m ³ |
| Bulk density dried | 300 – 400 kg/m ³ |
| Specific heat | 1,25 kJ/kg °C |



(as received from Baromfi)

Product and air temperatures

| | |
|--------------------------------------|--|
| Ambient temperature | design: 20 °C / 80 %RH, range 5 - 35°C |
| Drying air temperature | nom. 175 °C range 150 - 180 °C |
| Cooling air temperature | design 30°C / 40% RH |
| Exhaust air temperature dryer/cooler | ~ 75-80 °C |
| Product temperature at inlet | design: 25 °C |
| Product temperature at outlet dryer | ± 75-80 °C |
| Product temperature at outlet cooler | ≤ 50°C @ 30 °C / 80% RH. |

Required utilities

| | |
|-------------------|--|
| Electrical | 3 x 400 V/50 Hz 1 x 230 V/50Hz |
| Electrical motors | IP 55 – Efficiency in accordance with EU guideline EuP 2019/125/EG: IE2 (in combination with VFD) en IE3 on motors without VFD between 0,75-375 kW |
| Natural gas | LHV 36 MJ/Nm ³ ,300 mbar supply pressure |
| LPG | 25,1 MJ/L , gas supply 300 mbar |
| Compressed air | 6 bar(g) free of oil and water ISO 8573-1 Class 4 for bag filters and dryer ISO 8573-1, Class 2 for Firefly |

Design Specification Updating Existing LineDesign specifications nominal

| | |
|-------------------------|-------------------|
| Product at dryer inlet | 10,5 T/h @ 38% mc |
| Product at dryer outlet | 7,5 T/h @ 14% mc |
| Water evaporation | 3,0 T/h |

Dryer sizing and air quantities

| | |
|-------------------------|--|
| Dryer size and area | $8,9 \times 2,15 = 19,1 \text{ m}^2$ |
| Cooler size and area | $1,1 \times 2,15 = 2,4 \text{ m}^2$ |
| Total size and area | $10 \times 2,15 = 21,5 \text{ m}^2$ |
| Drying air quantity | 60.000 kg/h |
| Combustion air included | 4.500 kg/h |
| Cooling air quantity | 8.000 kg/h |
| Exhaust air quantity | ~18.000 m ³ /h @ 75-80°C - 270 g/kg |

Natural gas or LPG *)

| | |
|-------------------------|--------------------------------------|
| Consumption nett on LHV | 3.000 kW, Installed Capacity 3300 kW |
|-------------------------|--------------------------------------|

*) based on a continuous and constant feed of wet material and stationary dryer operation

Design Specification New Line

Design specifications maximum MC

| | |
|-------------------------|-------------------|
| Product at dryer inlet | 10,5 T/h @ 50% mc |
| Product at dryer outlet | 6,0 T/h @ 14% mc |
| Water evaporation | 4,5 T/h |

Design specifications nominal

| | |
|-------------------------|-------------------|
| Product at dryer inlet | 13,9 T/h @ 38% mc |
| Product at dryer outlet | 10,0 T/h @ 14% mc |
| Water evaporation | 3,9 T/h |

Dryer sizing and air quantities

| | |
|----------------------|--|
| Dryer size and area | $13,0 \times 2,15 = 28,0 \text{ m}^2$ |
| Cooler size and area | $2,0 \times 2,15 = 4,25 \text{ m}^2$ |
| Total size and area | $15 \times 2,15 = 32,25 \text{ m}^2$ |
| Drying air quantity | 90.000 kg/h |
| Cooling air quantity | 15.000 kg/h |
| Exhaust air quantity | ~25.000 m ³ /h @ 75-80°C – 270-300 g/kg |

Natural gas or LPG *)

| | |
|--------------------------------|---------------------------------------|
| Consumption for nominal on LHV | 3.900 kW, installed capacity 4.500 kW |
|--------------------------------|---------------------------------------|

*) based on a continuous and constant feed of wet material and stationary dryer operation

| | |
|----------------------|---|
| Electrical installed | 400 kW (included scrubber) |
| Electrical usage | 315 kW/h (included scrubber) |
| Compressed air | < 180 Nm ³ /h |
| Dust emission | <= 5 mg/Nm ³ (measured acc to. VDI 2066) |

ATEX Normative

The equipment design described in this quotation is compliant with the ATEX directive 94/9/EC, as per TEMA Process expertise from the delivery of 4 chicken litter dryers in the past whereby the following measures were taken into account:

- Antistatic design
- Limitation of product temperature
- Drying process under low oxygen

Under consideration of the following design assumptions :

- Zone location : No Zone Risk Area NZRA
- Zone classification 22-21-20 not applicable
- Equipment placed in a safe area
- Firefighting equipment fire extinguish duct connection on safe and accessible distance of risk area (minimum 5 meters)

In the case additional measures are requested it has to be determined if system stays suitable or perhaps changes are to be foreseen, these are not included.

Section 4. Scope of supply

Item 1.1: Fluid bed dryer/cooler with drive unit, 10 x2,15 = 21,5 m²

- Installing an extension part on the wind box to increase the width from 1.650mm to 2.150mm. The added part is insulated where needed (aluminium cladding). Additional peace will be installed on top of the existing wind box.
- Installing an extension part to widen the suction hood from 1.650mm to 2.150mm. The added part is insulated (aluminium cladding).
- New air distribution plate with supports manufactured in stainless steel AISI 304L, size is 10.000 x 2.150 mm with a surface area of 21,5 m2.

Item 1.2: Air Supply System

- Existing burner will be upgraded for a capacity of 3.300 kW (dual fuel), consisting of modifications on the gas supply train , gas pressure increase, installation and commissioning works.
- Installation of a new recycle air fan:
Air supply fan drying section/recirculation fan. Single side suction coupling or belt driven centrifugal fan manufactured in stainless steel AISI 304L, motor support frame in steel coated with a primer and finish coating. Capacity: 80.000 kg/h air @ 70 - 80 °C and 250-300 g/kg dry air moisture content, static pressure 52 mbar, installed power: 200 kW, electrical consumption ~160 kW. Fan complete with insulation, drain and inspection opening. The fan is frequency controlled (the frequency control is enlarged in the MCC/PLC). Fan is designed as a non-sparking fan

Item 1.3: Exhaust air system

- Extension of Pulse-jet filter to a filtration area of 745m2, by elongating the filter height with 500mm. Filter compartments arrangement 2x12x13, L=5.000 mm bag length.
- Filter material poly-acrylic needle felt (peak temperature = 130°C, PAN-homopolymer), support bag cages in stainless steel AISI 304L
- TEMA will buy back and disassemble existing filter cages and send it back to facility in Wapenveld (part of price).
- Increasing size of the suction hood between dryer and filter by installing extension peace.

Item 1.4 Documentation and engineering.

Engineering and Documentation:

- Design of increasing size of the dryer
- Updating software
- Updating documentation

Pos. 2 New Drying Line**Item 2.1: Fluid bed dryer/cooler with drive unit, 15 x2,15 = 32,25 m²**

- Fluid bed wind box 15.000 mm length, 2.150 mm width and 900 mm height manufactured in stainless steel AISI 304L. The wind box dryer part is insulated and cladded with aluminium cladding.
- Fluid bed suction hood 15.000 mm length, 2.150 mm width expanding to 2.500 mm and 2.300 mm height manufactured in stainless steel AISI 304L. The suction hood is insulated and cladded with aluminium cladding.
- Air distribution plate with supports manufactured in stainless steel AISI 304L.
- Throttle plate in the drying section to create a pre-drying section, throttle plate is adjustable from the outside during operation.
- Dividing plate between the drying section and the cooling section.
- Hot air bypass to locally heat up the exhaust gas by 3-5 °C to prevent condensation in the 1st part of the suction hood.
- Inspection hatches and manholes:
 - Three hatches ø 450 mm in the wind box
 - Two hatches ø 450 mm in the suction hood
 - One hinged door at the rear wall 500 x 800 mm
- Flanges and measuring nozzles:
 - Drying air inlet on the front side of the wind box complete with flexible connection
 - Cooling air supply on the side wall of the wind box complete with flexible connection
 - Exhaust air outlets on top of the suction hood with flexible connections
 - Product inlet connection with flexible
 - Product outlet connection with flexible
 - Drain underneath the wind box
 - All required instrument nozzles
- Electrical operated weir. Weir is placed at the end of the cooling section, layer thickness is adjustable between 0-200 mm by adjusting the weir height (during production). Sufficient space between the rear wall and the threshold in case of any large chunks.
- Crankshaft drive mechanism with pneumatic springs/dampers. Drive manufactured in mild steel in epoxy coated. Shaking frequency variable between 2,5-4Hz using a frequency converter (converter included in the control panel pricing). Installed motor 15 kW, usage <10 kW.



