Carate Brianza ,25-01-2012

MACHINECO INC.
5650 Philippe Turcot St.
Montreal (QUEBEC)
CANADA H4C 1V6
Att: John Doak (mobile 514-867-3131
Robin Doak Mobile 514-952-3132
Tel 1-888-459-4025 / USA: 518-913-2733
E-mail: machineco.sales@gmail.com

Att.: [illegible]

Confirm order for the supply of:

PLANT "MICRO 120"-PR FOR THE PRETREATMENT AND PAINTING OF THE ALUMINIUM SHEETS AND PROFILES

Eco-friendly

60% less power
than conventional horizontal oven

European Patent n. EP 16249070

N.B.: this technical description is strictly confidential and it cannot be disclosed to third parties without our written authorization.

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CHAPTER 1.0 PRODUCTION PROCESS

The aluminium profiles are hooked by the operators on the bars holding the pieces parked in the loading area (n. 4 positions).

Each bars holding the pieces moves automatically sideways to the painting area. The bars holding the pieces, one after the other, move to the painting zone.

Once in position, the booth starts to move and the guns spray the powder which, thanks to the electrostatics charge generated by electronic unit, sticks to the external perimeter of the profiles.

When the booth has painted all profiles loaded on the bar, the bar goes out from the painting zone going into the overhead bell oven for curing.

Every single bar holding pieces is located in the accumulation area of the profiles which must be pre-treated.
When, in the pre-treatment area, the translation of the holding bars is finished the lifting system, laterally installed, starts the translation cycle of the bars holding the pieces. In the meantime the spraying ramps eject the chemical solutions contained in the bottom of the tank, for the time expected in each phase.

Once the pre-treatment cycle is finished the bars holding pieces are automatically placed into the drying oven.

When the drying cycle is finished the bar holding pieces is moved into the coating area. The booth starts moving and the guns eject the powder which, thanks to the electrostatic charge generated by electronic devices, adheres to the external perimeter of the profiles. As soon as all profiles loaded on the bar are powders coated, the booth comes from the working area disengaging the bar, which now goes into the “bell” oven.

Once the application cycle has finished, the holding bar is conveyed automatically in the area of accumulation placed into the oven. This area allows to polymerize the layer of powder applied. In the curing oven 8 bars are parked; when a bar enters, another goes out, having ended the cycle, and moves to the unloading zone. In the unloading area 4 bars are parked so that the profiles have the time to cool down before the operators unload them on a storage trolley.

The plant can be equipped with two booths for painting; so, while one is operating, the other can be cleaned and prepared for a new colour. Each booth is equipped with cyclone/sucking fan/filtering cartridges unit to recovery the powder, which is sent back to the powder tanks feeding the powder ejectors.

Between the two booths an infrared oven is placed. This oven is able to make a gelation of the powders ejected by the first booth in order to allow the application of a second hand and a single polymerization in the hot air oven.

The processing cycle includes the following steps:

First hypothesis of the pretreatment and coating cycle of aluminum profiles:

1- Loading	: from the storage trolley through operators
2- 1st station with acid degreasing	: 2,4 minutes at 25°C
3- 2nd station with acid degreasing	: 2,4 minutes at 25°C
4- 2nd station with acid degreasing	: 2,4 minutes at 25°C
5- Rinsing	: 2,4 minutes with rechanged water (room temperature)
6- Demi	: 2,4 minutes with rechanged water (room temperature)
7- Chrome (free)	: from 30 to 60 seconds at 20-30°C
8- Demi	: 2,4 minutes with rechanged water (roomd temperature)
8-Drying	: 20 minutes with hot air and recirculation at 70- 80°C
9-- 1st coating station	: 2,4 minutes
11- 2nd coating station	: 2,4 minutes
12- Polymerisation	: 23,5 minutes with hot recirculated air at 200°C
11- Unloading	: from the bars holding pieces by the operator

CHAPTER 2.0 GENERAL DATA

All the plant is manufactured according the UL-CSA rules Quebec

- Material to be painted : aluminium or steel profiles and sheets
- Medium charge dimension : mm 6500 x 300 x 1500 (H).
- Maximum charge dimension : 8000 x 500 x 1500 mm. In this case the bars holding pieces should be loaded at a double step
- Maximum sheets dimension : mm 5.000 x 1500 x 3.
- Maximum charge weight : kg. 120.
- Theoretical production capacity (maximum) :> 18- bars holding pieces/hour equal to. 864 aluminium profiles (considering profiles having a medium weight of 4 kg.) and the plant equipped with n. 1 application unit
  > 30 bars holding pieces/hour equal to. 1440- aluminium profiles (considering profiles having a medium weight of 4 kg.) and the plant equipped with n. 2 application units
- Curing temperature : 180-210° C.
- Curing time : 25 minutes about
- Max. oven air temperature : 230°C.
- Electric power installed : 350 kW approx.
- Power : 400Vac,50Hz,3Ph+hearth
- Thermal capacity installed : 500.000+160.000 Kcal/h

Eco-friendly

60% less power

than conventional horizontal oven

All the plant is manufactured according the CE rules.

All the plant is painted according to our standard colours; the components that into the oven, as well as the internal parts of the oven, are not painted.

