



POWDER COATING PLANT Painting line

With iron phosphate processing

See drawing: painting line.pdf

The painting line consists of following units:

- Iron phosphate 4 bath
- Drying oven
- Cooking oven
- Conveyer lines
- Powder coating cabinet
- Powder coating guns(Boymak), manual
- Powder coating guns(Wagner), automatic
- Automatic painting robot
- etc.



Contents

1.1.	Offer Validity:.....	4
1.2.	Delivery conditions:	4
1.3.	The delivery is excluding the following:	4
1.4.	Payment terms & conditions:	4
1.5.	Installation:	4
2.	Technical definitions.....	5
2.1.	FLUID TANKS:	5
2.2.	FILTERS:.....	5
2.3.	SPRAY PUMP:.....	5
2.4.	Maintenance and pressure adjustment valves:	5
2.5.	TANK FILLING AND DISCHARGE.	5
2.6.	Automatic control and output devices.	5
2.7.	TANK HEATING SYSTEM s.	5
2.8.	Manifold SPRAY AND PIPES.....	5
2.9.	SPRAY TUNNEL.....	5
2.10.	Exhaust fans and fresh air fan:	6
3.	Processing: De-OIL + Iron phosphate application form	6
3.1.	De-OIL Line general properties	6
3.2.	IRON PHOSPHATE LINE GENERAL SECTIONS.....	6
3.3.	Alcali De-Oiling.....	7
3.4.	Rinsing.....	7
3.5.	Iron Phoshate line.....	8
3.6.	Rinsing.....	8
3.7.	Exit hall.....	9
3.8.	Energy requirments	9
4.	Cooking oven (U-Type)	10
4.1.	Technical features of cooking oven	11
4.1.1.	Oven:.....	11
4.1.2.	Technical features.....	11
5.	Cooking oven (Tunnel-Type).....	12
5.1.	Technical features of cooking oven (Tunnel-Type)	13
5.1.1.	Oven:.....	13
6.	Powder coating cabin with 10 filters.....	14



6.1. Technical features	14
7. Conveyors	16
7.1. Technica features	16
8. PCA C4 corona system powder coating gun set	17
9. WAGNER Electrostatic automatic Gun Type PEA-C4	18
10. The Powder Cycle	20



1. price

Pos	Definition	Pieces	Unit price €	Price €
1	Spray cleaning plant (24 meters)	1		
2	Spray drying oven (10 000 x 800 x 2700 mm)	1		
3	Powder coating cabin with 10 filter	1		
4	Powder Cooking oven (15.000 x 2000x 2750 mm)	1		
5	Conveyers (Kardan) 200 x 38 (149 meter)	1		
	<ul style="list-style-type: none"> • Drive unit • Stretching unit • The torque limiter • Corners (90-180 °) 1,2-1,5 m/min • Lubrication unit, automatic 	1 1 1 7 1		
6	Facility main control cabinet and electrical installations	1		
7	Powder coating guns(Boymak), manual	1		
	Powder coating guns(Wagner), automatic	4		
	Automatic painting robot	2		
8	Recycling system	1		

1.1. Offer Validity:

The offer is valid for 6 months from its date for the whole system excluding the steel coil.

1.2. Delivery conditions:

Shipment to be done within 6 months from the date of L/C for the machines. See below

1.3. The delivery is excluding the following:

- Supply of primary electric connections to the cabinets
- Supply of utilities to the delivery point
- Basic to detail engineering to foundation works if required
- Foundation works (Excavating, concrete, grouting etc.)
- Preparation and operation of lifting and transport equipment

1.4. Payment terms & conditions:

Irrevocable, confirmed and transferable L/C at sight:

- 30% Advance payment against bank guarantee with the clarification of the order.
- 60 % of the payment against shipping documents
- 10% after installation and acceptance in your country

1.5. Installation:

120 days

2. Technical definitions

2.1. FLUID TANKS:

The base portion of the seal-welded tanks is inclined towards the drain valve. Tanks equipped with all necessary fittings are provided the convenience of operation. Bathrooms have maintenance covers and the filters are cleaned from here. The heated vessel is provided with 50 mm glass wool insulation and the outer side is covered with electrostatic paint of sheet metal.

2.2. FILTERS:

In order to protect pumps and spray nozzles in all tanks the filters are installed by using of two rows of AISI 316 stainless steel wire.

2.3. SPRAY PUMP:

In each region of the bathroom a spray pump is installed. All of mechanical seals for pumps standard trademark. We select the pumps by considering of used chemicals.

