

Scope of Supply

Ingeteam Power Technology, S.A, Industrial Systems Division and TSK are responsible for the complete turnkey electrical project:

- Project management
- Basic and detail engineering
- Supply of:
 - Medium voltage switchgears.
 - Power transformers.
 - Low voltage distribution centre.
 - Emergency diesel system.
 - Power compensation equipment.
 - Rectifiers and bus bars for coating.
 - Main motors.
 - Main AC drives – MOTOCONAC*.
 - Auxiliary AC drives – MOTOCONAC*.
 - AC motor control centre.
 - Field sensors.
 - Intercommunication and PA system.
 - Air-conditioning.
 - Fire detector and passive protections.
 - Line lighting.
 - UPS and control voltage distribution.
 - Control desks and local panels.
 - Integrated control equipment (SISTEAM OCS)*.
 - Control and supervision equipment (OPERATOR OCS)*.
- Electrical Installation.
- Supervision of electrical installation.
- Commissioning-

(*) The MOTOCONAC, SISTEAM OCS and OPERATOR OCS is equipment designed and manufactured by Ingeteam Power Technology, S.A.



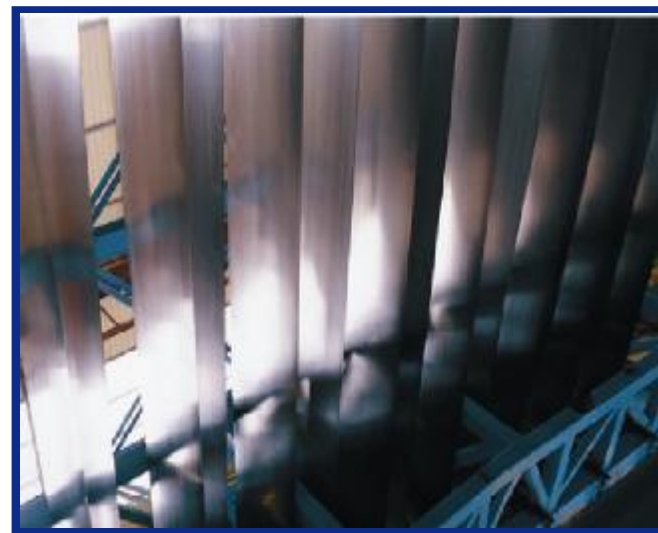
VVVF MOTOCONAC Equipment



Coils Loading Desk

After-Sales Services

- Hotline
- Spare parts in 24 hours
- Direct line with our technical staff
- Remote communication from our offices to the factory automation network



Acumulator

Ingeteam

Continuous Electrolytic Tinning Line Nr. 3

ArcelorMittal Asturias(Spain)



Process Description

In early 2002, **ArcelorMittal Asturias**, commissioned the consortium formed by **Ingelectric**, **Ingeniería de Sistemas, S.L.** (currently **Ingeteam Power Technology, S.A.**) and **TSK-Electrónica y Electricidad S.A.**, to carry out the engineering, the programming, the documentation, the installation, the commissioning and the electrical equipment supply for a new Electrolytic Tinning Line at its factory in **Avilés (Asturias)**.

The commissioning will take place in the first half of 2003 with production optimization foreseen during the second half of the same year.

The line is composed of:

- Coils loading section (two sections)
- Uncoilers (1 and 2)
- Double entry (upper and lower pass)
- Double shear
- Welding machine
- Entry accumulator (40 passes strip tower)
- Cleaning section (6 tanks)
 - 2 Alkaline cleaning tanks
 - 2 Electrolytic alkaline cleaning tanks
 - 2 Washing tanks with cascade water
- Low voltage flattener
- Pickling section (4 tanks)
 - 2 Electrolytic pickling tanks
 - 2 Water-washing tanks
- Tinning section (11 tanks)
- Coating thickness gauges
- Marking machine
- Passivity section (6 tanks)
 - 3 Electrolytic passivity tanks
 - 3 Washing tanks
- Oiling machine
- Flying shear
- Exit accumulator (20 passes strip tower)
- Coilers (1 and 2)
- Strapping machines
- Transfer cars

6.000 A. Rectifiers



TRANSFORMER

The rectifier transformer consists of:

- Windings: copper
- Installation: indoor
- Isolation: dry
- Primary voltage: 400V, 50 Hz, III
- Secondary voltage: 34V, 50 Hz
- Cooling: water-forced
- Service: continuous

RECTIFIER BRIDGE

- Bridge type: thyristor (secondary current control)
- Thyristor type: disc
- Thyristor assembly: heat sink
- Cooling: forced / water
- Full load output: 95%
- Nominal current: 6.000A
- Exit voltage: 30/40 Vdc according to application

Technical Features

Process Type: Continuous **Electrolytic Tinning Line Nr. 3**

Production Capacity (250.000 Tn/year)

100 000 Ton D.W.I.
75 000 Ton D.R.
75 000 Ton S.R.