CHAPTER 3.0 SUPPLY DESCRIPTION

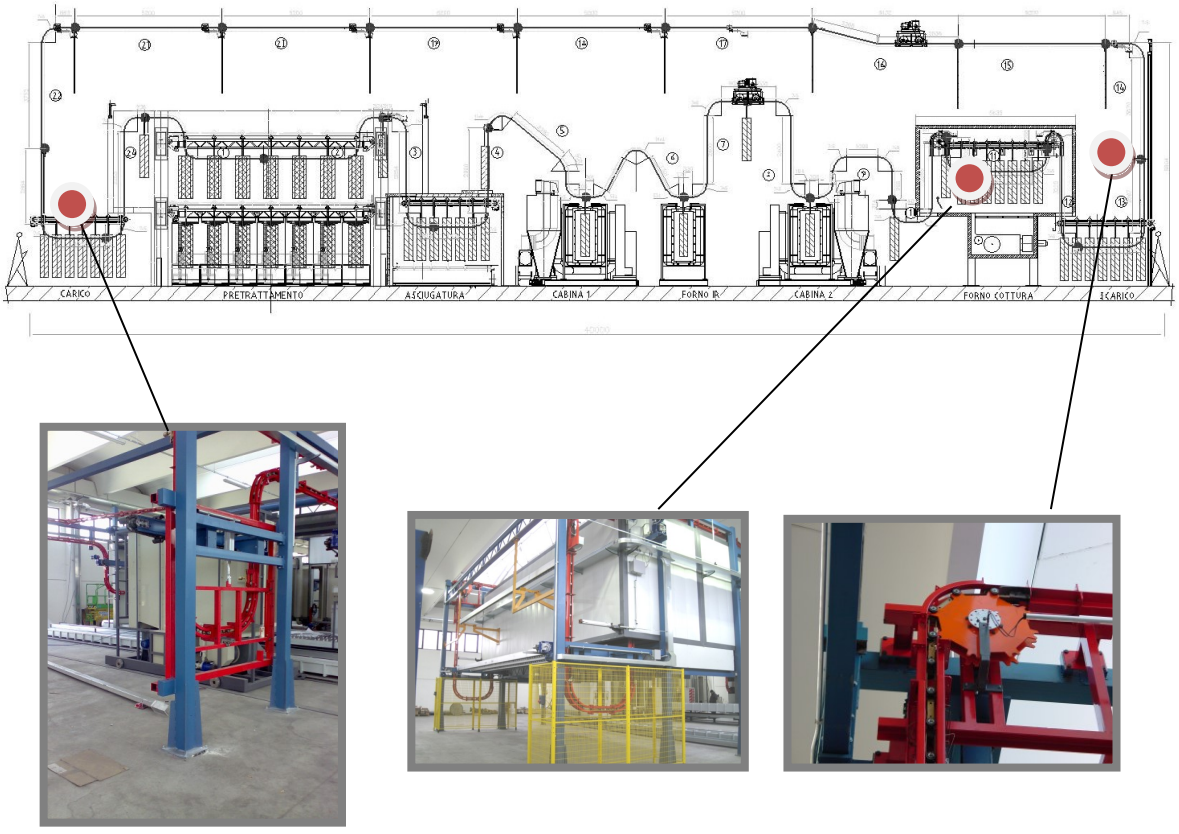
3.1 - CONVEYORS

Premise

The line consists of a main conveyor and two horizontal motorized parking for the accumulation of the bars holding pieces; one, one is located inside the oven and one in the discharge area of the profiles.

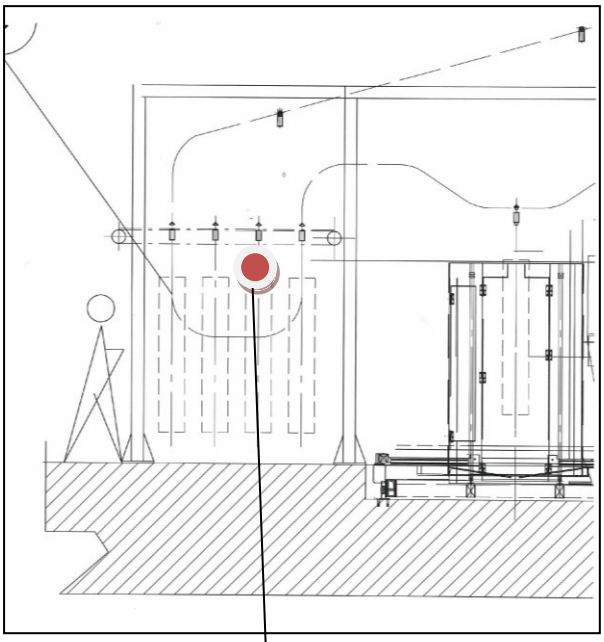
3.1.1 - Main conveyor (picture pag.6)

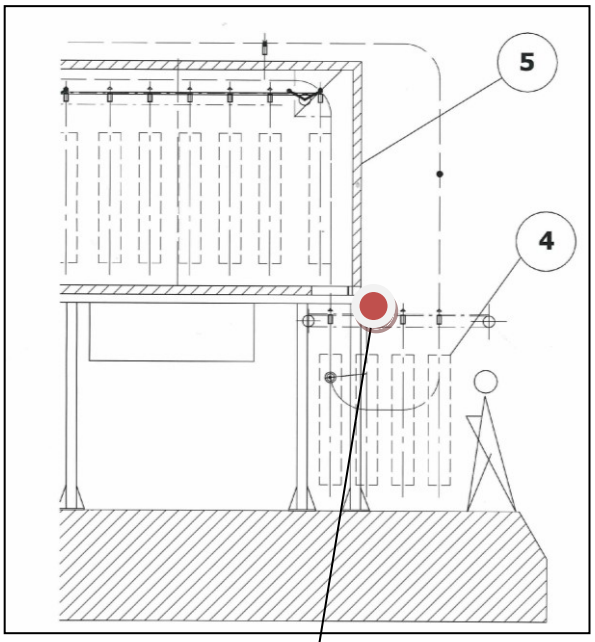
- Double rail made in bent sheet steel, reinforced by electrojoint flanges
- N. 2 toothed wheels for the chains driving, moved synchronized by 4 gear motors.
- N. 2 automatic lubrification system for the chain.



