



IPPL – INDUSTRIAL PLATE PRODUCTION LINE

Based on a well-proven technology, the line is designed to produce positive tubular grids and plates for industrial applications.



A first unit is designed for grid die-casting, spine cropping, and spine gauntlet insertion.

LEAD INGOT FEEDER AND LEAD POT

The ingot feeder features a robust chain conveyor for lead-ingot storage and transportation to the lead pot (2 ton capacity). It is provided with a system of limit switches to feed ingots one by one. The lead melting pot is electrically heated and equipped with a fume extraction hood.

The lead pump, with a hydraulic cylinder, injects the melted lead into the mould.



GRID DIE-CASTING

It is equipped with a 350-ton hydraulic press to close and seal the mould during the lead injection phase.

A specific device transfers the mould from casting to picking position where a grip takes the grid from the mould and deposits it to an intermediate buffer.

The control panel, through a PLC, displays temperatures and pressures in the hydraulic system. It also provides the following features: failure analysis, automatic data adjustment after mould changeover, and monitoring of the cooling units.



SPINE-CROPPING

The spine cropping unit consists of an air-operated cutting device to obtain the desired grid length automatically. The conveyor transports the cropped lead scrap back to the lead melting pot.



SPINE GAUNTLET INSERTION

An automatic feeding device inserts the spine into the gauntlet.

The gauntlets are stored in a buffer which is adjustable to fit different gauntlet dimensions.

A second unit is designed for plate paste filling, bottom bar closing & welding, washing, and palletizing.

PLATE PASTE FILLING

Plates are picked up in stacks from the first unit and transferred to the second unit.

A feeding device sets the plates in the filling position one at a time and holds them until the filling is completed.

A filling system, equipped with tubes, is inserted in the gauntlet and a sliding device moves the plates in order to inject the paste uniformly.



BOTTOM BAR CLOSING

An ad hoc system selects the bottom bars correctly positioned and feeds them one at a time to the insertion device.

The tubular plates are transported one by one and kept in position, the bottom bars are inserted, pressed and welded to the gauntlet with an ultrasonic device.



PLATE WASHING

A handling system places the plates vertically and a ramp with water spray nozzles cleans the gauntlet surface from paste residues.



PLATE WEIGHING & PALLETIZING

Once the tubular plates are cleaned, they are weighed one by one.

The plates complying with the specifications are stacked horizontally and positioned on a dedicated pallet. The height of the stack can be set by the operator via an HMI.

- ▶ **A throughput up to 4 tubular plates/min**
- ▶ **Filling of tubular grids up to a 630 mm length**
- ▶ **Suitable for both Antimony and Calcium lead alloys**

TECHNICAL DATA

OVERALL DIMENSIONS:

Width: 6,800 mm
 Length: 23,000 mm
 Height: 2,850 mm

PRODUCTION SPECIFICATIONS:

Throughput: up to 4 Tubular Plates/minute

PbCa alloys and Sb alloys with Sb content ranging between 2% and 9%

Restrictions to be made for Sb alloys with Sb content ranging between 3% and 6%

ELECTRICAL REQUIREMENTS:

Voltage: 400 V, three phases + N (or as required)
 Frequency: 50 Hz (or as required)
 Installed Power
 First Unit: 90 kW
 Second Unit: 40 kW
 Average Consumption: 100 kWh

COMPRESSED AIR:

Pressure: 0.6 MPa (6 bar)
 Installed: 1,300 Nm³/h
 Pipe Connector: 1/2" gas
 Average Consumption: 900 Nm³/h

EXHAUST REQUIREMENTS:

Suction Flow Rate: 1,500 m³/h

CHILLED WATER REQUIREMENTS:

Pressure: 5 bar
 Average Consumption:
 Water Supply: 10 m³/h
 Input Temperature: 8°C
 Output Temperature: 13°C
 Hardness Value: 15°F (French Degrees)
 pH: 7.5÷8
 Fe content: < 0.5 mg/kg
 Cu content: < 0.1 mg/kg
 Pipe Connector: 1" gas

TAP WATER REQUIREMENTS:

Pressure: 6 bar
 Average Consumption:
 Water Supply: 6 m³/h
 Hardness Value: 15°F (French Degrees)
 pH: 7.5÷8
 Fe content: < 0.5 mg/kg
 Cu content: < 0.1 mg/kg
 Pipe Connector: 1" gas