Process Material: Cold rolled steel

Covering conditions: 1 to 11'2 g/m² and face

Coils data

Thickness: 0.1 to 0.5 mm.
Width: 600 to 1,200 mm.
Inside diameter: 419 mm. (minimum)
Outside diameter: 2,100 mm. (maximum)
Weight: 25 Ton (maximum)

Line Speed

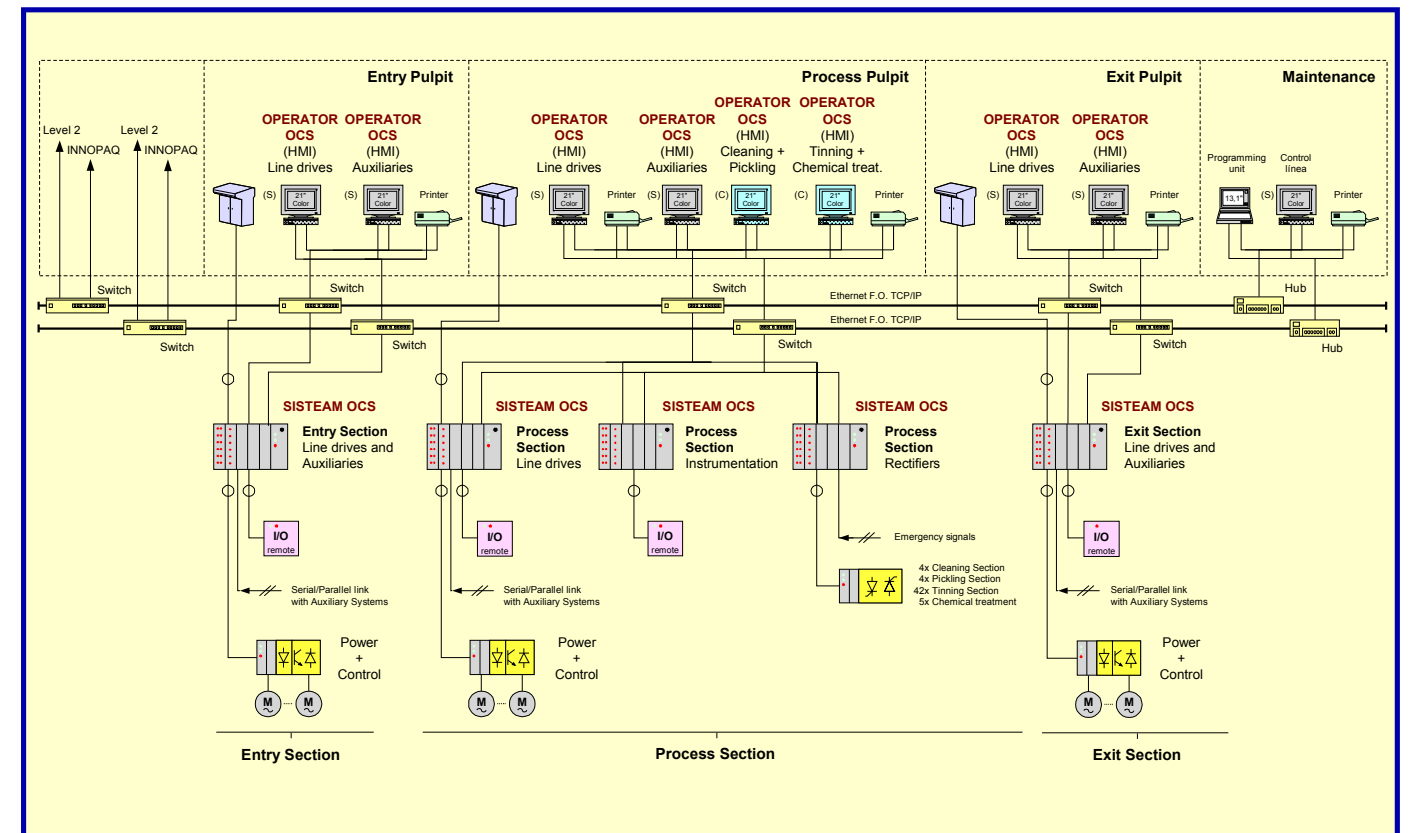
Threading: 45 m/minimum
Entry Section: 650 m/minimum
Process Section: 500 m/minimum
Exit Section: 650 m/minimum

Number of Rectifiers

Cleaning Section: 4 of 6 000 Amp. / 40 V.
Pickling Section: 4 of 6 000 Amp. / 40 V.
Tinning Section: 42 of 6 000 Amp. / 30 V.
Chemical section: 5 of 6 000 Amp. / 40 V.

(The rectifiers for Pickling and Cleaning sections have polarity static switching)

Control Diagram



Rectifiers Single Line Diagram

