



Coil Coating Line Technical Specification

1 Technical data

Dimensions

Overall length, 100 m

Ingoing material

Material		Steel or Aluminium
Thickness		0,3 – 1,50 mm
Width		600 - 1260 mm
Coil weight,	max 10 ton	
Coil inner diameter,		Uncoiler 508/610 mm
Recoiler		610 mm
Coil outer diameter		1500 mm

Line speeds

Line speed process section, max:		68 m/min
Line speed, entry/exit section, max:	90 m/min	

Coaters

Coater 1, Primer coater

Topside: No. of Application heads	2	
No. of Rolls per head		2
Backside: No. of Application heads	1	
No. of Rolls per head		2

Coater 2, Finish coater

Topside: No. of Application heads	2	
No. of Rolls per head		3
Backside: No. of Application heads	2	
No. of Rolls per head		3

Ovens

Oven 1, Primer oven

Length:		28 m
No. of heatingzones		4
Max temperature		400 °C
Fuel: propane		

Oven 2, Primer oven

Length:		28 m
No. of heatingzones		4
Max temperature		400 °C
Fuel: propane		

Media supply

Electrical power supply IT-system		
Voltage		3x500 V

2 Line description

2.1 General

The Coil Coating line is originally delivered by AEI-Herr in 1967 but several major modernizations had been made over the years that has given that only a few mechanical parts are of that age.

2.2 Entry section

Two Uncoilers, electrical driven with DC-motor. Uncoilers manufactured by FIMI, Italy, and installed 1989.

Coil cars, hydraulic operated. Manufactured 1985.

Two Feeders equipped with rubber rolls, machinery made in 1967, drive unit replaced in 1989. Open and close hydraulically. Strip joining machine, "Stitcher" operated by mechanical excenter press manufactured around 1970. Entry accumulator, hydraulically operated and equipped with load cells to keep constant tension in strip. Modified 1989 from 8 to 10 parts to increase the capacity to 45 m of material.

Strip joining procedure is made with a automatic function, with very few operator guided actions, to be able to join the strips at maximum line speed without reaching end of material in Entry accumulator.

2.3 Pretreatment section

Two Alkaline Degreasing stations with a Brush machine in between, followed by three rinse stations.

Manufactured in 1983.

Separate Squeezer roller stand to make strip dry before passivating unit. This unit is equipped with two sets of rubber rolls, this makes it possible to replace rollers during full production. This unit was manufactured 2005.

Drying section, strip passes in open air for a length of 16 m.

Passivating with a RTS®-unit (roller application of the passivating fluid) with double roller stands which makes it possible to replace rollers during full production.

Dryer, steam heated. Manufactured in 1992.

All equipment, except Dryer, is made in stainless steel. Storage tanks are placed beside the process units, which gives very good accessibility for maintenance etc.

2.4 Coating machine 1, Primer coater.

Primer coater is equipped with dual application units on top side and a single one on the back side.

Each application unit has two rolls driven by AC-motors with frequency converters.

Rolls are set against each other, Closed, with hydraulic cylinders. Distance between rolls in closed position, is adjusted by means of a manually operated screw and nut that gives very high accuracy.

Application unit is set against the strip with hydraulic cylinders. The gap is also here adjusted by means of a manually operated screw and nut that gives very high accuracy.

Top side is equipped with quick change between colour systems, since the two application units are placed beside each other on a sledge that is hydraulically moved from one position to the other.

Back side unit is also mounted on a sledge and can be moved to the side to simplify replacement of rolls.

Replacement of rolls is made with the help from manual chain hoists.

The machine was originally manufactured 1977 but a major renovation and modernisation was made 1989, at that time also all the drives were replaced.

2.5 Oven 1, Primer oven

Primer oven, 28 m long, heated by gas, propane, and is divided in 4 separate control zones. Equipped with exhaust gas purification with heat recovery that reduces CH contents in the exhaust to a minimum and at the same time reduces the need of additional propane to heat the oven. See also item 2.15

Originally installed 1974 but a major renovation and extension with 13,6 m was made in 1989. Manufacturer Stein Atkinson Stordy Ltd, England.

2.6 Quenching station 1

Quenching station made with two zones with temperature control in each step to minimize water consumption.

Process chamber with spray nozzles, divided into two zones, supplied with water from separate tanks.

