Processing lines and rolling mills for aluminum
Corrosion protection
for long life cycles

Innovative solutions for advanced materials with first-class surface quality

The excellent properties of the aluminum material mean that it can be used in very different fields of application. The automotive industry values its corrosion resistance and recyclability for example, the aerospace industry appreciates its light weight, and the electrical industry its good conductivity. Aluminum has also established itself as the basic material for food and beverage containers, solar technology, and in the construction industry.

Steel offering higher strength and corrosion resistance properties while also being lighter in weight is also experiencing growing demand in the automotive industry worldwide. The technologies that ANDRITZ METALS offers and continues to develop have made a major contribution to the high quality of the surface properties of steel and aluminum.

CONTENTS
Chemical treatment lines 06
Cold rolling mills 08
Multi-function lines 10
Cut-to-length lines 12
Electric and automation 14

Picture cover page: Aluminum 6-high rolling mill

Tension Leveler
High-performance manufacturing
All required processes from a single source

High production capacities and standards
ANDRITZ METALS is one of the few suppliers capable of providing all processes required in manufacturing lines for aluminum strip from a single-source. This ensures minimized interfaces and enables optimization of the entire process. The many years of experience provided by our engineers, the continuous further developments in our technologies, and the comprehensive, certified quality management system are proof of ANDRITZ’s leading role in the world market. Core components are developed in-house and manufactured at the company’s own facilities. The strip processing lines department plans, develops, and puts innovative solutions into practice for complete customized, turnkey plants and for extension and modernization projects. All the required processes and components – from engineering to start-up – are fully coordinated to provide optimum solutions.
Our manufacturing lines feature high production capacities and quality standards. Individual automation solutions geared exactly to the customers’ technical and financial requirements ensure short start-up times and smooth operation. The plants that we design are optimized with inline rolling mill stands, special shears, tension levelers, or coil logistics. Our future-oriented technologies are designed to increase and safeguard our customers’ ability to compete in the long term.

Processing line for automotive sheets
Processing lines for aluminum sheets

Engineered and built by ANDRITZ METALS, these lines meet the requirements of customers worldwide with regard to flexible production and high product quality.

Weight reduction and corrosion protection for long life cycles

The demand for aluminum strip products in the automotive industry has been growing sharply in recent years because these products reduce vehicle weight and thus increase fuel economy. Chemical treatment of aluminum strip is an important production step for aluminum in automotive use. The chemical process consists of degreasing, de-oxidizing (pickling), and passivation (conversion). Different demands for final surface properties by the well-known OEMs worldwide require the right concepts, expertise, and technology to combine the individual process agents, flexible contact times, and different methods of application.

Technical data

- Material: Aluminum and aluminum alloys
- Strip thickness: 0.2 mm - 6.3 mm
- Strip width: 900 mm - 2,300 mm
- Line speeds: 120 m/min max. (entry and exit section)
  90 m/min max. (process section)

A Ti/Zr-coater

Overview of a chemical treatment line

Spray treatment section

PP-tank design for Deox/conversion
Cold rolling mills for aluminum strip

Exact knowledge of the plant and process technology as well as many years of experience enable us to provide highly developed solutions that secure a leading ranking for our products on the world market in terms of quality and productivity.

From hot-rolled strip to added-value products

Enormous demands by OEMs require highest quality products with closest tolerances for our customers. This also means continuously rising technological demands on rolling mill equipment in the line. However, these demands can only be met if the entire process chain is tuned to provide optimum results.

This why, as an innovative company, we have set ourselves the goal of developing a new cold rolling mill for aluminum, thus ideally covering and aligning the entire process chain for the production of flat aluminum products. A cold rolling mill in a 4-high or 6-high design, with perfectly aligned equipment interacting with the mechanical equipment, the technological controls, and the drive system.

General features of the aluminum mill

- Coil preparation station in front of the inlet side of the mill
- Coil inspection station at the mill exit side
- Sleeve handling and transport system
- Coil logistics and transport system
- Fully automatic work roll and intermediate roll change without disconnecting the bending and shifting system
- Ironing roll to ensure good coil build-up with telescoping and avoid strip folds
- Rolling oil circulation system with compact pump unit design with easy maintenance and reduced requirements for piping and fittings
- Rolling oil filter system, designed as plate-type filter
- Hydraulic unit and valve stands
- Safety and environmental equipment
- Plate housing with lifting gates and integrated suction hoods to minimize the noise level around the mill, reduce the oil vapor, and enhance operating safety for the operating personnel
- Fire extinguishing system with very fast extinguishing in the event of a fire by using the additional roll gap extinguishing system
- Vapor extraction system with air cleaning unit

Main features of the 6-high aluminum rolling mill

- Deformation-optimized housing geometry
- Hydraulic long-stroke cylinder, exchangeable as a complete structural component
  - One servo-valve control per screw-down cylinder
  - High screw-down speeds and high control dynamics
  - Response time <35 mins.
- Mill-fixed intermediate roll bending system and mill-fixed work roll bending system
  - With positive and negative bending in order to improved strip flatness
  - No need to detach hose connections for roll changing
  - Low cost of roll change set
- Automatic pass line adjusting system for broad range of roll diameters
- Selective roll cooling system to provide a high degree of control of the asymmetrical thermal deformation of diameters along the face length of the work roll by means of precise and metered roll cooling
- Hot edge spraying system/induction heating
  - to extend thermal crowning of the work roll up to the full strip width
  - to reduce narrow edges
  - to avoid strip edge cracks
- High-impact strip drying system
Multi-function lines for aluminum strip
Recoiling, edge trimming, tension leveling, slitting, and inspection

Different process steps —
All in one line
Different process steps are needed in the production of finished aluminum strip in order to meet the demands of the market. The new ANDRITZ METALS multi-function plant meets these demands. Recoiling, edge trimming, tension leveling, inspection, and slitting in one line: High throughput and multiple functions are not a contradiction in terms here. These stringent demands can be met with an intelligent layout of the individual functions within the overall plant. From manual inspection to automatic surface checking, from edge trimming to slitting, from leveling of the leading strip end to precision tension leveling. All this at strip speeds of up to 1,000 m/min.