2.4. Maintenance and pressure adjustment valves:

The valves which are installed between spray pumps and fluid tanks are used to avoid the fluid losing in possible damages in the pumps. By the way the damages can be easy repaired. The valves which are installed between the pump and the spray pipes are used to keep the pressure under control.

2.5. TANK FILLING AND DISCHARGE

Fittings for the valve are installed at the top side of the tanks to fill water tanks. All necessary units are installed for a rapid filling and for a rapid exucute.

2.6. Automatic control and output devices

To keep the pressure of the spray pumps under control the gauges are used and to keep the temperature the thermostats are installed.

2.7. TANK HEATING SYSTEM

The tank will be provided with heating cartridge-type electrical heating elements.

2.8. Manifold SPRAY AND PIPES

Spray collectors in accordance with the active sections are placed, these spray pipes will be. fixed by fitting to manifolds. Spray pipes, the material has been designed to provide full contact with the surface of the fluid. Pipes are made of PPRC, collectors are made of S253JR.

2.9. SPRAY TUNNEL

Chassis of Tunnel are made of 2-3 mm in S253JR. To avoid losses of acid and water vapor distribution within the plant the exhaust fans are installed. To protect the conveyor from the vapor fresh air is pumped through the tunnel and come out of this space is prevented.

For maintenance the doors are installed in the necessary points in the tunnel. Conveyor is installed at the top of the tunnel chassis.

2.10. Exhaust fans and fresh air fan:

Two fans are installed on the upper part of the tunnel with a suction capacity of 5500 m³/h. This System gives garanty that the environment of the factory and the employees don not disturb thought the vapor, gases and chemicals, as well as fans for fresh air supply fresh air for the factory and the interior is intended to prevent damage to the conveyor

3. Processing: De-OIL + Iron phosphate application form

Processing	Number	Power supply	Degree	
Entrance hall	1	Medium		
De-OIL	1	Burner	40-55 C°	200.000
Infiltration	1	Medium		
Rinsing	1	Medium		
Infiltration	1	Medium		
Iron phosphate	1	Burner	40-55 C°	100.000
Infiltration	1	Medium		
Rinsing	1	Medium		
Exit hall	1	Medium		

3.1. De-OIL Line general properties

Conveyor speed	1,2 m/h
Tunnel width	1100 mm
Tank width	2200 mm
Total width	2200 mm
Tunnel	2750 mm
Tank height	900 mm
Total height	4300 mm
Total lenght	24.000 mm
Fresh air Fan	7500 m³/h
Vapor suching	4500 m³/h
Conveyer	525 mm
Nozzle Pressure	1,5-2 bar
Nozzle Flow	10-12 lt/dk
Nozzel Angle	60°



3.2. IRON PHOSPHATE LINE GENERAL SECTIONS

A-Entrance hall	
Section lenght	24000mm
Building materials	304 quality stainless steel
Coating	Galvanizing S253JR
Coating sheet	0,80 -1mm S253JR
Exhaust Fan	2 x 4500 m³/h
Exhaust Fan motor	2 x 2,2 kw/h
Sheet thickness	2-3 mm S253JR - 304 quality stainless steel
Building type	Modular

3.3. Alkali De-Oiling

B-De-Oiling Phosphate section	
Section length	4000 mm
Ring number	20 pieces
Nozzle axis range	350 mm
Ring axis range	350 mm
Number of Nozzles in the ring	9 pieces
Total Number of Nozzles	180 pieces
Spray Pump	200 m/h -2 pieces
Pump type	Standard
Motor power	5,5 kw-2 pieces
Salmastra Type	mechanic
Tank sizes	4000 x2200x1000
Tank volume	8,9 m ³
Tank sheet thickness	2 mm AISI 304
Bath temperature	40-50
Heating type	Plated
Heating capacity	120.000 Kcal/h
Infiltration section length	3000 mm
Tunnel building material	2-3 AISI 304
Tank an Tunnel isolation material	50 mm glass wool
Coating	080-1 mm



3.4. Rinsing

D-Section for Rinsing	
Section length	1000 mm
Ring number	3 pieces
Nozzle axis range	350 mm
Ring axis range	350 mm
Number of Nozzles in the	20 pieces
Total Number of Nozzles	48 pieces
Spray Pump	60 m/h
Pump type	Standard
Motor power	2 kw
Salmastra Type	mechanic
Tank sizes	1000x2200x900
Tank volume	2 m ³
Tank sheet thickness	2 mm AISI 304
Bath temperature	Medium
Heating type	Medium
Heating capacity	Medium
Infiltration section length	3000 mm
Tunnel building material	2-3 mm ISI304
Tank an Tunnel isolation	50 mm glass wool
Coating	080-1 mm galvanized



