COGNIMAN

Defect detecion in fibreglass production
3B- the fibreglass company, Norway

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The challenge

3B-the fibreglass company is an innovator and provider of glass fibre to cater to the needs of the automotive and wind sectors and seamlessly integrate into performance composites. The COGNIMAN project addresses the challenge of process performance degradation arising from an unforeseen disruption in production known as the "bushing break." This break causes fibres to tangle and results in increased waste, costs and potential risks to safety and quality.

Pilot description

This pilot focuses on the process of glass fibre production and the effect that "bushing breaks" have on the production process. Glass fibre products are created through a continuous procedure comprising multiple stages. These include batch mixing, glass melting and blending, transporting and distributing molten glass, forming fibres, winding fibres, as well as drying, curing and packaging. The process is designed to generate glass filaments with precise, controlled diameters and involves high temperatures of up to 1600° C.

This filament formation is prone to interruptions known as breaks, resulting in a downgraded process and an average defect and waste rate of up to 12%.

Desired outcome

3B Fibreglass requires a solution where the bushing breaks are predicted, enabling prompt operator response for minimising production disruption and process instability. Automating break categorisation to understand their origins, identify early signs and connect break incidents with monitored upstream parameters during the glass melting phase would solve the challenge.

Envisaged solution

Currently, operators utilise a microscope to manually examine glass beads that form when a glass fibre rupture occurs, a detection made while observing the bushing. No other signs of break are present. COGNIMAN aims to autonomously oversee the bushing and identify breaks by employing sensors and machine learning. This system enables operators to respond promptly to breaks and decrease production interruptions. The automated system will reduce waste, enhance the product's cost-efficiency and consequently enhance the efficiency of recycling glass waste.

Facts and figures

Process challenges

- Difficulty in break identification
- Demanding environment
- Ergonomic concerns
- High mental workload

Integration challenges

- Space constraints for machines
- Probability of electric arc while using metallic devices

Personnel involved in the process

- Furnace Operator
- Bushing Operating Team
- Senior Forming Operator
- Forming Operator
- Bushing Technician

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