**Referential work description of the industrial fully automatic surface cleaning/priming line for metal products:**

**Work piece data:**

\* Description of work pieces: plates and profiles (flat, bulb, angles, T, H)

\* Work piece material: steel S235, S355

\* Work piece dimensions:

thickness of plates: 4 - 100 mm

max height: 600 mm

max width: 3200 mm

min. length: 3000 mm

max. length: 18000 mm

Dimensions of smallest profile: 100 x 100 x 4 mm or IPE 100

Dimensions of biggest profile: HEB 1.000

\* max. load on roller conveyor: 2000 kg/running meter

\* max. load on cross transport: 2000 kg/table (for a plate length of 12000 mm)

\* min. load per meter length: approx. 20 kg/running meter

\* Reference work piece: 12.000 mm x 2.500 mm x 12 mm made of normal steel S235 JR G2

Initial condition:

\* Work piece condition: surface covered with rust and/or scale (max. grade B) dry and wet, free of grease and oil

\* Room temperature: -15°C / +40°C

\* Temperature outside: -15°C / +40°C

**Treatment / Machine function(s) BLASTING:**

\* Process objective: surface cleaning

\* Blast media: cast steel, round Ø 0,9 - 1,4 mm (48-51 HRC) (in first quality) (1700 N/mm²)

\* Finish after blasting: SA 2,5 according to DIN-EN-ISO 8501-1 (only in connection with an operating media mixture)

**Treatment / Machine function(s) PAINTING:**

\* Treatment process painting: application of zinc rich or water-based or epoxy-based primer

\* Final quality: 18 - 20 µm dry- film thickness, reference thickness of 18µm +/- 3,5 - 5 µm

Specifications for layout:

\* Max. machine height (from floor level): 6900 mm (See Drawing Nr.1)

\* New line should fit or would need minimum investment to existing building and foundation layout (see Drawing Nr.2). Foundations are marked in red with depth measurement points below floor level.

**Preservation line must include main sections, with specifications described below:**

1. Cross-Transfer-Tables (infeed) - for lateral transport, buffering and charging of the work pieces on a roller conveyor.

Quantity of tables min.8

Lenth of table no less than 7000 mm

Load on the table no less than 2000 kg

Special painting due to outside standing (Primer (min. 80 µm) + painting (min. 100 µm) + UV resistant varnish (min. 100 µm))

1. Roller Conveyor (infeed) - for transportation of the work pieces.

Total length: 21 500 mm

Usable width: 3 200 mm

Distance of rollers no more than 610 mm (from center to center)

Load no less than 2000 kg/running meter.

Special painting due to outside standing (Primer (min. 80 µm) + painting (min. 100 µm) + UV resistant varnish (min. 100 µm))

1. Blow-Off Unit with rotating brush - for reduction of standing water and loose debris from plates and profiles

Automatic height adjustable blow off nozzle

Light barriers for detecting the height of the incoming work pieces

1. Pre-heater with an high-convection pre-heating system (natural gas) -for heating up cold and moisty work pieces and reduction of the drying time after the painting process

Inner placed roller conveyor with heat-resistant bearings up to max. 300 °C

Frequency controlled air fan.

Isolated air evacuation duct from pre-heater to paint dryer for transferring the heated air from the pre-heater to the paint dryer.

1. **Shot blasting machine with Roller** conveyor – for cleaning surface of product to standard of SA 2,5 according to DIN-EN-ISO 8501-1

Solid 8 mm manganese steel housing with overlapping wear plate lining made of 8 mm manganese steel in the complete blasting chamber.

Distance of rollers inside of blasting machine no more than 400 mm (from center to center)

Effective abrasive transport and recovery system

Turbine count no less than 8 pcs.

Turbine power 22 kW/each with frequency inverters.

Blast media velocity approx. 90 m/s

Blast media flow rate no more than 290 kg/min (per turbine at full speed)

Shut off of each individual turbine possibility, for narrow products.

Inspection platform with ladder for an easy access in the area of the air flow separator and filter unit.

Depth of the foundation pit of 2,000 mm or deeper so the lower turbines are easily accessible. Drawing Nr.2

1. Brush and Blow-off Unit - for reduction of remaining blast media from the surface of the treated work pieces

Automatic height adjustment.