Fluid bed dryer for chicken manure

Item 2.2: Air supply system dryer/cooler

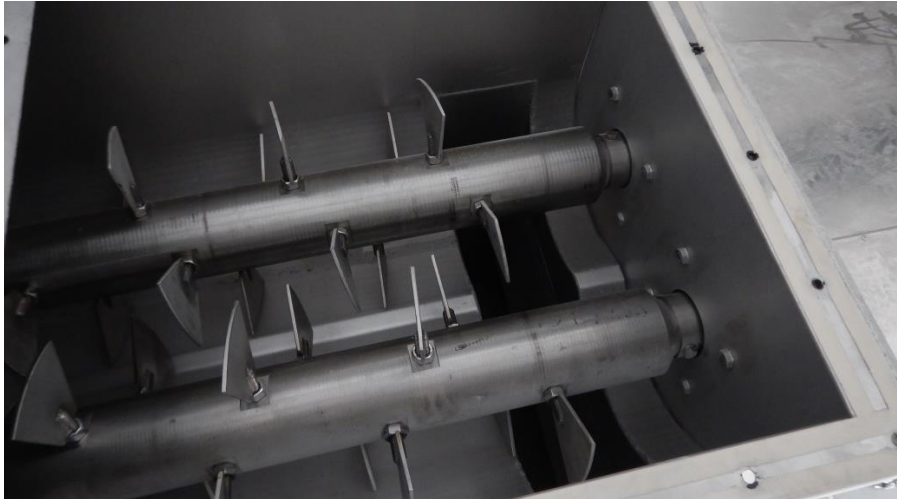
- Air supply fan drying section/recirculation fan. Single side suction coupling or belt driven centrifugal fan manufactured in stainless steel AISI 304L, motor support frame in steel coated with a primer and finish coating. Capacity: 115.000 kg/h air @ 70 - 80 °C and 250-300 g/kg dry air moisture content. Fan complete with insulation, drain and inspection opening. The fan is frequency controlled (the frequency control is included in the scope of the MCC/PLC). Fan is designed as a non-sparking fan. Fan pressure increase for the installation of the electrical heater and heat pump heat exchanger, total static pressure increase 18 mbar, total 70 mbar. installed power: 400 kW, electrical consumption ~340 kW.
- Ducting from the recirculation fan to the process air inlet of the heat-exchanger, length 6 meter, in stainless steel AISI 304L and including insulation.
- Dual fuel (natural gas and LPG) air heater (direct fired) for heating max 90.000 kg/h air from 65-75°C temperature to max. 200 °C. Installed thermal capacity: 4.500 kW, nominal usage 3.900 kW. Combustion chamber in stainless steel with 100 mm external insulation with aluminium cladding. Support structure in mild steel. Burner Management System mounted at the burner.
- Burner complete with spark igniter and flame rod, ignition gas: natural gas.
- Fuel gas pipe train in accordance with EN-746-2 consisting of: inlet cock, gas filter, pressure controller with internal relief valve, double block safety shut off valve with leak tester, full modulating control valve with servo motor and position feedback, pressure switches for high and low fuel gas pressure and local pressure gauges with isolating valves. All electrical components of the gas line are pre-wired to the local control panel. Standard is the IP protection class IP54.
- Connecting ducting between combustion air fan and the burner in mild steel hot dip galvanized.
- Combustion air fan, Single side suction direct driven centrifugal fan manufactured in mild steel hot dip galvanized. Capacity 15.000 kg/h @ 5-30°C temperature. Installed power: 15 kW, electrical consumption ~11 kW. Fan complete with drain and inspection opening. Fan is designed as a non-sparking fan.
- Cooling air fan, Single side suction direct driven centrifugal fan manufactured in mild steel hot dip galvanized. Capacity 6.750 kg/h @ 5-30°C temperature. Installed power: 15 kW, electrical consumption ~11 kW. Fan complete with drain and inspection opening.
- Noise attenuator on suction side of the cooling air fan, ducting between the fan and the cooling section manufactured in mild steel hot-dip galvanized, length 2 meter.
- Hand-operated throttle shutter mounted directly on pressure side of fan

Item 2.3: Exhaust air system with two filter unit, exhaust air fan.

- Two(2) Pulse-jet filter with 600 m² filtration area. Filter compartments arrangement 2 x 16 x 8, L= 4.500 mm bag length.
- Filter material poly-acrylic needle felt (peak temperature = 130°C, PAN- homopolymer), support bag cages in stainless steel AISI 304L. The filter top part is completely insulated and constructed of double walled stainless steel AISI 304L with insulation in between installed in our workshop. The filter top plate, bag house and dust hopper are manufactured in stainless steel AISI 304L. Support structures etc. in mild steel hot dip galvanised.
- AISI304 parts will not be pickled and passivated
- Special points of attention of the filter:
 - Insulation of the support structure to prevent thermal bridges
 - Insulated lids on top of the filter for exchange of the filter sleeves.
 - Anti-static design
 - Electrical tracing on the dust hopper
 - Local control panel, cable between control panel and air shots are not included in the scope.
- A screw conveyor in the dust hopper manufactured in stainless steel AISI 304L. Gear motor SEW 3 kW.
- One rotary valve under the dust screw to seal the air in AISI 304L , gear motor 1,1 kW
- Two large suction hood above the dryer. Manufactured in stainless steel AISI 304L complete with insulation and support structure.
- Ducting from the suction hood above the fluid bed up to the filter units, length approx. 3 meter insulated. Ducting from the filters unit to the recirculation fan, ducting length approx. 20 meter. Ducting in stainless steel AISI 304L and foreseen with insulation.
- Split for exhaust duct on the pressure side of the fan

Item 2.4: Product mixing / de-lumping system

- A double shaft paddle mixer (1x 22 kW) for de-lumping / mixing / conveying the chicken manure into the fluid bed. Manufactured in stainless steel AISI 304L.
- Paddles will be adjustable and made in stainless steel AISI-304 with reinforced design on the lump inlet, paddle edges cutting.



- Screw conveyer placed at the dryer outlet. Screw conveyer manufactured in stainless steel AISI 304L. Installed power 3 kW electrical usage < 2,4 kW.

Item 2.5: Acidic and oxidising gas scrubber with associated air ducting

A single stage process in which the NH_3 , the R-NH_2 , other ammonia derivatives and the VOC that can be hydrolyzed in an acid medium are absorbed.

In the optional second stage the H_2S and R-SH are absorbed, as well as any other sulphur derivatives, and the VOC that can be hydrolyzed in an alkaline medium.

In this process, the absorption of the polluting gas is carried out in counter flow inside of 2 scrubbers in series, and within spaces which are stuffed with large specific areas contact elements. This is combined in order to obtain an optimal contact of the gas/liquid stages and a constant distribution of both fluids throughout the process, where the washing liquid is dispersed and uniformly distributed by means of high-output full-cone nozzles, easily removable for revision or change.

These contact elements are supported by dismountable grates with a large pitch area and a low-of-head. Retention of drops originated by the liquid distribution system is to be carried out within the tower itself by means of a high-efficiency low-pressure-drop vertical-flow demister, that prevents the carryover and emission of drops to the atmosphere, as well as any loss of washing solution.

The washing liquid contained in the scrubber's bottom is recirculated through high performance (chemical as well as mechanical) centrifugal pumps.

The level of the washing liquid is kept constant by means of a water input through an electro valve controlled by a 3-contact level indicator. Reagent dosage is controlled by a pH meter for H_2SO_4 and NaOH , and a Red Ox meter for NaClO , reagents being kept in separated tanks.

Scrubber and associated equipment are for indoor application and any frost protection is not included.