3.5. Iron Phosphate line

B-De-Oiling Phosphate	
Section length	4000 mm
Ring number	20 pieces
Nozzle axis range	350 mm
Ring axis range	350 mm
Number of Nozzles in the ring	9 pieces
Total Number of Nozzles	180 pieces
Spray Pump	200 m/h -2 pieces
Pump type	Standard
Motor power	5,5 kw-2 pieces
Salmastra Type	mechanic
Tank sizes	3000 x2200x900 mm
Tank volume	8,9 m ³
Tank sheet thickness	2 mm AISI 304
Bath temperature	40-50
Heating type	Plated
Heating capacity	200.000 Kcal/h
Infiltration section length	3000 mm
Tunnel building material	2-3 AISI 304
Tank an Tunnel isolation	50 mm glass wool
Coating	080-1 mm galvanized



3.6. Rinsing

D-Section for Rinsing	
Section length	1000 mm
Ring number	3 pieces
Nozzle axis range	350 mm
Ring axis range	350 mm
Number of Nozzles in the	20 pieces
Total Number of Nozzles	48 pieces
Spray Pump	60 m/h
Pump type	Standart
Motor power	2,2 kw
Salmastra Type	mechanic
Tank sizes	1000x2200x900 mm
Tank volume	2 m ³
Tank sheet thickness	2 mm AISI 304
Bath temperature	Medium
Heating type	Medium
Heating capacity	Medium
Infiltration section length	3000 mm
Tunnel building material	2-3 mm ISI304
Tank an Tunnel isolation	50 mm glass wool
Coating	080-1 mm galvanized



3.7. Exit hall

E-Exit Hall	
Section lenght	3.500 mm
Building materials	AISI 304
Coating	galvanized S253JR
Coating sheet KALINLIĞI	0,80 -1mm S253JR
Exhaust Fan	7500 m ³ /h
Exhaust Fan motor	3 KW
Sheet thickness	2-3 mm S253JR
Building type	Modular

3.8. Energy requirments

Pumps	Pieces		Total
De-Oiling	1	5,5 KW	5,5 KW
Rinsing	2,2	2 KW	4,4 KW
Iron Phosphate	1	5,5 KW	5,5 KW
Rinsing	2,2	2 KW	4,4 KW
Fans	2,2	1,5 KW	3 KW
		Total	22 KW

4. Cooking oven (U-Type)

Definition:

In the drying and cooking oven the workpieces are carried out in hanging with the conveyers. The cooking and drying are provided during the movement of the workpieces with a constant speed through the ovens. The oven is produced in modular form to carry and install easy.

Technical information:

U-type cooking and drying ovens are manufactured as sandwich panels on the chassis and it is delivered in dis-assembled state. The inside and out side of the furnace is made of 1.2 mm S253JR galvanized sheet. Outer side of the oven is coated with electrostatic powder paint and corrosion resistance is increased. The panels of oven are insulated as standard with 150 mm insulation material. The panels inside of the oven are insulated with 50 mm rock wool and outside are insulated with 120 mm of glass wool. Thus this insulated ambient temperature stay (± 10 degree). In this way, the working environments is not heated unnescaserly and so consume less fuel. There radial type fan provides air circulation in the oven, through orifices disposed on the grooves extending along the air ducts and uniform heat distribution in the furnace is carried out. Entry and exit of tunnel baking ovens are arranged with two sliding doors. According to the size of the piece the doors can be adjusted automatically or manually. In this way, it is prevented unnecessary heat losses and save enegies. Temperature is controlled by using of thermocouples placed in a furnace. The temperature of the baking oven can be adjusted on the control panel by means of the digital clock 0-250° C.

Heating Unit

The heat exchangers are designed for maximum efficiency on the basis of minimum fuel consumption., The thermobloks which is mounted to the back side of the oven may quite easily lead the ambient temperature to + 230 ° C.

The heat exchangers are produced from 310 quality stainless steel and it resist up to 1000 °C The used smoke pipes on the Thermoblok are seamless tube. Thermoblock is provided into the combustion chamber and it is insulated around 150 mm with rock wool.

In the combustion room a chamber cover is installed in response to failures thermoblock and a turbine fan is installed that the temperature are distributed in the furnace.

The combustion efficiency is controlled through the peephole that is located on top of Thermoblok. Thermoblock is also a precaution against jams in the gas and diesel.