Storage tank, two chambers, separate from process chamber and placed beside the strip to simplify cleaning etc. Complete station made in stainless steel. Manufactured in 1985.

After quench there is a Dryer fan with high speed nozzles.

2.7 Coating machine 2, Finish coater

Finish coater is equipped with dual application units on both top and back side.

Each application unit has three rolls driven by AC-motors with frequency converters. Rolls are set against each other, Closed, with hydraulic cylinders. Distance between rolls in closed position, is adjusted by means of electrical operated hydraulic motors connected to a screw and nut that gives very high accuracy. Application unit is set against the strip with hydraulic cylinders. The gap is also here adjusted by means of hydraulic motors connected to a screw and nut that gives very high accuracy. Both top and back side is equipped with quick change between colours or systems, since the two application units are placed beside each other on a sledge that is hydraulically moved from one position to the other. Replacement of rolls is made with the help from manual chain hoists.

The machine is manufactured 1989 but roller drives, motor with frequency converters and gearboxes, was replaced in 2006.

2.8 Oven 2, Finish oven

Finish oven, 28 m long, heated by gas, propane, and is divided in 4 separate control zones. Equipped with exhaust gas purification with heat recovery that reduces CH contents in the exhaust to a minimum and at the same time reduces the need of additional propane to heat the oven. See also item 2.15. Originally installed 1974 but a major renovation was made in 1989. Manufacturer Stein Atkinson Stordy Ltd, England.

2.9 Embossing station

Its purpose is to emboss a pattern in the finish paint before quenching.

A revolver head with place for two Embossing rolls with specific pattern on the top side. Operated by electrical motor to the three different positions. Counter roll, rubber coated, on the back side that is operated up and down with pneumatic cylinders. Manufactured in 1989.

2.10 Quenching station 2

Quenching station made with two steps with temperature control in each step to minimize water consumption.

Process chamber with spray nozzles, divided into two zones, supplied with water from separate tanks.

Storage tank, two chambers, separate from process chamber and placed beside the strip to simplify cleaning etc. Complete station made from stainless steel. Manufactured in 1985.

After quench there is a Dryer fan with high speed nozzles.

2.11 Exit section

Exit accumulator, hydraulically operated and equipped with load cells to keep constant tension in strip. Modified 1989 from 8 to 10 parts to increase the capacity to 45 m of material. Recoiler with belt wrapper manufactured by FIMI, Italy in 2006.

2.12 Cut-to-length line

Between the Exit accumulator and the Recoiler there is a Cut-to-Length line that is used to cut away and stack, at full operating speed, scrap material on strips so that coils on Recoiler are only prime material. This part of the line was delivered by FIMI, Italy, in 2007.

2.13 Drive system

Control of the strip, speed and tension, is done by five drive units. Each of them equipped with two driven rolls. Motors are DC-motors and manufactured by Siemens. All of them are installed in 1989. Strip tension is measured by weight transducers and used to control motor torque to obtain a constant tension in the strip.

2.14 Strip guiding system

There are five strip guiding devices in the line.

1. Before Pretreatment section
2. Before Coater 1
3. Before Coater 2
4. Before Exit Accumulator
5. Edge control on Recoiler

2.15 Exhaust gas purification

Both ovens are equipped with an Ecopure®-TAR unit from Dürr, Germany, for gas purification and heat recovery. These units use an incineration method, by means of which organic contaminants are transformed mainly into water and carbon dioxide. Exhaust air from Coaters are also recycled and used as new air in to ovens. This equipment manufactured by company Dürr, Germany and delivered in 1991.

2.16 Electrical equipment

The complete electrical equipment was replaced in 1989.

PLC-system was upgraded to Siemens S7 in 2007. At this time also the HMI,

visualization system, was replaced to a Siemens WinCC –system.
The electrical equipment is placed in a separate room, with air conditioning.

2.17 Hydraulic equipment

A central hydraulic unit placed in a sound insulated room.

Equipped with 4 main pumps, each 90 l/min, working together to a main line with 100 bar. And one pump 15 l/min, for a 180 bar line.

Cooling and filtering is made with separate pump and oil/air cooler.

Tank volume 5000 l.

Pumps, manufacturer Mecman/Rexroth.

Complete station renovated in 1989 with new components.