Acidic scrubber:

- Column scrubber, size \varnothing 2.500 height 6.000/7.000 mm, manufactured in vinyl ester resin/ glass fibre.
- Removal efficiency > 95% on NH_3 .
- Acid usage approx. 1,5 litre 95% H_2SO_4 per kg (removed) NH_3
- Waste water- $(\text{NH}_3)_2\text{SO}_4$ tank is not included in te scope
- Polypropylene demister in the top of the scrubber to capture and remove droplets from the gas stream.
- Integrated recycle water tank. System complete with recirculation pump, recirculation piping, nozzles and accessories. Installed power recirculation pump 11 kW.
- Ducting from air recycle ducting (pressure side of the recirculation fan), with motor actuated stainless steel exhaust air valve. Dryer exhaust air volume 23.000 kg/h @ 65-70 °C, to the acidic scrubber inlet plus maximum 25.000 kg/h from the filtered pellet cooler exhaust air. Length of the ducting 3 meter.

Oxidizing gas scrubber

- Column scrubber, size \varnothing 2.500 height 6.000/7.000 mm, manufactured in vinyl ester resin/ glass fibre.
- Removal efficiency > 95% on H_2S and 90% on the rest of water soluble odour components
- Oxidizing reagent: NaClO and NaOH .
- Waste water tank is not included in te scope
- Polypropylene demister in the top of the scrubber to capture and remove droplets from the gas stream.
- Integrated recycle water tank. System complete with recirculation pump, recirculation piping, nozzles and accessories. Installed power recirculation pump 11 kW.
- Ducting from the acid scrubber outlet to the oxidizing scrubber inlet. Ducting manufactured in GRP, length 6 meter.
- Exhaust air stack installed directly on top of the oxidizing scrubber (\pm 2 meter), not free standing supported from the building.

1 set for 2 lines:

- Acid (40% H_2SO_4) storage vessel dosing pumps en piping (tubing).
- Reagent (25% NaOH) storage vessel, dosing pumps en piping (tubing).
- Reagent (15% NaClO) storage vessel, dosing pumps en piping (tubing).



Example Acidic and oxidizing gas scrubber

Item 2.6 Spark detection and extinguishing system.**Principle of the fire detection and extinguishing.**

- 1.) If there is insufficient water pressure on the extinguishing water supply the installation cannot start-up or if the water pressure is dropping during production the unit will go into controlled shut down. These actions can be overruled by the operator if required.
- 2.) On the drying air temperature, exhaust air temperature and product temperature we will program an additional offset. If any of these temperatures will go over this temperature the burner will be forced down and an alarm signal will be given. In principle the unit will increase the temperature again and continue the normal operation, the operator has time to judge if there is an abnormal situation and take the appropriate action.
- 3.) **If the spark signal from the sensors exceeds a certain level the fire extinguishing system is activated**, at the same time the unit goes into emergency shut-down.
- 4.) The level of spark signal is continuously stored and can be traced back.

Tema Process will supply and install three installation flanges for mounting spark sensors on the suction hood of the dryer/cooler.

- Supply and installation of **three** spark sensors (from Firefly) with compressed air cooling of the sensor.
- One control unit for the spark sensors for 2 lines together
- Three water spray nozzles in the suction hood, connected to one pipe (on top of the suction hood) and a flexible hose.
- Electric actuated open/close valve. Two hand operated open/close valve, one in parallel and one in series with the electric actuated valve.
- Pressure indication and alarm on the water pressure, if insufficient water pressure is present the installation stops (controlled shut down procedure) or will not start-up (changes in the fluid bed dryer/cooler PLC software)
- Pressure indication and alarm on the compressed air pressure, if insufficient compressed air pressure is present the installation stops (controlled shut down procedure) or will not start-up (changes in the fluid bed dryer/cooler PLC software)
- Water spray nozzles in the filter, pipe along the filter structure near to connection of the dryer pipe.
- Electric actuated open/close valve. Two hand operated open/close valve, one in parallel and one in series with the electric actuated valve.

Instrumentation (in accordance with flow sheet A16-1357-0002):

- QICA 9510 (Spark detection) mounted on air-inlet channel dryer
- QICA 9511 (Spark detection) mounted on the suction hood of the dryer
- QICA 9512 (Spark detection) mounted on the suction hood of the dryer
- PSA_L 9215 on spark detectors
- PSA_L-9210 mounted on the piping of the fire water supply to the dryer

Third party - BAROMFI delivery (= not included in the Tema Process scope)

- Cabling between the spark sensors and the (Firefly) control panel.
- Main cable (220 V - 1 ph) to the (Firefly) control panel.
- Water piping and compressed air up to 1 meter from the connection at the fluidbed (1 meter distance from suction hoods).



Independent control panel

Regarding the cooling air used for the detectors it has to be a compressor unit specified according to below:

Compressed air: Pressure: 6 – 8 bar

Quality: According to ISO 8573-1

Max. particle size: Class 2

Max. particle concentration: Class 2

Max. oil content: Class 2

Max. pressure dew point: Lower than the lowest ambient temperature.

Consumption, air cleaning unit ACN1: typically 6 NI/cleaning period and detector.

As you are aware of the cooling air has to be of the right quality, also the supply piping to be cleaned out before detector units are placed.

Item 2.7 Standard Instrumentation and MCC/PLC Control cabinet description

Instrumentation according to flow sheet A21-1592-0003.

Dryer;

- PI-1200 on drive unit compressed air supply
- PSA^H_L-1201 on drive unit compressed air supply
- PIA^H_L-1208 on supply air pressure
- TICA^H_L-1101 on supply air temperature
- TSA^{HH}-1102 on supply air temperature
- TICA^H_L-1113 on the product temperature after drying
- TIA^H_L-1114 on the product temperature after cooling
- PICA^H_L-1210 on dryer suction hood
- ES-1800 on hinged door at rear wall
- TICA^H_L-1126 on the exhaust air temperature
- TSA^{HH}-3110 on the exhaust air temperature

Filter dryer;

- PDIC^H-3200 pressure difference in filter bags
- PSA_L-3201 on the filter compressed air supply
- LA^H-3312 level alarm in the filter hopper
- LA^H-3313 level alarm in the filter hopper

Scrubbers;

Acidic scrubber:

- LSA-4300 on acidic scrubber level
- QICA^{pH}-4510 on acidic scrubber
- LISA_L-4301 on Acid storage tank

Oxidizing scrubber

- LSA-4303 on acidic scrubber level
- QICA^{pH}-4520 on acidic scrubber
- QICA^{redox}-4521 on acidic scrubber
- LISA_L-4304/06 on storage tanks

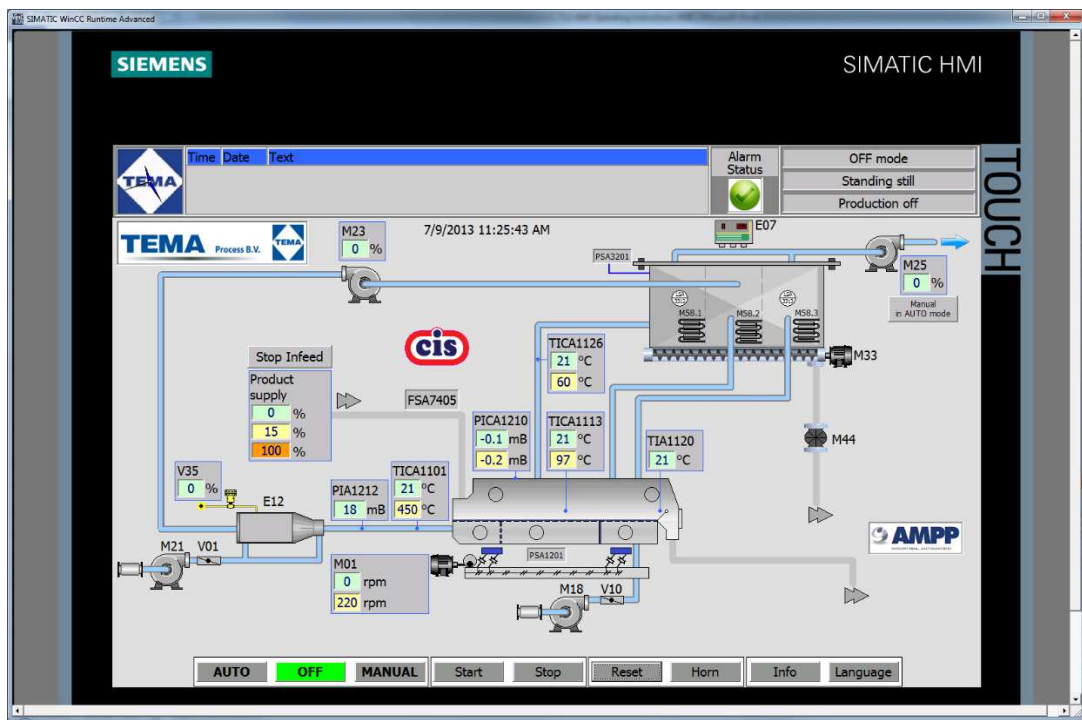
Control system

- MCC/PLC panel (to be installed in a safe area).
- PLC based (Siemens S7-300 series) control system.
- The process set point are adjustable from visualization.
- All relevant information is available on the PLC for the visualisation by customer (data - blocks) through ethernet (or profibus)
- Temperature and pressure controllers integrated in the PLC program
- Motor starter and motor safety switches
- VFD's installed inside the MCC panel, VFD's make Siemens or equal.
- Graphic Display (HMI unit) mounted on the control panel door.
- Electrical engineering and documentation: PLC parts list, PLC software and programming, electrical diagrams and definition list.
- Cabling between the field components and the panel is excluded. Cable list with recommend cable size is included in the scope.

