

## SUCCESS STORY

High capacity  
stainless steel output



METALS

# THE STRIP PROCESSING LINES

AT JINDAL STAINLESS STEEL PLANT

**ANDRITZ**

ENGINEERED SUCCESS



# High-capacity stainless steel output

A part of the O P Jindal group, Jindal Stainless Limited (formerly JSL Stainless Ltd.) is India's largest and the only fully integrated stainless steel manufacturer. Jindal Stainless Limited has grown from an indigenous single-unit stainless steel plant in Hisar, Haryana, to the present multi-location and multi-product conglomerate. Jindal stainless steel capacity after full expansion will be about 2.5 million tons per annum.



## PLANT FACTS

### Hot annealing and pickling line

Material	Cold and hot rolled stainless steel AISI 200, 300, and 400 series
Line capacity	0.8 million tons per year
Strip thickness	2.0–10.0 mm
Strip width	850–1,650 mm
Process speed	150 m/min in the uncoiling section 125 m/min at the S6-high mill exit 100 m/min in the process section
Project start	January 2008
Start of operation	July 2011

### SCOPE OF SUPPLY

- Entry section consisting of two uncoiling groups with uncoiler, flattener and CPC to thread the strip centralized
- Two crop shears with scrap removal system
- Welding machine
- Entry mill accumulator, strip accumulator
- S6-high mill
- Annealing furnace, strip cooling in two air-jet cooling and three water spray cooling chambers
- Four shot blasting chambers located in two identical construction housings
- Pickling section
- Exit crop shear
- Recoiler and elevating car

## THE LINES

In both lines optimized line production is based on high-sophisticated automation tools: "ABB Mathematical Mill Model", "Sundwig Flatness Control System"; "ANDRITZ Line Model (ALM)". The ALM combines ANDRITZ expert knowledge and customer operating experience. It uses the process data and information about both the running and next coils to optimize the production parameters for furnace, scale breaker, shot blaster and pickling process.

## PLANT FACTS

### Cold annealing and pickling line

Material	Cold and hot rolled stainless steel AISI 200, 300, and 400 series
Line capacity	0.45 million tons per year
Strip thickness	0.7–7.0 mm
Strip width	800–1,600 mm
Process speed	180 m/min in the uncoiling section 150 m/min at the S6-high mills exit 120 m/min in the process section
Project start	January 2008
Start of operation	March 2012

### SCOPE OF SUPPLY

- Entry section consisting of two uncoiling groups with uncoiler and CPC to thread the strip centralized.
- Two crop shears with scrap removal system, two welding machines
- Entry mill accumulator, strip accumulator
- Three S6-high mills
- Degreasing section (nozzle section with appr. 90° C, two brush scrub machine sections, 3-stage cascade rinsing heated up by steam injection)
- Annealing furnace
- Strip cooling with air-jet, spray mist and air
- Pickling section
- Inline skin pass mill
- Wet type tension leveller, creep looper, exit crop shear
- Recoiler and elevating car





# State-of-the-art technology and design

As in all plants designed and delivered by ANDRITZ Metals, special emphasis is laid on a maximum of environmental protection. The use of ultra-low NO<sub>x</sub> burners already minimizes the formation of NO<sub>x</sub> in the furnace.

Both pickling lines are equipped with the best available technology of exhaust gas cleaning. All exhaust fans are provided with drop separators prior to inlet and after outlet. Additionally, demineralized water is injected into the fans, thus achieving an additional washing out of acid vapours from the exhaust air.

The fumes produced in the electrolytic and mixed acid pickling sections as well as in the final rinse section additionally pass a gas scrubber and are heated in an air/air heat exchanger by means of hot clean gas obtained from the exhaust air treatment system.

The crude gas then streams into a burning chamber heated with fuel gas. In the NO<sub>x</sub>-reduction reactor, equipped with a solid metal oxide catalyst, ammonia will be added, and by a selective catalytic reduction process (SCR) NO/NO<sub>2</sub> is converted in N<sub>2</sub> and H<sub>2</sub>O. The dosing rate of ammonia is controlled by online measurement of NO<sub>x</sub> concentration with a measuring cell.

The length of the furnace in the HAPL is approximately 145 meters with 4 direct fired zones. The strip cooling system includes two air cooling chambers; the second one is additionally equipped with water-spray-cooling

tubes and three water spray cooling chambers. The last section is a strip dryer section.

The furnace in the CAPL is approximately 205 meters long with one chamber combining unfired and fired pre-heating followed by 4 direct fired zones. The strip cooling system includes ten air cooling chambers, the second air cooling is equipped with mist spraying tubes. Behind the air cooling chambers there is a spray cooling chamber for final cooling, and the strip dryer is the last section.



**145 m**  
—  
HAPL FURNACE SECTION

**205 m**  
—  
CAPL FURNACE SECTION

**4**  
—  
S6-HIGH MILLS

**10**  
—  
AIR COOLING CHAMBERS

**8**  
—  
DFF ZONES

**NO<sub>x</sub>**  
—  
REDUCTION REACTORS









## ENGINEERED SUCCESS FOR FLAT PRODUCT PROCESSING

ANDRITZ Metals is – via the Schuler Group – one of the world's leading suppliers of technologies, plants and digital solutions in sheet metal forming. The product portfolio also includes automation and software solutions, dies, process know-how and service. In the metals processing segment, the business area provides innovative and market-leading solutions for production and processing of flat products, for welding systems, as well as furnaces and services for the metals industry.

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