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PRÜFTECHNIK

Hot dip galvanizing

Application report

Butt weld detection in a continuous hot dip galvanizing line

Hot dip galvanizing line at Ornasteel (Ornatube) Enterprise Corporation, Taiwan

Butt weld detection

The position of the butt weld seam in hot dip galvanizing plants is crucial in order to control the units within the line, e.g.:

- to open and close skin pass mill stands,
- to open stripping lips and to protect them against damage,
- to lift stripping jets for the zinc layer and to protect them against damage,
- to control the shears to precisely cut out the butt weld seam.

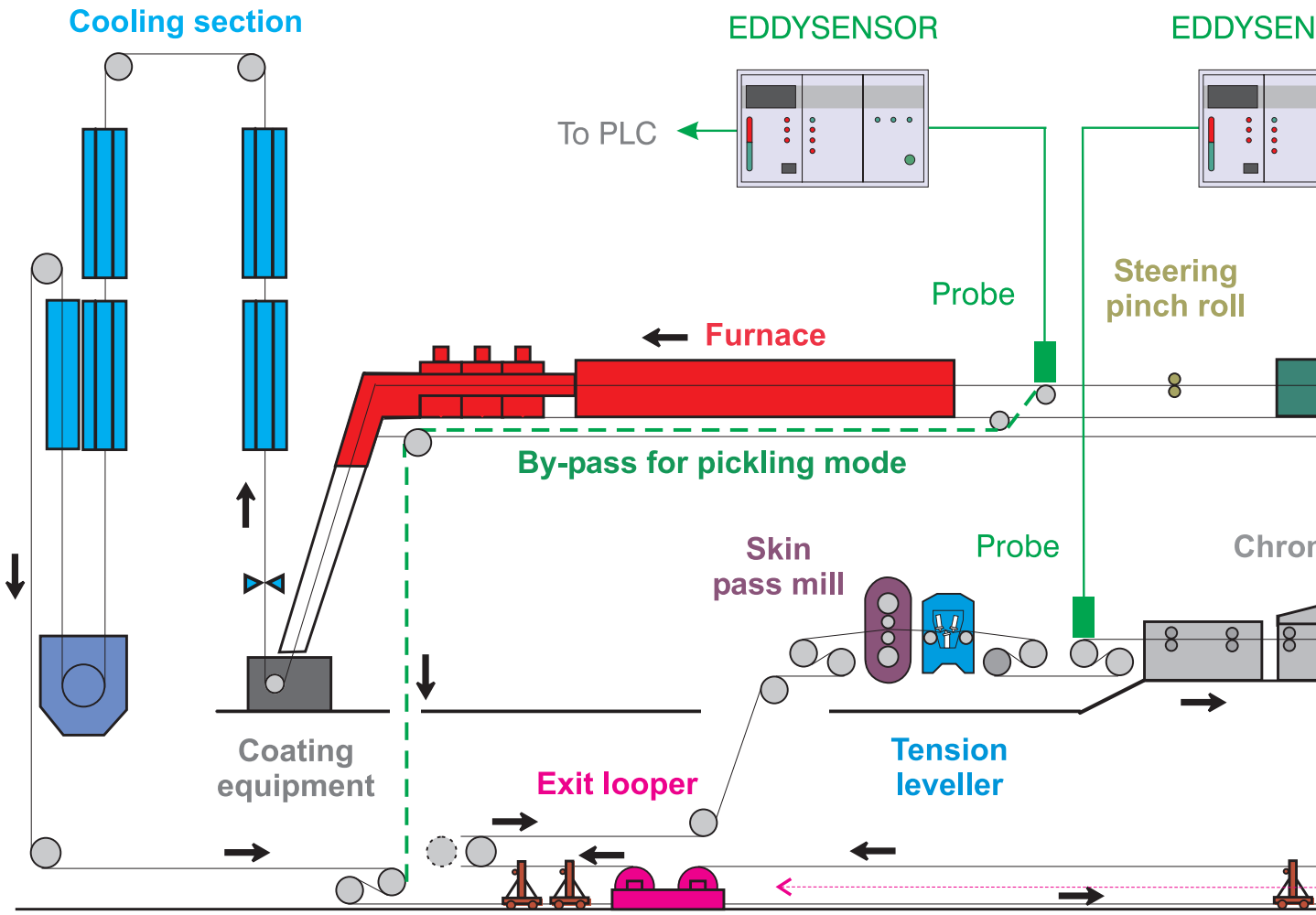
Traditional method

Until now, monitoring has been carried out by punching a hole in the butt weld seam and using light barriers to correct the location generated by encoder signals.

Disadvantages

- Liquid zinc escaping through the hole can block the stripping jets, preventing them from effectively blowing off excess zinc.
- When the hole puncher malfunctions, the units previously listed can no longer be controlled and are likely to become damaged. In addition, butt weld seams will not be cut out accurately.