| | |
|---------------------------------|---|
| Main switch | <input checked="" type="checkbox"/> Socomec |
| Selectors | <input checked="" type="checkbox"/> Eaton |
| Push Buttons | <input checked="" type="checkbox"/> Moeller |
| Signal fixtures | <input checked="" type="checkbox"/> Moeller |
| Current protection switches | <input checked="" type="checkbox"/> Siemens |
| Motor protection switches | <input checked="" type="checkbox"/> Siemens |
| Emergency stop relay | <input checked="" type="checkbox"/> Moeller |
| Contactors | <input checked="" type="checkbox"/> Siemens |
| Auxiliary relay | <input checked="" type="checkbox"/> Siemens |
| Control current/interface relay | <input checked="" type="checkbox"/> Phoenix |
| Auxiliary relay Burner switch | <input checked="" type="checkbox"/> Siemens |
| Contactor Valves | <input checked="" type="checkbox"/> Siemens Sirius |
| Time relay | <input checked="" type="checkbox"/> Siemens |
| Control current transformers | <input checked="" type="checkbox"/> Legrand |
| Supply 24 Vdc | <input checked="" type="checkbox"/> Murr |
| Supply 10 Vdc | <input checked="" type="checkbox"/> Murr |
| Terminals | <input checked="" type="checkbox"/> Phoenix |
| Cable entry | <input checked="" type="checkbox"/> klemband |
| Frequency converters | <input checked="" type="checkbox"/> Siemens G120 / G120C |
| Control cabinet | <input checked="" type="checkbox"/> Rittal |
| PLC system | <input checked="" type="checkbox"/> Siemens 1512 |
| Human Machine Interface | <input checked="" type="checkbox"/> Siemens TP1200 (12" TFT wide) |

Applied Software

| | |
|--------------|--|
| PLC software | <input checked="" type="checkbox"/> Siemens TIA Portal V13 |
| HMI software | <input checked="" type="checkbox"/> Siemens TIA Portal V13 |



Motor list except scrubber (Can change during engineering)

Fluid bed:

| | | | | |
|--------|------------------------------|--------|---------|------------|
| M01 | Drive fluid bed dryer/cooler | 15 kW | < 10 kW | VFD |
| M21 | Combustion Air Fan | 15 kW | 11 kW | Star/Delta |
| M23 | Recirculation fan | 400 kW | 340 kW | VFD |
| M18 | Cooling air fan | 15 kW | 11 kW | Star/Delta |
| M10 | Heat pump compressor | 400 kW | 300 kW | VFD |
| M11-12 | Liquid pumps | | | |

Filter unit (Each Filter):

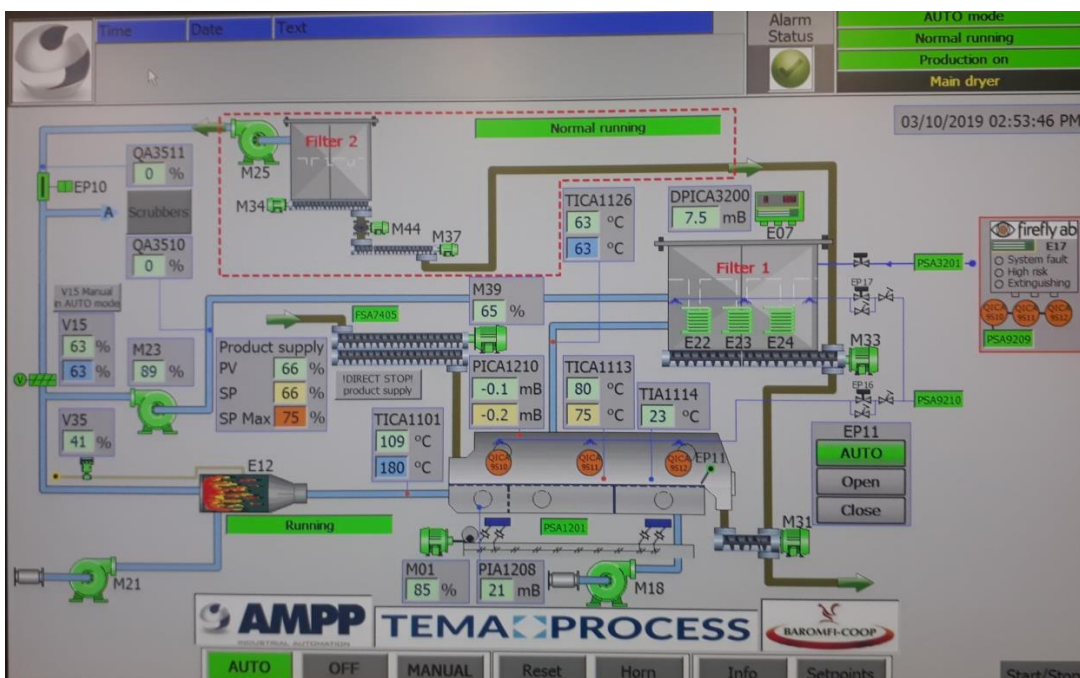
| | | | | |
|-----|----------------|--------|------|-----|
| M33 | Screw conveyor | 3 kW | 2 kW | DOL |
| M44 | Rotary valve | 1,1 kW | 1 kW | DOL |
| M.. | Tracing filter | 2 kW | 1 kW | DOL |
| M.. | Tracing filter | 2 kW | 1 kW | DOL |

Product conveying:

| | | | | |
|-----|-----------------------------|-------|--------|-----|
| M39 | Paddle screw conveyor | 22 kW | 11 kW | VFD |
| M40 | Screw conveyor dryer outlet | 4 kW | 2,5 kW | DOL |

Scrubbers (1 for 2 lines)

| | | | | |
|-----|-------------------------|---------|--------|-----|
| M76 | Pump acidic scrubber | 9 kW | 6 kW | DOL |
| M77 | Dosing pump acid | 0,12 kW | 0,1 kW | DOL |
| M78 | Pump oxidizing scrubber | 9 kW | 6 kW | DOL |
| M79 | Dosing pump NaOH | 0,12 kW | 0,1 kW | DOL |
| M80 | Dosing pump NaClO | 0,12 kW | 0,1 kW | DOL |



Item 2.8 Documentation and engineering.**Engineering and Documentation:**

Control-description, layout and design of the dryer unit as well as two hard copy and one soft copy of the instruction and maintenance manual. Layout drawing and foundation plan. Documentation in the English language.

Pos. 3 Site-works for both lines.

Item. 3.1 Installation:

Installation supervisor. Quoted is a lump sum base based on 8-10 working hours per day. Hotel and lodging are excluded. Estimated total 50-60 days in two-three periods.

Item. 3.2 Start-up and commissioning:

Start-up and process start-up would be done from our process engineer and electrical engineer and for a shorter period a burner engineer. Quoted is a lump sum base based on 8-10 working hours per day. Hotel and lodging are excluded. Estimated total 20-25 days in two periods.

Within the start-up time your operating personnel will be instructed in the operation and maintenance of the equipment. Any materials required for the start-up such as utilities, lubricants, raw materials, etc. shall be provided by the client free of charge.

Transport**Transport**

Transport is DDP Nyírákó -Hungary on truck included packing, excluded unloading.

