

Scope of Supply

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

- Total installed power: 12.500 kVA
- Project Management
- Basic and detail engineering
- Scope of Supply:
 - 5,4 kV. MV switchgears
 - Transformers
 - Reactive power compensation and harmonic filters
 - Low Voltage switchboards
 - Main Motors - manufactured by **INDAR** -
 - MOTOCON AC* Main drives
 - MOTOCON AC* Auxiliary drives
 - A.C. Motor control centers
 - Sensors
 - Integrated Control Systems SISTEAM M*
 - Human Machine Interfaces OPERATOR MT*
 - Level 2 automation
- Electrical Installation
- Commissioning
- Maintenance

(*) SISTEAM M, MOTOCON AC, OPERATOR MT is equipment designed and manufactured by Ingeteam Power Technology, S.A.

SMS -Demag AG has supplied the following automation and control system:

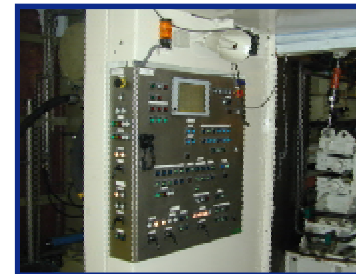
- Technological Control Systems
- Thickness and flatness measurement gauges
- Tensiometers, speed laser measurement and load cells

After-Sales Services

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



Main motor - Stand 1



Control panel - Stand 2



Tension reel - Local control desk



Pay-off reel

Ingeteam

Temper and Double Reduction Mill

ARCELORMITTAL- Etxebarri (Spain)



The Equipment

A̱ bil ̱ f̱q̱i has built a Double Reduction Skin Pass Mill in its plant of Etxebarri (Vizcaya - Spain) with the goal of producing very thin and hard tin plate, characteristics increasingly demanded by the market.

The mill consists of a Temper Mill, capable of operating in Dry Temper, Wet Temper and Double Reduction with coils up to 23 tons, 2.000 mm of max. outer diameter and 1.300 mm of max. width.

Type: 2 Quarto Stand Non-Reversing Mill

Operation:	Elongation minimum	Elongation maximum	Reduction maximum
Dry Temper:	0,5 %	2 %	-
Wet Temper:	3 %	20%	-
Double Reduction:	-	-	40%

Production:	Temper mode:	230.000 t/year - ref. strip 0,23 mm x 900 mm
	DR Mode:	100.000 t/year - ref. strip 0,16 mm x 900 mm