Combined Pickling - Galvanizing Line, ORNATUBE, Taiwan



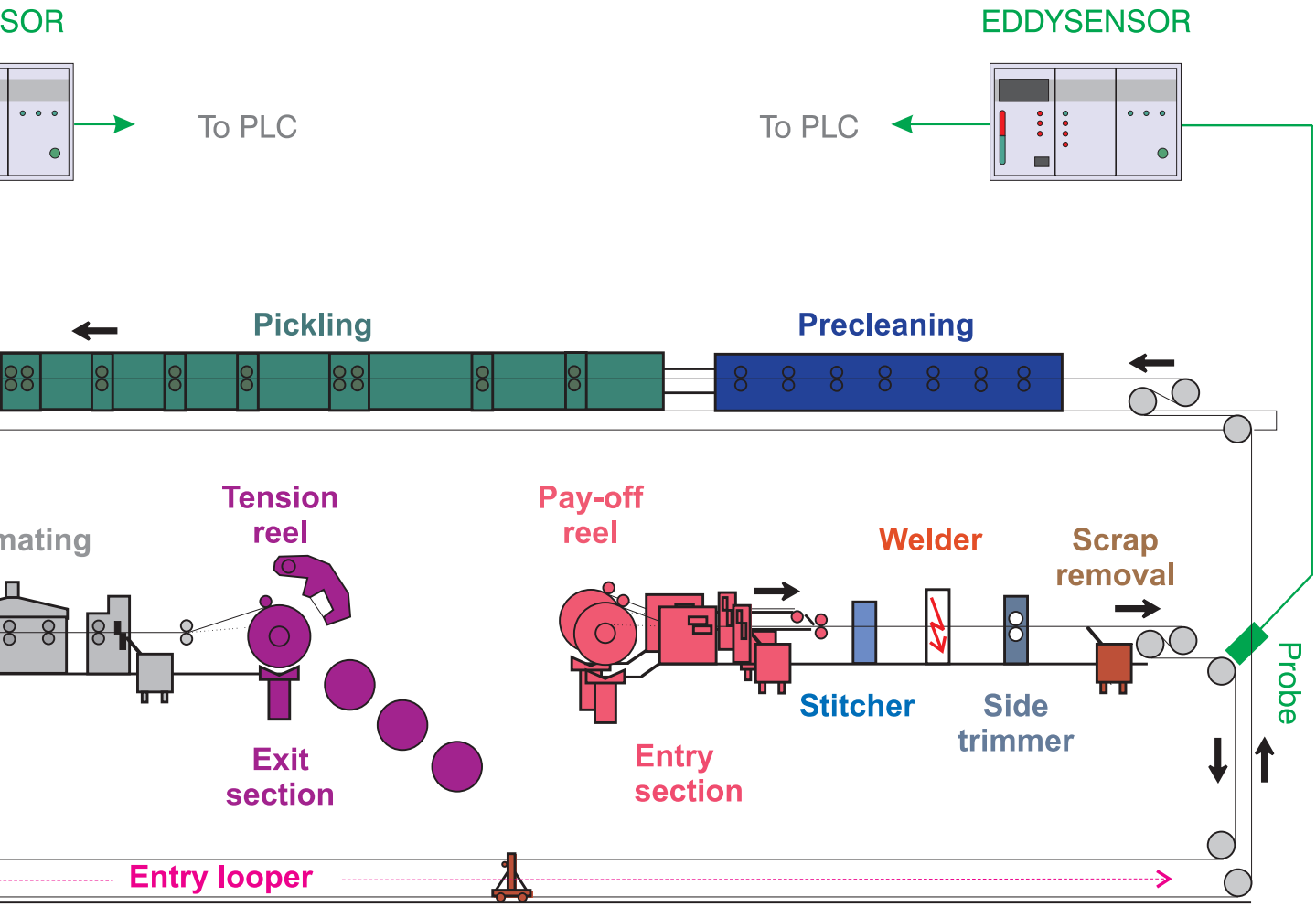
New technology

The EDDYSENSOR testing equipment was developed purely as a sensor for butt weld detection and similar applications.

An eddy current probe reliably recognizes the butt weld even at distances >10 mm from the strip and transmits this position undelayed to the PLC to correct the location the PLC calculated. This principle operates without any contact and does not suffer from the disadvantages mentioned above.

The EDDYSENSOR is normally used at three positions in hot dip galvanizing lines:
1. before the entry accumulator,
2. before the furnace,
3. before the shears.

References
At this time, the EDDYSENSOR effectively and reliably detects butt welds in hot dip galvanizing lines in Austria, Malaysia and Taiwan.



Interference factors

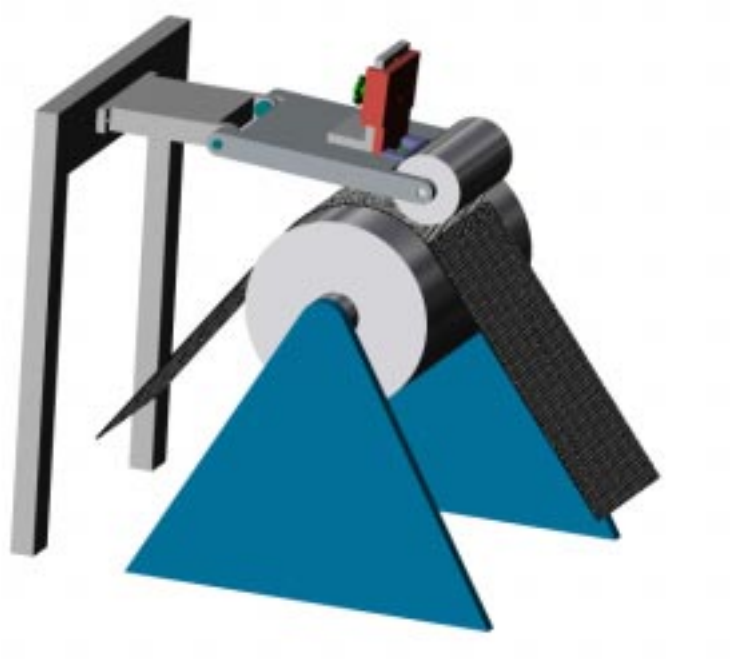
There are some sources of interference that can cause the EDDYSENSOR to transmit a false signal, e.g.:

- kinks in the strip after the entry accumulator or
- excess zinc after the galvanizing zone.

These interference factors can trigger a signal similar to the butt weld seam and are normally so suppressed in the PLC control that only a window of the previously calculated position of the butt weld seam opens in this area and waits for the trigger signal of the EDDYSENSOR. Thus, such interference factors are ignored and this ensures the operational safety of the plant.

Coil holder

The probe for the EDDYSENSOR must be free of vibration and is best placed riding on a drum where the strip is aligned and guided under high tensile stress (see diagram).



Important

The EDDYSENSOR is used purely as a sensor and transmits a simple signal to the PLC control unit. In this way, it is comparable with a light barrier with the distinct advantage that it has none of the negative side effects that occur when using the light barrier method.

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