Section 5. Exclusions

Below the items or activities excluded from the scope of supply unless specified differently in the proposal:

- Support frames, steel constructions and platforms for as far as these are not specifically mentioned.
- Supply lines for gas, compressed air and electric power.
- Electric field cabling and power distribution.
- Main electric power cable.
- Local motor (safety) switches and field cabling between the control panel and field instruments as well as power distribution.
- Civil and building work.
- Transport and hoisting equipment on the building site.
- Tools for installation work and maintenance.
- Lighting around the unit and/or provisions for lightning.
- Changing rooms and washing facilities.

Appendix 1. Orgalime Terms and Conditions

On the following page you can find the applicable Orgalime Terms and Conditions.



GENERAL CONDITIONS for the SUPPLY AND INSTALLATION OF MECHANICAL, ELECTRICAL AND ELECTRONIC PRODUCTS

Brussels, January 2014

PREAMBLE

1. These General Conditions shall apply when the parties agree In Writing or otherwise thereto. Any modifications of or deviations from them must be agreed In Writing.

DEFINITIONS

2. In these General Conditions the following terms shall have the meanings hereunder assigned to them:

- **“Contract”**: the agreement In Writing between the parties concerning delivery and performance of the Works and all appendices, including agreed amendments and additions In Writing to the said documents;

- **“Contract Price”**: the payment to be made for the Works. If installation is to be carried out on a time basis and has not been completed, the Contract Price for the purposes of Clauses 21, 43, 44 and 51 shall be the price for the Plant with the addition of 10 per cent or of any other percentage that may have been agreed by the parties;

- **“Gross Negligence”**: an act or omission implying either a failure to pay due regard to serious consequences, which a conscientious contracting party would normally foresee as likely to ensue, or a deliberate disregard of the consequences of such an act or omission;

- **“In Writing”**: communication by document signed by both parties or by letter, fax, electronic mail and by such other means as are agreed by the parties;

- **“Plant”**: the machinery, apparatus, materials, articles, documentation, software and other products to be supplied by the Contractor under the Contract;

- **“Site”**: the place where the Plant is to be installed, including as much of the surrounding area as is necessary for unloading, storage and internal transport of the Plant and installation equipment;

- **“Works”**: the Plant, installation of the Plant and any other work to be carried out by the Contractor under the Contract. If the Works shall according to the Contract be taken over by separate sections intended to be used independently from each other, these Conditions shall apply to each section separately. The term “Works” shall then refer to the section in question.

PRODUCT INFORMATION

3. All information and data contained in general product documentation and price lists shall be binding only to the extent that they are by reference In Writing expressly included in the Contract.

DRAWINGS AND TECHNICAL INFORMATION

4. All drawings and technical documents relating to the Works submitted by one party to the other, prior or subsequent to the formation of the Contract, shall remain the property of the submitting party.

Drawings, technical documents or other technical information received by one party shall not, without the consent of the other party, be used for any other purpose than that for which they were provided. They may not, without the consent of the submitting party, otherwise be used or copied, reproduced, transmitted or communicated to a third party.

5. The Contractor shall, not later than at the date of taking-over, provide free of charge information and drawings which are necessary to permit the Purchaser to commission, operate and maintain the Works. Such information and drawings shall be supplied in the number of copies agreed upon or at least one copy of each. The Contractor shall not be obliged to provide manufacturing drawings for the Plant or for spare parts.

TESTS BEFORE SHIPMENT

6. Tests before shipment of the Plant provided for in the Contract shall, unless otherwise agreed, be carried out at the place of manufacture during normal working hours.

If the Contract does not specify the technical requirements, the tests shall be carried out in accordance with general practice in the appropriate branch of industry concerned in the country of manufacture.

7. The Contractor shall notify the Purchaser In Writing of these tests in sufficient time to permit the Purchaser to be represented at the tests. If the Purchaser is not represented, the test report shall be sent to the Purchaser and shall be accepted as accurate.

8. If the tests show the Plant not to be in accordance with the Contract, the Contractor shall without delay remedy any deficiencies in order to ensure that the Plant complies with the Contract. New tests shall then be carried out at the Purchaser's request, unless the deficiency was insignificant.

9. The Contractor shall bear all costs for tests before shipment of the Plant. The Purchaser shall however bear all travelling and living expenses for his representatives in connection with such tests.

PREPARATORY WORK AND WORKING CONDITIONS

10. The Contractor shall in good time provide drawings showing the manner in which the Plant is to be installed, together with all information required for preparing suitable foundations, for providing access for the Plant and any necessary equipment to the Site and for making all necessary connections to the Works.

11. The Purchaser shall in good time undertake preparatory work to ensure that the conditions necessary for installation of the Plant and for the correct operation of the Works are fulfilled. This shall not apply to preparatory work which according to the Contract shall be performed by the Contractor.

12. The preparatory work referred to in Clause 11 shall be carried out by the Purchaser in accordance with the drawings and information provided by the Contractor under Clause 10. In any case the Purchaser shall ensure that the foundations are structurally sound. If the Purchaser is responsible for transporting the Plant to the Site, he shall ensure that the Plant is on the Site before the agreed date for starting the installation work.

13. If an error or omission in the drawings or information referred to in Clause 10 is discovered by the Contractor or notified to him In Writing before expiry of the period referred to in Clause 59, the costs of any necessary remedial work shall be borne by the Contractor.

14. The Purchaser shall ensure that:

a) the Contractor's personnel are able to start work in accordance with the agreed time schedule and to work during normal working hours. Provided that the Purchaser has been given notice In Writing in reasonable time, work may be performed outside normal working hours to the extent deemed necessary by the Contractor;

b) he has, in good time before installation is started, informed the Contractor In Writing of all relevant safety regulations in force at the Site. Installation shall not be carried out in unhealthy or dangerous surroundings. All the necessary safety and precautionary measures shall have been taken before installation is started and shall be maintained;

c) the Contractor's personnel are able to obtain suitable and convenient board and lodging in the neighbourhood of the Site and have access to internationally acceptable hygiene facilities and medical services;

d) he has made available to the Contractor free of charge at the proper time on the Site all necessary cranes, lifting equipment and equipment for transport on the Site, auxiliary tools, machinery, materials and supplies (including fuel, oils, grease and other materials, gas, water, electricity, steam, compressed air, heating, lighting, etc.), as well as the measuring and testing instruments of the Purchaser available on the Site. The Contractor shall specify In Writing his requirements concerning such cranes, lifting equipment, measuring and testing instruments and equipment for transport on the Site at the latest one month before the agreed date for starting the installation work;

e) he has made available to the Contractor free of charge sufficient offices on the Site, equipped with telephone and access to the Internet;

f) he has made available to the Contractor free of charge necessary storage facilities, providing protection against theft and deterioration of the Plant, the tools and equipment required for installation and the personal effects of the Contractor's personnel;

g) the access routes to the Site are suitable for the required transport of the Plant and the Contractor's equipment.

15. Upon the Contractor's request in good time, the Purchaser shall make available to the Contractor, free of charge, such labour and operators as may be specified in the Contract or as may reasonably be required for the purpose of the Contract. The persons made available by the Purchaser under this clause shall provide their own tools. The Contractor shall not be liable for such labour provided by the Purchaser or for any acts or omissions of the persons concerned.

16. If the Contractor so requires, the Purchaser shall give all necessary assistance required for the import and re-export of the Contractor's equipment and tools, including assistance with customs formalities. The assistance as such shall be provided free of charge.

17. The Purchaser shall give all necessary assistance to ensure that the Contractor's personnel obtain, in good time, visas and any official entry, exit or work permits and (if necessary) tax certificates required in the Purchaser's country, as well as access to the Site. The assistance as such shall be provided free of charge.

18. The parties shall, no later than when the Contractor gives notice that the Plant is ready for dispatch from the place of manufacture, each appoint a representative In Writing to act on their behalf during the work on the Site.

The representatives shall be present on or near the Site during working hours. Unless otherwise specified in the Contract, the representatives shall be authorised to act on behalf of their respective party in all matters concerning the installation work. Wherever these General Conditions stipulate that a notice shall be given In Writing, the representative shall always be authorised to receive such notice on behalf of the party he represents.

PURCHASER'S DEFAULT

19. If the Purchaser anticipates that he will be unable to fulfil in time his obligations necessary for carrying out installation, including complying with the conditions specified in Clauses 11, 12 and 14-17, he shall forthwith notify the Contractor In Writing, stating the reason and, if possible, the time when he will be able to carry out his obligations.

