

Roll Mark Detector

RollmaX-ES1

SIS GmbH
RollmaX

- **A Mill Surface Control System**
- **Detects and Classifies**
 - **Work Roll Marks**
 - **Work Roll Pin Holes**
 - **Chatter Marks**
 - **and other repetitive Structures**
 - **down to 200µm in Size**
- **at Rolling Speed up to 2400 m/min**
- **on Flat Rolled Products**
- **in Harsh Rolling Mill Environment**



Short Description

Cold rolled products, like aluminium foil and strip, must satisfy stringent quality standards. The quality is mainly characterised by gauge, shape and surface properties. While today automatic gauge and shape control is a standard instrumentation of modern rolling mills, web surface inspection still is done visually by human inspectors on a sample basis after each coil.

The objective of the new SIS RollmaX system is to close this "gap" and to provide a powerful new diagnostic tool for operators and process engineers. To our knowledge RollmaX is the first world wide commercially available and production proven system which is able to automatically and continuously control strip surface quality directly in the rolling mill.

The condition of a work roll surface is of essential importance for high product quality of foil and strip. Even the smallest surface specks or grains on reduction rollers imprint rolling defects, so called roll marks often accompanied by roll holes into the foil or strip surface.

SIS developed a production proven inline surface inspection system (SIS patent pending), which detects and classifies at highest rolling speed and web width even small roll marks on foil or strip. RollmaX allows operators to react immediately to defects and stop rolling, so that critical work rolls can be changed, which result in considerable scrap reduction and improvement of productivity and quality.

Features

- Ultra High Speed Surface Inspection System
- Up to 2400m/min Rolling Speed
- Up to 2200mm Strip or Foil Width
- Inspection Scan-Cycle ca. 3min/m (Cross web)
- Detects / Classifies periodical Work Roll Marks
- Defects Size down to 200µm
- Adaptable to wide Area Defects
- Installation direct in Cold Rolling Mill
- Solid-State Sensor Electronics and Light Source
- Compact rugged Sensor Head
- Roll Oil and Kerosene resistant
- State-of-the-Art digital Signal Processing
- Continuous PC-Display of Coil and Roll Status
- Printer Protocol and Data Archive

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RollmaX-ES1 System Principle

The system consists of the following main hardware components:

- Sensor Head (including Light Source)
- Traversing system and Motor Controller
- Signal Conditioning Unit
- Data Acquisition and Computer System

The operating principle is based on the fact that damaged work rolls generate repetitive defects or "streets" (marks) on the web that are not detected until the end of the process. This special "feature" is utilized in order to keep the system cost effective even at very high production speeds and defect size resolution. RollmaX sensors do not cover the entire web width at once, instead the RollmaX sensor is continuously scanning the product cross web while examining the surface through a narrow "inspection window".

The analog sensor signal is continuously digitized, analyzed and classified by fast analog to digital converters and high performance SIS digital signal processing algorithms.

Surface defects are reported to and treated by the Pentium PC, which acts as the operators console. The RollmaX computer evaluates and displays:

- Cross web roll mark profile
- Relative size of roll marks (= level of severeness)
- Location of defects, related to the strip edges
- Quality status of actual coil
- Quality status of actual work roll

The PC provides

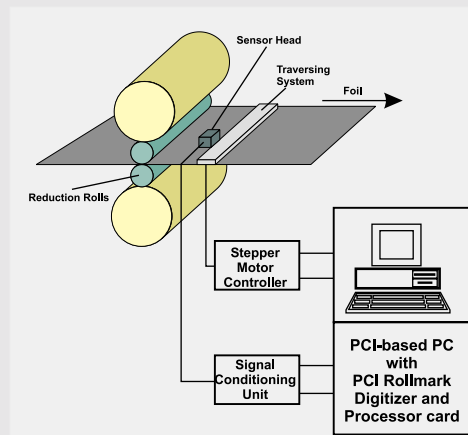
- Printer protocol for coils and work rolls
- Data storage on disk (Excel compatible format)
- Alarm or Warning PLC output

Applications

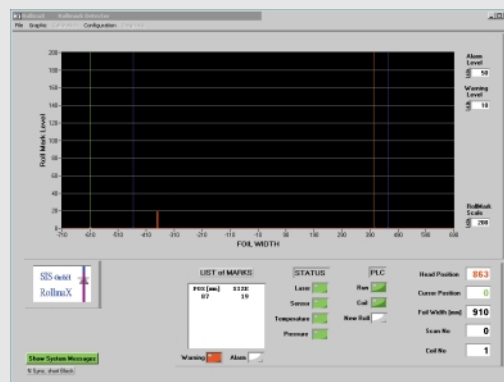
- Ultra High Speed Surface Inspection
- System Installation inside Cold Rolling Mills for continuous Work Roll and Web Control
 - Aluminum Foil
 - Aluminium Strip
 - Copper/Brass Strip
 - Steel Strip
- Repetitive Surface Defect Classification

RollmaX is supplied in a range of customized configurations for different rolling processes and applications.

Do not hesitate to contact us, we look forward to hearing from you!



RollmaX System Setup



RollmaX Screen Shot

Advantages

- minimizes scrap production
- considerably increases productivity
- supports mill operators and process engineers
- reduces energy consumption
- provides important computerized data for statistical process control
- allows quality control of related processes like continuous casting, oil filtering etc.

References (status 09/02)

- 4 systems up and running

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