4.1. Technical features of cooking oven

4.1.1. Oven: exterior dimensions

		Internal dimensions	exterior dimensions	Type
Weidth	mm	2000	2300	TF 15000
Lenght	mm	14000	15000	
Height	mm	2200	2750	

4.1.2. Technical features

Providing methode	Modular	
Panels	150mm sandwich panel	
Interior panel plate	1,2 mm st 37 13-18 mikron galvanized sheet	
Outer Interior panel plate	1,2 mm S253JR sheet	
Chassis	2-3 mm S253JR sheet	
Upper corner	2-3 mm S253JR sheet	
Contruction	65 and 100 mm iron profile	
Interior insulation	Inside 50 mm 50 kg/m3 Rack wool	
Outer insulation	Outside 120 mm 18 kg/m3 gals wool	
Air duct	2-3 mm galvanized S253JR sheet	
Air curtain	Blown from the wall opposite the entrance and	
Curtain air fan	2x 7500 m3/h	
Curtain air fan motor	3 KW	
Temperature	180-230 °C	
Temperature control	Digital Thermokup PT 100 and Fe constant	
Electricity	Siement + Schneider	
Cables	CE certified	
Painting	Upper corner: RAL 5015 panels: RAL 9010	
Heating Unit		
Providing methode	Modüler sistem	
Panels	150mm sandviç panel	
Insulation	150 mm 50 kg/m3 Rock wool	
Heating type	LPG	
Heating methode	Konveksiyon	
Heating load	350 000	
Thermeblok capacity	Serpantine resistans	
Thermeblok Material	310 chrom	
Thermeblok pipes	48-60 Seamles smoke pipe	
Thermeblok temp. control	digital	
Thermeblok repair methode	special design on the side of the furnace	
Burner	CE Certified	
Circulation Fun	2x 22000 m3/h	
Circulation Fun Motor	2x 11 kW	
TOTAL POWER REQUIREMENT		
Heating unit	350 000 K/CAL	
Circulation FAN	2x 22 KW	
CURTAIN AIR FAN	2x 6 KW	
Total	28,2KW	

5. Cooking oven (Tunnel-Type)

Definition:

In the drying and cooking oven the workpieces are carried out in hanging with the conveyers. The cooking and draying are provided during the movement of the workpieces with a constant speed through the ovens. The oven is produced in modular form to carry and install easy.

Technical information:

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Heating Unit

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In the combustion room a chamber cover is installed in response to failures thermoblock and a turbine fan is installed that the temperature are distributed in the furnace.

The combustion efficiency is controlled through the peephole that is located on top of Thermoblok. Thermoblock is also a precaution against jams in the gas and diesel.



5.1. Technical features of cooking oven (Tunnel-Type)

5.1.1. Oven:

		Internal dimensions	exterior dimensions	Type
Weidth	mm	800	1100	TF 10000
Lenght	mm	10000	10000	
Height	mm	2750	2750	