20. Without prejudice to the Contractor's rights under Clause 21, if the Purchaser fails to fulfil, correctly and in time, his obligations necessary for carrying out installation, including to comply with the conditions specified in Clauses 11, 12 and 14-17, the following shall apply:

a) The Contractor may at his own discretion choose to carry out or employ a third party to carry out the Purchaser's obligations or otherwise take such measures as are appropriate under the circumstances in order to avoid or alleviate the effects of the Purchaser's default.

b) The Contractor may suspend in whole or in part his performance of the Contract. He shall forthwith notify the Purchaser In Writing of such suspension.

c) If the Plant has not yet been delivered to the Site, the Contractor shall arrange for storage of the Plant at the Purchaser's risk. The Contractor shall also, if the Purchaser so requires, insure the Plant.

d) The Purchaser shall pay any part of the Contract Price which, but for the default, would have become due.

e) The Purchaser shall reimburse the Contractor for any costs not covered by Clause 47 or 48, which are reasonably incurred by the Contractor as a result of measures under a), b) or c) of this Clause.

21. If taking-over is prevented by the Purchaser's default as referred to in Clause 20 and this is not due to any such circumstance as mentioned in Clause 73, the Contractor may also by notice In Writing require the Purchaser to remedy his default within a final reasonable period.

If, for any reason which is not attributable to the Contractor, the Purchaser fails to remedy his default within such period, the Contractor may by notice In Writing terminate the Contract in whole or in part. The Contractor shall then be entitled to compensation for the loss he suffers by reason of the Purchaser's default, including any consequential and indirect loss. The compensation shall not exceed that part of the Contract Price which is attributable to that part of the Works in respect of which the Contract is terminated.

LOCAL LAWS AND REGULATIONS

22. The Contractor shall ensure that the Works are carried out and are in accordance with any laws, regulations and rules which are applicable to the Works. If required by the Contractor, the Purchaser shall provide the relevant information on these laws, regulations and rules In Writing.

23. The Contractor shall carry out any variation work necessary to comply with changes in laws, regulations and rules, referred to in Clause 22, or in their generally accepted interpretation, occurring between the date of submission of the tender and taking-over. The Purchaser shall bear the extra costs and other consequences resulting from such changes, including variation work.

24. If the parties are unable to agree on the extra costs and other consequences of changes in laws, regulations and rules, referred to in Clause 22, the Contractor shall be compensated for any variation work on a time basis.

VARIATIONS

25. Subject to the provisions of Clause 29, the Purchaser is entitled to request variations to the scope, design and construction of the Works until the Works have been taken over. The Contractor may suggest such variations In Writing.

26. Requests for variations shall be submitted to the Contractor In Writing and shall contain an exact description of the variation.

27. As soon as possible after receipt of a request for a variation or after having himself made a proposal for a variation, the Contractor

shall notify the Purchaser In Writing whether and how the variation can be carried out, stating the resulting alteration to the Contract Price, the time for taking-over and other terms of the Contract.

The Contractor shall also give such notice to the Purchaser when variations are required as a result of changes in laws, regulations and rules referred to in Clause 22.

28. If taking-over is delayed as a result of disagreement between the parties on the consequences of variations, the Purchaser shall pay any part of the Contract Price which would have become due if taking-over had not been delayed.

29. Save as provided in Clause 23, the Contractor shall not be obliged to carry out variations requested by the Purchaser until the parties have agreed on how the variations will affect the Contract Price, the time for taking-over and other terms of the Contract.

PASSING OF RISK

30. The risk of loss of or damage to the Plant shall pass to the Purchaser in accordance with any agreed trade term, which shall be construed in accordance with the INCOTERMS® in force at the date of formation of the Contract. If no trade term has been specifically agreed, delivery of the Plant shall be Free Carrier (FCA) at the place named by the Contractor.

Any risk of loss of or damage to the Works not covered by the first paragraph of this Clause shall pass to the Purchaser on taking-over of the Works.

Any loss of or damage to the Plant and Works after the risk has passed to the Purchaser shall be at the risk of the Purchaser, unless such loss or damage results from the Contractor's negligence.

TAKING-OVER TESTS

31. When installation has been completed taking-over tests shall, unless otherwise agreed, be carried out to determine whether the Works are as required for taking-over according to the Contract.

The Contractor shall notify the Purchaser In Writing that the Works are ready for taking-over. He shall in this notice give a date for taking-over tests, giving the Purchaser sufficient time to prepare for and be represented at these tests.

The Purchaser shall bear all costs of taking-over tests. The Contractor shall however bear all costs relating to his personnel and his other representatives.

32. The Purchaser shall provide free of charge any power, lubricants, water, fuel, raw materials and other materials required for the taking-over tests and for final adjustments in preparing for these tests. He shall also install free of charge any equipment and provide any labour or other assistance necessary for carrying out the taking-over tests.

33. If, after having been notified in accordance with Clause 31, the Purchaser fails to fulfil his obligations under Clause 32 or otherwise prevents the taking-over tests from being carried out, the tests shall be regarded as having been satisfactorily completed at the starting date for taking-over tests stated in the Contractor's notice.

34. The taking-over tests shall be carried out during normal working hours. If the Contract does not specify the technical requirements, the tests shall be carried out in accordance with general practice in the appropriate branch of industry concerned in the Purchaser's country.

35. The Contractor shall prepare a report of the taking-over tests. This report shall be sent to the Purchaser. If the Purchaser has not been represented at the taking-over tests after having been notified in accordance with Clause 31, the test report shall be accepted as accurate.

36. If the taking-over tests show the Works not to be in accordance with the Contract, the Contractor shall without delay remedy the deficiencies. If the Purchaser so requires In Writing without delay, new tests shall be carried out in accordance with Clauses 31-35. This shall not apply when the deficiency was insignificant.

TAKING-OVER

37. Taking-over of the Works shall be considered to take place:

a) when the taking-over tests have been satisfactorily completed or are regarded under Clause 33 as having been satisfactorily completed, or

b) where the parties have agreed not to carry out taking-over tests, when the Purchaser has received a Contractor's notice In Writing that the Works have been completed, provided that the Works are as required for taking-over according to the Contract.

Minor deficiencies which do not affect the efficiency of the Works shall not prevent taking-over.

The Contractor's obligation to install the Plant at the Site is fulfilled when the Works are taken over pursuant to this Clause 37, notwithstanding his obligation to remedy any remaining minor deficiencies.

38. The Purchaser is not entitled to use the Works or any part thereof before taking-over. If the Purchaser does so without the Contractor's consent In Writing, the Works shall be deemed to have been taken over. The Contractor is then relieved of his duty to carry out taking-over tests.

39. As soon as the Works have been taken over in accordance with Clause 37 or 38, the period referred to in Clause 59 shall start to run. The Purchaser shall, at the Contractor's request In Writing, issue a certificate stating when the Works have been taken over. The Purchaser's failure to issue a certificate shall not affect taking-over according to Clauses 37 and 38.

CONTRACTOR'S DELAY

40. If the parties, instead of specifying the date for taking-over, have specified a period of time within which taking-over shall take place, such period shall start to run as soon as the Contract is entered into and all agreed preconditions to be fulfilled by the Purchaser have been satisfied, such as official formalities, payments due at the formation of the Contract and securities.

41. If the Contractor anticipates that he will not be able to fulfil his obligations for taking-over before or at the time for taking-over,

he shall forthwith notify the Purchaser thereof In Writing, stating the reason and, if possible, the time when taking-over can be expected.

If the Contractor fails to give such notice, the Purchaser shall be entitled to compensation for any additional costs which he incurs and which he could have avoided had he received such notice.

42. The Contractor shall be entitled to an extension of the time for taking-over if delay occurs:

a) because of any of the circumstances referred to in Clause 73, or

b) as a result of variation work under Clause 23, or

c) as a result of variations under Clauses 25-29, or

d) as a result of suspension under Clauses 20, 51 or 76, or

e) by an act or omission on the part of the Purchaser or any other circumstances attributable to the Purchaser.

The extension shall be as necessary having regard to all the relevant circumstances. This provision applies regardless of whether the reason for the delay occurs before or after the agreed time for taking-over.

43. If the Works are not completed at the agreed time for taking-over, the Purchaser shall be entitled to liquidated damages from the date on which taking-over should have taken place.

