MEASUREMENT & ANALYTICS

Stressometer flatness systems increase operational reliability and productivity at stainless steel company in northern Taiwan

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01 Operator at stainless steel mill. The green screen in the background proclaims perfect strip flatness

A precision stainless steel-maker in Taiwan has successfully installed the ABB Stressometer flatness control system. In a short time, the patented ESVD control strategy has increased productivity by 2 percent at its two cluster mills. Both mills are operating in fully automatic mode 100 percent of the time.

Measurement made easy

What has been achieved?
We ask the Site Manager about ABB's Stressometer flatness control installations with the Extended Singular Value Decomposition (ESVD) control strategy:

"With ESVD control strategy, it is easy to reach the target curve and we have much more stable rolling after installing ESVD", says the Site Manager.

The stainless steel company has one 20-high cluster mill and one 12-high cluster mill. The SMS 20-high cluster mill was the first to have Stressometer flatness system installed and started production in 2011. The MHI 12-high cluster mill was installed with Stressometer flatness system in 2013.

The Stressometer system for the 20-high cluster mill was successfully installed with ESVD in 2017. Commissioning was carried through in two steps with a final fine-tuning and to date, the flatness system is running perfectly with ESVD.

"Now we have almost full production and the strip quality is very good", comments the Site Manager.

The mill operators are also satisfied with Stressometer/ESVD. Nowadays they cannot even run the rolling mill without the ESVD. Historically they used wooden sticks to detect tension in their first narrow mill. And now they just watch the screen and it is working perfectly with ESVD.

"We trust the system more than we trust ourselves", expresses one of the Operators.

Side story: Rolling mill on fire
The MHI 12-high mill was on fire in 2012. After extinguishing the fire, the flatness control system was completely out. The production was in a big mess and the company turned to ABB for help and an immediate meeting was set up. During two long days at ABB in Sweden, a new Stressometer flatness control system in the 12-high mill was discussed.

"ABB really took care of us. We got really good support and we felt really important. We got full support from ABB Force Measurement with all experts coming in from all different fields, which we really appreciate. Also we reduced our loss caused by the fire with a short delivery time from ABB", concludes the Site Manager.

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01 Stressometer/ESVD installed at stainless steel company in Taiwan
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02 Finished coils for shipping
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03 Stressometer/ESVD

Company overview and facts

The stainless steel company is the first private cold rolling mill in Taiwan to introduce domestic and foreign cold rolling mills and trimming equipment. Over 30 years, we have devoted to producing, manufacturing and selling stainless steel to gain the good reputation and specialty in stainless steel industry.

Their customers spread over Asia, Middle East, Europe and America. The operation model has been approved by customers in the world. Recently the precise cold rolling and cold rolled spring material have become the target of our R&D and has successfully expanded the product applications into IT industry, household appliance, photo-electronic component and green energy industry.

Mill data (12-high cluster mill)	
Mill builder	MHI 12-high cluster mill with ESVD
Rolled material	Stainless steel
Tonnage per year	60 Ktons
Coil weight	20 tons
Strip width min./max.	550 to 1100 mm
Exit strip thickness max./min.	4.0 to 0.2 mm
Rolling speed	600 mpm

Mill data (20-high cluster mill)	
Mill builder	SMS 20-high cluster mill with ESVD
Rolled material	Stainless steel
Tonnage per year	70 Ktons
Coil weight	23 tons
Strip width min./max.	1000 to 1350 mm
Exit strip thickness max./min.	5.0 to 0.3 mm
Rolling speed	800 mpm

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Supplied equipment

ABB Force Measurement has supplied the following equipment to the two cluster mills:

MHI 12-high cluster mill with ESVD

- One Stressometer flatness system 8.1 with ESVD
- Two (2) Millmate Strip Scanner sensors (MSS)
- Four (4) Strip tension Large PillowBlock load cells

SMS 20-high cluster mill with ESVD

- One Stressometer flatness system 8.2 with ESVD
- Two (2) Millmate Strip Scanner sensors (MSS)
- Four (4) Strip tension Large PillowBlock load cells

"We trust the system more than we trust ourselves"

Operator at stainless steel mill

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Comparison between classic flatness control and ESVD

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01 ABB Stressometer flatness measurement
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02 Stressometer/ESVD. The green strip on the screen proclaims perfect strip flatness.
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03 The ESVD flatness control is enabled at strip lengths of 55 meters.

ESVD is a flatness control system that is able to use all of a mill's actuators on all occasions and for all products; simultaneously and efficiently. Different actuator position combinations give the same flatness effect in cluster mills. No manual control should be needed.

The problem in cluster mill control is to select the optimum actuator combination with minimum actuator movement. The ABB patented method of Extended Singular Value Decomposition (ESVD) has solved this long-standing problem, enabling the actuators to work optimally together as an integrated unit.

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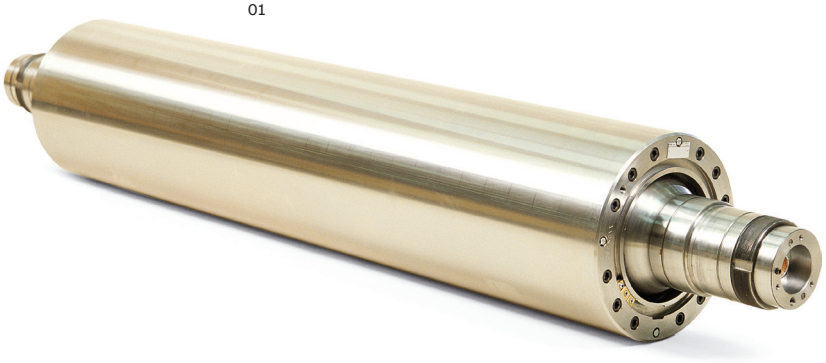

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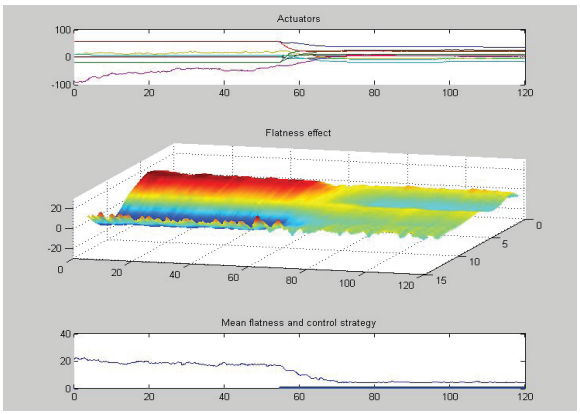

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