3.1.2 – parking conveyor located in the loading/unloading area

- N. 4 roll chains equipped with devices for automatic holding bars centring.
- N. 4 gear-motors for the two chains driving.
- Displacement step by step of the transfer synchronized with the main conveyor.
- Parking capacity: 6 bars (loading). 8 bars (unloading)





3.1.3 – pre-treatment parking

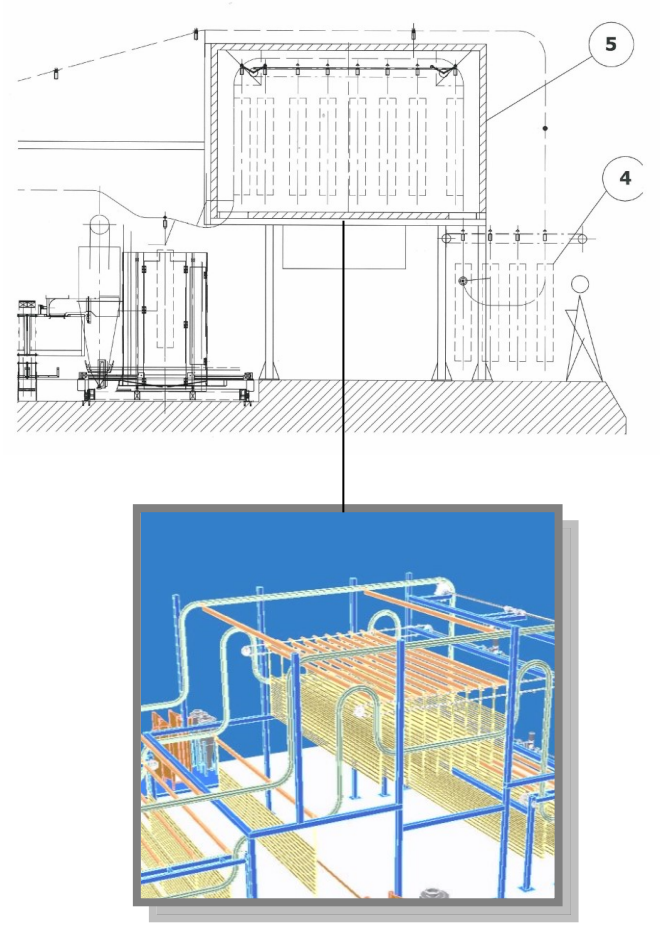
- N. 2 roll chains equipped with devices for holding bars centring.
- N. 2 gear-motors for the two chains driving
- Displacement step by step of the transfer synchronized with the main conveyor.
- Parking capacity: n. 7 bars (each one).

3.1.4 – drying oven parking

- N. 2 roll chains equipped with devices for bars centring.
- N. 2 gear-motors for the chains driving.
- Displacement step by step of the transfer synchronized with the main conveyor.
- Parking capacity: n. 6 bars (each one).

3.1.5 – internal oven parking

- N. 2 roll chains equipped with devices for holding bars centring.
- N. 2 gear-motors for the chains driving.
- Displacement step by step of the transfer synchronized with the main conveyor.
- Parking capacity: n. 8 bars



3.2 – PRE-TREATMENT AREA

The pre-treatment area has been specially studied to optimize time and space on a cycle which takes advantage of the application and polymerization on a "bell" oven.
The system to pretreat the profiles is composed by the followings:
N. 7 tanks in polypropylene , dimensions : 9000 x 1000 x h=2000.
N. 6 heaters of 15 kW. Acid degreasing
N.26 heaters of 15 kW. Crome (free)
N. 6 utilities for the discharge of liquids.
N. 14 spraying ramps .
N. 8 centrifugal electro-pumps of 3 kW each, in AISI 316.
N. 2 centrifugal electro-pumps of 5.5 kW each, in AISI 316 L.
N.1perimetric structure composed by pre-fabricated panels (50mm. of thickness).
N. 2 Fan with a screw in AISI 304 for the aspiration of fumes of acid degreasing.

The processing cycle includes the following steps:
First hypothesis of the pretreatment and coating cycle of aluminum profiles:

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5- Rinsing	: 2,4 minutes with rechanged water (room temperature)
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12- Polymerisation	: 23,5 minutes with hot recirculated air at 200°C
11- Unloading	: from the bars holding pieces by the operator