5.1.2. Technical features

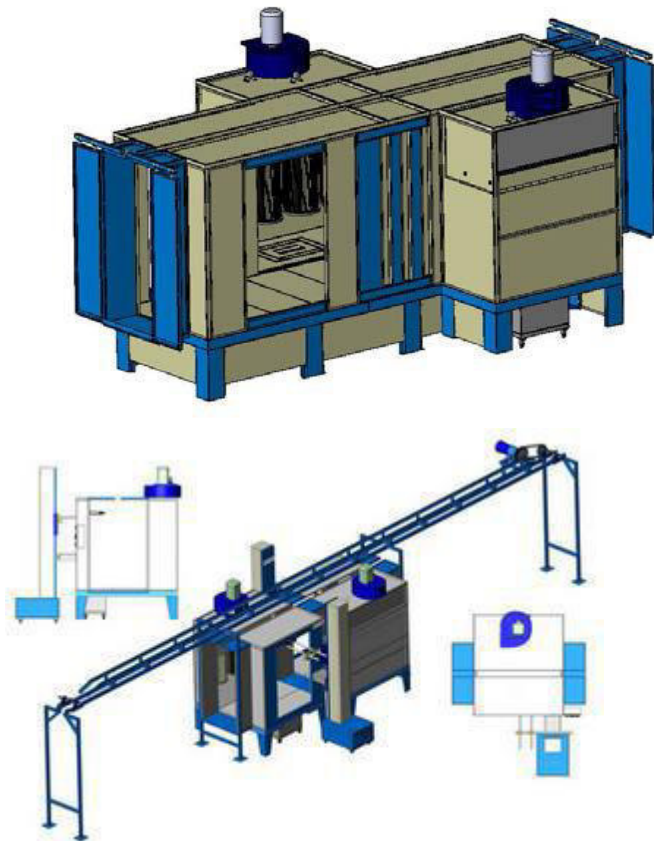
Providing methode	Modular	
Panels	150mm sandwich panel	
Interior panel plate	1,2 mm st 37 13-18 mikron galvanized sheet	
Outer Interior panel plate	1,2 mm S253JR sheet	
Chassis	2-3 mm S253JR sheet	
Upper corner	2-3 mm S253JR sheet	
Contruccion	65 and 100 mm iron profile	
Interior insulation	Inside 50 mm 50 kg/m3 Rack wool	
Outer insulation	Outside 120 mm 18 kg/m3 gals wool	
Air duct	2-3 mm galvanized S253JR sheet	
Air curtain	Blown from the wall opposite the entrance and	
Curtain air fan	2x 7500 m3/h	
Curtain air fan motor	2,2 KW	
Temperature	180-230 °C	
Temperature control	Digital Thermokup PT 100 and Fe constant	
Electricity	Siement + Schneider	
Cables	CE certified	
Painting	Upper corner: RAL 5015 panels: RAL 9010	
Heating Unit		
Providing methode	Modüler sistem	
Panels	150mm sandviç panel	
Insulation	150 mm 50 kg/m3 Rock wool	
Heating type	LPG	
Heating methode	Konveksiyon	
Heating load	200000 K/CAL	
Thermeblok capacity	250000 K/CAL	
Thermeblok Material	310 chrom	
Thermeblok pipes	48-60 Seamles smoke pipe	
Thermeblok temp. control	digital	
Thermeblok repair methode	special design on the side of the furnace	
Burner	CE Certified	
Circulation Fun	1x 22000 m3/h	
Circulation Fun Motor	1x 11 kW	
TOTAL POWER REQUIREMENT		
Heating unit	220 000 K/CAL	
Circulation FAN	11 KW	
CURTAIN AIR FAN	2,2 KW	
Total	13,2 KW	

6. Powder coating cabin with 10 filters

Filter powder coating cabins with high dust holding capacity is an environmentally friendly product. Cylindrical filters with capacity up to 10 microns are used in the cabins. The filter chambers are preferred for easy color change.

Number of used filter can be determined by considering of flow rate of fan and the size of object and the number of guns in the cabin.

Electrostatic powder coating cabins are produced according to customer's preference from Chrom, PVC, and Steel and galvanized material.



6.1. Technical features

		Internal dimensions	exterior dimensions	Type
Weidth	mm	1680	2000	12 Filter
Lenght	mm	5470	6000	
Height	mm	2000	2500	

Chassis	S253JR sheet coated electrostatic powder		
Radial FUN	4 kw	11.000 m ³	2 pieces
Number of Filter	330*1200	12 pieces	Paper filter
Powder tank	2 pieces automatic vibration sieve		
Maximum dimensions be painted	800*1300*3000		

- Powder coating cabinets are produced as modular by using of 1.5 mm and 2 mm DKP sheet. According to the wishes it can be produced from galvanized sheet metal, PVC or stainless steel material.
- All parts of the cabinet is disassembled, all bolted connections.
- Interior and exterior surfaces of cabinets are covered with electrostatic powder paint
- Automatic mesh storage is available in the cabin.
- Deposited powder in cabin filters can be reused.
- To prevent the accumulation of paint filters negative pressure is applied.
- Filter blasting is done automatically.
- The size of filters is Ø320x1.200mm. (Teflon filter)
- Powder paint filters are made of paper and 10 m² / surface area.
- The dust holding capable of filter is 0 microns.
- Dust suction fans used in paint cabinet are radiant type.
- Powder paint cabinet is a sliding cover.
- Suitable for manual and automatic work.
- Under cabinet can be added as optional automatic sweeping system.

