



METALS

# ELECTROLYTIC GALVANIZING LINES

FOR HIGHEST QUALITY STEEL STRIP

**ANDRITZ**

ENGINEERED SUCCESS

# World market leader for electrolytic galvanizing

ANDRITZ Metals electrolytic galvanizing lines are designed for the production of highest quality products for the car industry, household appliances, and office equipment. Our technologies for electrolytic galvanizing are backed by many years of experience in building zinc plating systems and on their consistent development. Our electrolytic galvanizing technologies ensure excellent corrosion protection and optimum surface finish.

In our plants steel strip is coated with a layer of zinc or a zinc alloy. Additionally, phosphate, chromate or organic layers can be applied. As proved by more than 35 installations throughout the industry our plants are run with a minimum of operating cost and, at the same time, a maximum of environmental compatibility in producing first-class products. As a result, leading automobile producers all over the world use products finished with our lines.

The mechanical equipment is designed to assure continuous operation at a constant speed in the process section to achieve the maximum possible output of the final product. If the speed in the process section is reduced, the coating algorithm (ANDRITZ Line Master ALM-EGL) will automatically adjust the current supply to the coating rectifiers to keep coating thickness constant according to the requirements.

## GREAT VARIETY OF APPLICATIONS

Surface finishing of annealed, skin-passed cold strip and other input materials

- for optimum surface quality (surface quality B according to EN 10152)

- for strip widths ranging from 100 mm to 1,950 mm
- for any typical strip thicknesses ranging from 0.2 mm to 3.0 mm
- for all typical thicknesses from 18 to 100 g/m<sup>2</sup>
- for coating on one or two sides or
- differential coating
- for coating with pure zinc or zinc alloys

## PROCESS AUTOMATION AND COMPLETE ELECTRICAL EQUIPMENT

The steel industry is facing continuously rising demands which can only be met by implementing sophisticated and cost-effective technical solutions.

This objective has been achieved by introducing flexible and application-oriented automation technology together with standardized state-of-the-art hardware and software systems. Precise and comprehensive knowledge of the line and the process technology combined with many years of practical experience have resulted in ingenious solutions enabling our customers to produce top level products in terms of quality and productivity.

# ANDRITZ has the appropriate answer

Electrolytic galvanizing systems from ANDRITZ are characterized by

- GRAVITEL process with
  - vertical, heavy-duty cells
  - automatic positioning of anode boxes
  - electrolyte flows from top to bottom via a weir
  - quick change from one- to two-sided operation
- no edge masks
- fully automatic coil feed to the line
- efficient pre-treatment technology (chemical and electrolytic cleaning, and pickling)
- low energy consumption
- post-treatment customized to requirements
- automatic strip inspection
- fully automatic coil removal from the line
- all process steps being optimized for environmentally friendly production



GRAVITEL anode box

# GRAVITEL - high flexibility during operation

Many years of experience and continuous improvements have raised the GRAVITEL process to significant efficiency levels. This is expressed by the energy and zinc saving operation with a minimum of downtimes.

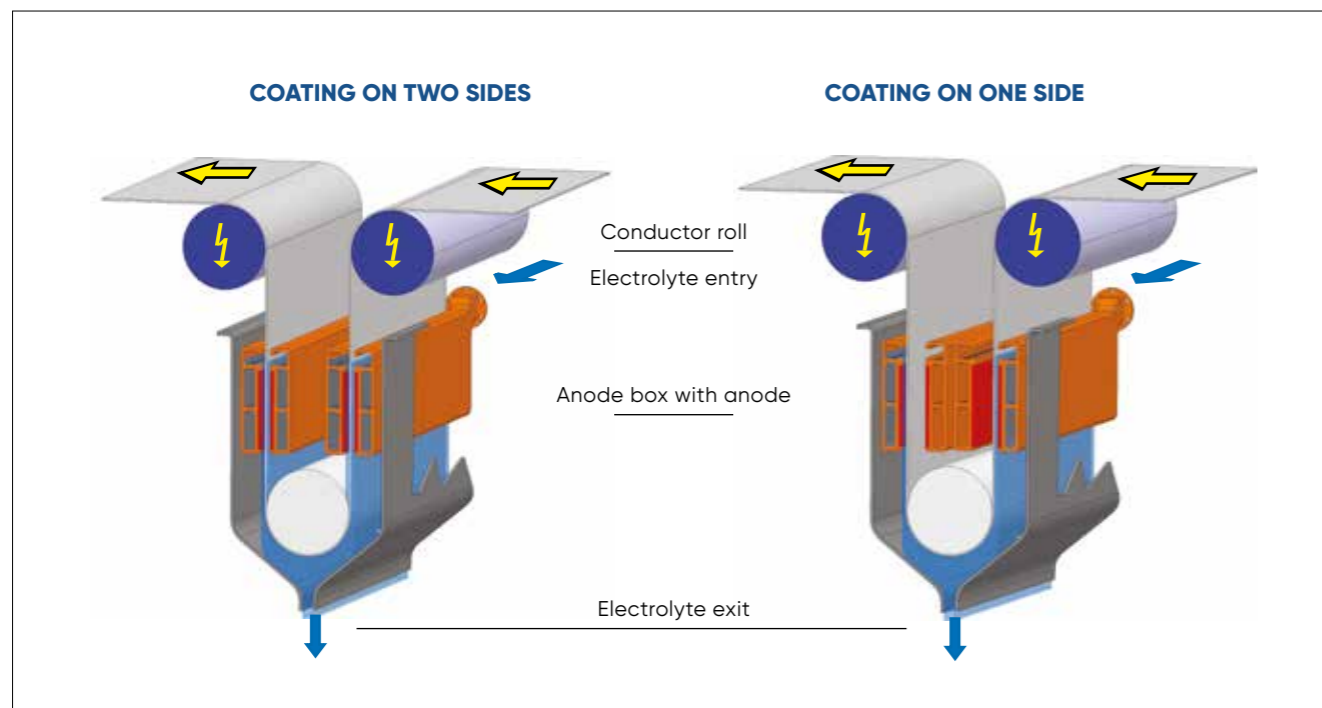
ANDRITZ GRAVITEL systems are setting the trends in electrolytic galvanizing technology for coating steel strip on one or two sides with zinc or zinc alloy. Manufacturers of galvanized steel opt, with good reason, for this technology.

