DALMAR
IMPIANTI

SEPOTRATT 500 GSP

PRODUCT DESCRIPTION

Sepotratt 500 GSP

GENERAL DESCRIPTION

Purpose of the installation

The fully automatic installation is conceived for the following processes:

- Treatment of the galvanic wastewater resulting from the intaglio plate making department (G)
- Pre-treatment of wastewater containing solvents, resulting from the offset plate making department (S)
- Treatment of PolyWash wastewater (P)

After the physical-chemical treatment, solids are separated by means of a filter press and removed in compact form, easy to handle.
The performance of the installation is guaranteed with lowest energy and running costs.

Working capacity

The plant is designed for treating the wastewater resulting from the following galvanic processes and relevant preparation and washing operations:

- Copper deposition
- Nickel deposition
- Chromium deposition
- Electrolytic dechroming
- Electrolytic degreasing
- Chemical degreasing
- Plate polishing
- Offset plate making
- Polymeric plate making

The plant capacity is:

- 1400 l/day for the galvanic effluent
- 700 l/day for the offset plate making effluent
- 700 l/day for the PolyWash wastewater

The capacity can be adapted to the customer's requirement.

PRODUCT DESCRIPTION

Characteristics of treated water

After treatment, the characteristics of the water are approx:

Temperature	max. 40°C
Colour	none
pH	6.5 to 9.0
Suspended solids	< 200 ppm
Grease and oil	< 40 ppm
Chrome VI	< 0.2 ppm
Copper	< 1 ppm
Lead	< 0.2 ppm
Nickel	< 0.15 ppm
Other metals	< 5 ppm

Plant composition

The plant is composed of the following main groups:

1. Collection of wastewaters containing solvents
2. Collection of galvanic wastewater containing chromium
3. Collection of galvanic wastewater containing copper and nickel
4. Collection of PolyWash wastewater
5. Physical-chemical treatment
6. Filtration and neutralisation
7. Electric control cabinet

Advantages

- Very compact and dehydrated solid waste.
- Very reduced energy consumption.

PRODUCT DESCRIPTION

DESCRIPTION OF PROCESS

Wastewater containing solvents
The wastewater containing solvents, coming from the offset plate making department, is preliminary stored in a collecting tank and then transferred to the pre-treatment tank. The process, carried out by batch, consists of the subsequent addition of the following chemicals:

- Potassium permanganate ($KMnO_4$), for solvents oxidation
- Sodium bisulphite ($NaHSO_3$), to start flocculation
- Flocculent, to complete flocculation

Once accomplished the process, the basket filter enables the separation of the flocculated matter from the effluent, which is then transferred to the collecting tank containing copper and nickel effluents.

Wastewater containing chromium
The wastewater containing chromium is collected in a specific storage tank, separately from the rest of the galvanic wastewater, and then transferred to the process tank for chromium reduction. Particularly, the treatment consists of the subsequent addition of chemicals:

- Sulphuric acid (H_2SO_4), to decrease the pH value of the solution
- Sodium bisulphite ($NaHSO_3$), to reduce chromium from hexavalent to trivalent

Once this pre-treatment carried out, this effluent is transferred in the collecting tank of the other galvanic water.

Wastewater containing copper and nickel
The wastewater containing copper and nickel is stored in a collecting tank, where also the other pre-treated waters are conveyed. The resulting effluent is transferred into the process tank, in which precipitation of metallic ions is carried out by the subsequent addition of the following chemicals:

- Caustic soda (NaOH) to increase pH value to 8.5 – 9.5
- Flocculent, to complete flocculation

After treatment, the effluent is filtered in the filter press to remove solid waste. The filtered effluent is sent to the neutralisation tank, where the pH is corrected within the range 6.5 – 9.0 by adding sulphuric acid, before drain.

PolyWash wastewater
This effluent is collected separately from all the rest and then transferred into a reaction tank, where the pH value is lowered to 2-2.5 by adding sulphuric acid.
Potassium permanganate is then added in a quantity of 4-5%; the reaction takes about 4 hours.
Afterwards caustic soda is added to reach a pH value of 9.5-10, before dosing a quantity of 0.5% w/v of flocculent.

Once accomplished the chemical process the basket filter enables the separation of the flocculated matter from the effluent, which is finally transferred to the neutralisation tank.

DESCRIPTION OF THE MAIN GROUPS

Collection and pre-treatment of wastewater containing solvents

- 1 Wastewater collecting tank (150), equipped with transfer pump, stirrer and level controls. Capacity: approx. 1000 l.
- 1 Pre-treatment tank for solvents oxidation (151), equipped with transfer pump, stirrer and level controls. Capacity: approx. 800 l.
- 1 HPDE storage tank for potassium permanganate, equipped with dosing pump and compressed air agitation system.
- 1 Basket filter (204), equipped with transfer pump and level controls.

