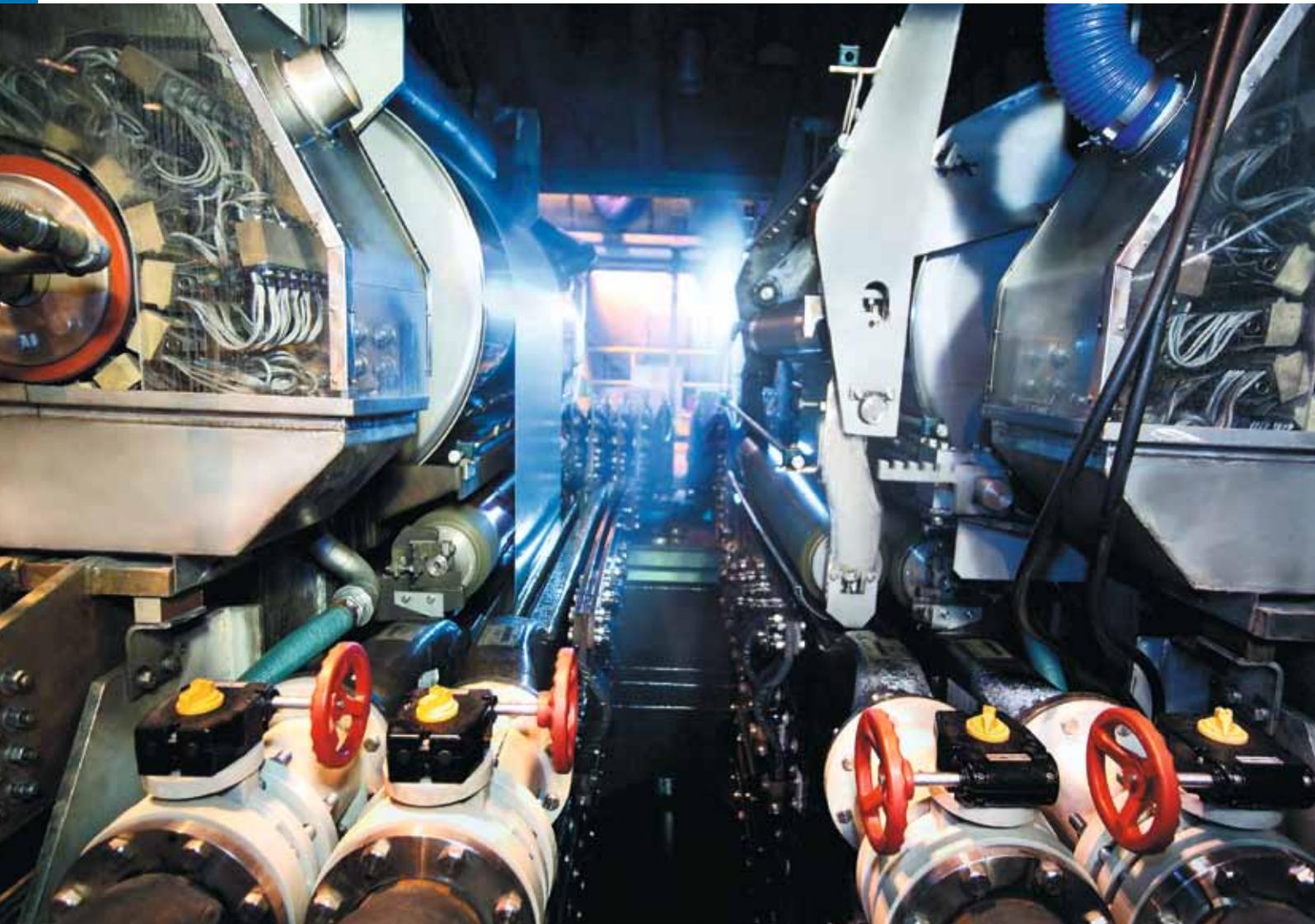


Electrolytic galvanizing lines



World market leader for electrolytic galvanizing lines

Our electrolytic galvanizing technologies ensure excellent corrosion protection and optimum surface finish.

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.

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/m²
- 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 for any set of requirements

We supply complete plants and their underlying processes.

