



**ROLL COATER FOR GALVANIZING
LINES AND COLOR COATING LINES**
HIGH PERFORMANCE COATING FOR
TOP-CLASS RESULTS

HIGH TECHNOLOGY FOR A WORLD ON THE MOVE

YOUR CHALLENGE

Markets are much more demanding in the current century than in the previous one mainly due to a high competition and numerous potential sourcing options. As the demand is moving to highest quality standards due to new coating materials, producers have to rank among the world's best to satisfy the high-level requirements at the lowest product cost. Producers attempt to optimize coating layer thickness, improve surface gloss and surface smoothness at minimized amount of material applied during coating operation and hence deliver more substantial cost savings. In addition, plant operators have to fulfil constantly stricter environmental and safety regulations at a minimum impact on production costs.

YOUR CHALLENGE

The key of Roll Coater is the newly developed servo-hydraulic roll adjustment called DynaCoater®, which offers a high precision Roll Coater setting combined with fast reaction time. The servo-hydraulic adjustment system eliminates the disadvantage of common roll adjustments for Roll Coaters (high maintenance efforts, slow and approximate adjustment of rolls). Primetals Technologies has developed this technology based on its high knowledge of hydraulic process control in the cold rolling mill activity. Technology transfer from the cold rolling mill to the coating application was possible utilizing in-depth experience in similar fields of automation, and the implementation stage was facilitated by extensive knowledge in closed loop control.

The results of this development are a combination of Primetals Technologies expertise:

- In mechanical aspects: high stiffness of the Roll Coater base frame and reliable and accurate sliding pads supporting the roll heads for both pickup roll and applicator roll
- In hydraulic field for the actuation system: low friction seals in the hydraulic cylinders and servo-control valves
- In automation control: closed loop control and drive system management

GOOD REASONS FOR ROLL COATER

The advantages of our Roll Coater are emphasized by our approach as an equipment builder to serve our clients and give them a substantial advantage in their market.

- **High productivity** - the fully automatic Roll Coater reduces set up time, providing high efficiency during transient stages such as paint changes, line speed changes, etc. The quick roll change system ensures minimum maintenance time
 - **Reduced operating costs** - the dynamic Roll Coater is a 'must' in terms of paint saving as the technology provides roll eccentricity compensation, tightest thickness tolerances by hydraulic force control and reduction of uncoated strip on weld passage
 - **Highest product quality** - machine stiffness, roll eccentricity compensation, PLC-based fast Roll Coater head set up, closed loop force or roll position control modes provide optimum coating thickness and surface quality with constant gloss
 - **User-friendly operation** - all of our Roll Coaters have been designed for safe and easy use. Operations are managed through the HMI (Human Machine Interface) or local pulpit. Running mode can be selected from the operator PLC to operate the Roll Coater in fully automatic or manual control modes
 - **Complete workshop testing** - our Roll Coaters are assembled and tested in our workshop in Montbrison, France. Testing includes mechanical adjustments, hydraulic pressure tests and automation. Every Roll Coater is fine-tuned to ensure smooth integration into the line
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ROLL COATER TECHNOLOGY

INNOVATIVE SOLUTION FOR HIGH PERFORMANCE COATING



High force adjustment between rolls



Photo nip feeder on top

Market constraints drive Roll Coater technology development to supply state-of-the-art in coating process. Primetals Technologies is well aware of market evolution and keeps pace with client requirements.

TYPES

Primetals Technologies offers different types of Roll Coaters with steady or shuttle frame:

To this effect, our Roll Coaters are designed as “mechatronic packages” including all technology aspects such as mechanical, fluids, electrical and automation functions. This modular approach offers the clients substantial benefits as completely integrated solutions.

LINE	COLOUR COATING LINE			GALVANIZING LINE	ANNEALING LINE
TYPE	Chemical post-treatment	Prime paint	Finish paint	Chemical post-treatment	Chemical post-treatment
Vertical	Y	Y	Y	Y	Y
Horizontal	Y	N	N	Y	Y
“S” wrap	Y	Y	Y	Y	Y
“C” wrap	N	Y	Y	Y	Y
“U” wrap	N	Y	Y	N	N
Single roll	N	Y	Y	N	N
Backer	N	Y	Y	N	N



3-roll configuration

FEATURES

The Roll Coater technology has been defined from the early stage of design and research on the basis of fundamental principles which guarantee coating quality and thickness homogeneity.