The liquidated damages shall be payable at a rate of 0.5 per cent of the Contract Price for each commenced week of delay. The liquidated damages shall not exceed 7.5 per cent of the Contract Price.

If only part of the Works is delayed, the liquidated damages shall be calculated on that part of the Contract Price which is attributable to such part of the Works as cannot in consequence of the delay be used as intended by the parties.

The liquidated damages become due at the Purchaser's demand In Writing, but not before taking-over has taken place or the Contract is terminated under Clause 44.

The Purchaser shall forfeit his right to liquidated damages if he has not lodged a claim In Writing for such damages within six months after the time when taking-over should have taken place.

44. If the delay is such that the Purchaser is entitled to maximum liquidated damages under Clause 43 and if the Works are still not ready for taking-over, the Purchaser may In Writing demand completion of the Works within a final reasonable period which shall not be less than one week.

If the Contractor does not complete the Works within such final period and this is not due to any circumstance which is attributable to the Purchaser, then the Purchaser may by notice In Writing to the Contractor terminate the Contract in respect of such part of the Works as cannot in consequence of the Contractor's failure be used as intended by the parties.

If the Purchaser terminates the Contract he shall be entitled to compensation for the loss he suffers as a result of the Contractor's delay, including any consequential and indirect loss. The total compensation, including the liquidated damages which are payable under Clause 43, shall not exceed 15 per cent of that

part of the Contract Price which is attributable to the part of the Works in respect of which the Contract is terminated.

The Purchaser shall also have the right to terminate the Contract by notice In Writing to the Contractor if it is clear from the circumstances that there will occur a delay in taking-over of the Works which under Clause 43 would entitle the Purchaser to maximum liquidated damages. In case of termination for this reason, the Purchaser shall be entitled to maximum liquidated damages and compensation under the third paragraph of this Clause 44.

45. Liquidated damages under Clause 43 and termination of the Contract with limited compensation under Clause 44 shall be the only remedies available to the Purchaser in case of delay on the part of the Contractor. All other claims against the Contractor based on such delay shall be excluded, except where the Contractor has been guilty of Gross Negligence.

PAYMENT

46. Unless otherwise agreed, payment shall be made within 30 days after the date of the invoice as follows:

a) when installation is carried out on a time basis:

- one third of the agreed price for the Plant at the formation of the Contract,
- one third when the Contractor notifies the Purchaser that the Plant or the essential part of it is ready for dispatch from the place of manufacture and
- the final third on arrival of the Plant at the Site.

Payment for installation shall be made against monthly invoices.

b) when installation is included in the lump sum Contract Price:

- 30 per cent of the Contract Price at the formation of the Contract,
- 30 per cent when the Contractor notifies the Purchaser that the Plant or the essential part of it is ready for dispatch from the place of manufacture,
- 30 per cent on arrival of the Plant at the Site,
- the remaining part of the Contract Price on taking-over.

47. When installation is carried out on a time basis the following items shall be separately charged:

a) all travelling expenses incurred by the Contractor in respect of his personnel and the transport of their equipment and personal effects (within reasonable limits) in accordance with the specified method and class of travel where these are specified in the Contract;

b) cost of board and lodging and other living expenses, including any appropriate allowances of the Contractor's personnel for each day's absence from their homes, including non-working days and holidays. The daily allowances shall be payable even during incapacity caused by sickness or accident;

c) the time worked, which shall be calculated by reference to the number of hours certified as worked in the time-sheets signed by the Purchaser. Overtime and work on Sundays, holidays

and at night shall be charged at special rates. The rates shall be as agreed in the Contract or, failing agreement, as normally charged by the Contractor. Save as otherwise provided, the hourly rates cover the normal wear and tear of the Contractor's tools and light equipment;

d) time necessarily spent on:

- preparation and formalities incidental to the outward and homeward journeys of the Contractor's personnel,
- the outward and homeward journeys and other journeys to which the personnel are entitled in accordance with current law, regulations or collective agreements in the Contractor's country,
- daily travel of the Contractor's personnel between lodgings and the Site, if it exceeds half an hour each way and there are no suitable lodgings closer to the Site,
- waiting when work is prevented by circumstances which are not attributable to the Contractor;

e) any expenses incurred by the Contractor in accordance with the Contract in connection with the provision of equipment by him, including where appropriate a charge for the use of the Contractor's own heavy equipment;

f) any taxes or dues levied on the invoice and payable by the Contractor in the country where installation takes place;

g) any costs which could not reasonably be foreseen by the Contractor and are caused by a circumstance which is not attributable to the Contractor;

h) any extra costs resulting from the applicability of mandatory rules of the Purchaser's country in the social field;

i) any costs, expenses and time spent resulting from extra work which is not attributable to the Contractor.

If these costs are time-related, they shall be charged at the rates referred to in this Clause 47 under c.

48. When installation is to be carried out for a lump sum, the Contract Price shall be deemed to include all the items mentioned in Clause 47, a) through e). Any items mentioned in Clause 47, f) through i), shall be deemed to be excluded from the Contract Price and shall therefore be charged separately. If these costs are time-related, they shall be charged at the rates referred to in Clause 47 under c).

49. If installation is delayed due to a cause which is attributable to the Purchaser, the Purchaser shall compensate the Contractor for any resulting additional costs, including but not limited to:

a) waiting time and time spent on extra journeys;

b) costs and extra work resulting from the delay, including removing, securing and setting up installation equipment;

c) additional costs, including costs as a result of the Contractor having to keep his equipment at the Site for a longer time than expected;

d) additional costs for journeys and board and lodging for the Contractor's personnel;

e) additional financing costs and costs of insurance;

f) other documented costs incurred by the Contractor as a result of changes in the installation programme.

If these costs are time-related, they shall be charged at the rates referred to in Clause 47 under c).

50. Whatever the means of payment used, payment shall not be deemed to have been effected before the Contractor's account has been irrevocably credited for the amount due.

51. If the Purchaser fails to pay by a stipulated date, the Contractor shall be entitled to interest from the day on which payment was due and to compensation for recovery costs. The rate of interest shall be as agreed between the parties or otherwise 8 percentage points above the rate of the main refinancing facility of the European Central Bank. The compensation for recovery costs shall be 1 per cent of the amount for which interest for late payment becomes due.

In case of late payment and in case the Purchaser fails to give an agreed security by the stipulated date the Contractor may, after having notified the Purchaser In Writing, suspend his performance of the Contract until he receives payment or, where appropriate, until the Purchaser gives the agreed security.

If the Purchaser has not paid the amount due within three months, the Contractor shall be entitled to terminate the Contract by notice In Writing to the Purchaser and, in addition to the interest and compensation of recovery costs according to this Clause 51, to claim compensation for the loss he incurs. Such compensation shall not exceed the Contract Price.

RETENTION OF TITLE

52. The Plant shall remain the property of the Contractor until paid for in full, including payment for installation of the Plant, to the extent that such retention of title is valid under the relevant law.

The Purchaser shall at the request of the Contractor assist him in taking any measures necessary to protect the Contractor's title to the Plant.

The retention of title shall not affect the passing of risk under Clause 30.

LIABILITY FOR DAMAGE TO PROPERTY BEFORE TAKING-OVER

53. The Contractor shall be liable for any damage to the Works which occurs before the risk has passed to the Purchaser. This applies irrespective of the cause of the damage, unless the damage has been caused by the Purchaser or anyone for whom he is responsible in connection with performance of the Contract. If the Contractor is not liable for the damage to the Works in accordance with this Clause, the Purchaser may still require the Contractor to remedy the damage, be it at the Purchaser's cost.

54. The Contractor shall be liable for damage to the Purchaser's property occurring before taking-over of the Works only if it is proved that such damage was caused by negligence on the part of the Contractor or anyone for whom he is responsible in connection with the performance of the Contract. The Contractor shall however under no circumstances be liable for loss of production, loss of profit or any other consequential or indirect loss.

LIABILITY FOR DEFECTS

55. Pursuant to the provisions of Clauses 56-71, the Contractor shall remedy any defect or nonconformity (hereinafter termed defect(s)) in the Works resulting from faulty design, materials or workmanship.

56. The Contractor shall not be liable for defects arising out of materials provided or a design stipulated or specified by the Purchaser.

57. The Contractor shall only be liable for defects which appear under the conditions of operation provided for in the Contract and under proper use of the Works.