Collection and treatment of PolyWash wastewater

- 1 Wastewater collecting tank (103), equipped with transfer pump, stirrer and level controls. Capacity: approx. 2000 l.
- 1 Treatment tank (201), equipped with transfer pump, stirrer, pH meter and level controls. Capacity: approx. 800 l.

Collection of galvanic wastewater

- 2 Collecting tanks for copper and nickel wastewater (101), interconnected and equipped with transfer pump, stirrers and level controls. Capacity: approx. 2000 l each.
- 1 Collecting tank for chromium wastewater (102), equipped with transfer pump, stirrer, and level controls. Capacity: approx. 2000 l.

Chemicals

- Chemicals are dosed by means of piston dosing pumps, manually adjusted and controlled by pH-Rx sensors.

Treatment - Filtration - Neutralisation

- 1 Tank for chromium pre-treatment (401), equipped with transfer pump, stirrer, pH meter, redox meter and level controls. Capacity: approx. 800 l
- 1 Treatment tank (501), equipped with transfer pump, stirrer, pH meter and level controls. Capacity: approx. 800 l.
- 1 Filter press (601), equipped with 10 polypropylene filter plates and cloths, feeding pump, hydraulic unit and control and safety devices.
- 1 Neutralisation tank (701), equipped with drain pump, stirrer, pH meter and level controls. Capacity: approx. 800 l.

PRODUCT DESCRIPTION

Electric control cabinet

The electric control cabinet is equipped with a central visualisation panel connected to a PLC and enabling all automatic and manual controls, alarm diagnostics included.

- Total electric power installed: 20 kW approx.
- Voltage supply: 400 V / 50 Hz
- Manufactured in accordance with European standards EN 60204-1
- Electronic components: PLC ABB Advance Controller AC31
- Electromechanical components: Möller

Construction materials and certificates

The construction materials for the above items are the following:

- Process tanks: HDPE
- Piping: PVC

Evidence of CE conformity in compliance with what described in the 89/392/EWG will be released.

DESCRIPTION OF SUPPLY

Items included in the supply

- Pipes, cables, trunking, etc., required for the interconnections of the various groups within the site of the plant.
- Products required for putting into operation and initial production:
  -250 litres Caustic soda solution 30%
  -250 litres Sulphuric acid solution 50%
  -150 litres Sodium bisulphite solution 30%
  -100 kg Potassium permanganate
  -5 kg Flocculent "Praestol"

Items not included in the supply

- All masonry and floor finish works
- Connections to the utilities (see table)

Net weight:	3000 kg
Gross weight:	5500 kg

PRODUCT DESCRIPTION

Analytical device included in the supply: Spectrophotometer DR3900

Complete set of equipment and reagents to make photometric analyses of the treated water from our SepoTratt equipment.
The spectrophotometer kit includes:

- Compact spectrophotometer with RFID technology for reliable and traceable measurement. The spectrophotometer measures the concentration contained in the treated water samples. The bar code of the tub is read by the system and the value measured is recorded in the archives according to the specific bar code results. Simple Preparation. It allows Fast execution, Comprehensive Documentation, Flexible Connectivity and Sample Tracking to be used in routine.
- Thermostat system used to heat up the testing tubs to initiate the reaction between the water sample and the reactive agents contained in the tub.
- Pipettes instruments to sample precisely the quantity of water to be analysed.
- Box of specific Tub tests made to measure parameters like:
  - Chromium (VI and total) 0,03-1,0 mg/L Cr
  - Nickel 0,1-6,0 mg/l Ni
  - DCO 150-1000 mg/l O2.
  - DCO 1000-10 000 mg/l O2

Net weight:4 kg

PRODUCT DESCRIPTION

UTILITIES TO BE PROVIDED LOCALLY

A	Galvanic waste waters from intaglio plate making dept.		1 PVC pipe DN 50
B	City water	For flocculent preparation	1 galvanised steel pipe Ø ½"
C	Compressed air	20 l/min – p ? 4 bar	1 pipe Ø ½"
D	Electric power supply	Installed 20 KW	3 wires + PE Min. 10 mm^2
E	Raw materials	Caustic soda Sulphuric acid Sodium bisulphite Potassium permanganate Flocculent	for future use (1^{st} load supplied)
F	Recovered water to intaglio plate making dept.		1 PVC pipe DN 25
G	Sludge to the discharge		

REACTANTS

Items	**Characteristics**	**Quantity** (*)
Caustic soda	Solution 30%	1500 litres
Sulphuric acid	Solution 50%	1500 litres
Sodium bisulphite	Solution 30%	1500 litres
Potassium permanganate		50 kg
Flocculent	Praestol 2440	50 kg
Filter cloths	Polypropylene	1 set = 10 pcs

** Estimated quantity for one-year production based upon a production of 8 plates per week.*

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