7. Conveyors



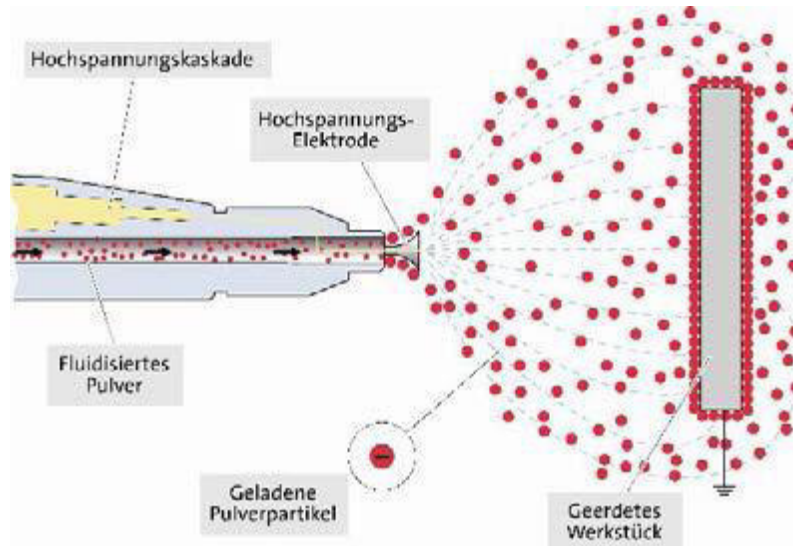
7.1. Technica features

Type	YM K38
Conveyor type	200/38 kardan shaft
Conveyor lenght	117 meter
SUSPENSION RANGE	400 mm
Gear	2x3 HP
RAY MATERIAL	3 mm ST 37
Reducer	1 D/dk –3 HP
Angles	750 mm 180 °
Speed	0.7-3 m/min
Speed control	digital
Bearing lubrication	automatic

8. PCA C4 corona system powder coating gun set

The producing of high voltage in the corona process is done with the aid of a high voltage cascade, which is integrated in the gun body. The high voltage is generated by means of a high voltage cascade that is installed in the gun body. The voltage level is regulated in the control module and is matched to the geometry of the work piece, or to the powder coating system in use. The charged particles „move“ along the field lines to the grounded work piece.

The advantages of the corona process are the low wear of the gun, the low air consumption as well as the universal application as many powder coatings (e.g. effect powder coatings) are not suitable for the tribo process.



9. WAGNER Electrostatic automatic Gun Type PEA-C4

HiCoat automatic guns for special application

The new XL powder guns are particularly well suited to plastic booths. All feed lines are integral and the connections are located outside the booth. This gun type is also used for demanding 3D coating tasks.

The gun surfaces can easily be cleaned with the blower nozzle system, so colour changes can be made more quickly. The new guns are available in the lengths 850 mm, 1100 mm, 1400 mm and 1800 mm.



Intuitive, easy handling for highest precision

Precise and extremely reliable for optimal coating results – that is the spirit of the new WAGNER control unit EPG-Sprint X. All parameters are arranged logically and can be easily adjusted. Hence guaranteed reproducible results for efficient and high-quality manual coating can be obtained.

The advantages at a glance:

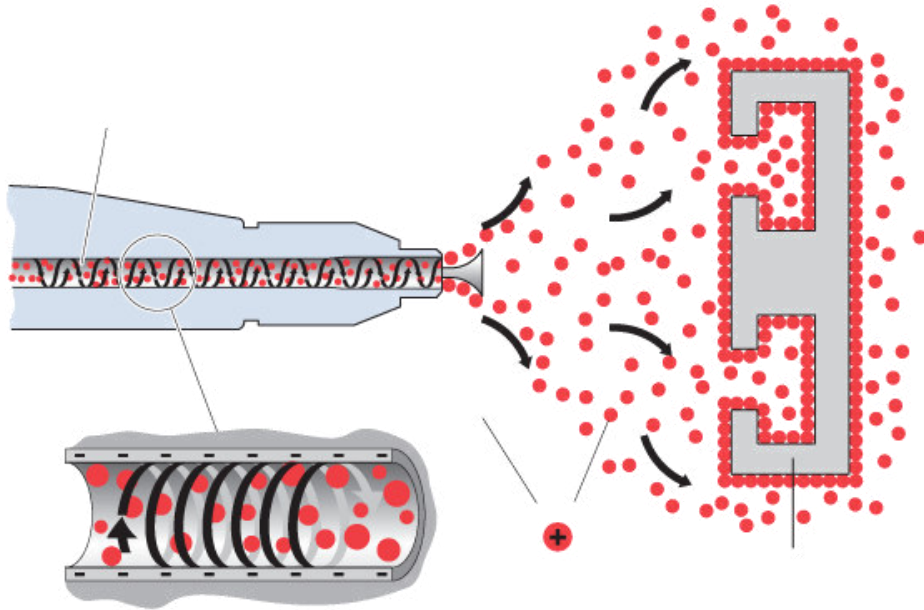
- Highest precision because of WAGNER Air Flow Control (AFC)
- Intuitive use
- Intelligent control technology
- Up to 50 coating programs for highest quality and reproducibility
- Logical arrangement of the different control parts



Tribo powder coating

The Tribo process is based on frictional charging. In this case, the fluidized powder/air mixture in a PTFE powder tube is charged by means of friction against the inside tube wall. Due to its excellent electrical insulation properties (negative), PTFE is well-suited to charging the particles and its good anti-frictional properties prevent build-up on the walls.

