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For the attention of

Subject: Offer Impregnation Plant (VI). Ready assembled.

March 27th, 2018

OFFER: 180327-1-R0

Vacuum Impregnation Plant with a vertical impregnation tank diameter 1200 mm, cylindrical height of 2000 mm. 1 (one) complete storage tank diam. 1200 mm, cylindrical height of 2000 mm. Full automation with internet connection.

OPTIONAL: Resin thermal management system.

Disclaimer:
According with current European regulations, the plant herewith offered does not comply with current ATEX regulations for the use of flammable or explosive gases and liquids, and thus it should not be used with flammable resins.

NOTE: Due to the introduction of improvements from time to time the right is reserved to supply products that may differ slightly from those illustrated or described in this publication.

Specifications (subject to modifications prior to sale):

SCOPE OF STANDARD SUPPLY:

01. Impregnation tank

Diameter (free inside):		**1200 mm**
Total height (cylindrical part)	:	**2000 mm**
Maximum resin height	:	**Approx. 1800 mm**
Design	:	Vertical cylinder
Operating pressure (absolute values):		0 bar / 1 bar *(atmospheric)*
Operating temp.		20ºC
Max. Design temp.		50ºC

Opening / closing of the folding cover is hydraulically driven by a hydraulic cylinder.

The tank is supplied with the following accessories:

- Solid-state vacuum and pressure gauge (0 to 1000 mbar abs)
- 1 Vacuum valve DN50 electro-pneumatically driven remote operation.
- 1 Venting valve DN32 electro-pneumatically driven remote operation (to release the over-pressure).
- 1 Resin/varnish valve DN80 electro-pneumatically driven remote operation (return of the impregnation media to the storage tank).
- Position detectors for the hydraulic opening and closing system.
- 1 illuminated sight glass DN100 (with 24 V light).
- 1 sight glass DN100
- Resin level direct and continuous measuring system for full automation of the plant.

02. Control panel

Full wired control panel complying with "CE" current regulations (*other national or international standards are available upon special request, please specify on ordering*), with the following elements (outside):

- Full colour 10" graphics touch screen.
- Two press buttons to open and close the tank lid.
- Control panel rearm button.
- Emergency stop push button.
- Main electrical switch.
- Ethernet connection.

03. Storage tank

Diameter	:	**1200 mm**
Free height (cylindrical part)	:	**2000 mm**
Design	:	Vertical cylinder
Operating pressure (abs. pressure)	:	0 bar / 1 bar
Operating temperature:		0 to 50ºC
Total volume		**> 2 m³**

The storage tank is supplied with the following accessories:

- Solid-state vacuum gauge (0 to 1000 mbar) for digital display.
- 1 Vacuum valve DN50 electro-pneumatically driven remote operation.
- 1 Venting valve DN32 electro-pneumatically driven remote operation
- 1 Resin/varnish valve DN80 electro-pneumatically driven remote operation.
- 1 illuminated sight glass DN100 (with 24 V light).
- 1 sight glass DN100.
- 1 PT100 temperature sensor for PLC monitoring and control.
- Resin level direct and continuous measuring system for full automation of the plant.
- 1 Man hole (DN500) for cleaning, inspection and repair of the resin tank
- Vacuum resin filling system from IBC containers or drums comprising a manual valve, vacuum resistant flexible hose and rigid steel sucking pipe.

04. Vacuum pump: One single stage high-performance, oil sealed, rotary vane vacuum pump. Vacuum pump is equipped with intake (mist separator) and exhaust filter.

Pumping capacity:	approx. 100 m^3/h
End (ultimate) absolute pressure:	< 1.0 mbar abs (at pump inlet port):
Power:	2.2 kW
Mains:	220 - 240 V /380 - 415 V, 50 Hz
Noise level:	69 dB
Protection:	IP 55

05. Hydraulic system

To conveniently operate the folding cover system

The system comprises (tentative, subject to changes):

- 1 hydraulic oil tank, capacity approx. 10 litres
- 1 hydraulic pump approx. 1 kW
- 1 cylinder operating the cover. Working pressure approx. 100 bar
- Oil filter.
- Oil pressure gauge.
- Overpressure by-pass valves.
- Pipes, electrical solenoid valves, etc…

06. Frame

The plant is supplied full assembled, completely piped (all internal connexion pipes are included) and wired up ready to start.