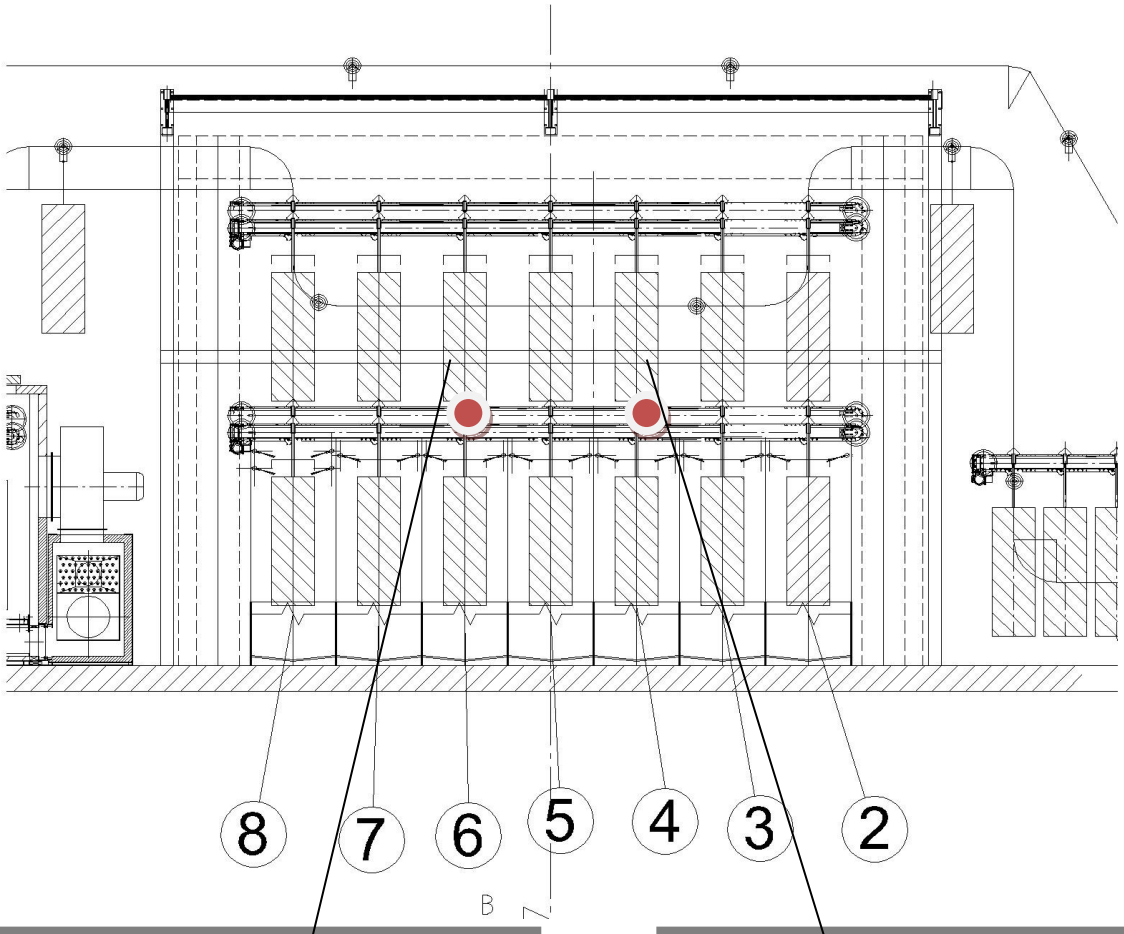
3.2.1 – AUTOMATIC SYSTEM FOR THE BARS TRANSLATION

Function:

Vertically translation of the bars holding the pieces, with maximal overall dimension of : 8000x500xH= 1500 and maximum gross weight of 200 kg. each, for a total weight of 1400 kg.

Construction:

- Structure with load-bearing frame for the sliding of trolleys; realized with criteria for transport on ordinary road.
- Vertical guides to avoid the lateral movement of the loading during the translation.
- Uplift at single speed with n. 2 groups of 250 kg/each independent but controlled by PLC.
    - Vertical translation with maximum speed of 8 m/minute.
    - Power installed : 2x2,2 kW.
- Maximum inclination 8° approx. in the two directions. In spray cycle the inclination is turned over the platform side, in stand-by the inclination is turned over the opposite side to obtain the drainage to the lower area of tank.
- Stroke-ends and edge sensors pre-assembled in working position on adjustable support.
- The reading of the translation position and the slowdown signals takes place by n. 3 proximity.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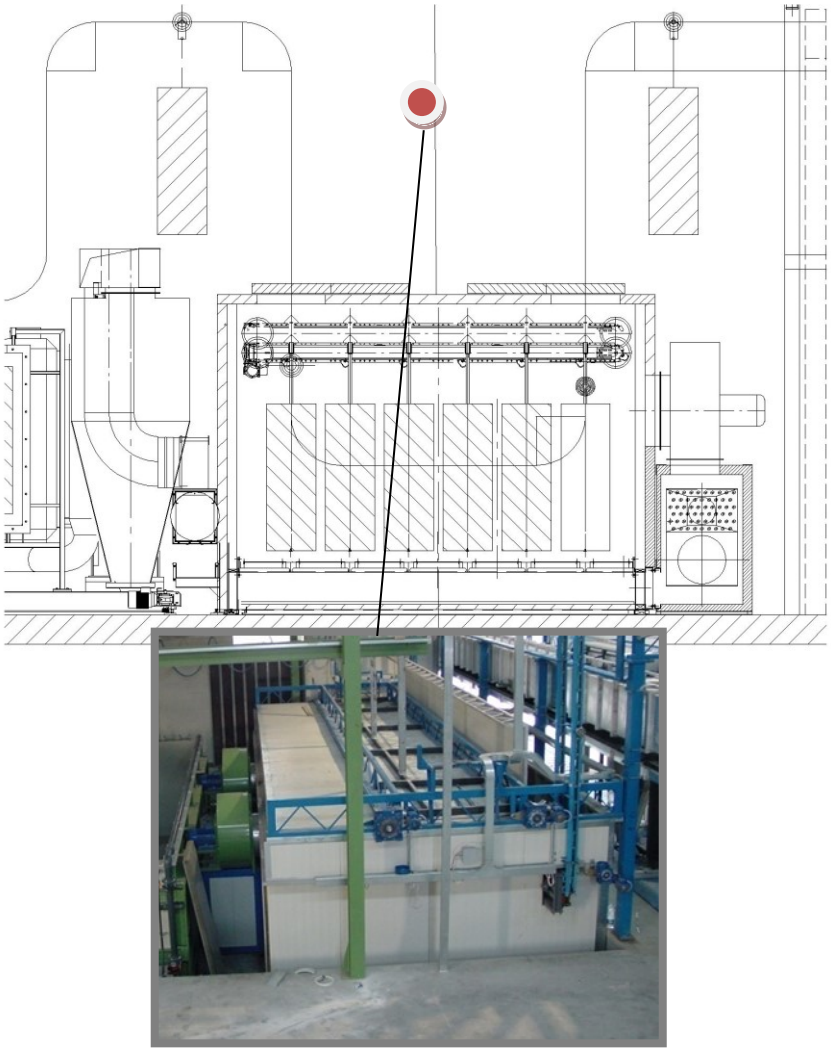
3.2.2 Oven for drying