Good access by big, dimensioned inspection door from both sides

Lower brush made of plastic. Brush from below in the workpiece cleaning unit for reduction of dust and remaining media from the bottom side of the plate

1. Roof-mounted Dust filter installation - for exhausting and cleaning the dusty air from the blasting chamber, brush and blow-off unit and air flow separator.

Residual dust in clean air: </= 1 mg/Nm³

Noise level: </= 80 dB(A)

Filter area no less than 400 m²

1. Painting Cabin **with Roller** conveyor - for automatic coating of work pieces

Distance of rollers no more 610 mm (from center to center)

Load no less than 2000 kg/running meter

Teflon lining inside the cabin for easy cleaning

Brush pre-cleaning unit, for cleaning of overspray.

Light barrier for the measurement of the workpiece height and width on the infeed of the painting cabin

2x8 pc. airless high pressure painting guns with a ex-proofed magnetic valve per each painting system

1. Dry Filter - for exhausting the air from the painting cabin.

Fan in ex-proved design

Rest dust content: < 0,2 mg/Nm³

Sound pressure level (body): < 80 dB (A)

1. Paint preparation system for 200 liter (2 psc.) – For automated paint preparation and continual stirring of paint during spraying process.

Certificated according ATEX 94/9 EG.

All parts, which are in contact with paint are built in stainless steel.

1. Paint dryer chamber with slat conveyor - for drying the work pieces after the painting process.

Total length of paint dryer chamber 10 000 mm

Conveyor speed remains constant at different loads.

Min. surface contact of sheets (6 points/m²)

Load no less than 2000 kg/running meter.

Lifting roller (pneumatic) as a support for the transportation of thin work pieces in the area of the painting cabin.

Temperature range of circulating air: 40 to 80 °C

Additional gas burner for optimal drying conditions in the chamber.

1. Marking unit for plate - The unit is designed for marking alphanumeric numbers and letters with single dots.

The Inkjet has 32 nozzles for single-row up to a height of app.80 mm (adjustable: 40-140 mm). Double-spaced marking with a letter height of app. 40 mm is as an alternative possible.

Print speed: app. 80 letters per second

1. Roller Conveyor (outfeed) - for transportation of the finished work pieces

Total length: approx. 22000 mm

Distance of rollers no more than 610 mm

Load no less than 2000 kg/running meter.

Special painting due to outside standing (Primer (min. 80 µm) + painting (min. 100 µm) + UV resistant varnish (min. 100 µm))

1. Cross-Transfer-Tables (outfeed) - for lateral transport, buffering and charging of the work pieces on a roller conveyor.

Quantity of tables min. **8**

Lenth of table no less than 7000 mm

Load on the table no less than 2000 kg

Special painting due to outside standing (Primer (min. 80 µm) + painting (min. 100 µm) + UV resistant varnish (min. 100 µm))

1. **Central Electrical Control Unit including "PLC" control and two operator panels with min. IP 55 rating.**
2. The purchase is subject to green purchasing requirements. Suppliers submitting commercial proposals must comply with the environmental management system standard ISO 14001 or its equivalent. The production of the product uses less or no hazardous chemicals, does not pollute the environment and does not pose a health risk.

**Please fill the table below for energy consumption of proposed line. This will be one of the criteria for evaluating energy effectiveness of the machine:**

Calculations should be made in situations where line should work in 8-hour shift, 5 days a week, producing 17 804 tons of primed products per year. The calculation should be evaluated on total consumption per year.

|  |  |  |
| --- | --- | --- |
| Section Nr. | Electricity, kW/year | Natural gas, m3/year |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| 4 |  |  |
| 5 |  |  |
| 6 |  |  |
| 7 |  |  |
| 8 |  |  |
| 9 |  |  |
| 10 |  |  |
| 11 |  |  |
| 13 |  |  |
| 14 |  |  |
| Total per year |  |  |

**Drawing Nr. 1 – Existing building heights**

Ein Bild, das Text, Screenshot, Diagramm, Rechteck enthält.

Automatisch generierte Beschreibung

**Drawing Nr. 2 – Existing building layout**

A blueprint with lines and symbols

Description automatically generated