58. The Contractor shall not be liable for defects caused by circumstances which arise after the risk has passed to the Purchaser, e.g. defects due to faulty maintenance or faulty repair by the Purchaser or to alterations carried out without the Contractor's consent In Writing. The Contractor shall neither be liable for normal wear and tear nor for deterioration.

59. The Contractor's liability shall be limited to defects in the Works which appear within a period of one year from taking-over. If the use of the Works exceeds that which is agreed, this period shall be reduced proportionately. If taking-over has been delayed for reasons which are attributable to the Purchaser, the Contractor's liability for defects shall not, except as stated in Clause 60, be extended beyond 18 months after delivery of the Plant.

60. When a defect in a part of the Works has been remedied, the Contractor shall be liable for defects in the repaired or replaced part under the same terms and conditions as those applicable to the original Works for a period of one year. For the remaining parts of the Works the period mentioned in Clause 59 shall be extended only by a period equal to the period during which and to the extent that the Works could not be used as a result of the defect.

61. The Purchaser shall without undue delay notify the Contractor In Writing of any defect which appears. Such notice shall under no circumstances be given later than two weeks after the expiry of the period given in Clause 59 or the extended period(s) under Clause 60, where applicable.

The notice shall contain a description of the defect.

If the Purchaser fails to notify the Contractor In Writing of a defect within the time limits set forth in the first paragraph of this Clause, he shall lose his right to have the defect remedied.

Where the defect is such that it may cause damage, the Purchaser shall immediately inform the Contractor In Writing. The Purchaser shall bear the risk of damage to the Works resulting from his failure so to notify. The Purchaser shall take reasonable measures to minimise damage and shall in that respect comply with instructions of the Contractor.

62. On receipt of the notice under Clause 61 the Contractor shall at his own cost remedy the defect without undue delay, as stipulated in Clauses 55-71. The time for remedial work shall be chosen in order not to interfere unnecessarily with the Purchaser's activities.

Remedial work shall be carried out at the Site, unless

the Contractor deems it more appropriate, having regard to the interests of both parties, that the defective part or the Plant is sent to him or a destination specified by him.

Where remedial work is carried out at the Site, Clauses 14-17 and 54 shall apply correspondingly.

If the defect can be remedied by replacement or repair of a defective part and if dismantling and re-installation of the part do not require special knowledge, the Contractor may demand that the defective part is sent to him or a destination specified by him. In such case the Contractor shall have fulfilled his obligations in respect of the defect when he delivers a duly repaired part or a part in replacement to the Purchaser.

63. The Purchaser shall at his own expense provide access to the Works and arrange for any intervention in equipment other than the Works, to the extent that this is necessary to remedy the defect.

64. Unless otherwise agreed, necessary transport of the Plant or parts thereof to and from the Contractor in connection with the remedying of defects for which the Contractor is liable shall be at the risk and expense of the Contractor. The Purchaser shall follow the Contractor's instructions regarding such transport.

65. Unless otherwise agreed, the Purchaser shall bear any additional costs which the Contractor incurs for remedying the defect caused by the Works being located in a place other than the Site.

66. Defective parts which have been replaced shall be made available to the Contractor and shall be his property.

67. If the Purchaser has given such notice as mentioned in Clause 61 and no defect is found for which the Contractor is liable, the Contractor shall be entitled to compensation for the costs he incurs as a result of the notice.

68. If the Contractor does not fulfil his obligations under Clause 62, the Purchaser may by notice In Writing fix a final reasonable period for fulfilment of the Contractor's obligations, which shall not be less than one week.

If the Contractor fails to fulfil his obligations within such final period, the Purchaser may himself undertake or employ a third party to undertake necessary repair work at the risk and expense of the Contractor.

Where successful repair work has been undertaken by the Purchaser or a third party, reimbursement by the Contractor of reasonable costs incurred by the Purchaser shall be in full settlement of the Contractor's liabilities for the said defect.

69. Where the defect has not been successfully remedied, as stipulated under Clause 68:

a) the Purchaser shall be entitled to a reduction of the Contract Price in proportion to the reduced value of the Works, provided that under no circumstances shall such reduction exceed 15 per cent of the Contract Price, or, where the defect

is so substantial as to significantly deprive the Purchaser of the benefit of the Contract as regards the Works or a substantial part of it,

b) the Purchaser may terminate the Contract by notice In Writing to the Contractor in respect of such part of the Works as cannot in consequence of the defect be used as intended by the parties. The Purchaser shall then be entitled to compensation for his loss, costs and damages up to a maximum of 15 per cent of that part of the Contract Price which is attributable to the part of the Works in respect of which the Contract is terminated.

70. Notwithstanding the provisions of Clauses 55-69 the Contractor shall not be liable for defects in any part of the Works for more than one year from the end of the liability period referred to in Clause 59 or from the end of any other liability period agreed upon by the parties.

71. Save as stipulated in Clauses 55-70, the Contractor shall not be liable for defects. This applies to any loss the defect may cause, including loss of production, loss of profit and other indirect loss. This limitation of the Contractor's liability shall not apply if he has been guilty of Gross Negligence.

ALLOCATION OF LIABILITY FOR DAMAGE CAUSED BY THE WORKS

72. The Contractor shall not be liable for any damage to property caused by the Works after taking-over and whilst the Works are in the possession of the Purchaser. Nor shall the Contractor be liable for any damage to products manufactured by the Purchaser or to products of which the Purchaser's products form a part.

If the Contractor incurs liability towards any third party for such damage to property as described in the preceding paragraph, the Purchaser shall indemnify, defend and hold the Contractor harmless.

If a claim for damage as described in this Clause is lodged by a third party against one of the parties, the latter party shall forthwith inform the other party thereof In Writing.

The Contractor and the Purchaser shall be mutually obliged to let themselves be summoned to the court or arbitral tribunal examining claims for damages lodged against one of them on the basis of damage allegedly caused by the Works. The liability between the Contractor and the Purchaser shall however be settled in accordance with Clause 78.

The limitation of the Contractor's liability in the first paragraph of this Clause shall not apply where the Contractor has been guilty of Gross Negligence.

FORCE MAJEURE

73. Either party shall be entitled to suspend performance of his obligations under the Contract to the extent that such performance is impeded or made unreasonably onerous by Force Majeure, meaning any of the following circumstances: industrial disputes and any other circumstance beyond the control of the parties, such as fire, war, extensive military mobilization, insurrection, requisition, seizure, embargo, restrictions in the use of power,

currency and export restrictions, epidemics, natural disasters, extreme natural events, terrorist acts and defects or delays in deliveries by sub-contractors caused by any such circumstance referred to in this Clause.

A circumstance referred to in this Clause, whether occurring prior to or after the formation of the Contract, shall give a right to suspension only if its effect on the performance of the Contract could not be foreseen at the time of the formation of the Contract.

74. The party claiming to be affected by Force Majeure shall notify the other party In Writing without delay on the intervention and on the cessation of such circumstance. If a party fails to give such notice, the other party shall be entitled to compensation for any additional costs which he incurs and which he could have avoided had he received such notice.

If Force Majeure prevents the Purchaser from fulfilling his obligations, he shall compensate the Contractor for expenses incurred in securing and protecting the Works.

75. Regardless of what might otherwise follow from these General Conditions, either party shall be entitled to terminate the Contract by notice In Writing to the other party if performance of the Contract is suspended under Clause 73 for more than six months.

ANTICIPATED NON-PERFORMANCE

76. Notwithstanding other provisions in these General Conditions regarding suspension, each party shall be entitled to suspend the performance of his obligations under the Contract where it is clear from the circumstances that the other party is not going to perform his obligations. A party suspending his performance of the Contract shall forthwith notify the other party thereof In Writing.

CONSEQUENTIAL LOSSES

77. Save as otherwise stated in these General Conditions there shall be no liability on either party towards the other party for loss of production, loss of profit, loss of use, loss of contracts or for any other consequential or indirect loss whatsoever.

DISPUTES AND APPLICABLE LAW

78. All disputes arising out of or in connection with the Contract shall be finally settled under the Rules of Arbitration of the International Chamber of Commerce by one or more arbitrators appointed in accordance with the said Rules.

79. The Contract shall be governed by the substantive law of the Contractor's country.

Appendix 2. Process Flow Diagram

On the following page you can find the applicable Process Flow Diagram.



Appendix 3. Negotiated Price

On the following page you can find the negotiated offer as part of this contract.