Carpentry made in carbon steel profiles electrowelded and bolted

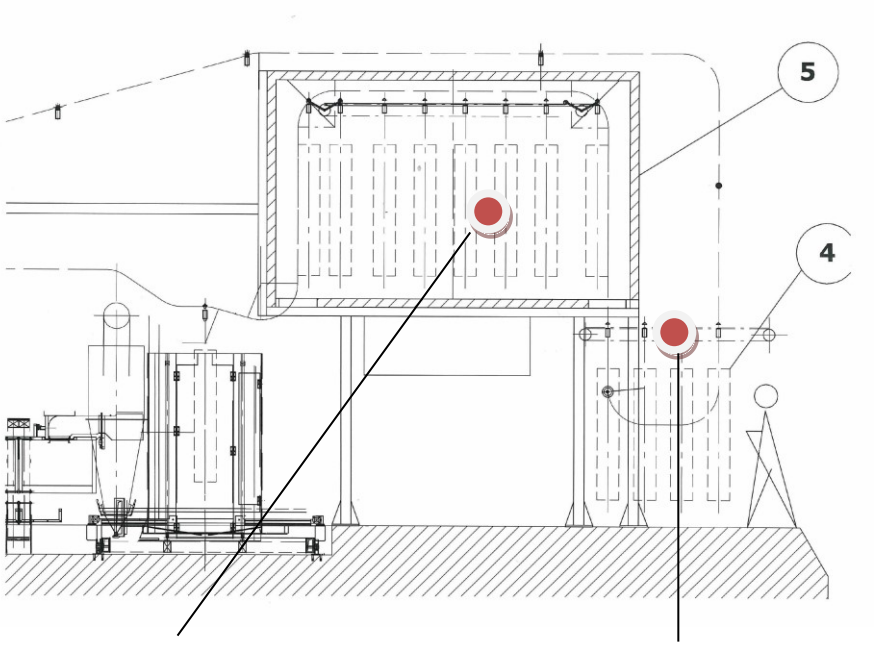
Exterior framework made by steel welded profiles.

- Exterior walls assembled with prefabricated panels.
- Interior panels coated with steel sheets.
- Internal parking studied to contain 6 bars holding pieces.
- N. 02 heat exchangers made in steel.
- N. 04 fans for the air recirculation.
- N.0 2 burner Kcal./h. 80.000.
- N. 02 doors with pneumatic opening



3.3 - N.1 CURING OVEN

- Framework made by electrowelded mild steel profiles.
- Internal/external walls made in galvanized steel sheets, thickness mm. 1,5.
- Thermal insulation made in mineral wool, density 100kg./m3; thickness mm. 120 for the oven walls and mm. 150 for the heat exchanger/firing chamber walls area.
- Firing chamber made in stainless steel sheets AISI 304.
- Heat exchanger made in stainless steel pipes AISI 304.
- N. 2 air ducts, for the uniform air distribution on the profiles.
- N. 4 centrifugal fans, kW. 5,5.
- N. 2 burner, capacity Kcal./h. 250.000, fed by natural gas , fitted on the firing chamber side; the combustion fumes do not enter in contact with the air circulating inside the oven.
- Temperature setting and control made through an electronic and programmable thermoregulator installed on the main control board.
- Max. air temperature 230°C.
- Pre-heating time 45 min. approx.