Approximate overall dimensions of the complete plant are:

Length: 4000 mm
Width: 2000 mm
Height: 3600 mm

07. Return filter

Physical strainer (filtering mesh) to clean the impregnating media on its way back from the impregnation vessel to the storage vessel. Filter is composed of a physical sieve filter with a fineness of approx. 500 µm.

The filter body is a vertical cylinder with a quick opening cover and drainage valve at the bottom and independent and interchangeable stainless steel filtering cartridges.

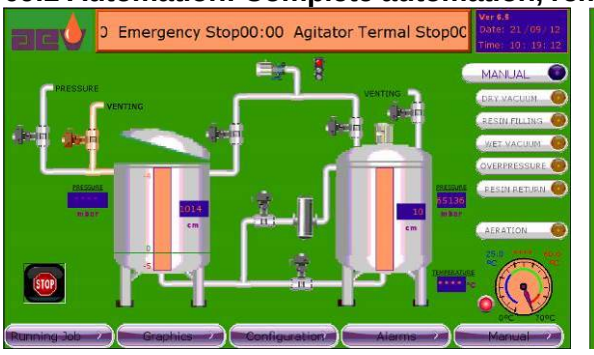
08. Agitator

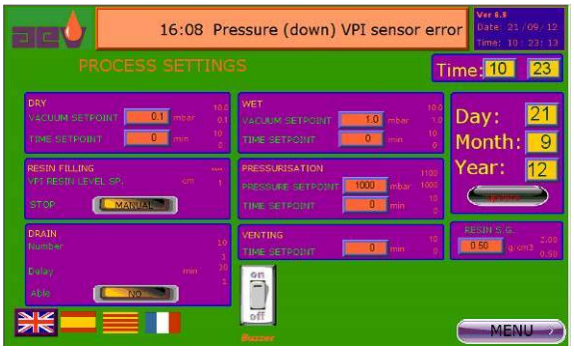
A propeller agitator to help maintain a constant temperature and homogeneous properties of the impregnating media. Agitator is designed to suit the resin specs.
(Final specifications are subject to resin physical properties)

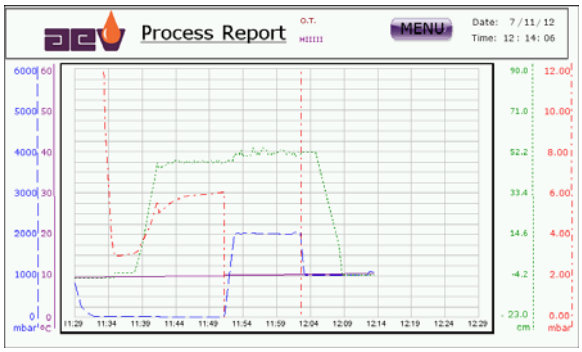
Specifications:
- Double 2-blade propeller system built in stainless steel ANSI 316 mounted on a flange.
- Propeller diameter: 600 mm
- Total length of the shaft: Approx. 2300 mm
- Rotating speed: 60 r.p.m
- Motor power: 1 kW (1.5 Hp), 1500 r.p.m.
- Motor protection: No
- Double vacuum tight mechanical seal made of PTFE.

09. PROCESS AUTOMATION

09.1 Automation: Complete automation, remote connection.







Process automation is carried out by a PLC which is installed at the control cabinet and allows the plant to operate the complete process automatically, semi-automatically or manually, allowing the operator to modify the main process parameters.

The control system comprises:
- 1 Modular programmable Logic Controller.
- 1 Full colour VGA 10” graphics touch screen to display and operate the plant.
- Scope of standard software including: Control software modules, display software modules, data logging, storing and printing (QA reports), LAN/WAN communication.
- Continuous measuring & display resin level (cm) sensors on impregnation tank.
- Continuous measuring & display resin level on resin storage tank.
- Temperature sensors for resin temperature monitoring, control and warning.

