

## Schaeffler Global Technology Solutions

Steel and  
non-ferrous metals

ThyssenKrupp Steel Europe AG, Germany

### Condition Monitoring increases Availability of Tandem Line „BETA“

With a turnover of nearly 13 billion euros, ThyssenKrupp Steel Europe AG (TKSE) is the leading manufacturer of high quality flat steel in Germany. The division AUTO Production Dortmund deals exclusively with the production and selling of steel products and services to the automotive industry. The Dortmund site uses an efficient cold rolling mill and modern surface refining installations operating for 24 hours a day to produce precision sheet metal to very high quality requirements.

#### Challenge for Schaeffler

At the Dortmund plant, for a long time TKSE has been using an online condition monitoring system based on FAG components for the monitoring of the pinion stand gearboxes and for chatter mark detection on the BETA tandem line. Qualified analysis and evaluation of the measured data is carried out by the vibration experts of Schaeffler. In order to further improve plant availability and production quality, TKSE decided to expand the scope of equipment monitoring. Based on the high level of satisfaction with services from Schaeffler, the decision was made again in favour of FAG monitoring systems.

#### Schaeffler Solution

Schaeffler installed three additional FAG DTECT X1 systems for permanent monitoring of rolling bearings in the triple roll system, holder, drawing and ASEA rollers on the tandem line. The measured data are sent by remote access to a higher-level control point, from which the data can be evaluated worldwide. As was already the case for the systems on the pinion stand gearboxes, Schaeffler also provided remote diagnosis facilities for the three FAG DTECT X1 systems. The customer is informed promptly if an alarm is triggered. Otherwise, he receives a half-yearly status report.



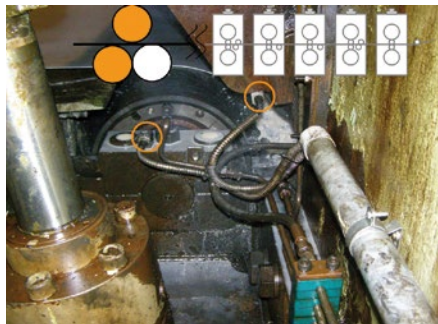
#### Technical Information about the Plant:

Tandem line:	5 stands – quarto with hydraulic adjustment
Capacity:	192 500 tons/month
Max. input speed:	460 m/min
Max. output speed:	1400 m/min
Input strip thickness:	2,00 – 6,0 mm
Output strip thickness:	0,36 – 3,0 mm
Strip width:	700 – 1700 mm
Power rating:	30 MW
Rolling force:	30 MN
Max. coil weight:	52 tons





Online monitoring system FAG DTECT X1



Sensor at triple roll of tandem line in cold rolling mill



Vibration experts at Online Monitoring Center

## Customer Benefit

Already during the installation of the system one damage to a rolling bearing in the top roll of the triple roll installation of the BETA plant was detected. After the damage was reported by the Schaeffler experts, the roll was replaced at the next planned shutdown and opened in the central workshop of TKSE in Duisburg. There the diagnosis was confirmed. Replacement of the roll at the right time made it possible to prevent an unplanned production downtime lasting six hours. Within three months, two more cases of incipient damage were successfully identified. Since monitoring was put into operation, there has been no further unplanned downtime due to roll changes. Material damage such as scratches, and the associated devaluation of the coils, have been significantly reduced. The repair costs of a planned roll replacement are 10 000 euros cheaper than those of an unplanned shutdown. By a total investment of 63 000 euros for the condition monitoring system the supplier part of Schaeffler had paid off in the first three months by three detected damages.

## What's special

On the tandem line, Schaeffler carries out not only condition monitoring of the rolls and pinion stand gearboxes but also quality assurance through chatter mark detection. TKSE benefits from the specific sector know-how of the vibration experts. At the same time TKSE has access to the knowledge of a leading worldwide rolling bearing manufacturer. Thus, the customer profits from application specific products and services from a single source.

### Technical Information about the Solution

#### Monitoring system:

3 x FAG DTECT X1

#### Components monitored:

- FAG DTECT X1 No. 1:  
Triple roll and flatness measurement roll, stand F5, 8 channels
- FAG DTECT X1 No. 2:  
Holding, drawing roll, stand F1 and drawing roll, stand F2, 6 channels
- FAG DTECT X1 No. 3:  
Drawing roll, stand F3, holder, drawing roll, stand F4, 6 channels

#### Sensors:

20 ICP acceleration sensor

#### Housing:

IP 66

#### Communication:

Com-Server

#### Additional signals:

6 different speeds