Curing oven zone

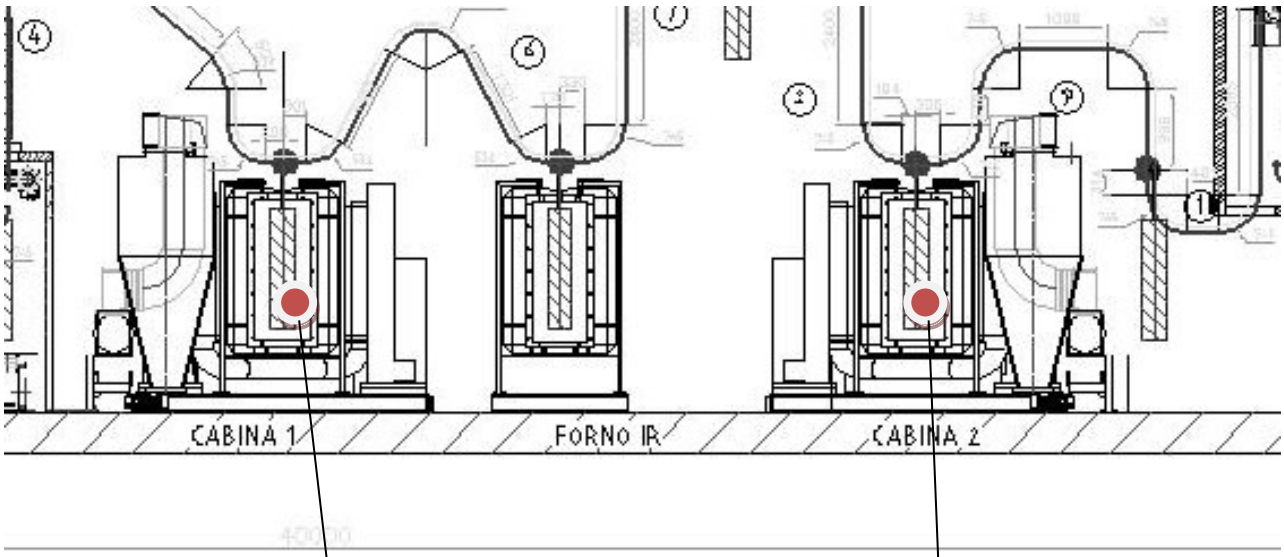
Curing oven exit door

3.4 – N. 2 COMPLETE APPLICATION UNITS

(description referred to n. 1 complete application unit)

3.4.1 – Mobile platforms

-Base trolley made in steel electrowelded profiles, placed on wheels running on two rails fixed to the floor.
-Trolley driven by geared motor controlled by inverter; adjustable speed from 1 to 15 m./min.
-N. 1 cartridge filter complete with counter-current compressed air blowing device for the cartridges cleaning.



View of painting booth

painting booth in work

-N. 01 set of semi-absolute filters.
-N. 01 centrifugal fan.
-N. 01 electrical cabinet.

3.4.1.1 – N. 1 Filtering block using ink cartridges

Metallic structure made in carbon steel, supplied with inspection hatches and a connection channel necessary to realize the suction of the cyclone.
Suction fan supplied with overturned blades (in compliance with Atex Rules) and connected downstream with the filters.
The ink filters supplied with an adequate Venturi are kept clean by means of a blowing system (using compressed air) that provides to the cleaning of all the filters in sequence.
An adequate electric device checks the losses of weight and intervenes in case of break of a filter.
At the base of the chest is fixed (by means of adequate hooks) a bag for the collection of the unusable dust.
A cone releases the draining when the suction stops, sending the dust directly in the collecting tank.

Technical data of the filtering block

Size	: mm. 1200 x1200xH 4200
Suction Fan	: 14.000 m3/h 22 KW
Noise produced by the fan	: max. 80 dB
Surface for each ink cartridge	: 5,4 m2
Total of Ink cartridges used	: 30
Total filtering surface	: 162 m2
System for ink cartridges	:cleaning by nozzles (using compressed air)
Speed of the air in the pipes	: 20 m/s
Total electric power absorbed	: 20 kW
Panel system	: 15/10 coated sheet.

Technical data of the Filtering Tissue

- Composition	: 10% PES linked in a thermic way, antistatic panelled
- Weight	: 240 gr/m2
- Thickness	: 1,1mm
- Air permeability	: 300 m3/m2/h
- Division of the particles	: ≥ 99%(≥ 1 micron)

3.4.2 – Powder coating booth, MAGICDISC

N. 2 opposed workspaces for the automatic coating (reciprocators and guns excluded)arranged for the horizontal or vertical placing of the guns.

- N. 1 booth made in PVC, with external metallic structure
- N. 1 disc made in PVC placed at the end of the booth and supplied with a cleaning system .
- N. 2 systems for the displacement of the disc.
- N. 2 doors for the passage of the pieces with a pneumatic opening.
- 1 cleaning system for the disc using compressed air.

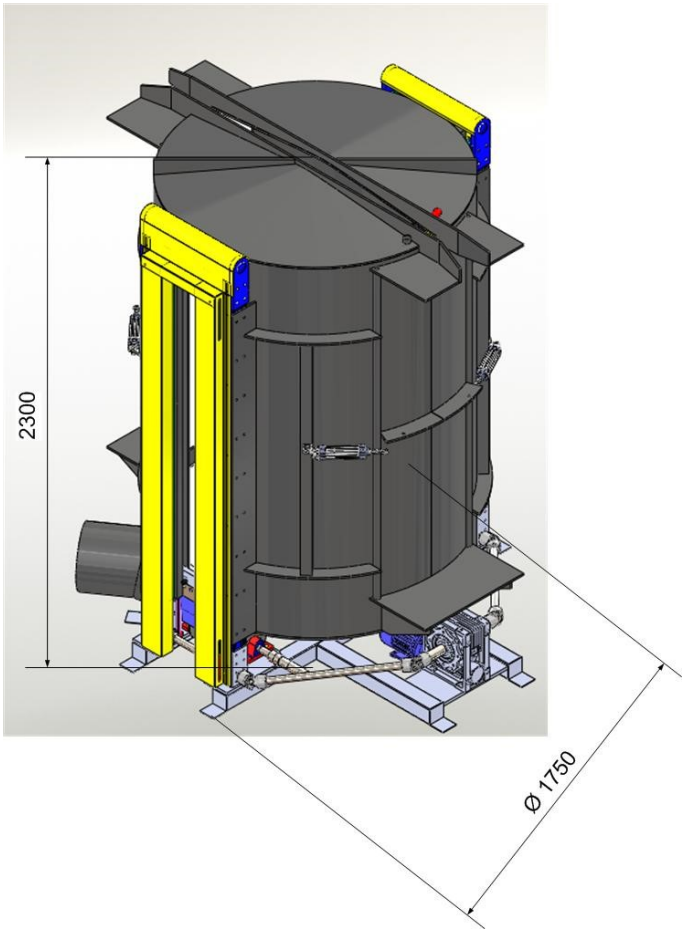
Optional:

- N. 2 cleaning systems using compressed air for the external cleaning of the guns during the phase of extraction for the change of colour.