When the plant runs on full automatic option and after the operator has loaded the tank and closed the cover, the PLC controls the timing and progress of all steps of the process until it finishes warning the operator by means of an alarm of “End of Cycle”.

The main process parameters are introduced by the operator to suit the production requirements: Process timings, vacuum levels, overpressure levels, resin level transfer, etc…).
The software includes a semi-automatic operation mode of the plant (Step by Step Mode), in which the operator can n where the operator can manually control all valves and vacuum pump, so as to carry out a manual process at any time.

Plant alarm screen: Alarm and plant mal function detailed information, historical events, etc…
Remote internet access module (Ethernet/wired or GPRS/wireless) for remote plant monitoring, plant control, troubleshooting, preventive maintenance, software updates, etc…

Note: Remote (internet) technical assistance is subject to a charge after the guarantee period has expired, the SIM card (for GPRS wireless access) monthly fee is not included. Please ask for our detailed sales conditions.

OPTIONS:

10. THERMAL MANAGEMENT OF THE RESIN

10.01. Cooling/heating coil

Specially designed internal spiral cooling/heating coil for optimum heat transfer, built with 25 mm diameter steel tube according to DIN 2440 standard. Working pressure < 3 kg/cm².

10.02. Thermal insulation of the storage tank

Insulation system using 40 mm thick rock wool insulation padding and cladded with aluminium panels. Coefficient of thermal transfer is approx. 0.85 m²K/W.

10.03. Cooling / heating unit

Water cooling and heating plant (reversible mode) to maintain the resin temperature exactly within the preset values. It includes a circulation pump, expansion vessel. Controlled by a dedicated microprocessor for easy set up and maintenance of the plant, it includes water temp. regulation, anti-freezing, compressor working cycle control, etc.

Specifications (subject to modification):

- Cooling power:	4 200 kcal/h (4.9 kW)
- Heating power:	4 558 kcal/h (5.3 kW)
- Nr of compressor units:	1
- Nr of cooling fans :	1
- Noise level:	59 dB
- Overall dimensions:	872 x 342 x 790 (width x depth x height)
- Weight:	98 kg
- Electrical power consumption:	2 kW
- Water flow rate:	0.3 l/s
- Total weight:	150 kg

TERMS OF THIS OFFER

Payment terms
30% down payment against order confirmation
60% On readiness for delivery against shipping documents
10% At sight after acceptance by customer

Installation, commissioning and training: Not included

Labour and installation materials are not included in the scope of this offer:
NOTE: Because of its size, this plant would be supplied completely assembled, connected, wired up and factory tested. Thus, installation works are very simple and reduced to the placement of the plant on a suitable pit (or construction of a platform) and connection to the services (electrical mains and compressed air supply), approximate installation commissioning and setting up time 3 working days.

Packing: Not included.

Transport: Not included.

Delivery time: Approx. 25 weeks after order confirmation and pre-payment (depending of number and type of options requested). Binding delivery time will be confirmed after pre-payment.

Insurance costs: Not included

Offer validity: 6 months

Warranty: 12 months after commissioning. Maximum 18 months after dispatch date.

Documents: 2 complete sets of documents in English are included (electronic file formats if not otherwise agreed): Users manual, maintenance schedule, certifications, construction plans, etc...

Not included in this offer : Customer must supply (if applicable):

- Adequate foundations.
- Cranes and all transport means for the final installation..
- Tools, except special tools, welding equipment, drilling machines, etc..
- Special equipment and instruments like voltmeters, amp meters, ohmmeters, hour counters.
- Certifications or inspections to fulfil customer's special regulations or local / national regulations.
- Anything not mentioned in the current offer.

TOTAL PRICE	**Pos. 01 to 09**	**62 000 €**

OPTIONS:

Thermal management of the plant	**Pos. 10.01 to 10.03**	**18 500 €**

We hope this offer will be of interest and look forward to hearing from you soon.

Best regards,

Josep Elias