The advantages of the tribo process are the good penetration depth and the better film thickness distribution. In comparison to the corona process, the powder can easily penetrate into depressions (e.g. mailboxes and rims). The coated surface is smoother with no "orange peel" effect.



10. The Powder Cycle

- Mini-cyclone unit
- Automatic control unit
- Automatic vibration unit
- Enclosed sieve
- 160-liter tank powder coating
- High capacity injectors



10.1. The Powder Center

Coating powder is best conveyed to the sprayguns if it is fluidized first. This is done in the Powder Feed Center, whose suction system submerges into the container and ads fluidizing air to the powder. The container is placed on a special shaker table. As soon as it begins to vibrate a homogenous powder-air mixture forms. During the normal coating process powder is consumed, which leads to a lowering of the powder level inside the container. A probe measures the level and lowers the suction system when required in order to ensure a continuous powder flow. In the case of powder shortage, an alarm is triggered. Depending on the type of powder feed center, the consumption of coating powder is compensated either automatically or by manually adding fresh powder into the container.

10.2. Powder Delivery

The fluidized powder is fed by the suction system from the container to the injectors and finally to the sprayguns by means of fluidizing air. The amount of powder that flows to the guns can be increased by applying more feeding air. The addition of dosage air speeds up the powder flow.

If the feeding air is turned off and the dosage air is opened completely, the powder supply to the guns stops, while the powder hose will be flushed with air. As soon as the feeding air is turned on and the dosage air is set to a normal level, the powder starts flowing again.

10.3. The Sprayguns

Depending on the application, Tribo or Corona sprayguns are used for industrial powder coating. The powder particles are charged inside the gun and then applied evenly to the object to be coated. Different shapes and objects like wire goods, gratings or aluminum cross sections require different powder clouds for high quality coating. This is why sprayguns must be able to be equipped with a great variety of nozzles systems, such as deflector cones, fan spray nozzles etc.

10.4. Powder recovery

A considerable amount of powder does not stick to the object during the coating process. The so called overspray is sucked from the spray booth through the exhaust air conduct and conveyed to the cyclone.

10.5. Separating the powder-air mixture

The cyclone sets the powder-air mixture in rotation. This creates centrifugal forces which push the powder particles outwards onto the cyclone walls. The powder subsequently slides onto the screen surface of the screening unit, where coarse impurities are held back. By means of a peristaltic conveyor, the recycled powder is finally supplied back to the container in the powder feed center.