To this effect, Primetals Technologies has acquired perfect control of:

- Stiffness of frames
- Guiding precision
- Fast hydraulic system
- Control automation

Stiffness of frames prevents extraneous vibrations likely to cause surface defects on the strip. Our design is based on solutions derived from our extensive experience in rolling mills and process lines.

Guiding precision is also essential to achieve top level performance in controlling the coating thickness and homogeneity of strip surfaces. Our technology substantially precludes hysteresis phenomena due to friction during movements of support arms.

Fast hydraulic system used for force control allowed to compensate roll eccentricity of applicator roll and pick-up roll and to reduce paint consumption by reducing vibrations. Control automation is similar to our control used for special equipment as welder, air knives Dynawipe. The conception simplified the operations for operator and are very easy to integrate in a line due to the standardisation of the equipment.

ROLL ADJUSTMENT CONFIGURATION

- Manual via screw jack gears
- Servo-hydraulic DynaCoater® force and position control

COATING HEAD CONFIGURATION

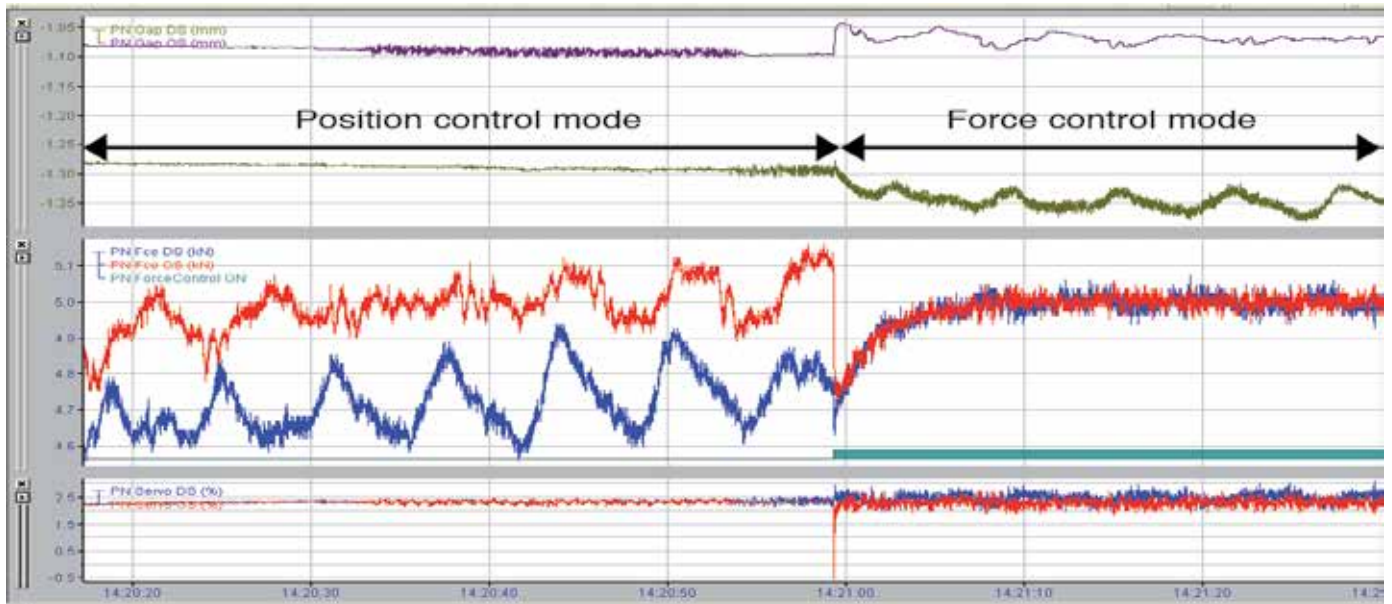
- 3 rolls (V or in-line layout)
- 2 rolls
- Nip feeder
- Forward or reverse coating
- Doctor blade