Technical data of the booth

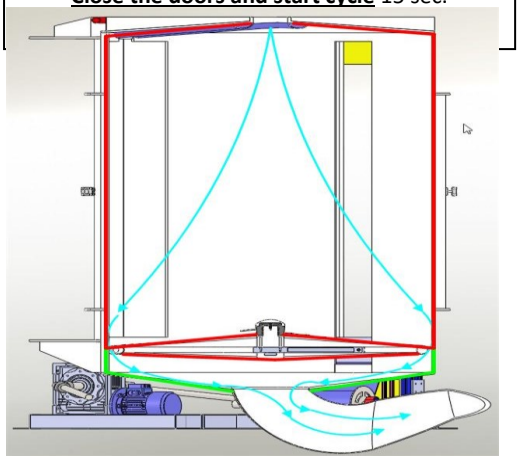
Free light of passage	:650 x H= 1800
Maximum encumbrance of the pieces	: 500 x H= 1500
Internal size	: Diameter mm 1800 x H= 2300

Booth in coating process



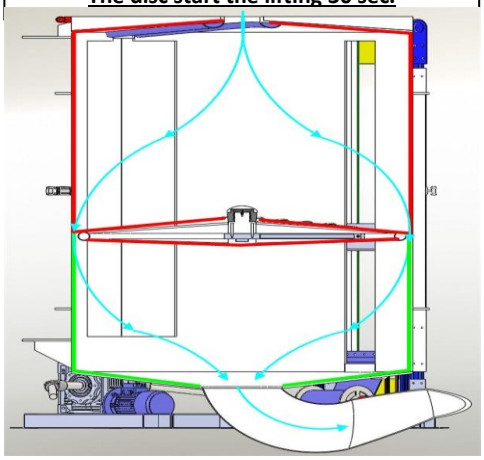
1st phase

Close the doors and start cycle 15 sec.



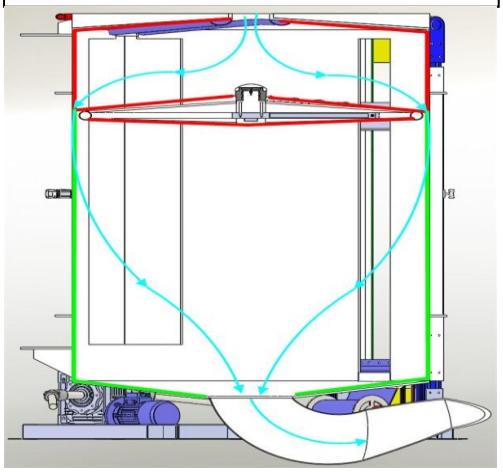
2nd phase

The disc start the lifting 30 sec.



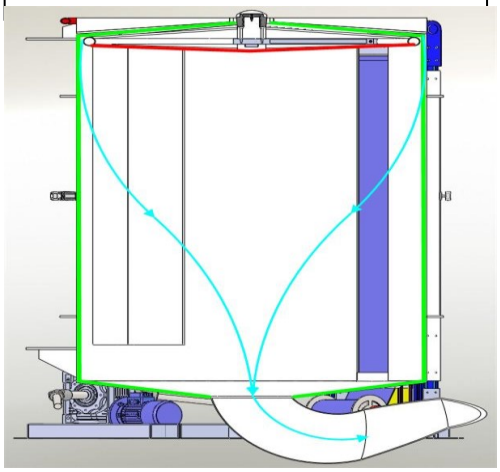
3th phase

The disc clean the wall 45 sec.



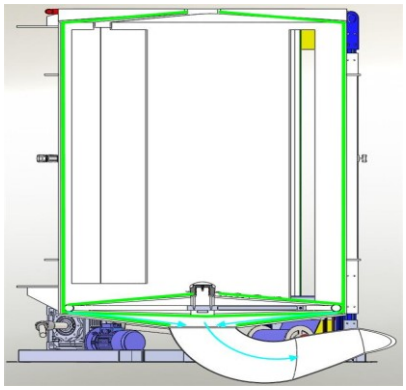
4th phase

The disc is on the upper position 60 sec.



5th phase

-the disc finish the cleaning cycle 90 sec.