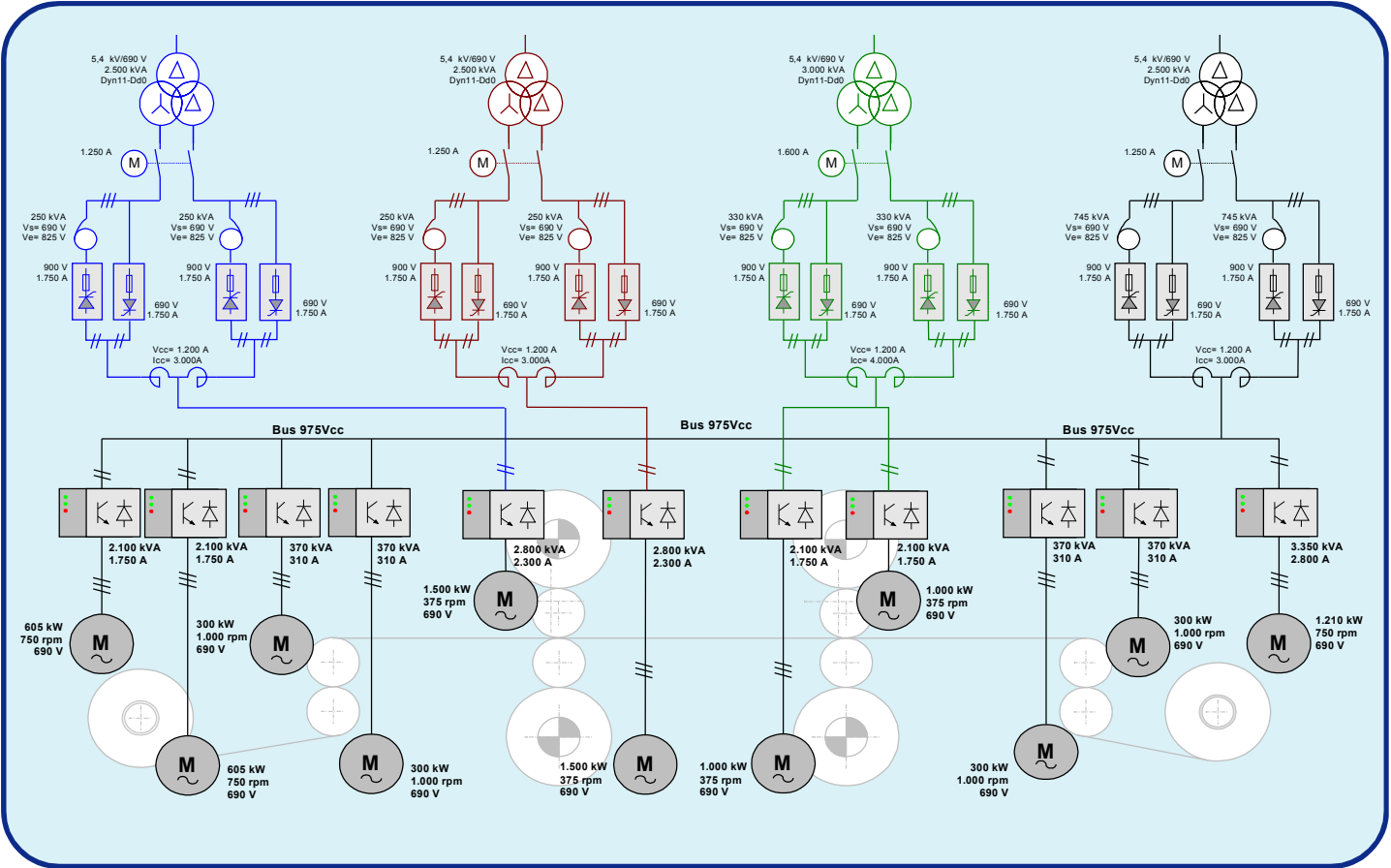
Coil characteristics:	Strip width:	600 - 1.300 mm
	Strip entry thickness:	0,15 - 0,6 mm
	Strip exit thickness:	0,14
	Inner diameter:	420 - 508 mm
	Outer diameter:	2.000 mm
	Max. weight:	23 t

Modes:

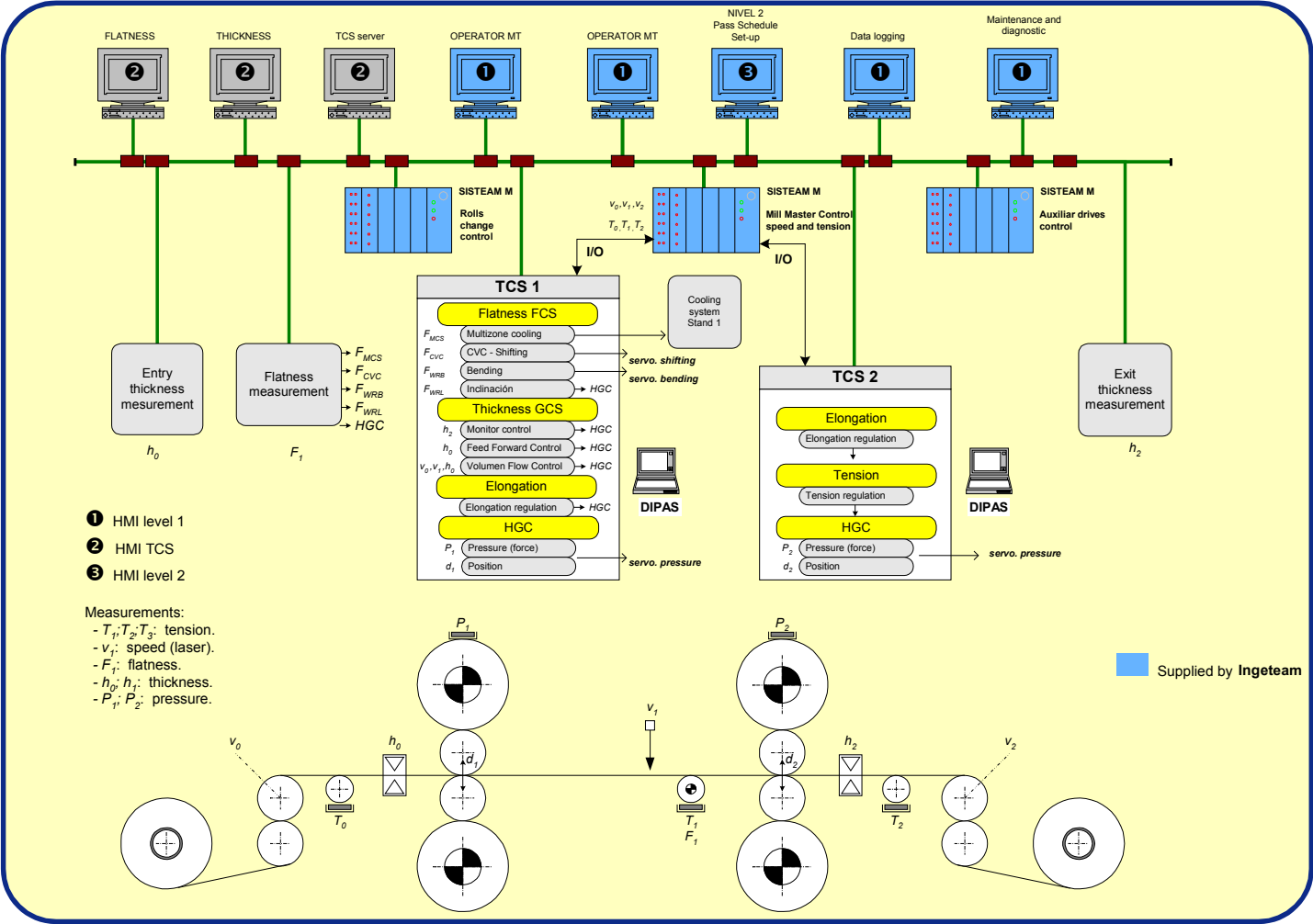
DCR: Strip thickness is reduced up to 40% in the first stand. The second stand makes a skin-pass with max. 1% strip elongation.

Skin Pass: Maximum strip elongation (2%) is achieved by rolling the strip in both stands.

Power Diagram



Control Diagram



	Pay-off reel	Entry tension bridle	Millstand 1		Millstand 2		Exit tension bridle	Tension reel
Diameters (mm)	2000/420	650/625	BUR	1100/1000x1400	BUR	1100/1000x1400	650/625	2000/508/420
Kind of drive			SPM	WR	SPM	WR		
Motor power (kW)	2x 605	Top 1 x 300 Bottom 1 x 300	DCR	560/510x1600 400x360x1600	DCR	560/510x1600	Top 1 x 300 Bottom 1 x 300	1x1210
Motor speed (rpm)	0-350/1667	0-1077/1120	SPM	0-260/637/700	SPM	0-260/637/700	0-1077/1120	0-350/1379/1668
Motor torque (kNm)	2x 16,5/3,5	Top 1x2,7 Bottom 1 x 2,7	DCR	0-260/463/509	DCR	2x37/15/14	Top 1 x 2,7 Bottom 1x 2,7	1x33/8,4/6,9
Gear ratio	1:1	Direct	SPM	Direct	SPM	Direct	Direct	1:1
Revolution (rpm)	0-350/1667	0-1077/1120	DCR	0-512/1251/1373 0-716/1273/1415	DCR	0-512/1551/1373	0-1077/1120	0-350/1379/1668
Speeds (m/min)	0-2200	0-2200	SPM	0-900/2200	SPM	0-900/2200/2200	0-2200	0-2200
Rolling torque (kNm)	-	-	DCR	0-900/1600	DCR	37/15/14	-	-
Tensions (kN)	33-2,2	49,5/3,6	80/5	49,5/3,6	33-2,2			

Motors are driven by Modular **MOTOCON AC** equipment, designed and manufactured by Ingeteam Industry.

These DC/AC inverters feature PWM technology with latest generation IGBTs.

For better energy efficiency, these drives are connected to different DC buses. Each DC Bus consists of rectifying stage based on regenerative 12-pulse converters.

Type: modular MOTOCON AC/MP-BT
Power: up to 4 MW
Voltage: 690 Vac
Technology: PWM, IGBTs



2,800 kVA inverter for Stand 1