AUXILIARY EQUIPMENT

- Chemical Supply
- Paint Supply
- Roll change equipment

DYNACOATER

INNOVATIVE SOLUTIONS TO FIT WITH YOUR NEEDS FOR PRIME AND FINISH PAINT COATERS



Dynamic compensation of roll eccentricity

FULL CONTROL OF ROLL COATER (FORCE & POSITION)

- Servo hydraulic roll adjustment with dynamic force and position control

BENEFITS

- Fast force control loop (5 msec) through a dedicated S7-315 CPU and high performance analog input and output boards
- Dynamic compensation of roll eccentricity
- Quick retracting and positioning of coating heads
- Quality improvement due to setting values stored in PLC
- Tightest thickness tolerances by hydraulic force control
- Reduction of uncoated strip length on weld passage
- Closed loop control via paint thickness measurement

CONTROL AUTOMATION SYSTEMS

- Siemens electrical equipment as PLC S7 and SIMATIC drives and motors

BENEFITS

- Simplified operations: via HMI, operators are able to visualize force and roll speed parameters, calculate system operating parameters and see technical data in real time
- Reduced coating product consumption by optimizing the deposited amount through pilot control models with performance data validated on our clients' sites
- Fast gap opening for applicator roll change



Servo hydraulic controller



Servo hydraulic controller

PRIMETALS TECHNOLOGIES WORKSHOP IN MONTBRISON

Our Roll Coater is assembled and tested in our workshop in Montbrison, France. Since 1994 the Primetals Technologies workshop has been compliant with international quality standards (ISO 9002 then, ISO 9001 today). Since 2007 our workshop has also been compliant with the international environmental standards and obtained ISO 14001 registration.

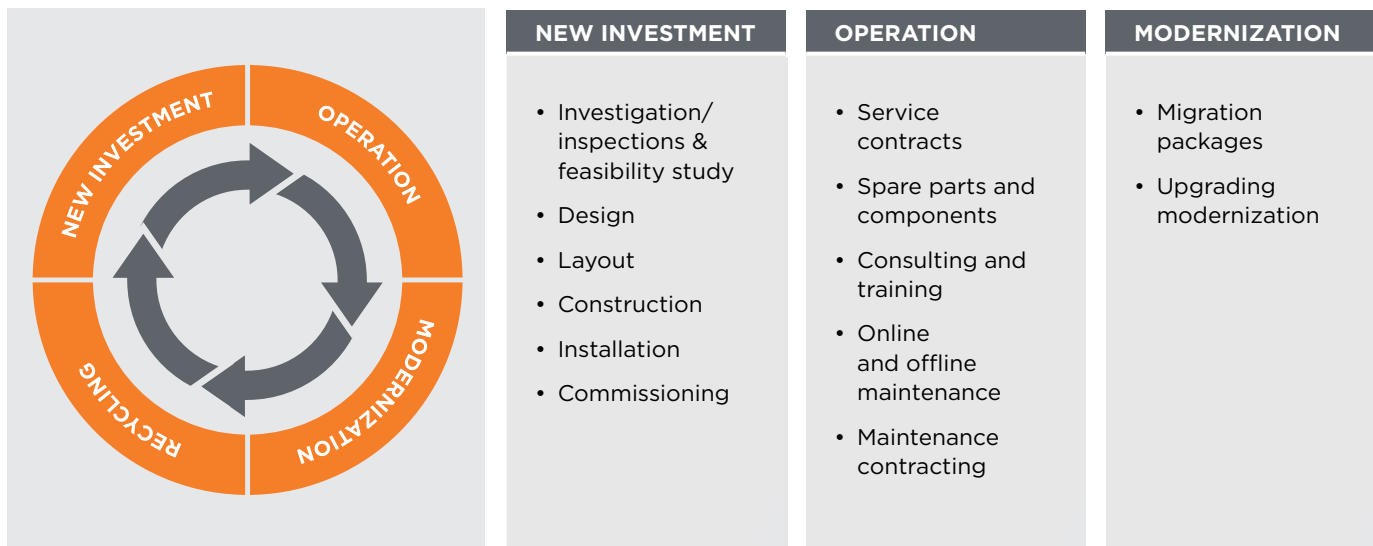
All special-process equipment is manufactured, assembled and tested in our workshop so as to ensure the best quality and performance from one single source. This not only provides our customers with the opportunity of pre-inspecting the equipment, but also allows for watching the machines in the course of manufacturing from project start to shipment.