Perfected plant engineering technology with intelligent automation solutions from a single source. The plants we have supplied worldwide are proof that we meet our customers’ demands with custom-tailoring.

Technical data
- Material: Aluminum and aluminum alloys
- Strip thickness: 0.15-2.0 mm
- Strip width: 1,000-2,300 mm
- Coil diameter: 2,600 mm max.
- Coil weight: 20,000 kg max.
- Plant operating speed: 1,000 m/min. max.
Cut-to-length lines for aluminum strip

Edge trimming, recoiling, precision leveling, and cutting to length to meet the highest standards

Aluminum sheets and strip for industrial applications and for the aeronautical industry are cut to the required shape on ANDRITZ METALS cut-to-length lines. These lines can process coils or plates with a strip width of 2,850 mm, up to 24 m in length, and with strip thicknesses of 0.8-15 mm. The lines are equipped for edge trimming, recoiling, precision-leveling, and cutting-to-length processes with all the necessary units, such as decoilers, edge trimming shears, precision-leveling machine with exchangeable cassettes, recoilers, cut-to-length shears, or vacuum transfer stacking system.

Technical data

<table>
<thead>
<tr>
<th>Material</th>
<th>Aluminum and aluminum alloys</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tensile strength</td>
<td>max. 500 N/mm²</td>
</tr>
<tr>
<td>Strip thickness</td>
<td>0.8-15.0 mm</td>
</tr>
<tr>
<td>Strip width</td>
<td>900-2,850 mm</td>
</tr>
<tr>
<td>Coil outer diameter</td>
<td>1,100-2,200 mm, with and without sleeves</td>
</tr>
<tr>
<td>Coil inner diameter</td>
<td>610 mm</td>
</tr>
<tr>
<td>Coil weight</td>
<td>22,000 kg</td>
</tr>
<tr>
<td>Sheet length</td>
<td>1,000-15,000 mm</td>
</tr>
<tr>
<td>Stack height</td>
<td>1,500 mm max.</td>
</tr>
<tr>
<td>Stack weight</td>
<td>10,000 kg max.</td>
</tr>
<tr>
<td>Plant operating speed</td>
<td>30 m/min. max.</td>
</tr>
</tbody>
</table>
Electrical and automation equipment for the metals industry

Complete electrical equipment and process automation

The specialist division ANDRITZ Automation supplies complete electrical equipment with drives, automation systems, instrumentation, and all the required technological control systems (TCS). ANDRITZ Automation has sound knowledge and worldwide experience gathered from reference plants in the metals industry sector. The close cooperation between mechanical engineer and automation engineering has proved to be a very big advantage. Very positive synergies result in the field of technical innovations, especially at the hydraulic-electrical and mechanical-electrical interfaces thanks to the communication advantage within ANDRITZ METALS.

What can you expect from us?

- Drive systems for low-voltage and medium-voltage drives with common DC bus systems
- Automation system with HMI
- Automatic gauge control (AGC)
- Pass schedule calculation and process optimization system (model-based)
- Mill management system (MMS): Level-2 system with coil tracking function, model integration, PDI system, roll management, different reporting and management functions, interface to Level-3 system
- System integration for instruments and package unit

A complete overview of our supply portfolio

Numerous customers worldwide rely on our technology and solution competence.

<table>
<thead>
<tr>
<th>Processes</th>
<th>Our products</th>
</tr>
</thead>
<tbody>
<tr>
<td>Processing</td>
<td>Turnkey systems for the processing of steel, stainless steel, aluminum, coated metals, copper and special materials</td>
</tr>
<tr>
<td></td>
<td>Strip processing lines for annealing, pickling, shot blasting, metal coating, hot-dip galvanizing, plastic coating, painting, surface conditioning, tension leveling, coil preparation, coil build-up, grinding, polishing, etc.</td>
</tr>
<tr>
<td>Rolling</td>
<td>Cold rolling mills for reducing, skin passing, cladding, and finish rolling in 20-high, 18-high, 12-high, 6-high, 4-high and 2-high designs as well as combinations of 2-high/4-high or 4-high/6-high design, available as one-way, reversing or tandem mill, inline and offline</td>
</tr>
<tr>
<td></td>
<td>Shape control systems for cold rolling mills and strip processing lines</td>
</tr>
<tr>
<td></td>
<td>Roll grinders</td>
</tr>
<tr>
<td>Finishing</td>
<td>Finishing lines for cutting-to-length, slitting, side trimming, rewinding, inspection and blanking</td>
</tr>
<tr>
<td></td>
<td>Multi-function lines</td>
</tr>
<tr>
<td></td>
<td>Precision leveler</td>
</tr>
<tr>
<td>Electric and automation</td>
<td>Complete electrical equipment including drive systems, process automation and level-2 systems for cold-rolling mills, strip processing lines, and finishing lines. Technological control systems for cold-rolling mills, such as thickness control systems (AGC) as well as fully automatic roll change systems for rolling mills</td>
</tr>
<tr>
<td>Modernization and plant revamp</td>
<td>Modernization packages to meet the most stringent environmental requirements, increase plant productivity and reduce operating costs</td>
</tr>
</tbody>
</table>

Operator’s desk