Dirty surface

clean surface

3.4.3 – N. 2 Oscillators SEF-TYPE 6X1500

Specifications:

Fully disbursed	: 250 mm
Number of providers	: 6
Cover	: from 200 to 400 mm
Overall coverage	: approx 1800 mm
Speed oscillation	: 20 to 60 per minute
Horizontal travel	: 500 mm

Construction: (for each oscillator)
Vertical column for attaching control arms
Metal platform complete with scroll wheels and guides for horizontal movement
No. 6 locking arms of the 6 guns
AC gear motor with frequency converter for varying oscillations
Sensor on the trolley horizontal edge
Command electric start built into electrical equipment cabin

3.4.4 – N. 1 High efficiency cyclone

- High Efficiently cyclone made in carbon steel connected upstream with a cylindrical piping system and downstream with the filtering group.
- Drum for the collection of dust made in transparent PVC and supplied with pneumatic pumps used to send the dust to the dust tank of the guns.
- N. 3 adequate moving pipes fed with compressed air, activated during the cleaning phase. They realize the internal cleaning of the dust concentrated in the conic area.

Technical data of the cyclone

External size	: Diameter mm. 1200
Height	: 3500 mm
Loss of charge	: 150 mm approximately
Capacity	: 12.000 m3/h
Theoretical productivity	: 95,1 %

Cyclone

3.4.5 – N. 1 Group of powder distribution (GEMA)

3.4.5.2 N. 1 Group for the electrostatic powder coating (GEMA)

N. 12 automatic electrostatic guns (GEMA)

3. 6 – N. 1 MAIN ELECTRIC BOARD

- Closet made by mild steel sheets, containing main switch, relays switches, thermal switches, fuses, etc.
- Protection degree IP 54.
- Main tension V. 600, Hz. 60.
- Tension of auxiliaries V. 24.dc
- Openable front door on which are installed the lamps, the displays of the curing oven temperature control, the push-button switches, etc.
- Light and sound alarm in case of functioning failure of some devices.
- All the electric cables, from the cupboard to the utilities, are in openable metallic and/or metallic plastic trays.
- PLC, for the control of the functioning cycle and the alarms management. ALLENBRADLEY

Main electric board

3.7 - N. 1 SYSTEM FOR THE TREATMENT OF WASTE WATERS (to be supplied and quoted by the Company C.I.E. srl)

CHAPTER 4.0 DOCUMENTATION

Together with the machine we will supply a copy of our standard documentation which includes:

- the use and machine maintenance handbook;
- the electric and pneumatic diagrams;
- the machine lay-out, complete with all the utilities points.

Possible documentation, exceeding the standard above mentioned, should be required during the contract stipulation and it will be supply at the cost.

The supply does not included the supply of constructive drawings, lists of software of the operational programs and others similar documents. This for ordinary raisons of industrial security.
Without written authorization from our part, you cannot supply to third parties copy or indications about the content of no documents received by us.
In case of transgression you could be contacted to refund damages.

CHAPTER 5.0 ASSEMBLY AND START-UP

The machine will be assembled in your factory by your personnel, under the supervision of our engineer.
Foreseen time: 160 days/man.
Once the machine will be completely assembled and all the utility points connections mentioned in our technical documents an official acceptance test certificate will be issued.

Before this time you should obtain the consumable material to test the cycle of the equipment and place the appropriate adjustments. During this period will be necessary the technical assistance of chemical products suppliers.

In case for raisons that do not depend on us the assembly and/or start-up could not be realised within 60 days from the delivery of the installations. At the effects of the contract expiry dates, the start-up will be considered realised with positive issue.

CHAPTER 6.0 EXCLUSIONS

All the power and compressed air connections from your main lines to our boards and/or utilities points and from our boards to the utilities points.
The connection between the machine burner and your gas or Diesel oil line.
The 4 burner.
The chimney for the combustion gas exhausting.
The chimney for the curing oven fumes exhausting.
The lifting and working tools necessary during the machine erection and commissioning and during the final test
All the process products such as the raw, necessary during the acceptance tests.
The lodging, food, local transportation costs of your personnel in our factory and of our personnel in your factory.

CHAPTER 7.0 GUARANTEE

All the machine and its components are guaranteed for a period of 12 months from the date of the final acceptance test, but not longer than 15 months from the shipping date.

During the above mentioned period we'll replace all the pieces that will be broken or will have shown a bad fonctionning.

The pieces that are subject to be worn are excluded by the guarantee.

The shipping costs of the spare parts, as well as the round-trip, lodging, food, local transportation costs of our personnel, coming to your factory for the eventual reparation, will be at your charge.

Any misuse of the machine will void immediately the guarantee.
N.B: The period above mentioned is linked to a daily use of the installation which must not exceed 8 hours.

CHAPTER 8.0 PRICES, SALES CONDITIONS AND OFFER VALIDITY

8.1 - PRICES

3.1 - CONVEYORS

3.2 –PRETREATMENT AREA

3.3 – N.1 CURING OVEN

3. 4 – N. 1 MAIN ELECTRIC BOARD

3.5 - N. 1 SYSTEM FOR THE TREATMENT OF WASTE WATERS **(to be supplied and quoted by the Company C.I.E. srl)**

3.6 – N. 2 COMPLETE APPLICATION UNITS **(to be supplied and quoted by the Company Gema)**

8.2 - SALES CONDITIONS

DELIVERY TIME	: ordinarily 5 months from the order
TRANSPORT	: CIF Montreal
PACKING	: not necessary for the goods shipped in container
PAYMENT	: to be agreed

CHAPTER 9.0 - APPLICABLE LAW AND CONVENTIONAL FORUM

The present offer is ruled and governed by Italian law.
Any dispute, which may arise with reference to the interpretation and/or execution of this offer will be exclusively defined by the forum of Monza.

The senses and effects mentioned in the articles 1341 e 1342 c.c are specifically approved by the clauses mentioned in the chapters 7-8-9.

SEF ITALIA srl

Paolo Roncoroni
(amministratore unico)