Electrolytic galvanizing systems from ANDRITZ METALS 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



▲ Process visualization

► Galvanizing plant



Make our experience your advantage

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

Characteristics of our plants	Customer benefits
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 ₂ -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

▲ View into a GRAVITEL cell

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

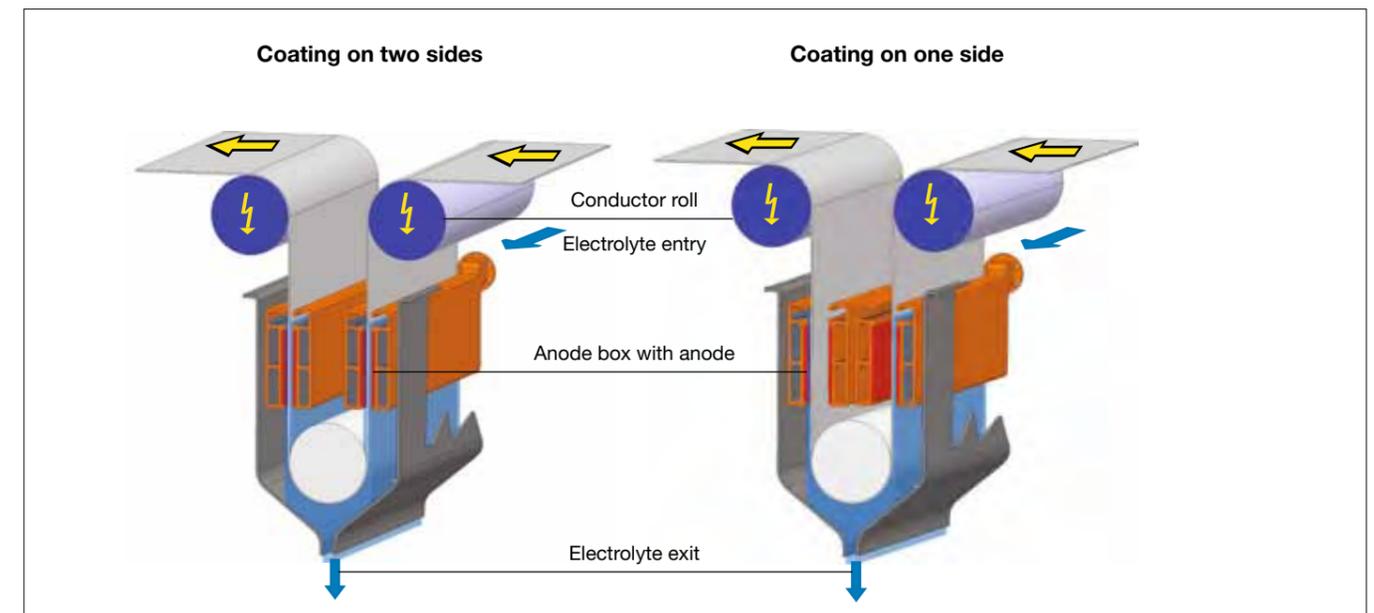
The unique feature of the GRAVITEL cell is its high flexibility by changes of strip width and in plating mode (one or two side coating or differential coating) during operation. The variation of the strip width is compensated by the electrolyte flow in the anode boxes, which is set by frequency controlled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

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 ³ /h
Current density	up to 180 A/dm ²
Gap anode strip	8 mm



▲ Schematic diagram of GRAVITEL cells

Rely on our solutions

like many other customers worldwide

The GRAVITEL process developed by ANDRITZ for electrolytic galvanizing systems has met with worldwide acceptance: Currently, over 30% of electrolytically galvanized products worldwide are produced using Gravitel lines.

Only some of our references

Customer	Country	Start-up year	Capacity t/a
E. Giebel GmbH	Luxembourg	1983	200,000
voestalpine	Austria	1985	290,000
Pre Finish Metals	USA	1985	360,000
Salzgitter	Germany	1987	300,000
I/N Kote	USA	1991	450,000
AK-Steel	USA	1991	700,000
Usiminas	Brazil	1993	360,000
Rasselstein	Germany	1995	300,000
TKS Duisburg	Germany	1998	280,000
TKS Dortmund	Germany	1999	280,000
Baosteel	China	2000	263,000
ArcelorMittal	Luxembourg	2000	200,000
Chang-Fa	China	2003	130,000
Baosteel	China	2007	310,000
Baosteel	China	2008	300,000
WISCO	China	2010	300,000



► Galvanizing plant

The road to your success

Complete solutions from one single source

ANDRITZ METALS is one of the few suppliers worldwide capable of providing all technologies and processes involved in the production of steel strip. For hot-dip galvanizing lines and continuous annealing lines used in the automotive industry, ANDRITZ METALS also follows the 'single-source'

concept. The plant components are precisely tuned to each other. The GRAVITEL process developed by ANDRITZ for electrolytic galvanizing systems has met with worldwide acceptance: Currently, over 30% of electrolytically galvanized products worldwide are produced using GRAVITEL lines.

Choose us as partners

- The complete mechanical equipment
- Process section with heavy-duty cells
- Instrumentation and automation
- Strip transport electrics
- Electrical equipment
- Peripheral equipment

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