

CASE STUDY

Automated Water Detection in Steel Rolling

Real-time water ingress monitoring for steel rolling gear oil



In steel rolling operations, protecting critical gear systems from water ingress is essential to maintaining asset integrity and avoiding costly unplanned downtime. **Spectrolytic FluidInspectIR®** provides a data-driven solution that detects water break-in events as they happen — enabling a shift from reactive lab sampling to **real-time, condition-based intervention**.

This case study highlights a proven application where FluidInspectIR® has delivered significant operational and financial benefits.

30%

Water concentration
detected in real time

Real-Time

Automated water
removal trigger

>£100,000

Total saving
over 9 months

The Challenge

In steel rolling operations, water ingress into gear oil causes rapid lubricant degradation and equipment damage. The challenge was a lack of real-time visibility into water contamination — resulting in:

- Rapid lubricant degradation following undetected water ingress
- Risk of damage to critical, high-value rolling equipment
- An inability of standard lab analysis to detect water break-in events in real time
- Critical equipment left exposed between sampling intervals

The operator required a reliable method to detect water ingress as it occurred and protect equipment between sampling intervals.

The Solution

A **Spectrolytic FluidInspectIR®** system was installed to provide continuous, real-time monitoring of water concentration in the gear oil. Using mid-IR based chemical analysis, the system detects water up to **30% concentration** in real time and can **trigger automated water removal systems** — delivering actionable data the moment a break-in event occurs.

This enabled a shift toward automated, evidence-based protection of critical equipment.

Implementation

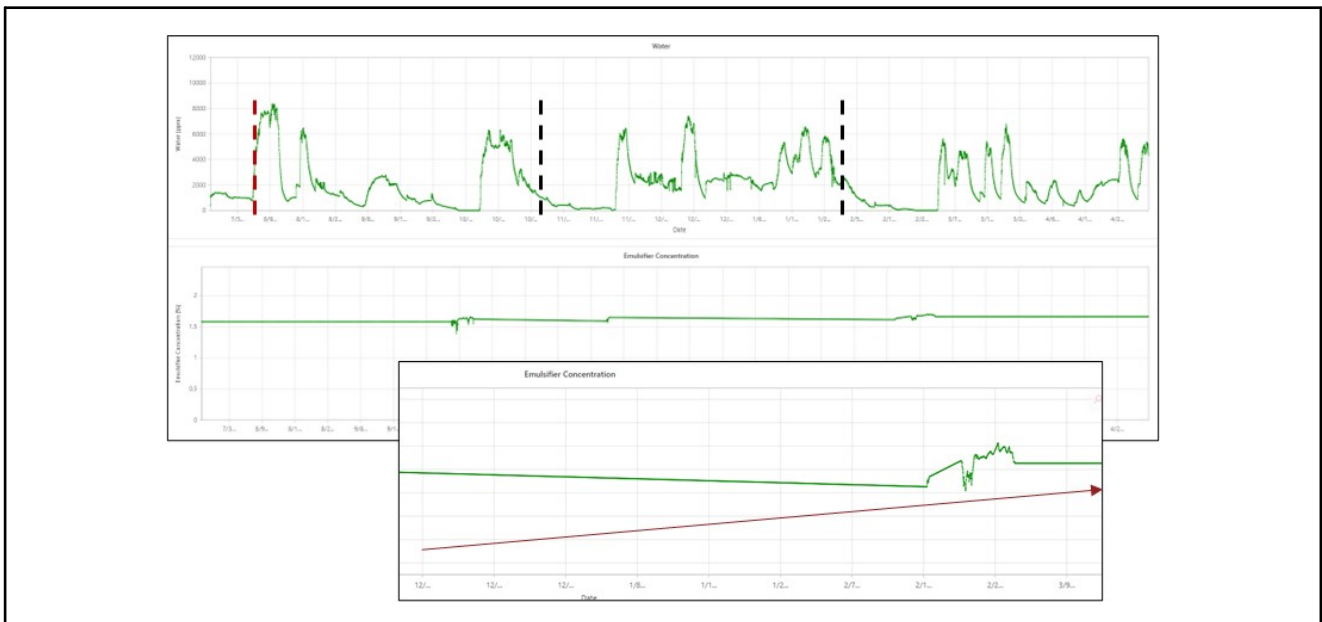
- Installation on critical, high-value steel rolling equipment
- Continuous real-time monitoring of water concentration in gear oil
- Integration with automated water removal systems
- Capture and trending of emulsifier concentration across multiple water break-in events

Results

The deployment delivered clear, measurable outcomes:

- Water detected up to **30% concentration in real time**
- Automated water removal systems **triggered on detection** of break-in events
- Each water break-in event captured by the emulsifier concentration chart — **entirely impossible with standard lab analysis**
- Avoided unplanned downtime and reduced oil spend

USE CASE — STEEL ROLLING: AUTOMATED WATER DETECTION



Real-time water and emulsifier concentration data captured by FluidInspectIR® — showing how each water break-in event is detected, impossible to capture with standard lab analysis.

Operational Impact

- Avoided unplanned downtime through early water detection
- Reduced oil consumption and replacement costs
- Improved health & safety by removing reliance on manual sampling
- Increased confidence in maintenance decision-making
- Protection of critical equipment between traditional sampling intervals

Key Insight

FluidInspectIR® provided the actionable, real-time data required to detect water break-in events that are invisible to periodic lab sampling. Rather than discovering contamination after damage had occurred, the operator could respond automatically the moment water ingress was detected.

Financial Benefits

Total saving over 9 months: > **£100,000**

Conclusion

Spectrolytic FluidInspectIR® enables steel rolling operators to move beyond reactive lab sampling and protect critical equipment with real-time water detection.

The result is a measurable combination of **avoided downtime, reduced oil spend, and improved health & safety** — supported by real, actionable data.

Real-time water detection is no longer just a maintenance improvement — it is a strategic safeguard for high-value assets.

Organisations adopting advanced monitoring solutions such as Spectrolytic FluidInspectIR® today will be best positioned to manage volatility and optimise performance tomorrow.

Interested in understanding how this can be applied within your operations?

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