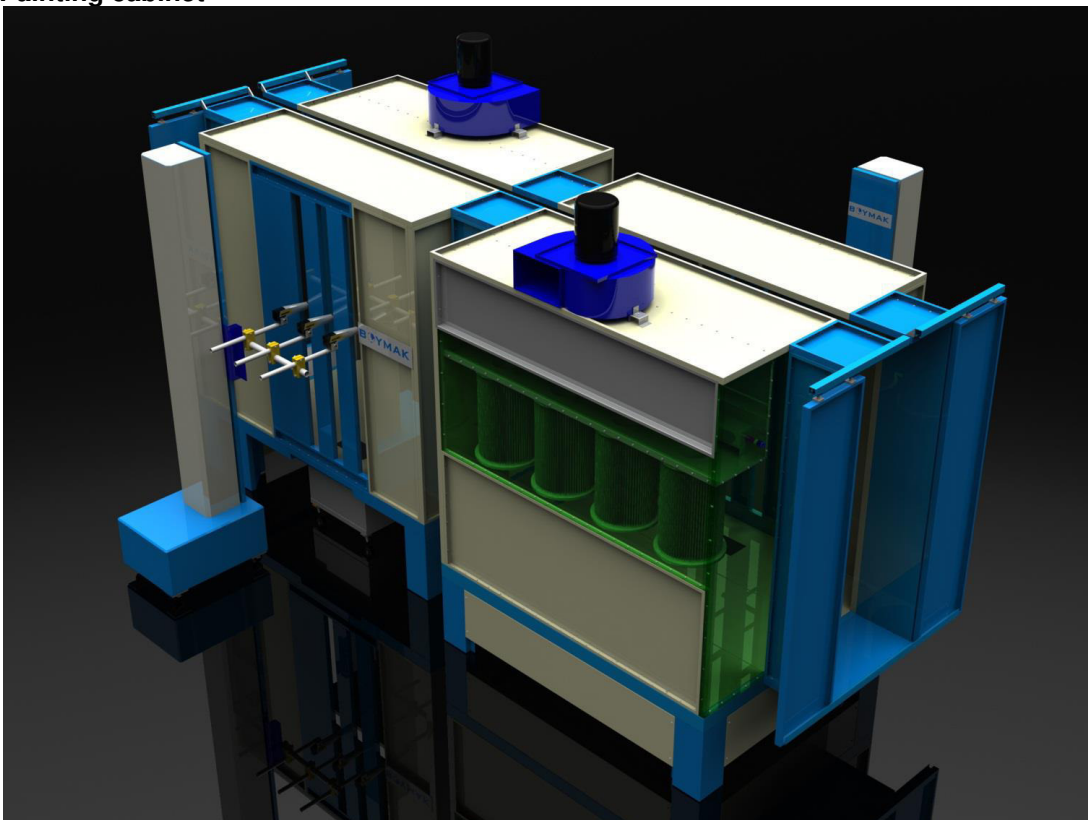
10.6. Filtering of the exhaust air

The cyclone sets the powder-air mixture in rotation. This creates centrifugal forces which push the powder particles outwards onto the cyclone walls. The powder subsequently slides onto the screen surface of the screening unit, where coarse impurities are held back. By means of a peristaltic conveyor, the recycled powder is finally supplied back to the container in the powder feed center.

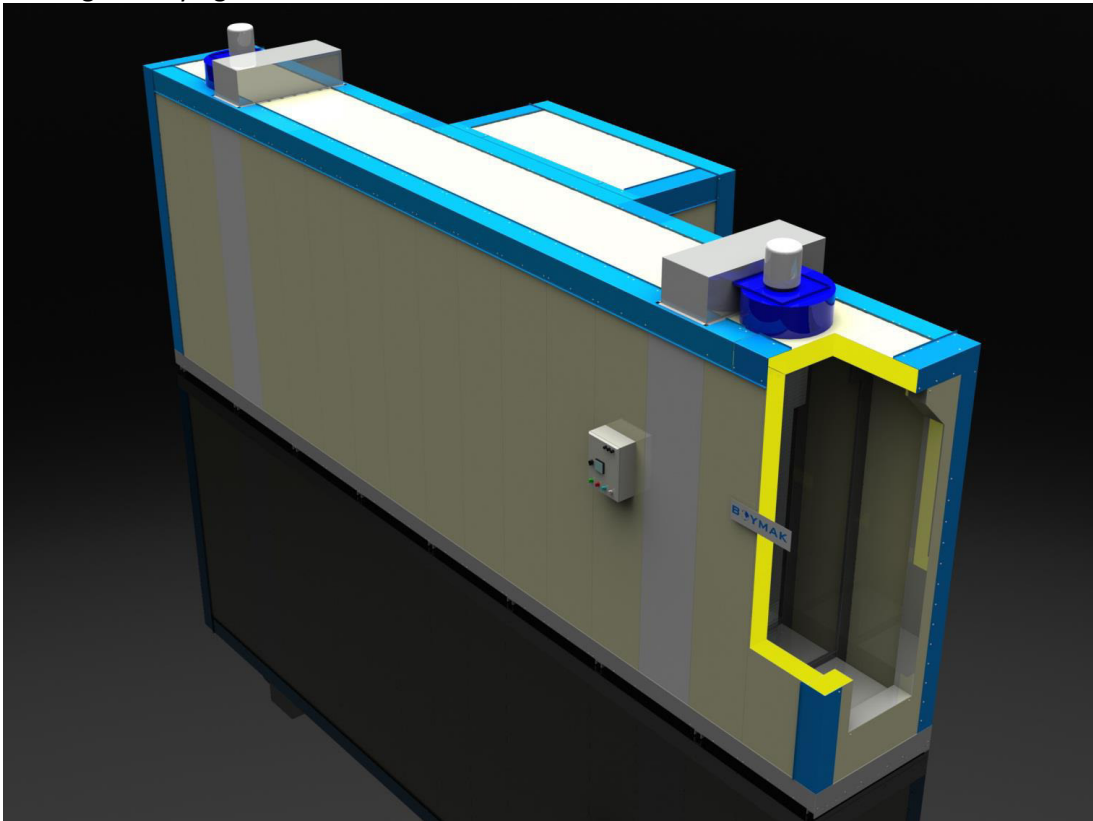
10.7. Control

To control the complex workflows within a powder system, several types of controls can be applied. The requirements for customer specific systems which are completely designed for special coating requirements are rising; systems need to be flexible and modular. Therefore WAGNER offers a wide range of modular control systems that guarantee the perfect control technology for each customer.

Painting cabinet



Cooking an draying oven



Spray Line