## HIGH DEGREE OF FLEXIBILITY

The unique feature of the GRAVITEL cell is its high flexibility by changes of strip width and in plating mode (one or two side coating or differential coating) during operation. The variation of the strip width is compensated by the electrolyte flow in the anode boxes, which is set by frequency controlled pumps. The GRAVITEL process

is further characterized by even coating distribution. No edge-over coating occurs, therefore, edge masks are not needed. The GRAVITEL process takes place in a vertical cell, where the strip is running at a narrow distance between two moveable anode boxes. The anode plates, which are made of titanium sheet coated with conductive iridium oxide, are attached to the anode boxes.

The electrolyte flows into the gap between anode and strip and is accelerated by gravity to a speed of 5 m/s. High electrolyte flow enables high capacity electroplating at a current density of up to 180 Amps per square decimeter.



Schematic diagram of GRAVITEL cells

# Make our experience your advantage

We develop state-of-the-art processes – a consistent challenge to us and a decisive benefit for our customers.

## WHAT CAN YOU BENEFIT FROM?

| Characteristics of our plants   | Customer benefit   |
|---|--|
| Heavy-duty cells with high-speed electrolyte flow and high current density                                    | Few cells with high coating performance  |
| Minimum strip/anode spacing   | Low energy consumption   |
| Coating algorithm coupled to weld tracking  | Change from two-sided to one-sided operation without stoppage  |
| Specially equipped for rapid electrolyte change   | Change from pure zinc to zinc alloy coating and back within a few hours  |
| Use of insoluble IrO <sub>2</sub> -coated titanium anodes   | No anode handling, therefore, reduced personnel requirement  |
| Special equipment for continuous conductor roll cleaning  | Reduced surface defects and improved output  |
| Mechanical equipment, process section, electrical-, automation-, and auxiliary equipment from a single source | Optimum integration of all plant items into an overall solution provides high reliability, ease of handling and operation at low operating costs |
| Closed electrolyte circuit by using an evaporator   | Reduction of waste water, recovery of valuable zinc  |
| High degree of automation   | Ensures constantly high product quality coupled with high plant performance and damage prevention  |



Roll coater for anti-fingerprint



Infrared dryer for post-treatment

# Proven and sophisticated design

## THE GRAVITEL FACTS

|                           |                               |
|---------------------------|-------------------------------|
| Process speed             | up to 180 m/min               |
| Current efficiency        | 97%                           |
| Electrolyte velocity      | up to 5 m/s                   |
| Electrolyte flow per cell | up to 1,250 m <sup>3</sup> /h |
| Current density           | up to 180 A/dm <sup>2</sup>   |
| Gap anode strip           | 8 mm                          |

## EXTRACT FROM OUR REFERENCE LIST

| Customer          | Country    | Capacity t/a |
|-------------------|------------|--------------|
| AK-Steel          | USA        | 700,000      |
| ArcelorMittal     | Luxembourg | 200,000      |
| Baosteel          | China      | 263,000      |
| Chang-Fa          | China      | 130,000      |
| E. Giebel GmbH    | Luxembourg | 200,000      |
| I/N Kote          | USA        | 450,000      |
| Pre Finish Metals | USA        | 360,000      |
| Salzgitter        | Germany    | 300,000      |
| Usiminas          | Brazil     | 360,000      |
| voestalpine Stahl | Austria    | 290,000      |
| WISCO             | China      | 300,000      |





## ENGINEERED SUCCESS FOR FLAT PRODUCT PROCESSING

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# ANDRITZ

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