

# Reduction of zinc consumption on ILVA TARANTO's continuous galvanizing line

HARDY (VAI CLECIM)

## 1. INTRODUCTION

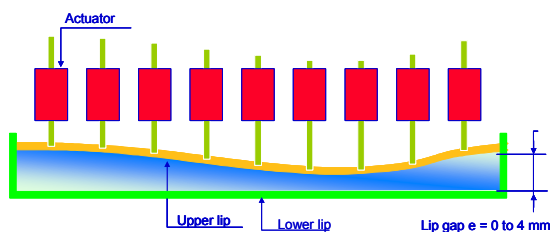
On the site of Taranto, south of Italy, ILVA group has invested in a galvanizing line. This line was engineered and built by VAI CLECIM and has an annual capacity of 450 000 tons for CQ, DQ, DDQ grades. To achieve high coating performance with reduced zinc consumption, a wiping system DAK® (Dynamic Air Knife) has been installed.

## 2. DAK® : MAIN FEATURES

The DAK® System is an original concept, developed by VAI Clecim, to significantly improve the zinc coating properties and to reduce the zinc consumption. It has already been adopted by 12 reference facilities around the world.

The regularity and quality of the zinc coating are dependent on the quality of wiping jets.

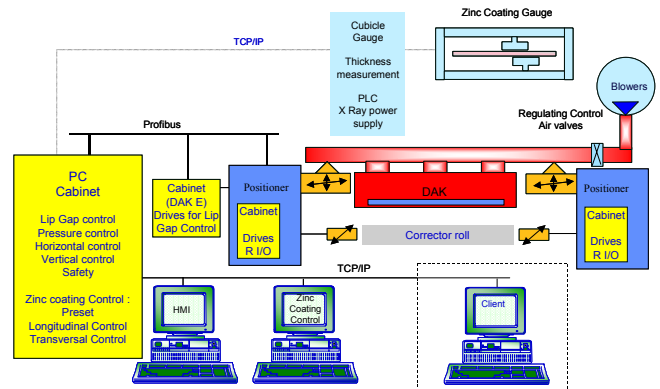
- To control the dispersion of zinc in the transverse direction, the wiping jet is flexible.
  - It is generated between 2 lips fixed to the air chamber
    - the lower lip is stationary
    - the upper lip is deformable and makes it possible to adjust the shape of the air jet according to the zinc distribution on the strip (this distribution is measured by a x-ray gauge located after the cooling tower at Tarente and possibly just after the knives).
- 12 brushless motors ensure adjustment of the blowing profile.



- Tungsten carbide lip coating reduces zinc sticking.

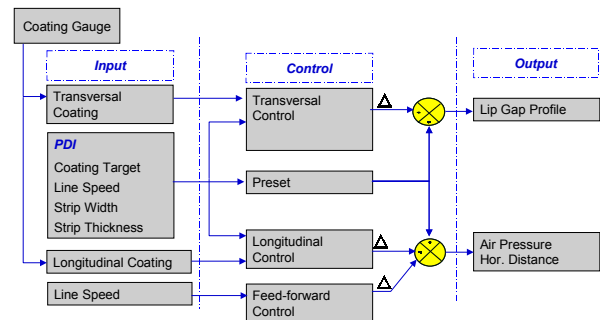
- An automatic cleaning system eliminates the zinc particles, when needed.
- The design of the air chamber allows easy maintenance of the lips.
- 2 positioners equipped with linear tables ensure a precise and repetitive positioning of air knives (vertically and horizontally).

## 3. ZINC COATING CONTROL



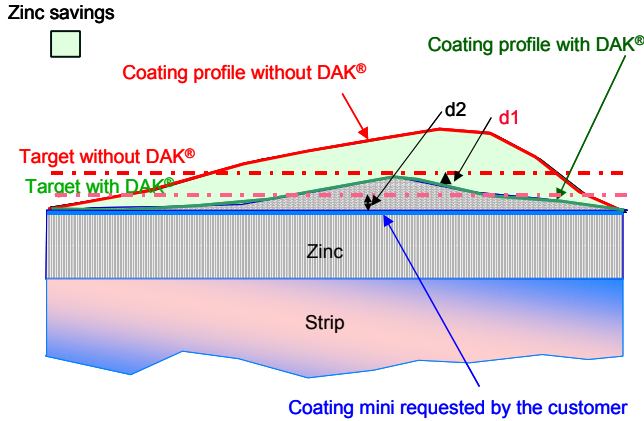
- One PC controls the positioning of DAK® actuators.
- An HMI helps the operator to control the system.
- One PC controls the zinc coating by using product data information, coating gauge data and coating model.

VAI Clecim developed an experimental model of zinc coating, which allows calculation of DAK® presets according to the PDI. The longitudinal and transverse control provides an on-line and real time adjustment of zinc coating leading to reduced zinc consumption.



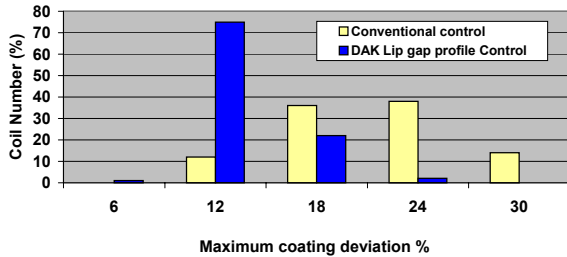
#### 4. RESULTS

The DAK<sup>®</sup>, installed in June 2002, made it possible to reduce the zinc consumption by 8 %.

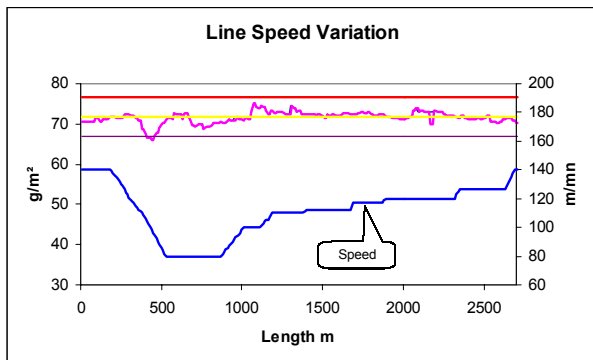


The use of transverse control allowed transverse dispersion to be reduced from 20 % to 12 %.

#### DAK<sup>®</sup> PERFORMANCE



The zinc coating control reduces out-of-tolerance strip lengths during line speed variations and zinc coating target modification.



The longitudinal and transverse control allows differential coating with a ratio 1:2.

As the distance between air knives and coating gauge is about 100 m, Smith predictor model is used to improve response time.

The automatic lip cleaning system decreases out-of-tolerance strip lengths by making lip cleaning easier and faster than with manual cleaning.

#### 5. CONCLUSION

Zinc coating control simplifies the zinc coating management by operators.

Ease of maintenance of immersed rolls and DAK<sup>®</sup> leads to reduced maintenance costs.

The quality of the equipment installed has allowed ILVA to produce quality products at minimum operating costs within a short period. As a result, the system has a proven return of investment of about 6 months.

Through continuous cooperation between ILVA and VAI CLECIM DAK<sup>®</sup> performance keeps improving. Developments are currently under way to increase the lifetime of immersed roll bearings.