TEST FACILITIES

Testing includes mechanical adjustments as well as individual and sequence tests. Every Roll Coater is fine-tuned for smoothest and fastest integration into your facility.

LIFECYCLE MANAGEMENT PARTNERSHIP NEVER ENDS

CONSULTING | PLANNING | FINANCING



PRIMETALS TECHNOLOGIES LIFECYCLE SERVICES

As a Roll Coater user, you have conflicting needs. On the one hand, your performance is measured each quarter against short-term profitability expectations. On the other hand, you have to think on a totally different time scale compared with the capital market. Depending on the lifetime of your Roll Coater, you have to take 15 years or more into account. At the very least, that's 60 full quarters.

But thanks to our comprehensive expertise and integrated approach to solutions, you benefit both short-term and long-term from our lifecycle services.

In the short term: backed by our extensive experience with many reference plants, we provide you with the certainty of fast, dependable production start-up and shorter amortization periods.

In the long term: our master plan guarantees competitive performance for your plant and your Roll Coater in every phase of its lifecycle. Whether we are providing 24/7 technical support, optimizing maintenance, or making permanent plant improvements, we are always working to ensure the cost effective operation of your plant and products. Thanks to our lifecycle supports organized in clusters (Europe, America and Asia), you will benefit from our worldwide presence.

THE FOLLOWING SERVICES ARE AVAILABLE TO OUR ROLL COATER:

- Spare parts management & supply - genuine and up-to-date spare parts available in the shortest delivery time, as well as related repair services and replacement
- Preventive maintenance visits to anticipate any loss of efficiency of the equipment at an early stage
- Hotline & remote support services
- On-demand on-site intervention

The services are proposed on the basis of a complete yearly and renewable package that may be customized to the specific customer requirements.



U-Wrap paint DynaCoater

ON YOUR SIDE FOR CONTINUOUS IMPROVEMENTS

Roll Coater experts are also available to assist in keeping equipment settings in line with production practices or customer requirements. This is done following a rigorous methodology, developed and enhanced through years of experience, and supported by highly efficient and user-friendly tools.

Our upgrade projects are mainly driven by:

- Reduction of operating costs (energy, maintenance and consumables, operation personnel)
- Improvement of product quality
- Adaptation of equipment in line with product mix extension

The solution may be purely electrical, automated, mechanical or a combination. Utmost attention is paid to seamless integration of the solution and to our flexibility in reducing the line downtime throughout work execution. For your convenience, the modernization work can be carried out during several maintenance stops or during a scheduled plant shutdown. Our team is available to assist you during restart operations and for performance ramp-up of your equipment.

EXCELLENCE FROM EXPERIENCE

SELECTED SUCCESS STORIES WITH ROLL COATER



Vertical chemical DynaCoater®

Customer: Tata Steel IJmuiden BV, Netherlands

Line type: Vertical chemical DynaCoater

Our solution: Fully automatic system controlled by high-end PLC

The result: Precise servo-hydraulic adjustment of rolls

Technical data: Width: 900 - 2.050 mm; thickness: 0.6 - 2.5 mm; speed 180 m/min



S-Wrap paint Dynacoater

Customer: ArcelorMittal Poland SA Branch, Poland

Line type: S-Wrap paint Dynacoater

Our solution: Fully automatic system controlled by high-end PLC

The result: Constant and precise painting directly from start of coating

Technical data: Width: 700 - 1.600 mm; thickness: 0.2 - 1.2 mm; speed 120 m/min



U-Wrap paint Dynacoater

Customer: Magnitogorsk Iron and Steel Works, Russia

Line type: U-Wrap paint Dynacoater

Our solution: Fully automatic system controlled by high-end PLC

The result: Quick opening for roll change

Technical data: Width: 700 - 1.650 mm; thickness: 0.2 - 1.6 mm; speed 140 m/min



S-Wrap paint roll Dynacoater

Customer: Acerías de Colombia - Acesco S.A.S., Colombia

Line Type: S-Wrap paint Dynacoater

Our solution: Roll adjustment actuated by hydraulic cylinder

The result: Reduction of unequal-coated strip

Technical data: Width: 600 - 1.250 mm; thickness: 0.2 - 2.5 mm; speed 35 m/min



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